N00164.AR.001928
NSA CRANE
5090.3a

FINAL TECHNICAL MEMORANDUM ECOLOGICAL MEDIA CLEANUP GOALS FOR SOLID WASTE MANAGEMENT UNIT 16 SURFACE SOIL NSA CRANE IN
10/1/2013
TETRA TECH

FINAL
TECHNICAL MEMORANDUM
ECOLOGICAL MEDIA CLEANUP GOALS
SWMU 16 SURFACE SOIL
NSA CRANE, INDIANA

Naval Support Activity Crane
Crane, Indiana

Naval Facilities Engineering Command Midwest
Great Lakes, Illinois

Contract Number N62470-08-D-1001
Contract Task Order F27Q

October 2013

FINAL
TECHNICAL MEMORANDUM
ECOLOGICAL MEDIA CLEANUP GOALS
FOR
SWMU 16 SURFACE SOIL
NSA CRANE, INDIANA

Naval Support Activity Crane
Crane, Indiana

Submitted to:
Naval Facilities Engineering Command Midwest
201 Decatur Avenue
Building 1A, Code EV
Great Lakes, Illinois 60088

Submitted by:
Tetra Tech, Inc.
234 Mall Boulevard, Suite 260
King of Prussia, Pennsylvania 19406

CONTRACT NUMBER N62470-08-D-1001
CONTRACT TASK ORDER F27Q

OCTOBER 2013

PREPARED UNDER THE DIRECTION OF:

JAMES GOERDT
PROJECT MANAGER
TETRA TECH, INC.
PITTSBURGH, PENNSYLVANIA

APPROVED FOR SUBMISSION BY:

JOHN TREPANOWSKI, PE
PROGRAM MANAGER
TETRA TECH, INC.
KING OF PRUSSIA, PENNSYLVANIA

TABLE OF CONTENTS

SECTION **PAGE NO.**

EXECUTIVE SUMMARY **1**

1.0 INTRODUCTION **2**

2.0 SAMPLE COLLECTION AND SELECTION FOR TOXICITY TESTS **2**

3.0 TOXICITY TESTS AND TISSUE BIOACCUMULATION ANALYSIS **3**
- 3.1 Earthworm Toxicity Tests 4
- 3.1.1 Protocol Deviations 4
- 3.1.2 Results and Discussion 5
- 3.2 Earthworm Bioaccumulation 6
- 3.3 Plant Toxicity Tests 8
- 3.3.1 Protocol Deviations 8
- 3.3.2 Results and Discussion 8

4.0 DETERMINING THE FINAL PRGS **10**
- 4.1 Soil Invertebrates 10
- 4.2 Invertivorous Birds 10
- 4.3 Terrestrial Plants 11

REFERENCES **12**

ATTACHMENTS

- **1 SOIL SAMPLE FIELD LOG SHEETS**
- **2 TOXICITY TEST LABORATORY REPORTS**
  - **2A EARTHWORM TOXICITY TEST LABORATORY REPORT**
  - **2B RED CLOVER TOXICITY TEST LABORATORY REPORT**
  - **2C RYEGRASS TOXICITY TEST LABORATORY REPORT**
- **3 FLOW CHARTS FROM SAMPLING AND ANALYSIS PLAN**
- **4 EARTHWORM TISSUE REGRESSION ANALYSIS**
- **5 PLANT TOXICITY TEST PLOTS**
- **6 pH PLOTS**

TABLES

NUMBER

1 Surface Soil Sample Log
2 Summary of Analytical Metals Results and Selection of Samples for Toxicity Testing
3 Summary of Earthworm Toxicity Test Data and Statistical Comparisons
4 Earthworm NOECs Based on Survival and Growth in Toxicity Tests
5 Earthworm Tissue Concentrations After 28 Day Toxicity Test
6 Earthworm Bioaccumulation Factors for Lead
7 Calculation of PRGs for Invertivorous Birds Represented by the American Woodcock
8 Summary of Plant Toxicity Test Results
9 Summary of Plant Toxicity Test Data, Statistical Comparison of Survival and Germination
10 Summary of Plant Toxicity Test Data, Statistical Comparisons of Growth
11 NOECs and LOECs for Ryegrass and Clover Based on Growth
12 Soil Remediation Goals

FIGURE

NUMBER

1 Soil Sampling Locations

TECHNICAL MEMORANDUM
ECOLOGICAL MEDIA CLEANUP GOALS
SURFACE SOIL
SWMU 16
NSA CRANE, INDIANA

EXECUTIVE SUMMARY

The Ecological Risk Assessment for SWMU 16 concluded that terrestrial plants and/or invertebrates at SWMU 16 could be impacted from exposure to antimony, copper, lead, and zinc in soil, while birds could be impacted from lead and zinc in soil. Because these conclusions were not based on site-specific toxicity or biological data, toxicity/bioaccumulation tests using surface soil from SWMU 16 and standard test organisms were conducted to establish site-specific soil cleanup goals for antimony, copper, lead, and zinc. Final soil cleanup standards (PRGs) were developed using the site-specific toxicity/bioaccumulation data as follows.

For soil invertebrates, the PRGs are the no-observed-effect concentration (NOECs), except when the NOEC is less than Ecological Soil Screening Levels (Eco SSLs) established by the United States Environmental Protection Agency (USEPA). Therefore, the PRGs for copper [253 milligrams per kilogram (mg/kg)] and zinc (1,950 mg/kg) are the no-observed-effect concentrations NOECs based on the toxicity test data while the PRGs for antimony (78 mg/kg) and lead (1,700 mg/kg) are based on the invertebrate Eco-SSLs.

For avian wildlife (invertivorous birds), the final PRG is the geometric mean of the no-observed-adverse-effect level (NOAEL) PRGs and lowest-observed-adverse-effect level (LOAEL) PRGs. For zinc, this value is 4,580 mg/kg. For lead, this value is 163 mg/kg, which is based on the median bioaccumulation factor (BAF). Because birds are exposed to contamination over large areas, the average concentration across SWMU 16 should be compared to the invertivorous bird PRGs to determine whether areas of elevated concentrations of zinc or lead are present and warrant remediation for this endpoint.

Finally, the geometric mean of the NOECs and LOECs based on impacts to plant growth were selected as the PRGs. These values are 6.3 mg/kg for antimony, 652 mg/kg for lead, and 1,716 mg/kg for zinc. The terrestrial plant PRG for copper (253 mg/kg) is the NOEC because a LOEC could not be developed. All these values are greater than the Eco SSLs for plants.

1.0 INTRODUCTION

The Ecological Risk Assessment for SWMU 16, submitted in December 2008 as part of the Resource Conservation and Recovery Act (RCRA) Facility Investigation Report (RFI) for Solid Waste Management Unit (SWMU) 16 (Tetra Tech, 2008), concluded that terrestrial plants and/or invertebrates at SWMU 16 could be impacted from exposure to antimony, copper, lead, and zinc in soil; and birds could be impacted from lead and zinc in soil. These conclusions were based on generic screening levels and food-chain models using literature-derived soil-to-earthworm bioaccumulation factors (BAFs). The Naval Support Activity (NSA) Crane Project Team decided that site-specific soil cleanup goals that are protective of ecological receptors should be developed. Therefore, toxicity/bioaccumulation tests using surface soil from SWMU 16 and standard test organisms were conducted to establish site-specific soil cleanup goals for antimony, copper, lead, and zinc. This Technical Memorandum describes the studies that were conducted and the methodology that was used to develop the cleanup goals.

The cleanup goals were developed using the methodology presented in Appendix D of the Sampling and Analysis Plan (SAP) for SWMU 16 (Tetra Tech, 2010), except where noted herein.

2.0 SAMPLE COLLECTION AND SELECTION FOR TOXICITY TESTS

Surface soil samples were collected from 18 locations (Figure 1) and were analyzed within seven days of collection for antimony, copper, lead, and zinc. As described in more detail below, of the 18 samples initially collected, nine were selected for toxicity/bioaccumulation testing: eight which were representative of the soil conditions at SWMU 16, and one reference sample (SS116). Note that one of the soil samples selected to represent SWMU 16 soil conditions (SS114) was actually proposed to be a reference sample. However, it was selected to ensure that an appropriate concentration gradient was achieved. Sampling locations were selected based on previous data evaluated in the RFI (Tetra Tech, 2008).

Soil was collected from each location using a hand auger. The SAP indicated that soil samples would be collected from the upper 24 inches of soil. However, based on discussions with EPA Region 5, most samples were collected from less than 24 inches below ground surface (bgs) due to refusal with the hand auger because of the presence of tightly compacted clay in subsurface soil. Instead of collecting to a depth of 24 inches bgs, which in many locations would have included several inches or more of clay, it was agreed that soil samples would be collected from within the root zone for herbaceous plants, vines, and small shrubs. This corresponds to the bioactive zone for most invertebrates and plants, with the exception of trees. The field team visually identified the root zone and collected soil samples from that depth. The sample depth was extended to include approximately one inch of clay when the root zone consisted of loose sand, to ensure that metals that leached to the top of the clay layer were included in the soil samples. The soil was sieved in the field through a 1/8-inch sieve to remove large organic

material and debris, such as roots and rocks. The field logs (Attachment 1) provide details regarding the soil samples, and Table 1 summarizes that information.

Analytical results for the 18 soil samples are presented in Table 2, which also indicates the samples that were selected for toxicity/bioaccumulation tests and the associated rationale for selection. Nine samples (eight site and one reference) were selected which were representative of the range of concentrations of the four chemicals of concern (COCs) (antimony, copper, lead, and zinc) found at SWMU 16. Soil samples selected for toxicity/bioaccumulation testing were also analyzed for pH, total organic carbon (TOC), cation exchange capacity (CEC), and total volatile solids. In addition, the laboratory measured the pH of the soil in the samples initially selected for toxicity testing. However, as discussed below, because the pH in some of these samples was less than the optimal pH range for terrestrial plant toxicity tests, additional samples were selected to replace some of those samples. This is discussed in more detail below and on Table 2.

Four soil samples were collected from locations expected to be free of SWMU 16 related contamination (Tables 1 and 2). SS116 was selected as the reference sample for toxicity/bioaccumulation tests because it was the sample with the lowest concentrations of metals, and was the only one of the four "reference" samples whose soil pH was within the desired range of 6.0 to 7.5, which is the optimal pH range for terrestrial plant toxicity tests. This sample was collected from an area approximately 1,000 feet north of SWMU 16 (Figure 1).

Sample SS114 was initially intended to be a reference sample. This sample was collected 200 feet northwest of what is considered as the area impacted by former operations at the site (Figure 1). Sample SS114; however, was ultimately used to represent the low end of a range of contaminant of potential concern (COPC) concentrations needed to generate a dose-response curve. The pH in sample SS114 was 5.66, which was slightly less than the minimum desired pH of 6.0; therefore, it was not selected as the reference sample. Nevertheless, the sample appeared to be the best representative of low concentrations of metals.

Note that the sample identification numbers in Table 2 and subsequent tables are abbreviated from the identification numbers shown in Table 1. For example, sample SS100 in Table 2 is shown by its complete identification number of 16SS1000001 in Table 1. For convenience, sample numbers in all subsequent tables and in the text of this memorandum are similarly abbreviated.

3.0 TOXICITY TESTS AND TISSUE BIOACCUMULATION ANALYSIS

The eight samples representing SWMU 16 and one reference sample were subjected to the following toxicity/bioaccumulation tests and analyses:

- 28-day earthworm (*Eisenia fetida*) toxicity.
- 28-day earthworm (*Eisenia fetida*) bioaccumulation of lead and zinc.
- 28-day plant toxicity using perennial ryegrass (*Lolium perenne*) and red clover (*Trifolium pratense*).

The earthworm and plant toxicity tests were conducted by EnviroSystems, Inc., (EnviroSystems) Hampton, New Hampshire. The EnviroSystems toxicity reports are provided in Attachment 2. The earthworm tissue analyses were conducted by Katahdin Analytical Services (Katahdin), Scarborough, Maine. The results of the above tests and their use in generating soil cleanup goals for SWMU 16 are presented and discussed below.

3.1 Earthworm Toxicity Tests

A 28-day exposure assay was conducted using earthworms (*Eisenia fetida*) obtained from cultures maintained at the laboratory. The toxicity tests were designed to evaluate the survival and growth of earthworms after 28 days of exposure to SWMU 16 soil. The test methods followed procedures of the American Society for Testing and Materials (ASTM) (2004) and the United States Protection Agency (USEPA) (1989), and used eight samples representing SWMU 16, one reference sample (SS116), and one laboratory control sample. Survival and growth after 28 days were the endpoints of interest. Growth was evaluated for each of five replicates using two methods: (1) total weight of organisms recovered at the end of the test divided by the number of survivors, and (2) total weight of organisms recovered at the end of the test divided by the number of organisms initially exposed. The earthworm toxicity report from EnviroSystems is included in Attachment 2A.

3.1.1 Protocol Deviations

The toxicity laboratory reported four deviations from protocol. Two deviations were related to temperature, one was related to light intensity, and one to the number of test organisms per replicate. These deviations are not believed to have impacted the outcome of the assay, and are discussed below.

The protocol for toxicity tests using *Eisenia fetida* calls for the temperature to be maintained between 19 to 25°C, and at a mean temperature of 22°C ± 1°C. However, the temperature control unit failed during day 16, resulting in a rapid temperature increase from 22°C to 31.4°C. Based on data recovered from the temperature logger, the temperature was above 25°C for 10 hours. The second temperature deviation was that the overall mean temperature during the assay was 20.8°C, which is 0.2°C below the desired mean range of 22°C ± 1°C. Because the elevated temperature duration was short, the mean

temperature was well within the range of 19 to 25°C, and the laboratory control survival was 97.3 percent. The temperature deviations are not believed to have impacted the outcome of the assay.

During the period when the primary incubator was being serviced as a result of the temperature malfunction, the test chambers were maintained in an alternate incubator in which the light intensity was 1,238 lux; this was greater than the protocol range of 100 to 1,000 lux. Because the duration of the elevated light intensity was short and the laboratory control survival was 97.3 percent, the light intensity deviation does not appear to have impacted the outcome of the assay.

At test initiation, 15 earthworms were placed into each of five replicate test chambers for each of the 10 samples being tested. At test conclusion, however, more than 15 surviving earthworms were counted in eight of the 50 test chambers (16 surviving worms were counted in seven chambers, and 18 in one chamber). The laboratory report (Attachment 2A) states that, "In several replicates more than 15 worms were added to the test chamber." In response to this discrepancy, the laboratory director clarified that the earthworms are counted twice in the laboratory before placing them in test chambers; therefore, it is unlikely that more than 15 worms were placed in the chambers. A more likely possibility is that one or more worms were in the samples upon receipt. The laboratory does not sieve soil samples prior to test initiation, so it is possible that a small worm was not discovered. If so, at test termination it would not be possible to differentiate between a "native" worm and a worm that was added at the start of the assay, unless there was an obvious difference in species. Although this would initially seem to cast doubt on the accuracy of the survival measured after 28 days, the uncertainty does not appear to have significantly impacted the test results. The eight aberrations were distributed fairly evenly among six samples, and the survival was consistently high in all replicates (see Appendix A of Attachment 2A).

3.1.2 Results and Discussion

The earthworm toxicity test results and statistical comparisons are summarized in Table 3. Mean survival was 97.3 percent in the laboratory control, 100 percent in the reference sample, and ranged from 96 to 100 percent in SWMU 16 samples. Growth, measured as mean weight (weight of organisms recovered at the end of the test divided by the number of survivors) was 349.8 milligrams (mg) in the laboratory control, 352.6 mg in the reference sample, and ranged from 304.1 mg to 379.0 mg in SWMU 16 samples. Growth measured as weight of organisms recovered at the end of the test divided by the number of organisms initially exposed was also provided by the laboratory (see Attachment 2A). However, because this would be impacted by worm survival, Table 3 presents only the weight data based on the number of survivors. In addition, because survival was relatively high in all samples, differences in the two growth endpoints were minor (Attachment 2A).

As stated above, the survival of earthworms after 28 days was greater than 90 percent in all SWMU 16 samples. In addition, earthworm survival in all SWMU 16 samples was not significantly less than survival of earthworms in the laboratory control sample or in the reference sample (Table 3). Thus, in accordance with the methodology presented in Appendix D of the SAP for SWMU 16 (Tetra Tech, 2010) and summarized in flowcharts provided in Appendix D of the SAP (included herein as Attachment 3), all SWMU 16 samples are classified as "no unacceptable risk" regarding earthworm survival. Chemicals in SWMU 16 soil are not adversely impacting the survival of soil invertebrates at the highest concentrations tested.

The growth of earthworms in SS103 was significantly less than growth in the reference sample, but the growth of earthworms in all SWMU 16 samples was not significantly less than growth of earthworms in the laboratory control sample (Table 3). In accordance with the methodology summarized in flowcharts of the SAP (Attachment 3), all SWMU 16 samples are classified as "no unacceptable risk" regarding earthworm growth, and chemicals in SWMU 16 soil are not adversely impacting the growth of soil invertebrates at the highest concentrations tested.

Based on the earthworm toxicity test results and the conclusions in the two preceding paragraphs, the no observed effects concentrations (NOECs) are 6.5 milligrams per kilogram (mg/kg) for antimony, 253 mg/kg for copper, 656 mg/kg for lead, and 1,950 mg/kg for zinc (Table 4). NOECs are the greatest concentrations in a sample that do not cause a toxic response, and lowest observed effects concentrations (LOECs) are the lowest concentrations greater than the NOEC that do cause a toxic response. LOECs could not be calculated and are not applicable because the highest concentrations tested did not adversely impact survival or growth of the test organisms.

3.2 Earthworm Bioaccumulation

The ecological risk assessment for SWMU 16 (Tetra Tech, 2008) concluded that lead and zinc in surface soil at the site pose potential risks to invertivorous birds (i.e., birds whose primary food items consist of invertebrates). Therefore, after the 28-day toxicity test was completed, earthworms from the toxicity tests were depurated for 24 hours, frozen, and shipped to Katahdin where they were analyzed for lead and zinc. One laboratory control sample and one pre-assay earthworm sample were also analyzed for lead and zinc for comparison purposes. Earthworm tissue concentrations are summarized in Table 5. Lead and zinc concentrations in the pre-assay sample were similar to those in the laboratory control sample after 28 days, but the concentrations were lower than most of the concentrations in the site earthworm tissue samples.

The concentrations of lead and zinc in the earthworm tissue were used to calculate site-specific BAFs, which were then used to develop soil cleanup standards for lead and zinc that are protective of

invertivorous birds. A regression analysis was performed to determine whether earthworm tissue concentrations of lead and zinc were correlated with soil concentrations of lead and zinc (Attachment 4). Earthworm tissue concentrations of zinc were correlated with soil concentrations; therefore, a regression equation was developed and was used to describe the relationship between the zinc concentrations in the soil and the uptake of zinc into the earthworm tissue (Attachment 4). Earthworm tissue concentrations of lead were not correlated with soil concentrations, so lead BAFs were calculated using the BAF equation presented in Appendix D of the SAP, which is provided below.

$$BAF = Ce \div Cs$$

Where:

BAF	=	Non-normalized bioaccumulation factor (unitless)
Ce	=	Chemical concentration in earthworm tissue (mg/kg dry weight)
Cs	=	Chemical concentration in soil sample (mg/kg dry weight)

Lead BAFs in each soil sample were calculated, and from these, the maximum, median, and mean BAFs were determined (Table 6).

As per the SAP, the American woodcock is used herein to represent invertivorous birds. Using the preliminary remediation goal (PRG) equation and exposure assumptions provided in Table 7, which are taken from Appendix D of the SAP (Tetra Tech, 2008), the soil cleanup goals (also known as PRGs) developed to be protective for invertivorous birds were calculated. The only modifications from the SAP is that the LOAEL toxicity reference values (TRVs) for lead and zinc were changed based on comments from USEPA on the Draft Final Technical Memorandum – Ecological Media Cleanup Goals. The LOAEL TRVs the USEPA requested be used to calculate the PRGs were 9.7 mg/kg-day for lead and 128 mg/kg-day for zinc. These TRVs were developed by USEPA using data presented in the Baseline Ecological Risk Assessment Settling Ponds and Spoils Disposal Areas Site, Badger Army Ammunition Plant (SpecPro and Exponent, 2009) as follows:

- Lead TRV: Only bounded LOAEL TRVs for reproduction and growth (where adverse effects ranged from 5 – 15 percent) were used to calculate a geometric mean of 9.7 mg/kg-day for lead. This value was used to represent a maximum15 percent adverse effect for a woodcock.

- Zinc TRV: The geometric mean of the LOAELs with < 25 percent adverse effects based on reproduction or growth endpoints was the LOAEL TRV.

For lead, the PRGs based on the lead no observed adverse effects level (NOAEL) as a TRV are: 18.4 mg/kg (using maximum BAF), 52.3 mg/kg (mean BAF), and 66.6 mg/kg (median BAF). Based on the lead LOAEL as the TRV, the PRGs are: 110 mg/kg (maximum BAF), 311 mg/kg (mean BAF), and 396 mg/kg (median BAF) (Table 7). The three sets of PRG provide a range of cleanup goals, as specified in the SAP. However, because a regression equation was used to describe the bioaccumulation of zinc in the earthworm tissue, only one set of cleanup goals was calculated for zinc. For zinc, the PRGs are: 3,134 mg/kg when using the zinc NOAEL as the TRV, and 6,694 mg/kg when using the LOAEL as a TRV (Table 7).

3.3 Plant Toxicity Tests

Red clover (*Trifolium pratense*) and ryegrass (*Lolium perenne*) 28-day toxicity tests were conducted. The tests for each of the two plant species utilized five replicates for each of the samples being tested, with five seeds per replicate. The toxicity tests were designed to evaluate germination, survival, and growth after 28 days of exposure to SWMU 16 soil. Growth was evaluated based on three endpoints: plant height, above ground biomass (shoot dry weight), and below ground biomass (root dry weight). The test methods for the two species followed protocols of ASTM (2004) and USEPA (1989), and used the same eight SWMU 16 samples and reference sample as in the earthworm toxicity tests. A laboratory control sample was also tested. The plant toxicity reports from EnviroSystems are included in Attachments 2B and 2C.

3.3.1 Protocol Deviations

The desired temperature for plant toxicity tests is 25 ± 3°C. The laboratory that conducted the toxicity test reported that during three days the temperature exceeded this range: temperatures of 28.2°C, 29.4°C, and 28.3°C were recorded on days 21, 25, and 26, respectively. These slight deviations are not believed to have affected test results. No other deviations were reported by the laboratory.

3.3.2 Results and Discussion

The results of the plant toxicity tests are summarized in Table 8, and the statistical comparisons to the reference and laboratory control samples are summarized in Tables 9 and 10. Germination of ryegrass and germination of clover in the SWMU 16 samples were not significantly less than in the reference sample (Table 9). Although seed germination was an endpoint for the plant toxicity tests, the flowcharts in Appendix D of the SAP (Attachment 3) did not include a flowchart for seed germination. The data evaluation for germination followed the flowchart for plant survival.

Survival of ryegrass in the SWMU 16 samples was not significantly less than in the reference sample (Table 9). Survival of clover was significantly less than the reference and laboratory control in SS114 (Table 9), indicating potentially unacceptable site-related risk to plants in that sample. Survival of clover in other samples was not significantly less than in the reference sample (Table 9).

The growth of ryegrass (measured as above ground biomass) in SS114 was significantly less than in the reference and laboratory control (Table 10). The growth of clover (measured as below ground biomass) in SS104 was significantly less than in the reference and laboratory control (Table 10). The growth of clover (measured using all three growth parameters) in SS106, SS112, and SS114 was significantly less than in the reference and laboratory control (Table 10). Thus, samples SS104, SS106, SS112, and SS114 indicated potentially unacceptable site-related risk to plants, since at least one of three growth parameters in these four samples was less than the reference and laboratory control samples (Table 10).

Because four SWMU 16 samples were classified as posing "potentially unacceptable site-related risk to plants" (Tables 9 and 10), concentration plots were generated. The plots did not indicate a relationship between chemical concentrations and toxicity (Attachment 5). The methodology presented in Appendix D of the SAP for SWMU 16 (Tetra Tech, 2010) states that if a dose-response relationship is not identified for a chemical (as was the case for the plant toxicity data), “it will be determined that the chemical is not responsible for any observed toxicity and that chemical will be eliminated as a COPC.” However, it appears that the pH in several of the soil samples used in the toxicity test might have impacted the results. Therefore, the data were evaluated further to determine whether it was appropriate to develop NOECs and LOECs for plants despite the absence of an apparent relationship between chemical concentrations and toxicity. Because the greatest impacts to the site samples compared to the reference sample was for the growth endpoint, and because pH can affect plant growth (see below), this is the endpoint that was further evaluated.

The pH level for optimal plant growth is 6.0 to 7.5 (ASTM, 2009). As presented in Table 2, the pH was used to help select the samples used for toxicity testing; several samples initially proposed for testing were ultimately not selected because the pH was less than 6.0. The samples with the higher metals concentrations generally had the higher pH values, and the samples with the lower metals concentrations generally had the lower pH values (see Table 2 and the plots in Attachment 6). It appears that the naturally occurring pH level at the site is between 5 and 6, because that is the pH of the soil in the reference samples collected from the wooded area (SS114 and SS115). Sample SS116 had a pH value of 6.96, but this was collected in a grassy area well north of the site and may not consist of natural material. The reason for the higher metals in the area of higher pH is not known, but is suspected that the ash that contained the high concentrations of metals may have had a buffering effect on the soil to help raise the pH to more neutral levels.

Although attempts were made to select samples for toxicity testing that were within the pH range of 6.0 to 7.5, a few exceptions had to be made based on the metals concentrations in order to establish a concentration gradient. The pH in three samples used in the toxicity tests (SS101, SS103, and SS104) were slightly higher than 7.5 (Table 2), while the pH in one sample (SS114) was 5.66, which is less than the minimum recommended pH of 6.0. The plots of soil pH versus height of clover (*Trifolium pratense*), soil pH versus above ground biomass of clover, and soil pH versus below ground biomass of clover show moderate correlations of pH and growth (see Attachment 6). Thus, pH appears to have had some impact on the growth of clover in the toxicity tests. The low pH may have made the metals that were present more bioavailable. However, because the concentrations in most of the samples with lower growth were low, the low pH more likely made the nutrients less available and affected the absorption of nutrients by plant roots. The extent to which pH might have impacted the plant toxicity tests is unclear, but the observed toxicity in sample SS104, which had the greatest metals concentration was not due to low pH; the pH in sample SS104 (7.54) was just slightly greater than 7.5; therefore, pH was not low in this sample. Table 11 presents the NOECs and LOECs for the plants, based on the growth endpoint. NOECs were 6.1 mg/kg for antimony, 253 mg/kg for copper, 648 mg/kg for lead, and 1,510 mg/kg for zinc (Table 11). LOECs were 6.5 mg/kg for antimony, 656 mg/kg for lead, and 1,950 mg/kg for zinc (Table 11). An LOEC could not be developed for copper because the maximum concentration was in a non-toxic sample. Note that the NOECs for antimony and lead were similar to their respective LOEC values, which increases the uncertainty that the toxicity observed at SS104 (the toxic sample with the highest concentrations of antimony and lead) was actually related to the antimony or lead. It is more likely that the toxicity was due to zinc, because there was a larger range of values between the NOEC and LOEC for zinc.

4.0 DETERMINING THE FINAL PRGS

Soil cleanup standards (PRGs) were developed to be protective of receptors at SWMU 16 that the Ecological Risk Assessment (Tetra Tech, 2008) concluded could be at risk. These receptors consist of terrestrial invertebrates, terrestrial plants, and invertivorous birds.

4.1 Soil Invertebrates

LOECs could not be developed for invertebrates; therefore, the PRGs are the NOECs (Table 4), except when the NOEC is less than Ecological Soil Screening Levels (Eco SSLs) established by USEPA. As per Appendix D of the SAP, the Eco SSL will be the PRG when the Eco SSL is higher than the NOEC. For terrestrial invertebrates at SWMU 16, the invertebrate Eco SSLs for antimony (78 mg/kg; USEPA, 2005a) and lead (1,700 mg/kg; USEPA, 2005b) are the PRGs (Table 12). The PRGs for copper (253 mg/kg) and zinc (1,950 mg/kg) are the NOECs based on the toxicity tests.

4.2 Invertivorous Birds

In accordance with Appendix D of the SAP, the PRG for avian wildlife (invertivorous birds) is the geometric mean of NOAEL PRGs and LOAEL PRGs (Table 12). For zinc, this value is 4,580 mg/kg. The PRG for lead is 163 mg/kg, which based on the median BAF (Table 7). The median is a more appropriate measure of central tendency than the mean when outliers such as the BAF in SS114 (see Table 6) are present in a dataset. Both of the PRGs exceed the avian Eco SSLs for lead and zinc.

Because birds are exposed to contamination over large areas, the average concentration across SMWU 16 will be compared to the invertivorous bird PRGs to determine whether areas of elevated concentrations of zinc or lead are present and warrant remediation for this endpoint.

4.3 Terrestrial Plants

The geometric mean of the NOECs and LOECs based on impacts to plant growth were selected as the PRGs. The PRGs for lead and zinc shown in Table 11 exceed the plant-related Eco SSLs for lead (120 mg/kg) (USEPA, 2005b), and zinc (160 mg/kg) (USEPA, 2007a). There is no plant-related Eco SSL for antimony. Thus, terrestrial plant PRGs are 6.3 mg/kg for antimony, 652 mg/kg for lead, and 1,716 mg/kg for zinc (Table 12). The terrestrial plant PRG for copper (253 mg/kg) is the NOEC, because a LOEC could not be developed and the Eco SSL is a lower concentration (70 mg/kg) (USEPA 2007b).

References

American Society for Testing and Materials (ASTM). 2004. Standard Guide for Conducting Laboratory Soil Toxicity or Bioaccumulation Tests With the Lumbricid Earthworm *Eisenia fetida* and the Enchytraeid Potworm *Enchytraeus albidus.* E 1676-04, West Conshohocken, Pennsylvania.

ASTM. 2009. Standard Guide for Conducting Terrestrial Plant Toxicity Tests. E-1963-09. West Conshohocken, Pennsylvania.

SpecPro Inc. and Exponent, Inc. 2009. Baseline Ecological Risk Assessment Settling Ponds and Spoils Disposal Areas Site, Badger Army Ammunition Plant, Baraboo, Wisconsin. October.

Tetra Tech. 2008. Resource Conservation and Recovery Act Facility Investigation Report for Cast High Explosives Fill/B146 Incinerator (SWMU 16), Naval Surface Warfare Center Crane, Crane, Indiana. Prepared for Naval Facilities Engineering Field Division South (NAVFAC EFD SOUTH. December.

Tetra Tech. 2010. Sampling and Analysis Plan for SWMU 16 Cast High Explosives/ Building 146 Incinerator Ash Pile Toxicity Testing, Naval Support Activity Crane, Crane, Indiana. Prepared for Naval Facilities Engineering Command Midwest. May.

USEPA (U.S. Environmental Protection Agency). 1989. Protocol for Short Term Toxicity Screening of Hazardous Waste Sites. EPA/600/3-88/029.

USEPA, 2005a. Ecological Soil Screening Level for Antimony, Interim Final. Office of Emergency and Remedial Response. OSWER Directive 9285.7-61. February.

USEPA, 2005b. Ecological Soil Screening Level for Lead, Interim Final. Office of Emergency and Remedial Response. OSWER Directive 9285.7-70. March.

USEPA, 2007a. Ecological Soil Screening Level for Zinc, Interim Final. Office of Emergency and Remedial Response. OSWER Directive 9285.7-73. November.

USEPA, 2007b. Ecological Soil Screening Level for Copper, Interim Final. Office of Emergency and Remedial Response. OSWER Directive 9285.7-68. February.

TABLE 1

SURFACE SOIL SAMPLE LOG
SWMU 16 TOXICITY TESTING
NSA CRANE, CRANE, INDIANA

Sample Location	Sample Number	Depth (inches)	Description	Habitat	Observations/Notes
Site Locations					
16SB100	16SS1000001/ FD060910-01	0-12"	Large gravel to 10"; 10-12" brown clay.	Railroad Track	50% large gravel to 10" below surface
16SB101	16SS1010001	0-13"	Grayish-brown loose sand from 0-12"; Orangish, brown clay with gravel from 12-13".	Open area	Root zone from 0-5 inches. One inch of clay was included in sample.
16SB102	16SS1020001	0-8"	Brown silty clay with some rocks; bedrock at 8".	Open area	Earthworms were observed in soil.
16SB103	16SS1030001	0-12"	Brown silty clay to 10"; Gray clay from 10-12".	Open area	Clay appears to be weathered bedrock.
16SB104	16SS1040001	0-10"	Orange-brown loose sand from 0-9 inches; whitish-gray clay from 9-10".	Open area	Root zone from 0-5 inches. One inch of clay was included in sample. Clay layer may be weathered bedrock. Some large ricks were present.
16SB105	16SS1050001	0-10"	Orangish-brown sandy clay from the surface to 10".	Open area	Root zone from 0-3 inches. Very small organic layer at the surface. Sample was mostly clay.
16SB106	16SS1060002	0-16"	Dark brown silty clay top soil from 0-3"; Orangish-brown silty clay from 3-16".	Wooded area	Root zone from 0-14 inches.
16SB107	16SS1070001	0-6"	Brown-gray clay ranged from 1-6" in depth, depending on area. Roots in clay.	Open area	Roots observed in gray clay.
16SB108	16SS1080002	0-20"	Brownish-orange loose sandy moist clay from 0-19"; whitish hard clay at 19 inches.	Open area	One inch of hard clay was included in sample.
16SB109	16SS1090002	0-24"	Brown silty semi-dry clay from 0-24".	Open area	Root zone from 0-17 inches in clay. Large rocks; few small rocks.
16SB110	16SS1100002	0-24"	Brownish/orange with lots of black sandy clay, and slightly moist.	Wooded area	Root zone from 0-18 inches. Many large rocks and roots.
16SB111	16SS1110002	0-24"	Brownish/orange with dark specks sandy clay. Loose material and a little moist.	Wooded area	
16SB112	16SS1120001	0-8"	Black organic peat from 0-2"; Brown silty-clay from 2-8".	Wooded area	Bedrock at 8".
16SB113	16SS1130001	0-12"	Black organic peat from 0-1"; Black/light brown silty-clay from 1-2"; Light brown silty clay with sand from 2-12".	Wooded area	Root zone from 0-10 inches. Bedrock at 12". Very few rocks.
Reference Locations					
16SB114	16SS1140001	0-12"	Brown with some organic matter speckles; silty-clay with some gravel from 0-12".	Wooded area	Refusal at 12 inches because of rocks.
16SB115	16SS1150001	0-14"	Orangish-brown silty clay from 0-14".	Wooded area	Bedrock at 14 inches. Rocks on surface and scattered throughout soil profile.
16SB116	16SS1160002	0-16"	Grass and topsoil from 0-2"; Brown silty clay from 2-16".	Open area	Root zone from 0-6 inches.
16SB117	16SS1170002	0-24"	Brownish-orange silty clay from 0-24".	Open area	

TABLE 2

SUMMARY OF ANALYTICAL METALS RESULTS AND SELECTION OF SAMPLES FOR TOXICITY TESTING SWMU 16 TOXICITY TESTING NSA CRANE, CRANE, INDIANA

Sample Number	Soil data; mg/kg dry wt.[1]				Total Solids (%)	pH[2]	TOC[3] (mg/kg)	CEC[3] (meq per 100g)	Total Volatile Solids (%)	Selected for Toxicity Testing?	
	Antimony	Copper	Lead	Zinc						Yes/No	Rationale
Site Samples											
SS100	42.3	1880	5480	5800	91.2					No	Poor habitat at this location (railroad bed). Sample was mostly gravel and soil was not representative of other soil samples.
FD[4]	44.2	2130	6390	5650	90.4					No	
SS101	4.2	132	452	576	91.6	7.82	36000	33	2.7	Yes	Moderate concentrations of metals.
SS102	6.1	253	648	1270	89.4	7.33	19000	23	3.7	Yes	High (antimony, copper, lead) to moderate (zinc) concentrations of metals.
SS103	4.3	170	422	1510	93.2	7.55	8100	55	2	Yes	High (zinc) to moderate (antimony, copper, lead) concentrations of metals.
SS104	6.5	216	656	1950	82.6	7.54	9100	40	3.28	Yes	High concentrations of all metals.
SS105	4.5	141	403	1360	90.4					No	Sample was solid clay.
SS106	1.9 J	112	318	932	80.5	6.02	13000	16	4.9	Yes	Moderate concentrations of metals
SS107	3.1	117	444	996	84.9					No	Similar concentrations in 16SS1060001.
SS108	0.76 J	27	32.7	144	82.1	5.28				No	Soil pH was outside the desired range (6.0 to 7.5) for plant toxicity tests.
SS109	3	135	277	1130	86.9	7.41	8500	25	3.31	Yes	Moderate concentrations of metals
SS110	2.9 UJ	27.2	51.9	168	79.3	5.13				No	Soil pH was outside the desired range for plant toxicity tests.
SS111	0.92 J	28.3	58.8	223	64.2	5.13				No	Soil pH was outside the desired range for plant toxicity tests.
SS112	0.88 J	57.9	175	706	79.4	6.24	25000	31	3.91	Yes	Moderate concentrations of metals
SS113	0.74 J	36.4	114	410	66.4					No	Not needed for concentration gradient.
Reference Samples											
SS114[5]	2.2 UJ	31.8	77.2	277	65.8	5.66	16000	27	4.03	Yes	Low concentrations of metals; suitable for low concentration gradient even though it was collected from a reference location.
SS115	2 UJ	14.7	41.2	133	66.7	5.50				No	Soil pH was outside the desired range for plant toxicity tests.
SS116	2.9 UJ	19.9	52.1	186	80.5	6.96	7800	19	2.91	Yes	Lowest metals concentration with soil pH within the acceptable range for the plant toxicity test.
SS117	2.2 UJ	14.6	21.6	71.6	72.5	5.50				No	Even though it had the lowest metals concentrations and a similar soil type as the site samples, the soil pH was outside the acceptable range for the plant toxicity test.

Footnotes:

1 Metals were analyzed on a quick-turn basis.
2 Soil pH was measured by the toxicity test laboratory.
3 Total organic carbon (TOC), Cation Exchange Capacity (CEC), and Total Volatile Solids were only analyzed for in samples where toxicity tests were conducted.
4 This sample was a field duplicate of SS100.
5 Sample was originally intended to represent reference location, but due to detected concentrations of metals, was used to represesent low concentration gradients at SWMU 16.
J - estimated value
UJ - nondetect, estimated value

Note: The sample numbers were abbreviated on this table and all remaining tables in this section as discussed in the text.

TABLE 3

SUMMARY OF EARTHWORM TOXICITY TEST DATA AND STATISTICAL COMPARISONS
SWMU 16 TOXICITY TESTING
NSA CRANE, INDIANA

Sample Number	Survival				Growth			
	Survival (%)	Statistically Different Compared to:		Risk	Growth (mg)[1]	Statistically Different Compared to:		Risk
		Reference SS116	Lab Control			Reference SS116	Lab Control	
Laboratory Control Sample								
Lab Control	97.3	-	-	NA	349.8	-	-	NA
Reference Sample								
SS116	100	-	No	NA	352.6	-	No	NA
Site Samples								
SS101	98.7	No	No	no unacceptable risk[2]	330.0	No	No	no unacceptable risk[3]
SS102	100	No	No	no unacceptable risk[2]	328.7	No	No	no unacceptable risk[3]
SS103	96	No	No	no unacceptable risk[2]	304.1	Yes	No	no unacceptable risk[3]
SS104	98.7	No	No	no unacceptable risk[2]	311.9	No	No	no unacceptable risk[3]
SS109	98.7	No	No	no unacceptable risk[2]	329.8	No	No	no unacceptable risk[3]
SS106	98.7	No	No	no unacceptable risk[2]	308.1	No	No	no unacceptable risk[3]
SS112	100	No	No	no unacceptable risk[2]	340.5	No	No	no unacceptable risk[3]
SS114	97.3	No	No	no unacceptable risk[2]	379.0	No	No	no unacceptable risk[3]

1 - Wet weight; total weight of organisms recovered divided by the number of survivors.
2 No unacceptable risk - survival in sample is greater than 90 percent and is similar to survival in laboratory control and reference sample.
3 No unacceptable risk - growth in sample is not significantly less than growth in laboratory control sample.

NA - Not applicable

TABLE 4

EARTHWORM NOECs BASED ON SURVIVAL AND GROWTH IN TOXICITY TESTS
SWMU 16 TOXICITY TESTS
NSA CRANE, INDIANA

Sample Number	Concentrations (mg/kg)			
	Antimony	Copper	Lead	Zinc
SS116 (Reference sample)	2.9	19.9	52.1	186
SS101	4.2	132	452	576
SS102	6.1	253	648	1270
SS103	4.3	170	422	1510
SS104	6.5	216	656	1950
SS109	3	135	277	1130
SS106	1.9	112	318	932
SS112	0.88	57.9	175	706
SS114	2.2	31.8	77.2	277
NOEC(1)	6.5	253	656	1950

1 - Survival and growth were not impacted in any sample, so the no observed effects concentration (NOEC) is the highest concentration of each metal.

Note: Lowest observed effects concentrations for earthworm survival and growth are not applicable because the concentrations tested had no impacts on test organisms.

TABLE 5

EARTHWORM TISSUE CONCENTRATIONS AFTER 28 DAY TOXICITY TEST
SWMU 16 TOXICITY TESTING
NSA CRANE, INDIANA

Sample Number	Lead (mg/kg)[1]	Zinc (mg/kg)[1]	Total Solids (%)
Pre-assay[2]	0.2 J	73.7	17
Lab Control	0.2 J	87	17
SS116	3	85.4	19
SS101	16.5	112	20
SS102	34.2	168	21
SS103	49.8	200	20
SS104	98.7	218	20
SS106	86.1	170	20
SS109	19.8	124	20
SS112	31.4	160	19
SS114	46.6	117	20

1 - Dry weight concentrations
2 - The pre-assay sample was collected from the same batch of earthworms used in the bioaccumulation test. However, they were collected at the beginning of the bioaccumulation test to represent baseline concentrations.
J - Estimated value

TABLE 6

EARTHWORM BIOACCMULATION FACTORS FOR LEAD
SWMU 16 TOXICITY TESTING
NSA CRANE, INDIANA

Sample Identification	Dry Weight Concentrations of Lead (mg/kg)		Lead BAF
	Earthworm Tissue	Soil	
SS116	3	52.1	0.06
SS104	98.7	656	0.15
SS103	49.8	422	0.12
SS102	34.2	648	0.05
SS109	19.8	277	0.07
SS106	86.1	318	0.27
SS112	31.4	175	0.18
SS101	16.5	452	0.04
SS114	46.6	77.2	0.60

Maximum	0.60
Median	0.12
Mean	0.17

BAF - Bioaccumulation factor = tissue concentration/soil concentration

TABLE 7

CALCULATION OF PRGs FOR INVERTIVOROUS BIRDS REPRESENTED BY THE AMERICAN WOODCOCK
SWMU 16 TOXICITY TESTING
NSA CRANE, INDIANA

Chemical	BAF[1]	Bird TRVs		PRGs		Geometric Mean (mg/kg)
		NOAEL (mg/kg-day)	LOAEL (mg/kg-day)	NOAEL PRG (mg/kg)	LOAEL PRG (mg/kg)	
Lead (Maximum BAF)	0.6	1.63	9.7	18.4	110	45
Lead (Average BAF)	0.17	1.63	9.7	52.3	311	128
Lead (Median BAF)	0.12	1.63	9.7	66.6	396	163
Zinc	0.067 × Cs + 86.8	66.1	128	3134	6694	4580

1 - See Table 6 for derivation of lead BAFs and Attachment 4 for derviation of zinc BAFs.
2 - The PRG for lead was calculated using the below equation. The PRG for zinc was calculated by reversing the equation and plugging in a soil concentration until the EEQ was 1.0.

$$PRG = \frac{BW*TRV*EEQ}{[(BAF*If)+(Is)]*AUF}$$

American Woodcock Exposure Inputs	Average Values	Units
Body Weight = BW	0.1895	kg
Food Ingestion Rate = If	0.0253	kg/day
Soil Ingestion Rate - Is	0.0016	kg/day
Home Range = HR	61.3	acres

AUF - Area Use Factor (assumed 100%) = Site Acreage/HR
BAF - Soil-to-earthworm bioaccumulation factor
BW - Body Weight
Cs - Chemical concentration in soil
EEQ - Ecological Effects Quotient (equals 1.0)
If - Food Ingestion Rate
Is - Incidental Surface Soil Ingestion Rate
LOAEL - Lowest Observed Adverse Effects Level
NOAEL - No Observed Adverse Effects Level
PRG - Preliminary Remediation Goal
TRV - Toxicity Reference Value (i.e., NOAEL or LOAEL)

TABLE 8

SUMMARY OF PLANT TOXICITY TEST RESULTS
SWMU 16 TOXICITY TESTING
NSA CRANE, INDIANA

Ryegrass (*Lolium perenne*)					
Sample Identification	**Seed Germination (%)**	**Survival (%)**	**Growth**		
			Plant Height (mm)	**Mass (mg)[1]**	
				Above Ground	**Below Ground**
Laboratory Control Sample					
Lab Control	84	84	106.6	3.22	9.42
Reference Sample					
SS116	56	56	131.9	4.32	8.79
Site Samples					
SS101	64	64	103.1	3.56	2.80
SS102	64	60	80.3	1.75	3.51
SS103	40	40	91.5	2.10	3.29
SS104	56	56	89.7	1.87	2.20
SS109	44	44	122.1	2.45	3.02
SS106	88	84	107.8	3.58	8.51
SS112	76	76	131.9	5.21	6.20
SS114	28	28	81.4	0.74	1.44

Clover (*Trifolium pratense*)					
Sample Identification	**Seed Germination (%)**	**Survival (%)**	**Growth**		
			Plant Height (mm)	**Mass (mg)[1]**	
				Above Ground	**Below Ground**
Laboratory Control Sample					
Lab Control	76	76	61.8	18.00	6.91
Reference Sample					
SS116	72	72	28.8	7.43	5.83
Site Samples					
SS101	64	64	25.7	9.15	5.26
SS102	68	60	26.0	7.55	3.73
SS103	60	60	21.4	5.17	5.51
SS104	60	56	22.3	4.44	2.95
SS109	72	68	30.8	10.65	8.70
SS106	56	56	18.0	3.79	1.70
SS112	56	56	17.3	4.53	1.04
SS114	56	48	13.8	3.21	0.88

1 Dry weight, mean result of 5 replicates

TABLE 9

SUMMARY OF PLANT TOXICITY TEST DATA [1]
STATISTICAL COMPARISONS OF SURVIVAL AND GERMINATION
SWMU 16 TOXICITY TESTING
NSA CRANE, INDIANA

Ryegrass *(Lolium perenne)*							
		Statistically different when compared to:			Statistically different when compared to:		
Sample Number	**Survival (%)**	**Reference SS116**	**Lab Control**	**Germination (%)**	**Reference SS116**	**Lab Control**	**Conclusion**
Lab Control Sample							
Lab Control	84	-	-	84	-	-	NA
Reference Sample							
SS116	56	-	NO	56	-	NO	NA
Site Samples							
SS101	64	NO	YES	64	NO	YES	No unacceptable site-related risk to plants[2]
SS102	60	NO	YES	64	NO	YES	No unacceptable site-related risk to plants[2]
SS103	40	NO	YES	40	NO	YES	No unacceptable site-related risk to plants[2]
SS104	56	NO	NO	56	NO	NO	No unacceptable risk to plants[3]
SS109	44	NO	YES	44	NO	YES	No unacceptable site-related risk to plants[2]
SS106	84	NO	NO	88	NO	NO	No unacceptable risk to plants[3]
SS112	76	NO	NO	76	NO	NO	No unacceptable risk to plants[3]
SS114	28	NO	YES	28	NO	YES	No unacceptable site-related risk to plants[2]

Clover *(Trifolium pratense)*							
		Statistically different when compared to:			Statistically different when compared to:		
Sample Number	**Survival (%)**	**Reference SS116**	**Lab Control**	**Seed Germination (%)**	**Reference SS116**	**Lab Control**	**Conclusion**
Lab Control Sample							
Lab Control	76	-	-	76	-	-	NA
Reference Sample							
SS116	72	-	NO	72	-	NO	NA
Site Samples							
SS101	64	NO	NO	64	NO	NO	No unacceptable risk to plants[3]
SS102	60	NO	NO	68	NO	NO	No unacceptable risk to plants[3]
SS103	60	NO	NO	60	NO	NO	No unacceptable risk to plants[3]
SS104	56	NO	NO	60	NO	NO	No unacceptable risk to plants[3]
SS109	68	NO	NO	72	NO	NO	No unacceptable risk to plants[3]
SS106	56	NO	NO	56	NO	NO	No unacceptable risk to plants[3]
SS112	56	NO	YES	56	NO	YES	No unacceptable site-related risk to plants[2]
SS114	48	YES	YES	56	NO	YES	Potentially unacceptable site-related risk to plants[4]

1 Attachments 2B and 2C present the complete toxicity reports.

2 No unacceptable site-related risk to plants - seed germination and survival in sample is significantly less than seed germination and survival in laboratory control sample, but is not significantly less than seed germination and survival in reference sample.

3 No unacceptable risk to plants - seed germination and survival in sample is not significantly less than seed germination and survival in laboratory control sample.

4 Potentially unacceptable site-related risk to plants - survival in sample is significantly less than survival in laboratory control sample and reference sample.

TABLE 10

SUMMARY OF PLANT TOXICITY TEST DATA [1]
STATISTICAL COMPARISONS OF GROWTH
SWMU 16 TOXICITY TESTING
NSA CRANE, INDIANA

Ryegrass *(Lolium perenne)*										
		Statistically different when compared to:			Statistically different when compared to:			Statistically different when compared to:		
Sample Number	Plant Height (mm)	Reference SS116	Lab Control	Above Ground Mass[2] (mg)	Reference SS116	Lab Control	Below Ground Mass[2] (mg)	Reference SS116	Lab Control	Conclusion
Lab Control Sample										
Lab Control	106.6	-	-	3.22	-	-	9.42	-	-	NA
Reference Sample										
SS116	131.9	-	NO	4.32	-	NO	8.79	-	NO	NA
Site Samples										
SS101	103.1	YES	NO	3.56	NO	NO	2.80	NO	YES	No unacceptable site-related risk to plants[3]
SS102	80.3	YES	NO	1.75	NO	NO	3.51	NO	YES	No unacceptable site-related risk to plants[3]
SS103	91.5	YES	NO	2.1	NO	NO	3.29	NO	YES	No unacceptable site-related risk to plants[3]
SS104	89.7	YES	NO	1.87	NO	NO	2.20	NO	YES	No unacceptable site-related risk to plants[3]
SS109	122.1	NO	NO	2.45	NO	NO	3.02	NO	YES	No unacceptable site-related risk to plants[3]
SS106	107.8	YES	NO	3.58	NO	NO	8.51	NO	NO	No unacceptable site-related risk to plants[3]
SS112	131.9	NO	NO	5.21	NO	NO	6.20	NO	NO	No unacceptable site-related risk to plants[3]
SS114	81.4	YES	NO	0.74	YES	YES	1.44	NO	YES	Potentially unacceptable site-related risk to plants[4]

Clover *(Trifolium pratense)*										
		Statistically different when compared to:			Statistically different when compared to:			Statistically different when compared to:		
Sample Number	Plant Height (mm)	Reference SS116	Lab Control	Above Ground Mass[2] (mg)	Reference SS116	Lab Control	Below Ground Mass[2] (mg)	Reference SS116	Lab Control	Conclusion
Lab Control Sample										
Lab Control	61.8	-	-	18.00	-	-	6.91	-	-	NA
Reference Sample										
SS116	28.8	-	YES	7.43	-	YES	5.83	-	NO	NA
Site Samples										
SS101	25.7	NO	YES	9.15	NO	YES	5.26	NO	NO	No unacceptable site-related risk to plants[3]
SS102	26	NO	YES	7.55	NO	YES	3.73	NO	YES	No unacceptable site-related risk to plants[3]
SS103	21.4	NO	YES	5.17	NO	YES	5.51	NO	NO	No unacceptable site-related risk to plants[3]
SS104	22.3	NO	YES	4.44	NO	YES	2.95	YES	YES	Potentially unacceptable site-related risk to plants[4]
SS109	30.8	NO	YES	10.65	NO	NO	8.70	NO	NO	No unacceptable site-related risk to plants[3]
SS106	18	YES	YES	3.79	YES	YES	1.70	YES	YES	Potentially unacceptable site-related risk to plants[4]
SS112	17.3	YES	YES	4.53	YES	YES	1.04	YES	YES	Potentially unacceptable site-related risk to plants[4]
SS114	13.8	YES	YES	3.21	YES	YES	0.88	YES	YES	Potentially unacceptable site-related risk to plants[4]

1 Attachments 2B and 2C present the complete toxicity reports.

2 Dry weight, mean result of five replicates.

3 No unacceptable site-related risk to plants- growth in sample is not significantly less than growth in laboratory control sample, and/or growth is not significantly less than in reference sample.

4 Potentially unacceptable site-related risk to plants - growth in sample is significantly less than growth in laboratory control sample and reference sample.

TABLE 11

NOECs AND LOECs FOR RYEGRASS AND CLOVER BASED ON GROWTH
SWMU 16
NSA CRANE, INDIANA

Sample Identification	Concentrations of metals (mg/kg)			
	Antimony	Copper	Lead	Zinc
Toxic samples[1]				
SS104	6.5	216	656	1950
SS106	1.9	112	318	932
SS112	0.88	57.9	175	706
SS114	2.2	31.8	77.2	277
Non-Toxic Samples[2]				
SS116	2.9	19.9	52.1	186
SS101	4.2	132	452	576
SS102	6.1	253	648	1270
SS103	4.3	170	422	1510
SS109	3	135	277	1130
NOEC[3]	6.1	253	648	1510
Maximum concentration in toxic sample	6.5	216	656	1950
LOEC[4]	6.5	NA	656	1950
Geometric mean of NOEC and LOEC	6.3	NA	652	1716

1 - Samples exhibiting potentially unacceptable site-related risk in toxicity tests; summarized in Table 10.
2 - Samples exhibiting no unacceptable site-related risk in toxicity tests, as summarized in Table 10.
3 - No observed effects concentration; highest concentration in a non-toxic sample.
4 - Lowest observed effects concentration; lowest concentration in a toxic sample that is greater than the maximum concentration in a non-toxic sample.
NA - Not applicable; maximum detected concentration was in a non-toxic sample.

TABLE 12

SOIL REMEDIATION GOALS
SWMU 16 TOXICITY TESTING
NSA CRANE, INDIANA

Assessment Endpoint	Concentrations of metals (mg/kg)			
	Antimony	Copper	Lead	Zinc
Soil Invertebrates				
Preliminary Remediation Goal	78[(1)]	253	1,700[(1)]	1,950
Invertivorous Birds				
Preliminary Remediation Goal	-	-	163	4,580
Terrestrial Plants				
Preliminary Remediation Goal	6.3	253	652	1,716

1 - Based on USEPA Ecological Soil Screening Levels (USEPA 2005a and b).

PGH P:\GIS\CRANE_NSWC\MAPDOCS\MXD\SWMU16_TOX_LOCS_REV.MXD 10/23/13 SP

DRAWN BY	DATE
S. PAXTON	10/23/13
CHECKED BY	DATE
J. GOERDT	10/23/13
REVISED BY	DATE
—	—
SCALE	
AS NOTED	

NAVFAC

SOIL SAMPLING LOCATIONS
SWMU 16 CAST HIGH EXPLOSIVES FILL/
BUILDING 146 INCINERATOR
NSA CRANE
CRANE, INDIANA

CONTRACT NUMBER	CTO NUMBER
3539	F27Q
APPROVED BY	DATE
—	—
APPROVED BY	DATE
—	—
FIGURE NO.	REV
1	0

ATTACHMENT 1

SOIL SAMPLE FIELD LOG SHEETS

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: SMWU 16
Project No.: 1126 00041

[✓] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 16SS100 0001
Sample Location: 16 SB 100
Sampled By: BLT
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 6/9/10
Time: 1175
Method: Hand Auger & Tow
Monitor Reading (ppm): NA

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
0-10"	gravel +	gravel fill
10"-12"	BR	clay Bed Rx at 1'

COMPOSITE SAMPLE DATA:

Date:
Method:
Monitor Readings (Range in ppm):

Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Antimony, Copper, Pb + Zn	4 oz jar		
Sent to Toxicology Lab held until analytical results from metals may or may not do TOX Analysis	3-1 gallon Buckets		

OBSERVATIONS / NOTES:

50% Large gravel to 10" Below surface
BR clay to Bed Rx -

MAP:

Collect at same location as Coor. provided in SAP

Circle if Applicable:

MS/MSD

Duplicate ID No.: FD060910-01

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page 1 of ___

Project Site Name: SWMU 16
Project No.: 112G00041

[✓] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 16SS101 0001
Sample Location: 16SB101
Sampled By: B. Collins
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 6/9/16
Time: 1115
Method: hand auger/travel
Monitor Reading (ppm): 0

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
0-13 ~~feet~~ inches	0-12 was grayish brown sand	12-13 inches was orangish brown clay. Filled w/gravel

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
- Lab analysis for Antimony, Copper, lead, zinc	4 oz jar		
- Send to Toxicolosy lab to ~~for~~ holding until we get analytical results (may or may not do tox analysis).	3-1 gallon buckets		

OBSERVATIONS / NOTES: Lots of gravel

Root zone from 0-5 inches bgs
Loose sand from 0-12 inches
Hit the thick clay layer at 12 inches bgs. Included 1 inch of clay in the sample (per EPA).

MAP:

Collected sample at coordinates provided in the SAP

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s): BG

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: SWMU 16
Project No.: 1126 00041

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 16SS102 0001
Sample Location: 16 SB 102
Sampled By: GLT
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 6/9/10			
Time: 3:15:15	8"	BR	Silty clay - Dry
Method: Hand Auger? Two			Some Rocks
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Antimony, Cu, PB, Zn	4oz glass	GPAP	
	3 - 1 gallon plstic Bags		

OBSERVATIONS / NOTES:

8" A hog - with Earth worms - Bed rx at 8" Some large Rocks -

MAP:

Collected At Same location as Coor provided in SAP

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: SWMU ~~B~~ 16
Project No.: 112G 00041

[x] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 16SS103 0001
Sample Location: 16SB103
Sampled By: BLT
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: ~~5-05~~ 6/3/10			
Time: 5:05			
Method: Hand auger & Trowel	1 foot	Brown	silty clay to 10"
Monitor Reading (ppm):		GRAY	clay 10'-12"

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Antimony, Copper, lead, & Zinc	4 oz jar		
Tox analysis (holding until we receive metals results).	3 1-gallon buckets		

OBSERVATIONS / NOTES:

Few Rocks - silty clay to clay at 10" - clay appears to be weathered Bedrock

MAP:

As per SAP

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: SWMU16
Project No.: 112G00041

[✓] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 16SS104000 1
Sample Location: 16SB104
Sampled By: B. Collins
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 6/9/10
Time: 14:45
Method: Hand auger/travel
Monitor Reading (ppm):

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
0 – 10 inches	0-9 inches = brownish gray 9-10 = whitish gray	→ sandy clay material w/some rocks → clay

COMPOSITE SAMPLE DATA:

Date:
Method:
Monitor Readings (Range in ppm):

Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Lab analysis for Antimony, Copper, lead, zinc	4 oz jar		
Toxicology lab to hold until we get analytical results (may or may not do tox analysis)	3 1-gallon buckets		

OBSERVATIONS / NOTES:

Root zone: 0-5 inches
Sandy material from 0-9 inches
Hit a thick clay layer (weathered bedrock?) at ~~10~~ 9 inches. Included 1 inch of clay in the sample (per EPA).
Has some large rocks

MAP:

Collected sample at coordinates provided in the SAP.

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s): B. C.

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: SWMU 16
Project No.: 112G00041

[✓] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 16SS105000 1
Sample Location: 16SB105
Sampled By: B. Collins
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 6/9/10 Time: 17:45 Method: Hand auger/bowl Monitor Reading (ppm):	0 - 10 inches	orangish brown	Sandy clay (very small organic layer)

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Lab Analysis for Antimony, copper, lead zinc	4 oz jar		
Tox analysis (lab will hold & may or may not analyze)	3 1-gallon buckets		

OBSERVATIONS / NOTES:

Soil was a sandy clay material from the surface (just under organic layer) on down. Root zone approx. 3 inches deep. Sampled to 10 inches even though it was solid clay b/c the whole location was solid clay

MAP:

used coordinates from SAP

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: SWMU 16
Project No.: 112G00041

Sample ID No.: 16SS106 0002
Sample Location: 16 SB 106
Sampled By: GLT
C.O.C. No.:

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 6/10/10
Time: 3:30
Method: Hand Auger
Monitor Reading (ppm): 0

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
~~[illegible]~~ 3"	Dic BR	Silty clay top soil
3"–16"	Organic BR	Silty clay –

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Antimony, Pb, Zn, Cu	4 oz. glass		
Tox analysis (holding until we receive the metals results).	3 1 gallon Bags		

OBSERVATIONS / NOTES:

Roots to 14"
in woods

MAP:

As per SAP

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: SWMU 16
Project No.: 112G00041

[✓] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 16SS107 0001
Sample Location: 16SB107
Sampled By: BLT
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 6/9/10	6"	BR	Silty Clay
Time: 19:17		GRAY	clay
Method: Hand Auger			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Antimony, Zn, Cu, Pb	40 glass		
Tox Analysis (holding until we receive metals results)	3 - 1 gal Bag		

OBSERVATIONS / NOTES:

GRAY clay at 1" Below Surface in places - 6" Below service in other Roots in GRAY clay

MAP:

As per SAP

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: SWMU 16
Project No.: 112G00041

[✓] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 16SS108 0002
Sample Location: 16SB108
Sampled By: B. Collins
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 6/10/10
Time: 0945
Method: hand auger
Monitor Reading (ppm):

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
0-~~20 feet~~ 19 inches (19-20 inches)	brownish orange → whitish clay	sandy clay (loose material) Clay not very hard; moist → hard clay at ~~20~~ 19 inches

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Lab Analysis - Antimony, copper, lead, zinc	4 oz jar		
Tox Analysis (holding until we tell them to analyze)	3 - 1 gallon buckets		

OBSERVATIONS / NOTES:

Augered down to ~2 feet bgs because the material was not a hard clay. Hit a hard clay at approx. 19 inches, so augered down to 20 inches (ted an inch of the hard clay)

MAP:

Used coordinates provided in SAP

Duplicate ID No.:

Signature(s): BCS

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: SWMU 16
Project No.: 112 G 00041

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 16 SS109 0001
Sample Location: 16 SB 109
Sampled By: GLT
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 6/10/10
Time: 0945
Method: Hand auger
Monitor Reading (ppm):

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
~~0-16"~~ 0-24"	BR	silty clay, semi dry

COMPOSITE SAMPLE DATA:

Date:
Method:
Monitor Readings (Range in ppm):

Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Antimony Pb, Cu, Zn	4 oz jar		
Tox analysis (holding until we receive metals results)	3 - 1 gal. Bag		

OBSERVATIONS / NOTES:

Roots to 17" in clay
large rocks - but few
small rocks

MAP:

location as
16 SB 109 from
SAP

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: SWMU 16
Project No.: 112G00091

[✓] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 16SS110 0002
Sample Location: 16SB110
Sampled By: B. Collins
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 6/10/10 Time: 1800 Method: hand auger Monitor Reading (ppm): 0	0-2	brownish orange w/ lots of black	sandy clay, slightly moist, lots of large roots

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Lab Analysis for antimony, copper, lead, zinc	4 oz jar		
Tox. analysis (holding until metals results come back)	3 1-gallon buckets		

OBSERVATIONS / NOTES:

Made the following hand auger holes to collect sample from
0-12 inches: Hit a large root & could not go farther
0-18 inches: Hit a root " "
0-15 inches: Hit a root " "

MAP:

[illegible] coordinates in SAP

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: SWMU 16
Project No.: 112G00041

[✓] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 16SB1110002
Sample Location: 16SB111
Sampled By: B. Collins
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 6/10/10 Time: 1550 Method: Hand auger Monitor Reading (ppm):	0-2 feet	brownish orange w/ dark specks	sandy clay - loose a little moist

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Lab Analysis for antimony, copper, lead, zinc	4 oz		
Tox analysis (hold until we know metals results)	3 1-gallon buckets		

OBSERVATIONS / NOTES:

Collected 3 hand auger holes (24 inches deep) ~~feet~~ of soil. Soil is a loose sandy clay

MAP:

Used coordinates from SAP

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

BS

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: SWMU 16
Project No.: 112G00041

[✓] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 16SS112 0001
Sample Location: B112
Sampled By:
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 6/10/10
Time: 13:15
Method: Hand Auger
Monitor Reading (ppm): 0

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2"	Bk	peat
2-8'	Br	silty clay

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Arsenic, Pb, Zn, Cu	4oz glass		
	3 1 gallon containers		

OBSERVATIONS / NOTES:

organic layer at top scraped away - Bedrock at 8"

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: SWMU 16
Project No.: 112G0004

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 16SS113 0001
Sample Location: 16SB113
Sampled By: GLT
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 6/11/16
Time: 13:13
Method: Hand Auger
Monitor Reading (ppm):

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
0-1"	Blk	peat
1-2"	Blk & Lt Br	silty clay
2"-12"	Lt Br	silty clay w/ sand

COMPOSITE SAMPLE DATA:

Date:
Method:
Monitor Readings (Range in ppm):

Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Antimony, Pb, Zn, Cu	4 oz glass		
	3-1 gallon plastic tubs		

OBSERVATIONS / NOTES:

Bed Rx at 12"
Organic layer - scraped away
Roots to 10" - Dry silty clay w/ sand - very few Rxs

MAP:

Location based on 16SB113

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: SWMU 16
Project No.: 112G0004

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 16SS1140001
Sample Location: 16SB114
Sampled By: B.C. & G.T.
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 6/11/10
Time: 0930
Method: Handauger
Monitor Reading (ppm):

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
0-12"	Brown w/ Some org. matter speckles	silty clay w/ some gravel Hit refusal at 12" (rocks)

COMPOSITE SAMPLE DATA:

Date:
Method:
Monitor Readings (Range in ppm):

Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Lab Analysis for antimony, copper, lead & zinc	4 oz jar		
TCLP analysis (holding until we get metal results)	3 1-gallon containers		

OBSERVATIONS / NOTES:

Lots of rocks - hit refusal b/c of the rocks. Brown, loose, silty clay.

MAP:

Approximated location based on aerial & collected GPS coordinates

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s): B.C.

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: SWMU 16
Project No.: N2G00041

[✓] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 16SS115 0001
Sample Location: 16SB115
Sampled By: BC, GT
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 6/11/10
Time: 1700
Method: hand auger
Monitor Reading (ppm):

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
0-14" Refusal (bedrock)	~~[illegible]~~ orangish brown	silty clay

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Lab analysis for antimony, copper, zinc, lead	1 4oz jar		
Tox analysis (holding until we receive metals results)	3 1-gallon buckets		

OBSERVATIONS / NOTES:

Bedrock very shallow here - rocks on surface & scattered throughout soil profile.
Dug 4 hand auger holes about 14" deep

MAP:

Had to collect a GPS point approx. 50 feet South of the actual location. Move point 50 feet north.

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: Swmu 16
Project No.: 112 G 00041

[✓] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 1655116 0002
Sample Location:
Sampled By: GLT BC
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 6/10/10
Time: 8:35 pm
Method: Hand Auger
Monitor Reading (ppm):

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
0-2	grass	grasse top soil
2-16	BR	Silty clay

COMPOSITE SAMPLE DATA:

Date:
Method:
Monitor Readings (Range in ppm):

Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Antimony, Cu, PB, Zn	4°c		
	3 1 gallon Bag		

OBSERVATIONS / NOTES:

sample collected in grass covered area - grass roots to 6" below surface -

MAP:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: SWMU 16
Project No.: 112G0004

[✓] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: 16SS1170002
Sample Location: 16SB17
Sampled By:
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 6/11/10 Time: 15:13 Method: Hand auger Monitor Reading (ppm):	0-2'	brownish orange	Silty clay

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

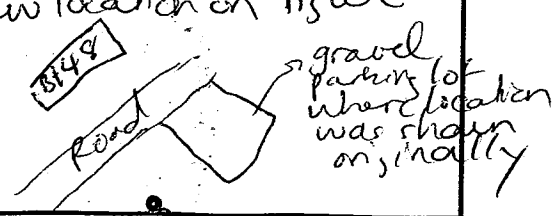
Analysis	Container Requirements	Collected	Other
Lab Analysis for Antimony, Copper, Lead & Zinc	4 oz		
Tox analysis (holding until we get metals results)	3 1-gallon buckets		

OBSERVATIONS / NOTES:

Did 4 auger holes; 3 were 24 inches deep & 1 was about 8 inches deep

MAP:

Moved sample but could not collect a GPS coordinate
Drew location on figure



New location (in forest)

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

ATTACHMENT 2

TOXICITY TEST LABORATORY REPORTS

ATTACHMENT 2A

EARTHWORM TOXICITY TEST LABORATORY REPORT

TOXICOLOGICAL EVALUATION
OF SOIL SAMPLES:

SWMU 16 - Cast High Explosives Fill/B146 Incinerator
Naval Surface Warfare Center Crane
Crane, Indiana
Comprehensive Long-Term Environmental Action-Navy (CLEAN)
Contract N62467-94-D-0888, Contract Task Order (CTO) NO. 0377

28 Day *Eisenia fetida* Evaluation
Survival and Growth Toxicity Tests

Prepared For:

Tetra Tech NUS, Inc.
661 Andersen Drive, Foster Plaza 7
Pittsburgh, Pennsylvania 15220-2745

Prepared By:

EnviroSystems, Incorporated
1 Lafayette Road
Hampton, New Hampshire 03842

June 2010
Reference Number 19811-10-06

TABLE OF CONTENTS

1.0 INTRODUCTION 3

2.0 MATERIALS AND METHODS 3
2.1 General Methods, Biological Evaluations 3
2.2 Test Species 3
2.3 Test Samples 3
2.4 *Eisenia fetida* 28 Day Survival and Growth Evaluation 4
2.5 Statistical Analysis 4
2.6 Quality Control 4
2.7 Protocol Deviations 4

3.0 RESULTS AND DISCUSSION 6
3.1 Laboratory Control and Project Reference Site Performance 6
3.2 Summary 7

4.0 REFERENCES 7

LIST OF TABLES

Table 1. Summary of Sample Collection Information. 5
Table 2. Summary of Soil Characteristics. 6
Table 3. Summary of Reference Toxicant Data. 6
Table 4. Summary of Acceptable Endpoints and Measurements 6
Table 5. Summary of Project Reference Site Performance 7
Table 6. Summary of Significant Endpoints 7
Table 7. Summary of *Eisenia fetida* Day 28 Survival Data 8
Table 8. Summary of *Eisenia fetida* Day 28 Wet Weight Data 9
Table 9. Summary of *Eisenia fetida* Day 28 Biomass Data 10

APPENDIX A: RAW DATA AND STATISTICAL SUPPORT 11

TOXICOLOGICAL EVALUATION
OF SOIL SAMPLES:

SWMU 16 - Cast High Explosives Fill/B146 Incinerator
Naval Surface Warfare Center Crane
Crane, Indiana
Comprehensive Long-Term Environmental Action-Navy (CLEAN)
Contract N62467-94-D-0888, Contract Task Order (CTO) NO. 0377

28 Day *Eisenia fetida* Evaluation
Survival and Growth Toxicity Tests

1.0 INTRODUCTION

This report presents the results of chronic exposure toxicity tests conducted on soil samples collected from the SWMU 16, Naval Surface Warfare Center in Crane, Indiana. Samples were provided by Tetra Tech NUS, Inc. Pittsburgh, Pennsylvania. Testing was based on programs and protocols developed by the ASTM (2009) and US EPA (1989). The toxicity of the samples was assessed by conducting 28 day exposure assays with the earthworm, *Eisenia fetida*. Toxicity tests and supporting analyses were performed at EnviroSystems, Incorporated (ESI), Hampton, New Hampshire. Tissue samples were submitted to Katahdin Analytical Services in Scarborough, Maine for chemical analysis.

Toxicity tests expose groups of organisms to environmental samples, a laboratory control and field reference sites for a specified period to assess potential impacts on a variety of endpoints, such as survival, growth or reproduction. Analysis of variance techniques are used to determine the relative toxicity of the samples as compared to the laboratory control and/or field reference sites. Endpoints for this study included survival and growth, measured as wet weight and biomass.

2.0 MATERIALS AND METHODS

2.1 General Methods, Biological Evaluations

Toxicological and analytical protocols used in this program follow procedures outlined in *Standard Methods for the Examination of Water and Wastewater*, 20th Edition (APHA 1998)*, Standard Guide for Conducting Laboratory Soil Toxicity or Bioaccumulation Tests With the Lumbricid Earthworm Eisenia Fetida and the Enchytraeid Potworm Enchytraeus albidus* (ASTM 2009), and *Protocol for Short Term Toxicity Screening of Hazardous Waste Sites* (EPA 1989). These protocols provide standard approaches for physical and chemical analysis and for the evaluation of toxicological effects of soils on terrestrial organisms.

2.2 Test Species

E. fetida were obtained from cultures maintained by EnviroSystems, Inc. The original source of the culture was a commercial supply company, Shady Creek Worm Farm, Halls, Tennessee. Earthworms were cultured in coconut coir fiber. Temperature during the holding period was maintained at approximately 20 - 23°C. Worms used in the assays were adults with a well-developed clitellum and having a mean wet weight between 300 and 500 mg. Prior to the test, a representative group of worms were rinsed with deionized water, blotted dry, and weighed to the nearest 0.1 mg to determine the mean initial weight. These data are included in the data appendix.

2.3 Test Samples

Soil samples collected from the SWMU 16 project site were received at ESI under chain of custody. Once received, samples were inspected to determine integrity, given unique sample numbers and logged into the laboratory sample management database. Once logged in, the samples were placed in a secure refrigerated, 2 - 4 °C, storage area. A listing of sample sites, sample collection, and receipt information is summarized in Table 1.

The control substrate was coconut coir fiber that was hydrated to approximately 50-85% saturation with moderately hard reconstituted water.

2.4 *Eisenia fetida* 28 Day Survival and Growth Evaluation

Prior to testing, pH, total volatile solids and cation exchange capacity was determined for each sample. Total volatile solids (loss on ignition) is used as an estimate of total organic content. A summary of these soil characteristics (i.e., pH, total volatile solids and cation exchange capacity) are presented in Table 2.

Test chambers for the assay were 9 cm diameter by 30 cm tall polycarbonate cylinders. The bottom of the cylinders was sealed with 200 µm mesh Nitex® screen attached using silicone adhesive. The top of the cylinder was covered with translucent film, "Parafilm" with a 0.5 mm holes to allow ventilation. Prior to adding soils the cylinders were filled with rinsed crushed stone, to a depth of 4 cm. Cylinders were filled with enough soil to exceed a loading rate of 16mg soil/individual test organism/day of exposure (approximately 250 to 500 mL of soil). After filling the cylinders they were placed in plastic dishes. Deionized water was added to each dish to a depth equal to the top of the crushed stone. Water levels were checked and maintained throughout the assay.

Before the addition of organisms, test chambers were randomized using the CETIS® software program. Worms were then removed from the culture medium before being randomly assigned to test vessels. The randomization work sheets are included in the data appendix. The test utilized 5 replicates with 15 worms per replicate. Containers were placed in an incubator at 22 ±1°C. Lighting was set at 24 hours illumination. Light intensity was approximately 100 to 1,000 Lux. During the exposure period, incubator temperature was checked daily for the duration of the assay and hourly using a data logger. The worms were not fed during the assay.

General behavior was observed approximately 2 hours after placing worms in the test chambers. Instances of worms not burrowing or actively attempting to avoid the sample were noted. After 28 days exposure, chambers were uncovered and the contents removed onto trays. Living worms were removed from the soil and counted for survival statistical comparisons. Once counted, the worms were rinsed with deionized water to remove soil particles and placed in a petri dish lined with moistened filter paper for 24 hours to allow for depuration. After the depuration period, the worms were rinsed again with deionized water to remove soil particles, blotted dry and weighed to the nearest 0.1 milligram. Wet weight data was used for growth statistical comparisons. Earthworms were transferred to glass containers and frozen. Frozen tissue samples were submitted to Katahdin Analytical Services for subsequent analysis.

2.5 Statistical Analysis

Survival and growth data were analyzed using CETIS® software to determine significant differences between the test soils, the laboratory control and the reference site sample. Wet weight calculations are based on the total weight of organisms recovered divided by the number of survivors. Biomass calculations are based on the total weight of organisms recovered divided by the number of organisms exposed. Data sets were evaluated to determine normality of distribution and homogeneity of sample variance. Data sets were subsequently evaluated using the appropriate parametric or non-parametric Analysis of Variance (ANOVA) statistic. Pair-wise comparisons were made using the appropriate statistical evaluation. Statistical difference was evaluated at α=0.05.

2.6 Quality Control

As part of the laboratory quality control program, reference toxicant evaluations are completed on a regular basis for each test species. These results provide relative health and response data while allowing for comparison with historic data sets. Results were within two standard deviations of the historic mean for the species. Results are summarized in Table 3. Review of the reference toxicant data documented that the LC-50 for the worms used in the assay was within the normal range for the species.

2.7 Protocol Deviations

Review of data collected during this assay documented the following protocol deviations.

In several replicates more than 15 worms were added to the test chamber. This does not appear to have had a negative impact on the results of the test.

The second deviation relates variances in temperature ranges. The acceptable temperature for the assay is a mean value of 22±1°C with maximum limits of 19 to 25°C. During the assay there was a temperature control failure in the test incubator. During the night on day 16 of the assay temperatures increased from 22 to 30°C in less than 3 hours and reached a maximum 31.4°C. The incubator control shut down the unit when temperatures exceeded 26°C but values climbed due to residual heat before starting to fall. When the temperature deviation was noted the following morning, day 17 of the assay, the test chambers were removed from the incubator and placed in an alternative unit. Based on data recovered from the temperature logger, temperatures were out of range for 10 hours. The recorded temperatures were within the tolerance of *Eisenia fetida*. Additionally, the overall mean temperature recorded by the temperature logger was 20.8°C, below the lower limit of the range of 22±1°C by 0.2°C. Temperatures recorded during daily observations were within the acceptable range. The test chambers were maintained in a reserve incubator for one day while the primary incubator was being serviced. As a result of moving the test chambers, there was a loss of hourly temperature monitoring for one day. Light intensity data from the second incubator documented an intensity of 1,238 lux, exceeding the protocol range of 100 -1,000 lux.

It is the opinion of ESI's study director that these deviations did not impact the outcome of the assay.

Table 1. Summary of Sample Collection Information. SWMU 16, Naval Surface Warfare Center Crane, Crane, Indiana. CTO-0377. June 2010.

			Sample Collected		Sample Received	
Field ID	ESI Code	Designation	Date	Time	Date	Time
16 SS1000001	19811-001	Hold	06/09/10	1115	06/11/10	1000
16 SS1010001	19811-002	Test Soil*	06/09/10	1115	06/11/10	1000
16 SS1020001	19811-003	Test Soil*	06/09/10	1515	06/11/10	1000
16 SS1030001	19811-004	Test Soil*	06/09/10	1705	06/11/10	1000
16 SS1040001	19811-005	Test Soil*	06/09/10	1445	06/11/10	1000
16 SS1050001	19811-006	Hold	06/09/10	1745	06/11/10	1000
16 SS1070001	19811-007	Hold	06/09/10	1917	06/11/10	1000
16 SS1080002	19811-008	Hold	06/10/10	945	06/11/10	1000
16 SS1090002	19811-009	Test Soil*	06/10/10	945	06/11/10	1000
16 SS1060002	19811-010	Test Soil*	06/10/10	1530	06/12/10	1100
16 SS1100002	19811-011	Hold	06/10/10	1800	06/12/10	1100
16 SS1110002	19811-012	Hold	06/10/10	1550	06/12/10	1100
16 SS1120001	19811-013	Test Soil*	06/10/10	1715	06/12/10	1100
16 SS1140001	19811-014	Test Soil*	06/11/10	930	06/12/10	1100
16 SS1160002	19811-015	Reference Soil*	06/10/10	2035	06/12/10	1100
16 SS1130001	19811-016	Hold	06/11/10	1313	06/14/10	1100
16 SS1150001	19811-017	Hold	06/11/10	1700	06/14/10	1100
16 SS1170002	19811-018	Hold	06/11/10	1513	06/14/10	1100

*Per phone conversation between Aaron Bernhardt and Renee McIsaac on 06/16/10 these samples were selected to be used in the toxicity test.

Table 2. Summary of Soil Characteristics. SWMU 16, Naval Surface Warfare Center Crane, Crane, Indiana. CTO-0377. June 2010.

Field ID	ESI Code	Initial pH	Total Volatile Solids (% dry wt)	Cation-Exchange Capacity (meq per 100g)
16 SS1010001	19811-002	7.82	2.7	33
16 SS1020001	19811-003	7.33	3.7	23
16 SS1030001	19811-004	7.55	2	55
16 SS1040001	19811-005	7.54	3.28	40
16 SS1090002	19811-009	7.41	3.31	25
16 SS1060002	19811-010	6.02	4.9	16
16 SS1120001	19811-013	6.24	3.91	31
16 SS1140001	19811-014	5.66	4.03	27
16 SS1160002	19811-015	6.96	2.91	19

Table 3. Summary of Reference Toxicant Data. SWMU 16, Naval Surface Warfare Center Crane, Crane, Indiana. CTO-0377. June 2010.

Date	Endpoint		Value	Historic Mean/ Central Tendency	Acceptable Range	Reference Toxicant
Eisenia fetida						
07/08/10	Survival	LC-50	353	1622	0 - 4274	Cadmium (mg/L)

3.0 RESULTS AND DISCUSSION

Table 4 provides a summary of assay acceptability criteria and laboratory control achievement. Table 5 summarizes the reference site performance. Table 6 summarizes findings of significant endpoints, with detailed summaries of survival and growth data and statistical analyses presented in Tables 7 through 9. Laboratory bench sheets, detailed summaries of survival, wet weights and associated statistical support data are included in Appendix A.

3.1 Laboratory Control and Reference Site Performance

At the end of the 28-day exposure period survival in the laboratory control treatment was 97.3% with a coefficient of variation (CV) of 3.75%. Mean wet weight of the surviving organisms was 349.8 mg/worm. These endpoints meet or exceed the minimum protocol specification of 80% survival.

Based on daily observations, the mean temperature during the assay was 21°C with a range of 20 to 21°C. Confirmation temperature data collected in a surrogate replicate documented a mean temperature of 20.8°C with a range of 19.7 to 31.4°C. The acceptable temperature for the assay is a mean value of 22±1°C with maximum limits of 19 to 25°C.

Table 4. Summary of Acceptable Endpoints and Measurements. SWMU 16, Naval Surface Warfare Center Crane, Crane, Indiana. CTO-0377. June 2010.

Endpoint / Measurement	Protocol		
Mean Survival	lab≥ 80%	%	97.3%
		Protocol Met	Yes
Mean Temperature	22°±1°C	daily / hourly	21 / 20.8*
		Protocol Met	Yes / No*
Minimum Temperature	19°C	daily / hourly	20 / 19.7
		Protocol Met	Yes / Yes

Endpoint / Measurement	Protocol		
Maximum Temperature	25°C	daily / hourly	21 / 31.4*
		Protocol Met	Yes / No*

* See Section 2.7 for a discussion of the temperature deviation.

Table 5. Summary of Project Reference Site Performance.SWMU 16, Naval Surface Warfare Center Crane, Crane, Indiana. CTO-0377. June 2010.

Reference Site	ESI Code	Mean Survival	Mean Dry Weight (mg)	Mean Dry Biomass (mg)
16 SS1160002	19811-015	100%	352.6	352.6

3.2 Summary

This program utilized protocols developed by the U.S. EPA and ASTM to assess the potential toxicological impacts that exposure to soils from the SWMU 16 project site would have on soil invertebrates. Tables 7 through 9 provide summaries of assay endpoints and detailed statistical results for each sample location. With the exception of soil from sample 16 SS1030001 (19811-004), none of the project soils had a negative impact on earthworms. Table 6 provides a summary of the endpoints that were impacted, based on the finding of a statistically significant reduction in either the laboratory control or reference site.

Table 6. Summary of Significant Endpoints. SWMU 16, Naval Surface Warfare Center Crane, Crane, Indiana. CTO-0377. June 2010.

		Finding of Significant Difference(s) between Project Sites and					
		Lab Control (19811-000)			16 SS1160002 (19811-015)		
Field ID	ESI Code	survival	wet wt	biomass	survival	wet wt	biomass
16 SS1160002	19811-015						
16 SS1010001	19811-002						
16 SS1020001	19811-003						
16 SS1030001	19811-004			Yes		Yes	Yes
16 SS1040001	19811-005						
16 SS1090002	19811-009						
16 SS1060002	19811-010						
16 SS1120001	19811-013						
16 SS1140001	19811-014						

4.0 REFERENCES

APHA. 1998. *Standard Methods for the Examination of Water and Wastewater,* 20th Edition.

ASTM. 2009. Volume 11.06. *Standard Guide for Conducting Laboratory Soil Toxicity or Bioaccumulation Tests With the Lumbricid Earthworm Eisenia Fetida and the Enchytraeid Potworm Enchytraeus albidus.* E1676-04

US EPA. 1989. *Protocol for Short Term Toxicity Screening of Hazardous Waste Sites*. EPA/600/3-88/029.

Table 7. Summary of *Eisenia fetida* Day 28 Survival Data. SWMU 16, Naval Surface Warfare Center Crane, Crane, Indiana. CTO-0377. June 2010.

Day 28 Survival Summary

Field ID	ESI Code	Reps	Mean	Minimum	Maximum	CV
Laboratory Control	19811-000	5	97.3%	93.3%	100.0%	3.75%
16 SS1160002	19811-015	5	100.0%	100.0%	100.0%	0.00%
16 SS1010001	19811-002	5	98.7%	93.3%	100.0%	3.02%
16 SS1020001	19811-003	5	100.0%	100.0%	100.0%	0.00%
16 SS1030001	19811-004	5	96.0%	86.7%	100.0%	6.21%
16 SS1040001	19811-005	5	98.7%	93.3%	100.0%	3.02%
16 SS1090002	19811-009	5	98.7%	93.3%	100.0%	3.02%
16 SS1060002	19811-010	5	98.7%	93.3%	100.0%	3.02%
16 SS1120001	19811-013	5	100.0%	100.0%	100.0%	0.00%
16 SS1140001	19811-014	5	97.3%	86.7%	100.0%	6.13%

Day 28 Survival Statistical Summary			Statistically Significant Difference as Compared to			
			Lab Control (19811-000)		16 SS1160002 (19811-015)	
Field ID	ESI Code	Mean	p Value	statistically significant	p Value	statistically significant
Laboratory Control	19811-000	97.3%	-	-	-	-
16 SS1160002	19811-015	100.0%	0.9162	No	-	-
16 SS1010001	19811-002	98.7%	0.6548	No	0.3452	No
16 SS1020001	19811-003	100.0%	0.9294	No	0.0706	No
16 SS1030001	19811-004	96.0%	0.3618	No	0.1004	No
16 SS1040001	19811-005	98.7%	0.6548	No	0.3452	No
16 SS1090002	19811-009	98.7%	0.6548	No	0.3452	No
16 SS1060002	19811-010	98.7%	0.6548	No	0.3452	No
16 SS1120001	19811-013	100.0%	0.9137	No	0.5000	No
16 SS1140001	19811-014	97.3%	0.5794	No	0.3452	No

Table 8. Summary of *Eisenia fetida* Day 28 Wet Weight Data.SWMU 16, Naval Surface Warfare Center Crane, Crane, Indiana. CTO-0377. June 2010.

Day 28 Wet Weight (mg) Summary

Field ID	ESI Code	Reps	Mean	Minimum	Maximum	CV
Laboratory Control	19811-000	5	349.8	283.9	410.3	13.45%
16 SS1160002	19811-015	5	352.6	296.4	394.5	10.99%
16 SS1010001	19811-002	5	330.0	317.2	341.9	2.99%
16 SS1020001	19811-003	5	328.7	297.1	375.0	9.68%
16 SS1030001	19811-004	5	304.1	267.3	340.2	11.31%
16 SS1040001	19811-005	5	311.9	262.7	363.0	12.81%
16 SS1090002	19811-009	5	329.8	298.8	354.0	6.99%
16 SS1060002	19811-010	5	308.1	249.6	345.2	13.60%
16 SS1120001	19811-013	5	340.5	305.1	359.8	6.75%
16 SS1140001	19811-014	5	379.0	332.0	419.9	9.70%

Day 28 Wet Weight (mg) Statistical Summary			Statistically Significant Difference as Compared to			
			Lab Control (19811-000)		16 SS1160002 (19811-015)	
Field ID	ESI Code	Mean	p Value	statistically significant	p Value	statistically significant
Laboratory Control	19811-000	349.8	-	-	-	-
16 SS1160002	19811-015	352.6	0.5396	No	-	-
16 SS1010001	19811-002	330.0	0.1916	No	0.1206	No
16 SS1020001	19811-003	328.7	0.2146	No	0.1584	No
16 SS1030001	19811-004	304.1	0.0587	No	0.0348	Yes
16 SS1040001	19811-005	311.9	0.1036	No	0.0705	No
16 SS1090002	19811-009	329.8	0.2088	No	0.1453	No
16 SS1060002	19811-010	308.1	0.0882	No	0.0594	No
16 SS1120001	19811-013	340.5	0.3510	No	0.2826	No
16 SS1140001	19811-014	379.0	0.8469	No	0.8493	No

Table 9. Summary of *Eisenia fetida* Day 28 Biomass Data. SWMU 16, Naval Surface Warfare Center Crane, Crane, Indiana. CTO-0377. June 2010.

Day 28 Biomass (mg) Summary

Field ID	ESI Code	Reps	Mean	Minimum	Maximum	CV
Laboratory Control	19811-000	5	339.7	283.9	382.9	11.65%
16 SS1160002	19811-015	5	352.6	296.4	394.5	10.99%
16 SS1010001	19811-002	5	325.6	308.3	341.9	4.24%
16 SS1020001	19811-003	5	328.7	297.1	375.0	9.68%
16 SS1030001	19811-004	5	292.3	234.2	334.3	13.96%
16 SS1040001	19811-005	5	307.7	262.7	363.0	13.11%
16 SS1090002	19811-009	5	325.1	298.8	351.3	5.82%
16 SS1060002	19811-010	5	304.7	233.0	345.2	15.73%
16 SS1120001	19811-013	5	340.5	305.1	359.8	6.75%
16 SS1140001	19811-014	5	368.6	332.0	419.9	10.71%

Day 28 Biomass Statistical Summary

			Statistically Significant Difference as Compared to			
			Lab Control (19811-000)		16 SS1160002 (19811-015)	
Field ID	ESI Code	Mean	p Value	statistically significant	p Value	statistically significant
Laboratory Control	19811-000	339.7	-	-	-	-
16 SS1160002	19811-015	352.6	0.6924	No	-	-
16 SS1010001	19811-002	325.6	0.2368	No	0.0899	No
16 SS1020001	19811-003	328.7	0.3205	No	0.1584	No
16 SS1030001	19811-004	292.3	0.0498	Yes	0.0218	Yes
16 SS1040001	19811-005	307.7	0.1206	No	0.0551	No
16 SS1090002	19811-009	325.1	0.2390	No	0.0956	No
16 SS1060002	19811-010	304.7	0.1219	No	0.0602	No
16 SS1120001	19811-013	340.5	0.5163	No	0.2826	No
16 SS1140001	19811-014	368.6	0.8595	No	0.7313	No

APPENDIX A:
RAW DATA AND STATISTICAL SUPPORT

Contents	Number of Pages
E. fetida 28-Day Soil Toxicity Test	
Daily Temperature and Daily Observation Bench Sheet	1
Day 28 Recovery Bench Sheets	2
Day 0 Wet Weights	1
Day 28 Wet Weights	2
CETIS Work Sheet	2
Day 28 Survival and Growth Statistical Analysis	53
Soil pH Record	1
Soil Total Volatile Solids	1
Cation Exchange Capacity	1
Summary of Daily Environmental Measurements	1
Temperature Profile	1
Sample Receipt Logs; Chain of Custody Records; Custody Seals	14
Sample Field Identification Clarification	1
Total Appendix Pages	81

Eisenia fetida 28 Day Assay

STUDY NUMBER: 19811 **PROJECT:** Crane IN, CTO 377

START DATE: 06/18/10 **CLIENT:** Tetra Tech NUS

DAY	DATE	TEMP (°C)	LIGHT (FC)	GENERAL OBSERVATIONS	INITIALS
0	6/18/10	21	26	No worms present at surface. Trays saturated.	AM
1	6/19/10	21	32		KC/JP
2	6·20	21	34	No mortality	DM
3	6·21	21	39		DM
4	6·22	21	36		DM
5	6/23	21	34	No mortality. DI added where needed	AM
6	6·24	21	38		DM
7	6/25/10	21	28	No Mortality	AM
8	6/26/10	21	29		WM
9	6·27	21	32		DM
10	6·28	21	36		DM
11	~~6·28~~	~~21~~	~~29~~	7-14-10 Day 28 21°C 36 (FC)	DM
12	6·29	21	33		DM
13	6/30	21	33		KC
14	7/1	21	30		KC
15	7/2	21	26		LB
16	7/3	21	33		WM
17	7/4	21	35	Added DI	KC
18	7/5	21	36	No Mortality. No worms on surface	AM
19	7-6	21	30		DM
20	7-7	21	34	Moved from INC#1 → Inc#7	DM
21	7·8	20	115	Moved from INC#7 → Inc#1	DM
22	7/9	20	24		SJ
23	7/10	21	46		LB
24	7-11	21	26		DM
25	7-12	20	28	Added DI where Needed	DM
26	7-13	21	32		DM
27	~~7/14/10~~ 7-15	~~21~~	~~37~~ 34	~~Added DI where needed~~	~~KC~~ DM
28	7-16	20	32		DM

Data Logger ID:	**Model:** Telatemp Micro 8000	**Serial #:** N18443
Light Meter ID:	**Model:** Quantum Instruments	**Serial #:** 1149

NOTES: Daily temperature recorded is to confirm general temperature compliance. Hourly data collected from Data Logger maintained during assay.

Eisenia fetida 28 Day Assay

STUDY NUMBER: 19811 **PROJECT: Crane IN, CTO 377**

DATE: 07/16/10 **CLIENT: Tetra Tech NUS**

Sample Code	Rep	Pos	# Survived	Pan Count	Initials
19811-009	1	1	18	18	RAM
19811-015	1	2	15	15	
19811-002	1	3	15	15	
19811-005	1	4	16	16	
19811-010	1	5	15	15	
19811-004	1	6	15	15	
19811-013	1	7	15	15	
19811-000	1	8	15	15	
19811-003	1	9	15	15	
19811-014	1	10	15	15	
19811-002	2	11	15	15	
19811-009	2	12	15	15	
19811-000	2	13	15	15	
19811-013	2	14	15	15	
19811-015	2	15	16	16	
19811-014	2	16	15	15	
19811-004	2	17	RAM (E3) ~~15~~ 16	16	
19811-010	2	18	15	15	
19811-003	2	19	15	15	
19811-005	2	20	16	16	
19811-014	3	21	15	15	
19811-009	3	22	15	15	RAM
19811-002	3	23	15	15	JEB
19811-003	3	24	15	15	JTP
19811-015	3	25	15	15	AM
19811-000	3	26	15	15	AM
19811-013	3	27	16	16	JEB
19811-004	3	28	15	15	JTP
19811-010	3	29	JTP (E3) ~~15~~ 14	14	JEB
19811-005	3	30	15	15	JEB
19811-004	4	31	13	13	JTP
19811-014	4	32	15	15	JTP
19811-009	4	33	JTP (E3) ~~15~~ 14	14	JEB
19811-015	4	34	JTP (E3) ~~15~~ 16	16	JTP
19811-010	4	35	15	15	JTP
19811-002	4	36	14	14	JTP
19811-003	4	37	15	15	JEB
19811-005	4	38	14	14	JEB
19811-013	4	39	15	15	JEB
19811-000	4	40	14	14	AM
19811-004	5	41	14	14	AM
19811-013	5	42	15	15	AM
19811-002	5	43	15	15	AM

Eisenia fetida 28 Day Assay

STUDY NUMBER: 19811 **PROJECT:** Crane IN, CTO 377

DATE: 07/16/10 **CLIENT:** Tetra Tech NUS

Sample Code	Rep	Pos	# Survived	Pan Count	Initials
19811-015	5	44	15	15	AM
19811-003	5	45	15	15	AM
19811-005	5	46	JTP ~~14~~ 15	15	AM
19811-014	5	47	13	13	AM
19811-010	5	48	16	16	AM
19811-009	5	49	15	15	AM
19811-000	5	50	14	14	AM

Eisenia fetida 28 Day Assay

Study Number: 19811

Client: Tetra Tech NUS

Project: Crane IN, CTO 377

ESI SAMPLE ID	REP	WET WEIGHT (G)
Start Worms	A	0.4363
	B	0.4467
	C	0.4890
	D	0.3868
	E	0.5103
	F	0.5693
	G	
	H	

RECORDED BY: AM

DATE: 6/18/10

NOTES:

Number Worms per Replicate: 15

Average wet weight per worm: 0.0315 Grams

Average wet weight per replicate: 0.4731 Grams

Average wet weight of soil per replicate: 439 Grams

Loading rate (g worm/kg soil): ~~0.0011~~ 1.08 AM 6/21 Grams Worm / Kg Soil

Balance: AccuSeries Model 225D Serial#: 17008376

Alternate Balance: ID: Serial #:

STUDY: 19811
CLIENT: Tetra Tech NUS, Inc.
PROJECT: SWMU 16, Crane Indiana, CTO 377
ASSAY: *E. fetida* 28 Day
TASK: Wet Weight Data - Balance Output File
BALANCE: AccuSeries Model 225D, SN# 17008376

Date / Init:	07/17/10 JTP		Total Wt	Duplicate
Sample Code	Rep	Pos.	(mg)	Total Wt
19811-009	1	1	5377.67	
19811-015	1	2	5442.88	
19811-002	1	3	4757.88	
19811-005	1	4	4523.20	
19811-010	1	5	5062.64	
19811-004	1	6	4627.38	
19811-013	1	7	4577.05	
19811-000	1	8	4258.54	
19811-003	1	9	4599.62	
19811-014	1	10	6022.06	
19811-002	2	11	5128.39	
19811-009	2	12	5268.81	
19811-000	2	13	4966.66	
19811-013	2	14	5346.15	
19811-015	2	15	5318.94	
19811-014	2	16	4979.54	
19811-004	2	17	5348.68	
19811-010	2	18	4174.00	
19811-003	2	19	4455.85	
19811-005	2	20	4202.58	4174.09
19811-014	3	21	6297.97	
19811-009	3	22	4801.29	
19811-002	3	23	4857.60	
19811-003	3	24	5195.88	
19811-015	3	25	5653.89	
19811-000	3	26	5585.98	
19811-013	3	27	5277.55	
19811-004	3	28	4009.19	
19811-010	3	29	3494.41	
19811-005	3	30	5005.29	
19811-004	4	31	3512.86	
19811-014	4	32	5247.89	
19811-009	4	33	4955.82	
19811-015	4	34	4743.19	
19811-010	4	35	5177.38	
19811-002	4	36	4624.89	
19811-003	4	37	4775.17	
19811-005	4	38	4447.94	
19811-013	4	39	5397.05	
19811-000	4	40	5743.81	5741.85

Date / Init:	07/17/10 JTP		Total Wt	Duplicate
Sample Code	Rep	Pos.	(mg)	Total Wt
19811-004	5	41	4762.18	
19811-013	5	42	5272.70	
19811-002	5	43	5050.37	
19811-015	5	44	5917.49	
19811-003	5	45	5624.53	
19811-005	5	46	5444.29	
19811-014	5	47	5096.01	
19811-010	5	48	5275.51	
19811-009	5	49	4873.90	
19811-000	5	50	4920.92	4919.45

CETIS Test Data Worksheet

Report Date: 19 Jul-10 17:04 (p 1 of 2)
Test Code: 00-0021-2096/19811Ef

Eisenia 28-d Survival and Growth Soil Test **EnviroSystems, Inc.**

Start Date: 18 Jun-10 12:00 **Species:** Eisenia fetida **Sample Code:** 19811-000
End Date: 16 Jul-10 12:00 **Protocol:** EPA/600/R-92/183 (1992) **Sample Source:** Crane Indiana
Sample Date: 16 Jun-10 12:00 **Material:** Soil **Sample Station:** Laboratory Control Sample; 19811-0

Sample Code	Rep	Pos	# Exposed	# Survived	Total Weight-mg	Tare Weight-mg	Pan Count	Mean Length-mm
19811-000	1	8	15	15	4258.54	0	15	
19811-000	2	13	15	15	4966.66	0	15	
19811-000	3	26	15	15	5585.98	0	15	
19811-000	4	40	15	14	5743.81	0	14	
19811-000	5	50	15	14	4920.92	0	14	
19811-015	1	2	15	15	5442.88	0	15	
19811-015	2	15	16	16	5318.94	0	16	
19811-015	3	25	15	15	5653.89	0	15	
19811-015	4	34	16	16	4743.19	0	16	
19811-015	5	44	15	15	5917.49	0	15	
19811-002	1	3	15	15	4757.88	0	15	
19811-002	2	11	15	15	5128.39	0	15	
19811-002	3	23	15	15	4857.6	0	15	
19811-002	4	36	15	14	4624.89	0	14	
19811-002	5	43	15	15	5050.37	0	15	
19811-003	1	9	15	15	4599.62	0	15	
19811-003	2	19	15	15	4455.85	0	15	
19811-003	3	24	15	15	5195.88	0	15	
19811-003	4	37	15	15	4775.17	0	15	
19811-003	5	45	15	15	5624.53	0	15	
19811-004	1	6	15	15	4627.38	0	15	
19811-004	2	17	16	16	5348.68	0	16	
19811-004	3	28	15	15	4009.19	0	15	
19811-004	4	31	15	13	3512.86	0	13	
19811-004	5	41	15	14	4762.18	0	14	
19811-005	1	4	16	16	4523.2	0	16	
19811-005	2	20	16	16	4202.58	0	16	
19811-005	3	30	15	15	5005.29	0	15	
19811-005	4	38	15	14	4447.94	0	14	
19811-005	5	46	15	15	5444.29	0	15	
19811-009	1	1	18	18	5377.67	0	18	
19811-009	2	12	15	15	5268.81	0	15	
19811-009	3	22	15	15	4801.29	0	15	
19811-009	4	33	15	14	4955.82	0	14	
19811-009	5	49	15	15	4873.9	0	15	
19811-010	1	5	15	15	5062.64	0	15	
19811-010	2	18	15	15	4174	0	15	
19811-010	3	29	15	14	3494.41	0	14	
19811-010	4	35	15	15	5177.38	0	15	
19811-010	5	48	16	16	5275.51	0	16	
19811-013	1	7	15	15	4577.05	0	15	
19811-013	2	14	15	15	5346.15	0	15	
19811-013	3	27	16	16	5277.55	0	16	
19811-013	4	39	15	15	5397.05	0	15	
19811-013	5	42	15	15	5272.7	0	15	
19811-014	1	10	15	15	6022.06	0	15	
19811-014	2	16	15	15	4979.54	0	15	

CETIS Test Data Worksheet

Report Date: 19 Jul-10 17:04 (p 2 of 2)
Test Code: 00-0021-2096/19811Ef

Sample Code	Rep	Pos	# Exposed	# Survived	Total Weight-mg	Tare Weight-mg	Pan Count	Mean Length-mm
19811-014	3	21	15	15	6297.97	0	15	
19811-014	4	32	15	15	5247.89	0	15	
19811-014	5	47	15	13	5096.01	0	13	

CETIS Summary Report

Report Date: 22 Jul-10 12:06 (p 1 of 2)
Test Code: 00-0021-2096/19811Ef

Eisenia 28-d Survival and Growth Soil Test — **EnviroSystems, Inc.**

Batch ID:	00-3538-6679	**Test Type:**	Survival-Growth	**Analyst:**	
Start Date:	18 Jun-10 12:00	**Protocol:**	EPA/600/R-92/183 (1992)	**Diluent:**	Not Applicable
Ending Date:	16 Jul-10 12:00	**Species:**	Eisenia fetida	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	In-House Culture	**Age:**	

Sample Code	Sample ID	Sample Date	Receive Date	Sample Age	Client Name	Project
19811-000	16-3877-0522	16 Jun-10 12:00	16 Jun-10 12:00	48h	Tetra Tech NUS	Ecological Risk Assessme
19811-015	01-2243-1399	10 Jun-10 20:35	12 Jun-10 11:00	7d 15h		
19811-002	17-6880-6936	09 Jun-10 11:15	11 Jun-10 10:00	9d 1h		
19811-003	18-3180-8748	09 Jun-10 15:15	11 Jun-10 10:00	8d 21h		
19811-004	00-2207-8607	09 Jun-10 17:05	11 Jun-10 10:00	8d 19h		
19811-005	03-5602-2744	09 Jun-10 14:45	11 Jun-10 10:00	8d 21h		
19811-009	09-3929-1612	10 Jun-10 09:45	11 Jun-10 10:00	8d 2h		
19811-010	06-3043-2289	10 Jun-10 15:30	12 Jun-10 11:00	7d 20h		
19811-013	11-7434-4542	10 Jun-10 17:15	12 Jun-10 11:00	7d 19h		
19811-014	20-8714-0719	11 Jun-10 09:30	12 Jun-10 11:00	7d 2h		

Sample Code	Material Type	Sample Source	Station Location	Latitude	Longitude
19811-000	Soil	Crane Indiana	Laboratory Control Sample; 1981		
19811-015	Soil	Crane Indiana	16 SS1160002; 19811-015		
19811-002	Soil	Crane Indiana	16 SS1010001; 19811-002		
19811-003	Soil	Crane Indiana	16 SS1020001; 19811-003		
19811-004	Soil	Crane Indiana	16 SS1030001; 19811-004		
19811-005	Soil	Crane Indiana	16 SS1040001; 19811-005		
19811-009	Soil	Crane Indiana	16 SS1090002; 19811-009		
19811-010	Soil	Crane Indiana	16 SS1060002; 19811-010		
19811-013	Soil	Crane Indiana	16 SS1120001; 19811-013		
19811-014	Soil	Crane Indiana	16 SS1140001; 19811-014		

Proportion Survived Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	0.9733	0.9597	0.987	0.9333	1	0.006667	0.03651	3.75%	0.0%
19811-015	5	1	1	1	1	1	0	0	0.0%	-2.74%
19811-002	5	0.9867	0.9755	0.9978	0.9333	1	0.005443	0.02981	3.02%	-1.37%
19811-003	5	1	1	1	1	1	0	0	0.0%	-2.74%
19811-004	5	0.96	0.9377	0.9823	0.8667	1	0.01089	0.05963	6.21%	1.37%
19811-005	5	0.9867	0.9755	0.9978	0.9333	1	0.005443	0.02981	3.02%	-1.37%
19811-009	5	0.9867	0.9755	0.9978	0.9333	1	0.005443	0.02981	3.02%	-1.37%
19811-010	5	0.9867	0.9755	0.9978	0.9333	1	0.005443	0.02981	3.02%	-1.37%
19811-013	5	1	1	1	1	1	0	0	0.0%	-2.74%
19811-014	5	0.9733	0.9511	0.9956	0.8667	1	0.01089	0.05963	6.13%	0.0%

Wet Biomass - Mean Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	339.7	324.9	354.5	283.9	382.9	7.223	39.56	11.65%	0.0%
19811-015	5	352.6	338.2	367.1	296.4	394.5	7.078	38.77	10.99%	-3.81%
19811-002	5	325.6	320.4	330.7	308.3	341.9	2.518	13.79	4.24%	4.15%
19811-003	5	328.7	316.8	340.6	297.1	375	5.809	31.82	9.68%	3.24%
19811-004	5	292.3	277.1	307.6	234.2	334.3	7.451	40.81	13.96%	13.93%
19811-005	5	307.7	292.6	322.8	262.7	363	7.363	40.33	13.11%	9.41%
19811-009	5	325.1	318	332.1	298.8	351.3	3.453	18.91	5.82%	4.3%
19811-010	5	304.7	286.8	322.6	233	345.2	8.749	47.92	15.73%	10.29%
19811-013	5	340.5	332	349.1	305.1	359.8	4.194	22.97	6.75%	-0.25%
19811-014	5	368.6	353.8	383.3	332	419.9	7.208	39.48	10.71%	-8.51%

Eisenia 28-d Survival and Growth Soil Test — **EnviroSystems, Inc.**

Wet Weight - Mean Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	349.8	332.3	367.4	283.9	410.3	8.594	47.07	13.45%	0.0%
19811-015	5	352.6	338.2	367.1	296.4	394.5	7.078	38.77	10.99%	-0.8%
19811-002	5	330	326.3	333.7	317.2	341.9	1.799	9.853	2.99%	5.67%
19811-003	5	328.7	316.8	340.6	297.1	375	5.809	31.82	9.68%	6.05%
19811-004	5	304.1	291.2	316.9	267.3	340.2	6.281	34.4	11.31%	13.08%
19811-005	5	311.9	297	326.9	262.7	363	7.298	39.97	12.81%	10.83%
19811-009	5	329.8	321.2	338.4	298.8	354	4.21	23.06	6.99%	5.73%
19811-010	5	308.1	292.4	323.7	249.6	345.2	7.647	41.89	13.6%	11.94%
19811-013	5	340.5	332	349.1	305.1	359.8	4.194	22.97	6.75%	2.66%
19811-014	5	379	365.3	392.8	332	419.9	6.711	36.76	9.7%	-8.35%

Proportion Survived Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	1	1	1	0.9333	0.9333
19811-015	1	1	1	1	1
19811-002	1	1	1	0.9333	1
19811-003	1	1	1	1	1
19811-004	1	1	1	0.8667	0.9333
19811-005	1	1	1	0.9333	1
19811-009	1	1	1	0.9333	1
19811-010	1	1	0.9333	1	1
19811-013	1	1	1	1	1
19811-014	1	1	1	1	0.8667

Wet Biomass - Mean Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	283.9	331.1	372.4	382.9	328.1
19811-015	362.9	332.4	376.9	296.4	394.5
19811-002	317.2	341.9	323.8	308.3	336.7
19811-003	306.6	297.1	346.4	318.3	375
19811-004	308.5	334.3	267.3	234.2	317.5
19811-005	282.7	262.7	333.7	296.5	363
19811-009	298.8	351.3	320.1	330.4	324.9
19811-010	337.5	278.3	233	345.2	329.7
19811-013	305.1	356.4	329.8	359.8	351.5
19811-014	401.5	332	419.9	349.9	339.7

Wet Weight - Mean Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	283.9	331.1	372.4	410.3	351.5
19811-015	362.9	332.4	376.9	296.4	394.5
19811-002	317.2	341.9	323.8	330.3	336.7
19811-003	306.6	297.1	346.4	318.3	375
19811-004	308.5	334.3	267.3	270.2	340.2
19811-005	282.7	262.7	333.7	317.7	363
19811-009	298.8	351.3	320.1	354	324.9
19811-010	337.5	278.3	249.6	345.2	329.7
19811-013	305.1	356.4	329.8	359.8	351.5
19811-014	401.5	332	419.9	349.9	392

Eisenia 28-d Survival and Growth Soil Test — **EnviroSystems, Inc.**

Analysis ID:	03-9670-1231	**Endpoint:**	Proportion Survived	**CETIS Version:**	CETISv1.7.0
Analyzed:	19 Jul-10 11:29	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Batch ID:	00-3538-6679	**Test Type:**	Survival-Growth	**Analyst:**	
Start Date:	18 Jun-10 12:00	**Protocol:**	EPA/600/R-92/183 (1992)	**Diluent:**	Not Applicable
Ending Date:	16 Jul-10 12:00	**Species:**	Eisenia fetida	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	0	C > T	Not Run					4.71%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
19811-015		19811-014	25		1	0.3452	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	2.683	2.29	0.0004	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.006380539	0.006380539	1	1.068	0.3316	Non-Significant Effect
Error	0.04777877	0.005972346	8			
Total	0.05415931	0.01235288	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2330	23.15	<0.0001	Unequal Variances
Distribution	Shapiro-Wilk Normality	0.6324		0.0001	Non-normal Distribution

Proportion Survived Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	1	1	1	1	1	0	0	0.0%	0.0%
19811-014	5	0.9733	0.9507	0.996	0.8667	1	0.01107	0.05963	6.13%	2.67%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	1.443	1.442	1.444	1.441	1.445	0.0004183	0.002253	0.16%	0.0%
19811-014	5	1.392	1.351	1.434	1.197	1.441	0.02029	0.1093	7.85%	3.5%

Proportion Survived Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	1	1	1	1	1
19811-014	1	1	1	1	0.8667

Eisenia 28-d Survival and Growth Soil Test — **EnviroSystems, Inc.**

Analysis ID:	11-0875-4481	**Endpoint:**	Proportion Survived	**CETIS Version:**	CETISv1.7.0
Analyzed:	19 Jul-10 11:29	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Batch ID:	00-3538-6679	**Test Type:**	Survival-Growth	**Analyst:**	
Start Date:	18 Jun-10 12:00	**Protocol:**	EPA/600/R-92/183 (1992)	**Diluent:**	Not Applicable
Ending Date:	16 Jul-10 12:00	**Species:**	Eisenia fetida	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	0	C > T	Not Run					1.69%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
19811-015		19811-013	27.5		1	0.5000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.697	2.29	0.6884	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	1.708119E-06	1.708119E-06	1	0.4	0.5447	Non-Significant Effect
Error	3.416238E-05	4.270298E-06	8			
Total	3.58705E-05	5.978417E-06	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.5	23.15	0.7040	Equal Variances
Distribution	Shapiro-Wilk Normality	0.7586		0.0045	Non-normal Distribution

Proportion Survived Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	1	1	1	1	1	0	0	0.0%	0.0%
19811-013	5	1	1	1	1	1	0	0	0.0%	0.0%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	1.443	1.442	1.444	1.441	1.445	0.0004183	0.002253	0.16%	0.0%
19811-013	5	1.442	1.441	1.443	1.441	1.445	0.00034	0.001831	0.13%	0.06%

Proportion Survived Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	1	1	1	1	1
19811-013	1	1	1	1	1

Eisenia 28-d Survival and Growth Soil Test — **EnviroSystems, Inc.**

Analysis ID:	05-8005-9352	**Endpoint:**	Proportion Survived	**CETIS Version:**	CETISv1.7.0
Analyzed:	19 Jul-10 11:29	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Batch ID:	00-3538-6679	**Test Type:**	Survival-Growth	**Analyst:**	
Start Date:	18 Jun-10 12:00	**Protocol:**	EPA/600/R-92/183 (1992)	**Diluent:**	Not Applicable
Ending Date:	16 Jul-10 12:00	**Species:**	Eisenia fetida	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	0	C > T	Not Run					3.11%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
19811-015		19811-010	25		1	0.3452	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	2.68	2.29	0.0005	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.001844967	0.001844967	1	1.045	0.3366	Non-Significant Effect
Error	0.01412708	0.001765886	8			
Total	0.01597205	0.003610853	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	688.2	23.15	<0.0001	Unequal Variances
Distribution	Shapiro-Wilk Normality	0.6527		0.0002	Non-normal Distribution

Proportion Survived Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	1	1	1	1	1	0	0	0.0%	0.0%
19811-010	5	0.9867	0.9753	0.998	0.9333	1	0.005536	0.02981	3.02%	1.33%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	1.443	1.442	1.444	1.441	1.445	0.0004183	0.002253	0.16%	0.0%
19811-010	5	1.416	1.393	1.438	1.31	1.445	0.01103	0.05939	4.19%	1.88%

Proportion Survived Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	1	1	1	1	1
19811-010	1	1	0.9333	1	1

Eisenia 28-d Survival and Growth Soil Test — **EnviroSystems, Inc.**

Analysis ID:	08-5228-1762	**Endpoint:**	Proportion Survived	**CETIS Version:**	CETISv1.7.0
Analyzed:	19 Jul-10 11:29	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Batch ID:	00-3538-6679	**Test Type:**	Survival-Growth	**Analyst:**	
Start Date:	18 Jun-10 12:00	**Protocol:**	EPA/600/R-92/183 (1992)	**Diluent:**	Not Applicable
Ending Date:	16 Jul-10 12:00	**Species:**	Eisenia fetida	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	0	C > T	Not Run					3.14%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
19811-015		19811-009	25		1	0.3452	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	2.673	2.29	0.0006	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.001654501	0.001654501	1	0.9068	0.3688	Non-Significant Effect
Error	0.01459561	0.001824451	8			
Total	0.01625011	0.003478952	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	711.1	23.15	<0.0001	Unequal Variances
Distribution	Shapiro-Wilk Normality	0.6742		0.0004	Non-normal Distribution

Proportion Survived Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	1	1	1	1	1	0	0	0.0%	0.0%
19811-009	5	0.9867	0.9753	0.998	0.9333	1	0.005536	0.02981	3.02%	1.33%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	1.443	1.442	1.444	1.441	1.445	0.0004183	0.002253	0.16%	0.0%
19811-009	5	1.417	1.394	1.44	1.31	1.453	0.01121	0.06036	4.26%	1.78%

Proportion Survived Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	1	1	1	1	1
19811-009	1	1	1	0.9333	1

Eisenia 28-d Survival and Growth Soil Test — **EnviroSystems, Inc.**

Analysis ID:	18-8130-4317	**Endpoint:**	Proportion Survived	**CETIS Version:**	CETISv1.7.0
Analyzed:	19 Jul-10 11:28	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Batch ID:	00-3538-6679	**Test Type:**	Survival-Growth	**Analyst:**	
Start Date:	18 Jun-10 12:00	**Protocol:**	EPA/600/R-92/183 (1992)	**Diluent:**	Not Applicable
Ending Date:	16 Jul-10 12:00	**Species:**	Eisenia fetida	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	0	C > T	Not Run					3.12%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
19811-015		19811-005	25		1	0.3452	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	2.68	2.29	0.0005	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.001734401	0.001734401	1	0.9668	0.3543	Non-Significant Effect
Error	0.01435163	0.001793954	8			
Total	0.01608603	0.003528355	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	699.2	23.15	<0.0001	Unequal Variances
Distribution	Shapiro-Wilk Normality	0.6533		0.0002	Non-normal Distribution

Proportion Survived Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	1	1	1	1	1	0	0	0.0%	0.0%
19811-005	5	0.9867	0.9753	0.998	0.9333	1	0.005536	0.02981	3.02%	1.33%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	1.443	1.442	1.444	1.441	1.445	0.0004183	0.002253	0.16%	0.0%
19811-005	5	1.417	1.394	1.439	1.31	1.445	0.01112	0.05986	4.23%	1.83%

Proportion Survived Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	1	1	1	1	1
19811-005	1	1	1	0.9333	1

Eisenia 28-d Survival and Growth Soil Test — **EnviroSystems, Inc.**

Analysis ID:	00-2071-9872	**Endpoint:**	Proportion Survived	**CETIS Version:**	CETISv1.7.0
Analyzed:	19 Jul-10 11:28	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	00-3538-6679	**Test Type:**	Survival-Growth	**Analyst:**	
Start Date:	18 Jun-10 12:00	**Protocol:**	EPA/600/R-92/183 (1992)	**Diluent:**	Not Applicable
Ending Date:	16 Jul-10 12:00	**Species:**	Eisenia fetida	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	0	C > T	Not Run					5.37%

Unequal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-004	1.53	2.132	0.106	0.1004	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	2.294	2.29	0.0488	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.01445224	0.01445224	1	2.34	0.1647	Non-Significant Effect
Error	0.04941823	0.006177278	8			
Total	0.06387046	0.02062952	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2410	23.15	<0.0001	Unequal Variances
Distribution	Shapiro-Wilk Normality	0.8326		0.0360	Normal Distribution

Proportion Survived Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	1	1	1	1	1	0	0	0.0%	0.0%
19811-004	5	0.96	0.9373	0.9827	0.8667	1	0.01107	0.05963	6.21%	4.0%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	1.443	1.442	1.444	1.441	1.445	0.0004183	0.002253	0.16%	0.0%
19811-004	5	1.367	1.325	1.409	1.197	1.445	0.02064	0.1111	8.13%	5.27%

Proportion Survived Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	1	1	1	1	1
19811-004	1	1	1	0.8667	0.9333

Eisenia 28-d Survival and Growth Soil Test — **EnviroSystems, Inc.**

Analysis ID:	18-5871-5892	**Endpoint:**	Proportion Survived	**CETIS Version:**	CETISv1.7.0
Analyzed:	19 Jul-10 11:28	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	00-3538-6679	**Test Type:**	Survival-Growth	**Analyst:**	
Start Date:	18 Jun-10 12:00	**Protocol:**	EPA/600/R-92/183 (1992)	**Diluent:**	Not Applicable
Ending Date:	16 Jul-10 12:00	**Species:**	Eisenia fetida	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	0	C > T	Not Run					1.67%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-003	1.633	1.86	0.001883	0.0706	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.643	2.29	0.8052	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	6.832477E-06	6.832477E-06	1	2.667	0.1411	Non-Significant Effect
Error	2.049743E-05	2.562179E-06	8			
Total	2.732991E-05	9.394656E-06	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Variance	3	13.75	0.1340	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8142		0.0215	Normal Distribution

Proportion Survived Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	1	1	1	1	1	0	0	0.0%	0.0%
19811-003	5	1	1	1	1	1	0	0	0.0%	0.0%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	1.443	1.442	1.444	1.441	1.445	0.0004183	0.002253	0.16%	0.0%
19811-003	5	1.441	1.441	1.441	1.441	1.441	0	0	0.0%	0.11%

Proportion Survived Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	1	1	1	1	1
19811-003	1	1	1	1	1

Eisenia 28-d Survival and Growth Soil Test — **EnviroSystems, Inc.**

Analysis ID:	05-2311-0124	**Endpoint:**	Proportion Survived	**CETIS Version:**	CETISv1.7.0
Analyzed:	19 Jul-10 11:28	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Batch ID:	00-3538-6679	**Test Type:**	Survival-Growth	**Analyst:**	
Start Date:	18 Jun-10 12:00	**Protocol:**	EPA/600/R-92/183 (1992)	**Diluent:**	Not Applicable
Ending Date:	16 Jul-10 12:00	**Species:**	Eisenia fetida	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	0	C > T	Not Run					3.09%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
19811-015		19811-002	25		1	0.3452	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	2.681	2.29	0.0005	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.001958951	0.001958951	1	1.128	0.3192	Non-Significant Effect
Error	0.0138957	0.001736963	8			
Total	0.01585465	0.003695913	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	676.9	23.15	<0.0001	Unequal Variances
Distribution	Shapiro-Wilk Normality	0.6386		0.0002	Non-normal Distribution

Proportion Survived Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	1	1	1	1	1	0	0	0.0%	0.0%
19811-002	5	0.9867	0.9753	0.998	0.9333	1	0.005536	0.02981	3.02%	1.33%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	1.443	1.442	1.444	1.441	1.445	0.0004183	0.002253	0.16%	0.0%
19811-002	5	1.415	1.393	1.437	1.31	1.441	0.01094	0.0589	4.16%	1.94%

Proportion Survived Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	1	1	1	1	1
19811-002	1	1	1	0.9333	1

Eisenia 28-d Survival and Growth Soil Test — **EnviroSystems, Inc.**

Analysis ID:	13-1027-6210	**Endpoint:**	Proportion Survived	**CETIS Version:**	CETISv1.7.0
Analyzed:	19 Jul-10 11:28	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Batch ID:	00-3538-6679	**Test Type:**	Survival-Growth	**Analyst:**	
Start Date:	18 Jun-10 12:00	**Protocol:**	EPA/600/R-92/183 (1992)	**Diluent:**	Not Applicable
Ending Date:	16 Jul-10 12:00	**Species:**	Eisenia fetida	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	0	C > T	Not Run					5.72%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
19811-000		19811-014	29		1	0.5794	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	2.239	2.29	0.0692	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	3.633551E-05	3.633551E-05	1	0.004239	0.9497	Non-Significant Effect
Error	0.06857108	0.008571384	8			
Total	0.06860741	0.00860772	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.295	23.15	0.4409	Equal Variances
Distribution	Shapiro-Wilk Normality	0.6673		0.0004	Non-normal Distribution

Proportion Survived Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	0.9733	0.9594	0.9872	0.9333	1	0.006781	0.03651	3.75%	0.0%
19811-014	5	0.9733	0.9507	0.996	0.8667	1	0.01107	0.05963	6.13%	0.0%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	1.389	1.361	1.416	1.31	1.441	0.01339	0.07213	5.19%	0.0%
19811-014	5	1.392	1.351	1.434	1.197	1.441	0.02029	0.1093	7.85%	-0.27%

Proportion Survived Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	1	1	1	0.9333	0.9333
19811-014	1	1	1	1	0.8667

Eisenia 28-d Survival and Growth Soil Test — **EnviroSystems, Inc.**

Analysis ID:	05-2000-8733	**Endpoint:**	Proportion Survived	**CETIS Version:**	CETISv1.7.0
Analyzed:	19 Jul-10 11:28	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	00-3538-6679	**Test Type:**	Survival-Growth	**Analyst:**	
Start Date:	18 Jun-10 12:00	**Protocol:**	EPA/600/R-92/183 (1992)	**Diluent:**	Not Applicable
Ending Date:	16 Jul-10 12:00	**Species:**	Eisenia fetida	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	0	C > T	Not Run					3.6%

Unequal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-013	-1.658	2.132	0.06879	0.9137	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.643	2.29	0.8064	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.007157028	0.007157028	1	2.749	0.1359	Non-Significant Effect
Error	0.02082647	0.002603309	8			
Total	0.0279835	0.009760337	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1523	23.15	<0.0001	Unequal Variances
Distribution	Shapiro-Wilk Normality	0.8222		0.0269	Normal Distribution

Proportion Survived Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	0.9733	0.9594	0.9872	0.9333	1	0.006781	0.03651	3.75%	0.0%
19811-013	5	1	1	1	1	1	0	0	0.0%	-2.74%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	1.389	1.361	1.416	1.31	1.441	0.01339	0.07213	5.19%	0.0%
19811-013	5	1.442	1.441	1.443	1.441	1.445	0.00034	0.001831	0.13%	-3.85%

Proportion Survived Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	1	1	1	0.9333	0.9333
19811-013	1	1	1	1	1

Eisenia 28-d Survival and Growth Soil Test — **EnviroSystems, Inc.**

Analysis ID:	18-7834-8861	**Endpoint:**	Proportion Survived	**CETIS Version:**	CETISv1.7.0
Analyzed:	19 Jul-10 11:28	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Batch ID:	00-3538-6679	**Test Type:**	Survival-Growth	**Analyst:**	
Start Date:	18 Jun-10 12:00	**Protocol:**	EPA/600/R-92/183 (1992)	**Diluent:**	Not Applicable
Ending Date:	16 Jul-10 12:00	**Species:**	Eisenia fetida	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	0	C > T	Not Run					4.04%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
19811-000		19811-010	30		2	0.6548	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.705	2.29	0.6728	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.001844967	0.001844967	1	0.4227	0.5338	Non-Significant Effect
Error	0.03491939	0.004364924	8			
Total	0.03676436	0.006209891	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.475	23.15	0.7155	Equal Variances
Distribution	Shapiro-Wilk Normality	0.7628		0.0051	Non-normal Distribution

Proportion Survived Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	0.9733	0.9594	0.9872	0.9333	1	0.006781	0.03651	3.75%	0.0%
19811-010	5	0.9867	0.9753	0.998	0.9333	1	0.005536	0.02981	3.02%	-1.37%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	1.389	1.361	1.416	1.31	1.441	0.01339	0.07213	5.19%	0.0%
19811-010	5	1.416	1.393	1.438	1.31	1.445	0.01103	0.05939	4.19%	-1.96%

Proportion Survived Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	1	1	1	0.9333	0.9333
19811-010	1	1	0.9333	1	1

Eisenia 28-d Survival and Growth Soil Test — **EnviroSystems, Inc.**

Analysis ID:	13-3504-3938	**Endpoint:**	Proportion Survived	**CETIS Version:**	CETISv1.7.0
Analyzed:	19 Jul-10 11:28	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Batch ID:	00-3538-6679	**Test Type:**	Survival-Growth	**Analyst:**	
Start Date:	18 Jun-10 12:00	**Protocol:**	EPA/600/R-92/183 (1992)	**Diluent:**	Not Applicable
Ending Date:	16 Jul-10 12:00	**Species:**	Eisenia fetida	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	0	C > T	Not Run					4.07%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
19811-000		19811-009	30		2	0.6548	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.716	2.29	0.6495	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.002045808	0.002045808	1	0.4625	0.5157	Non-Significant Effect
Error	0.03538792	0.00442349	8			
Total	0.03743373	0.006469298	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.428	23.15	0.7383	Equal Variances
Distribution	Shapiro-Wilk Normality	0.7685		0.0060	Non-normal Distribution

Proportion Survived Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	0.9733	0.9594	0.9872	0.9333	1	0.006781	0.03651	3.75%	0.0%
19811-009	5	0.9867	0.9753	0.998	0.9333	1	0.005536	0.02981	3.02%	-1.37%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	1.389	1.361	1.416	1.31	1.441	0.01339	0.07213	5.19%	0.0%
19811-009	5	1.417	1.394	1.44	1.31	1.453	0.01121	0.06036	4.26%	-2.06%

Proportion Survived Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	1	1	1	0.9333	0.9333
19811-009	1	1	1	0.9333	1

Eisenia 28-d Survival and Growth Soil Test — **EnviroSystems, Inc.**

Analysis ID:	18-5415-6047	**Endpoint:**	Proportion Survived	**CETIS Version:**	CETISv1.7.0
Analyzed:	19 Jul-10 11:28	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Batch ID:	00-3538-6679	**Test Type:**	Survival-Growth	**Analyst:**	
Start Date:	18 Jun-10 12:00	**Protocol:**	EPA/600/R-92/183 (1992)	**Diluent:**	Not Applicable
Ending Date:	16 Jul-10 12:00	**Species:**	Eisenia fetida	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	0	C > T	Not Run					4.06%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
19811-000		19811-005	30		2	0.6548	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.712	2.29	0.6572	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.001958951	0.001958951	1	0.4459	0.5231	Non-Significant Effect
Error	0.03514394	0.004392993	8			
Total	0.03710289	0.006351943	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.452	23.15	0.7265	Equal Variances
Distribution	Shapiro-Wilk Normality	0.7638		0.0053	Non-normal Distribution

Proportion Survived Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	0.9733	0.9594	0.9872	0.9333	1	0.006781	0.03651	3.75%	0.0%
19811-005	5	0.9867	0.9753	0.998	0.9333	1	0.005536	0.02981	3.02%	-1.37%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	1.389	1.361	1.416	1.31	1.441	0.01339	0.07213	5.19%	0.0%
19811-005	5	1.417	1.394	1.439	1.31	1.445	0.01112	0.05986	4.23%	-2.02%

Proportion Survived Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	1	1	1	0.9333	0.9333
19811-005	1	1	1	0.9333	1

Eisenia 28-d Survival and Growth Soil Test — **EnviroSystems, Inc.**

Analysis ID:	18-5612-7739	**Endpoint:**	Proportion Survived	**CETIS Version:**	CETISv1.7.0
Analyzed:	19 Jul-10 11:28	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	00-3538-6679	**Test Type:**	Survival-Growth	**Analyst:**	
Start Date:	18 Jun-10 12:00	**Protocol:**	EPA/600/R-92/183 (1992)	**Diluent:**	Not Applicable
Ending Date:	16 Jul-10 12:00	**Species:**	Eisenia fetida	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	0	C > T	Not Run					5.79%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-004	0.3663	1.86	0.1102	0.3618	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.924	2.29	0.3185	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.001177265	0.001177265	1	0.1341	0.7237	Non-Significant Effect
Error	0.07021053	0.008776316	8			
Total	0.0713878	0.009953581	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.373	23.15	0.4230	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8163		0.0228	Normal Distribution

Proportion Survived Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	0.9733	0.9594	0.9872	0.9333	1	0.006781	0.03651	3.75%	0.0%
19811-004	5	0.96	0.9373	0.9827	0.8667	1	0.01107	0.05963	6.21%	1.37%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	1.389	1.361	1.416	1.31	1.441	0.01339	0.07213	5.19%	0.0%
19811-004	5	1.367	1.325	1.409	1.197	1.445	0.02064	0.1111	8.13%	1.56%

Proportion Survived Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	1	1	1	0.9333	0.9333
19811-004	1	1	1	0.8667	0.9333

Eisenia 28-d Survival and Growth Soil Test — **EnviroSystems, Inc.**

Analysis ID:	05-1188-5009	**Endpoint:**	Proportion Survived	**CETIS Version:**	CETISv1.7.0
Analyzed:	19 Jul-10 11:27	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	00-3538-6679	**Test Type:**	Survival-Growth	**Analyst:**	
Start Date:	18 Jun-10 12:00	**Protocol:**	EPA/600/R-92/183 (1992)	**Diluent:**	Not Applicable
Ending Date:	16 Jul-10 12:00	**Species:**	Eisenia fetida	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	0	C > T	Not Run					3.17%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-003	-1.633	1.86	0.05999	0.9294	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.643	2.29	0.8052	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.006937602	0.006937602	1	2.667	0.1411	Non-Significant Effect
Error	0.02081281	0.002601601	8			
Total	0.02775041	0.009539203	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Mod Levene Equality of Variance	3	13.75	0.1340	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8142		0.0215	Normal Distribution

Proportion Survived Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	0.9733	0.9594	0.9872	0.9333	1	0.006781	0.03651	3.75%	0.0%
19811-003	5	1	1	1	1	1	0	0	0.0%	-2.74%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	1.389	1.361	1.416	1.31	1.441	0.01339	0.07213	5.19%	0.0%
19811-003	5	1.441	1.441	1.441	1.441	1.441	0	0	0.0%	-3.79%

Proportion Survived Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	1	1	1	0.9333	0.9333
19811-003	1	1	1	1	1

Eisenia 28-d Survival and Growth Soil Test — **EnviroSystems, Inc.**

Analysis ID:	03-5474-4618	**Endpoint:**	Proportion Survived	**CETIS Version:**	CETISv1.7.0
Analyzed:	19 Jul-10 11:27	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Batch ID:	00-3538-6679	**Test Type:**	Survival-Growth	**Analyst:**	
Start Date:	18 Jun-10 12:00	**Protocol:**	EPA/600/R-92/183 (1992)	**Diluent:**	Not Applicable
Ending Date:	16 Jul-10 12:00	**Species:**	Eisenia fetida	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	0	C > T	Not Run					4.03%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
19811-000		19811-002	30		2	0.6548	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.697	2.29	0.6884	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.001734401	0.001734401	1	0.4	0.5447	Non-Significant Effect
Error	0.03468801	0.004336001	8			
Total	0.03642241	0.006070402	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.5	23.15	0.7040	Equal Variances
Distribution	Shapiro-Wilk Normality	0.7586		0.0045	Non-normal Distribution

Proportion Survived Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	0.9733	0.9594	0.9872	0.9333	1	0.006781	0.03651	3.75%	0.0%
19811-002	5	0.9867	0.9753	0.998	0.9333	1	0.005536	0.02981	3.02%	-1.37%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	1.389	1.361	1.416	1.31	1.441	0.01339	0.07213	5.19%	0.0%
19811-002	5	1.415	1.393	1.437	1.31	1.441	0.01094	0.0589	4.16%	-1.9%

Proportion Survived Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	1	1	1	0.9333	0.9333
19811-002	1	1	1	0.9333	1

Eisenia 28-d Survival and Growth Soil Test — **EnviroSystems, Inc.**

Analysis ID:	11-4927-1437	**Endpoint:**	Proportion Survived	**CETIS Version:**	CETISv1.7.0
Analyzed:	19 Jul-10 11:27	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	00-3538-6679	**Test Type:**	Survival-Growth	**Analyst:**	
Start Date:	18 Jun-10 12:00	**Protocol:**	EPA/600/R-92/183 (1992)	**Diluent:**	Not Applicable
Ending Date:	16 Jul-10 12:00	**Species:**	Eisenia fetida	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	0	C > T	Not Run					3.6%

Unequal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-015	-1.683	2.132	0.06881	0.9162	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.642	2.29	0.8070	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.00737987	0.00737987	1	2.834	0.1308	Non-Significant Effect
Error	0.0208333	0.002604163	8			
Total	0.02821317	0.009984033	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1015	23.15	<0.0001	Unequal Variances
Distribution	Shapiro-Wilk Normality	0.8262		0.0301	Normal Distribution

Proportion Survived Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	0.9733	0.9594	0.9872	0.9333	1	0.006781	0.03651	3.75%	0.0%
19811-015	5	1	1	1	1	1	0	0	0.0%	-2.74%

Angular (Corrected) Transformed Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	1.389	1.361	1.416	1.31	1.441	0.01339	0.07213	5.19%	0.0%
19811-015	5	1.443	1.442	1.444	1.441	1.445	0.0004183	0.002253	0.16%	-3.91%

Proportion Survived Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	1	1	1	0.9333	0.9333
19811-015	1	1	1	1	1

Eisenia 28-d Survival and Growth Soil Test — **EnviroSystems, Inc.**

Analysis ID:	07-2000-0457	**Endpoint:**	Wet Weight - Mean	**CETIS Version:**	CETISv1.7.0
Analyzed:	22 Jul-10 11:57	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	00-3538-6679	**Test Type:**	Survival-Growth	**Analyst:**	
Start Date:	18 Jun-10 12:00	**Protocol:**	EPA/600/R-92/183 (1992)	**Diluent:**	Not Applicable
Ending Date:	16 Jul-10 12:00	**Species:**	Eisenia fetida	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					12.6%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-014	-1.105	1.86	44.43	0.8493	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.577	2.29	0.9639	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	1742.338	1742.338	1	1.221	0.3013	Non-Significant Effect
Error	11417.05	1427.131	8			
Total	13159.38	3169.469	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.112	23.15	0.9203	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9108		0.2865	Normal Distribution

Wet Weight - Mean Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	352.6	337.9	367.4	296.4	394.5	7.199	38.77	10.99%	0.0%
19811-014	5	379	365.1	393	332	419.9	6.826	36.76	9.7%	-7.49%

Wet Weight - Mean Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	362.9	332.4	376.9	296.4	394.5
19811-014	401.5	332	419.9	349.9	392

Eisenia 28-d Survival and Growth Soil Test — **EnviroSystems, Inc.**

Analysis ID:	09-4979-1966	**Endpoint:**	Wet Weight - Mean	**CETIS Version:**	CETISv1.7.0
Analyzed:	22 Jul-10 11:57	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	00-3538-6679	**Test Type:**	Survival-Growth	**Analyst:**	
Start Date:	18 Jun-10 12:00	**Protocol:**	EPA/600/R-92/183 (1992)	**Diluent:**	Not Applicable
Ending Date:	16 Jul-10 12:00	**Species:**	Eisenia fetida	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					10.63%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-013	0.6	1.86	37.48	0.2826	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.87	2.29	0.3898	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	365.5045	365.5045	1	0.36	0.5651	Non-Significant Effect
Error	8123.202	1015.4	8			
Total	8488.707	1380.905	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.848	23.15	0.3350	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9456		0.6165	Normal Distribution

Wet Weight - Mean Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	352.6	337.9	367.4	296.4	394.5	7.199	38.77	10.99%	0.0%
19811-013	5	340.5	331.8	349.3	305.1	359.8	4.266	22.97	6.75%	3.43%

Wet Weight - Mean Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	362.9	332.4	376.9	296.4	394.5
19811-013	305.1	356.4	329.8	359.8	351.5

Eisenia 28-d Survival and Growth Soil Test — **EnviroSystems, Inc.**

Analysis ID:	19-3013-1087	**Endpoint:**	Wet Weight - Mean	**CETIS Version:**	CETISv1.7.0
Analyzed:	22 Jul-10 11:57	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	00-3538-6679	**Test Type:**	Survival-Growth	**Analyst:**	
Start Date:	18 Jun-10 12:00	**Protocol:**	EPA/600/R-92/183 (1992)	**Diluent:**	Not Applicable
Ending Date:	16 Jul-10 12:00	**Species:**	Eisenia fetida	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					13.46%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-010	1.747	1.86	47.46	0.0594	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.536	2.29	1.0000	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	4968.995	4968.995	1	3.051	0.1188	Non-Significant Effect
Error	13029.95	1628.744	8			
Total	17998.94	6597.738	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.167	23.15	0.8845	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8764		0.1187	Normal Distribution

Wet Weight - Mean Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	352.6	337.9	367.4	296.4	394.5	7.199	38.77	10.99%	0.0%
19811-010	5	308.1	292.1	324	249.6	345.2	7.778	41.89	13.6%	12.64%

Wet Weight - Mean Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	362.9	332.4	376.9	296.4	394.5
19811-010	337.5	278.3	249.6	345.2	329.7

Eisenia 28-d Survival and Growth Soil Test — **EnviroSystems, Inc.**

Analysis ID:	15-2699-5033	**Endpoint:**	Wet Weight - Mean	**CETIS Version:**	CETISv1.7.0
Analyzed:	22 Jul-10 11:57	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	00-3538-6679	**Test Type:**	Survival-Growth	**Analyst:**	
Start Date:	18 Jun-10 12:00	**Protocol:**	EPA/600/R-92/183 (1992)	**Diluent:**	Not Applicable
Ending Date:	16 Jul-10 12:00	**Species:**	Eisenia fetida	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					10.64%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-009	1.132	1.86	37.51	0.1453	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.868	2.29	0.3924	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	1303.112	1303.112	1	1.281	0.2905	Non-Significant Effect
Error	8139.035	1017.379	8			
Total	9442.147	2320.491	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.827	23.15	0.3384	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9602		0.7881	Normal Distribution

Wet Weight - Mean Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	352.6	337.9	367.4	296.4	394.5	7.199	38.77	10.99%	0.0%
19811-009	5	329.8	321	338.6	298.8	354	4.282	23.06	6.99%	6.47%

Wet Weight - Mean Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	362.9	332.4	376.9	296.4	394.5
19811-009	298.8	351.3	320.1	354	324.9

Eisenia 28-d Survival and Growth Soil Test — **EnviroSystems, Inc.**

Analysis ID:	14-5507-6573	**Endpoint:**	Wet Weight - Mean	**CETIS Version:**	CETISv1.7.0
Analyzed:	22 Jul-10 11:57	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	00-3538-6679	**Test Type:**	Survival-Growth	**Analyst:**	
Start Date:	18 Jun-10 12:00	**Protocol:**	EPA/600/R-92/183 (1992)	**Diluent:**	Not Applicable
Ending Date:	16 Jul-10 12:00	**Species:**	Eisenia fetida	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					13.13%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-005	1.634	1.86	46.31	0.0705	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.513	2.29	1.0000	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	4139.484	4139.484	1	2.67	0.1409	Non-Significant Effect
Error	12403.96	1550.495	8			
Total	16543.45	5689.979	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.063	23.15	0.9541	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9454		0.6141	Normal Distribution

Wet Weight - Mean Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	352.6	337.9	367.4	296.4	394.5	7.199	38.77	10.99%	0.0%
19811-005	5	311.9	296.7	327.1	262.7	363	7.423	39.97	12.81%	11.54%

Wet Weight - Mean Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	362.9	332.4	376.9	296.4	394.5
19811-005	282.7	262.7	333.7	317.7	363

Eisenia 28-d Survival and Growth Soil Test — **EnviroSystems, Inc.**

Analysis ID:	17-3217-5157	**Endpoint:**	Wet Weight - Mean	**CETIS Version:**	CETISv1.7.0
Analyzed:	22 Jul-10 11:57	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	00-3538-6679	**Test Type:**	Survival-Growth	**Analyst:**	
Start Date:	18 Jun-10 12:00	**Protocol:**	EPA/600/R-92/183 (1992)	**Diluent:**	Not Applicable
Ending Date:	16 Jul-10 12:00	**Species:**	Eisenia fetida	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					12.22%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-004	2.094	1.86	43.11	0.0348	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.626	2.29	0.8451	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	5891.667	5891.667	1	4.386	0.0696	Non-Significant Effect
Error	10746.63	1343.328	8			
Total	16638.29	7234.996	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.27	23.15	0.8225	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9242		0.3929	Normal Distribution

Wet Weight - Mean Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	352.6	337.9	367.4	296.4	394.5	7.199	38.77	10.99%	0.0%
19811-004	5	304.1	291	317.2	267.3	340.2	6.389	34.4	11.31%	13.77%

Wet Weight - Mean Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	362.9	332.4	376.9	296.4	394.5
19811-004	308.5	334.3	267.3	270.2	340.2

Eisenia 28-d Survival and Growth Soil Test — **EnviroSystems, Inc.**

Analysis ID:	11-3635-9433	**Endpoint:**	Wet Weight - Mean	**CETIS Version:**	CETISv1.7.0
Analyzed:	22 Jul-10 11:57	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	00-3538-6679	**Test Type:**	Survival-Growth	**Analyst:**	
Start Date:	18 Jun-10 12:00	**Protocol:**	EPA/600/R-92/183 (1992)	**Diluent:**	Not Applicable
Ending Date:	16 Jul-10 12:00	**Species:**	Eisenia fetida	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					11.83%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-003	1.068	1.86	41.71	0.1584	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.68	2.29	0.7232	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	1434.337	1434.337	1	1.141	0.3167	Non-Significant Effect
Error	10061.03	1257.629	8			
Total	11495.37	2691.966	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.485	23.15	0.7110	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9619		0.8075	Normal Distribution

Wet Weight - Mean Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	352.6	337.9	367.4	296.4	394.5	7.199	38.77	10.99%	0.0%
19811-003	5	328.7	316.6	340.8	297.1	375	5.908	31.82	9.68%	6.79%

Wet Weight - Mean Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	362.9	332.4	376.9	296.4	394.5
19811-003	306.6	297.1	346.4	318.3	375

Eisenia 28-d Survival and Growth Soil Test — **EnviroSystems, Inc.**

Analysis ID:	03-3185-0327	**Endpoint:**	Wet Weight - Mean	**CETIS Version:**	CETISv1.7.0
Analyzed:	22 Jul-10 11:57	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	00-3538-6679	**Test Type:**	Survival-Growth	**Analyst:**	
Start Date:	18 Jun-10 12:00	**Protocol:**	EPA/600/R-92/183 (1992)	**Diluent:**	Not Applicable
Ending Date:	16 Jul-10 12:00	**Species:**	Eisenia fetida	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					9.43%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-002	1.266	1.86	33.27	0.1206	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	2.107	2.29	0.1435	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	1281.466	1281.466	1	1.602	0.2413	Non-Significant Effect
Error	6400.438	800.0548	8			
Total	7681.904	2081.521	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	15.48	23.15	0.0212	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9615		0.8033	Normal Distribution

Wet Weight - Mean Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	352.6	337.9	367.4	296.4	394.5	7.199	38.77	10.99%	0.0%
19811-002	5	330	326.2	333.7	317.2	341.9	1.83	9.853	2.99%	6.42%

Wet Weight - Mean Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	362.9	332.4	376.9	296.4	394.5
19811-002	317.2	341.9	323.8	330.3	336.7

Eisenia 28-d Survival and Growth Soil Test — **EnviroSystems, Inc.**

Analysis ID:	16-1355-0043	**Endpoint:**	Wet Weight - Mean	**CETIS Version:**	CETISv1.7.0
Analyzed:	22 Jul-10 11:57	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	00-3538-6679	**Test Type:**	Survival-Growth	**Analyst:**	
Start Date:	18 Jun-10 12:00	**Protocol:**	EPA/600/R-92/183 (1992)	**Diluent:**	Not Applicable
Ending Date:	16 Jul-10 12:00	**Species:**	Eisenia fetida	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					14.2%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-014	-1.093	1.86	49.67	0.8469	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.656	2.29	0.7763	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	2131.201	2131.201	1	1.195	0.3061	Non-Significant Effect
Error	14267.12	1783.39	8			
Total	16398.32	3914.591	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.64	23.15	0.6436	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9762		0.9413	Normal Distribution

Wet Weight - Mean Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	349.8	331.9	367.7	283.9	410.3	8.741	47.07	13.45%	0.0%
19811-014	5	379	365.1	393	332	419.9	6.826	36.76	9.7%	-8.35%

Wet Weight - Mean Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	283.9	331.1	372.4	410.3	351.5
19811-014	401.5	332	419.9	349.9	392

Eisenia 28-d Survival and Growth Soil Test — **EnviroSystems, Inc.**

Analysis ID:	08-4782-3574	**Endpoint:**	Wet Weight - Mean	**CETIS Version:**	CETISv1.7.0
Analyzed:	22 Jul-10 11:57	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	00-3538-6679	**Test Type:**	Survival-Growth	**Analyst:**	
Start Date:	18 Jun-10 12:00	**Protocol:**	EPA/600/R-92/183 (1992)	**Diluent:**	Not Applicable
Ending Date:	16 Jul-10 12:00	**Species:**	Eisenia fetida	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					12.45%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-013	0.3968	1.86	43.56	0.3510	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.888	2.29	0.3648	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	215.9302	215.9302	1	0.1574	0.7019	Non-Significant Effect
Error	10973.28	1371.66	8			
Total	11189.21	1587.59	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	4.198	23.15	0.1936	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9733		0.9199	Normal Distribution

Wet Weight - Mean Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	349.8	331.9	367.7	283.9	410.3	8.741	47.07	13.45%	0.0%
19811-013	5	340.5	331.8	349.3	305.1	359.8	4.266	22.97	6.75%	2.66%

Wet Weight - Mean Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	283.9	331.1	372.4	410.3	351.5
19811-013	305.1	356.4	329.8	359.8	351.5

Eisenia 28-d Survival and Growth Soil Test — **EnviroSystems, Inc.**

Analysis ID:	03-7030-8652	**Endpoint:**	Wet Weight - Mean	**CETIS Version:**	CETISv1.7.0
Analyzed:	22 Jul-10 11:57	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	00-3538-6679	**Test Type:**	Survival-Growth	**Analyst:**	
Start Date:	18 Jun-10 12:00	**Protocol:**	EPA/600/R-92/183 (1992)	**Diluent:**	Not Applicable
Ending Date:	16 Jul-10 12:00	**Species:**	Eisenia fetida	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					14.98%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-010	1.483	1.86	52.4	0.0882	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.57	2.29	0.9840	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	4364.913	4364.913	1	2.199	0.1764	Non-Significant Effect
Error	15880.03	1985.003	8			
Total	20244.94	6349.916	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.263	23.15	0.8266	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9451		0.6107	Normal Distribution

Wet Weight - Mean Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	349.8	331.9	367.7	283.9	410.3	8.741	47.07	13.45%	0.0%
19811-010	5	308.1	292.1	324	249.6	345.2	7.778	41.89	13.6%	11.94%

Wet Weight - Mean Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	283.9	331.1	372.4	410.3	351.5
19811-010	337.5	278.3	249.6	345.2	329.7

Eisenia 28-d Survival and Growth Soil Test — **EnviroSystems, Inc.**

Analysis ID:	09-3269-8380	**Endpoint:**	Wet Weight - Mean	**CETIS Version:**	CETISv1.7.0
Analyzed:	22 Jul-10 11:57	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	00-3538-6679	**Test Type:**	Survival-Growth	**Analyst:**	
Start Date:	18 Jun-10 12:00	**Protocol:**	EPA/600/R-92/183 (1992)	**Diluent:**	Not Applicable
Ending Date:	16 Jul-10 12:00	**Species:**	Eisenia fetida	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					12.46%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-009	0.8546	1.86	43.59	0.2088	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.887	2.29	0.3667	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	1003.308	1003.308	1	0.7304	0.4176	Non-Significant Effect
Error	10989.11	1373.639	8			
Total	11992.42	2376.947	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	4.167	23.15	0.1958	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9768		0.9460	Normal Distribution

Wet Weight - Mean Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	349.8	331.9	367.7	283.9	410.3	8.741	47.07	13.45%	0.0%
19811-009	5	329.8	321	338.6	298.8	354	4.282	23.06	6.99%	5.73%

Wet Weight - Mean Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	283.9	331.1	372.4	410.3	351.5
19811-009	298.8	351.3	320.1	354	324.9

Eisenia 28-d Survival and Growth Soil Test — **EnviroSystems, Inc.**

Analysis ID:	17-1297-4900	**Endpoint:**	Wet Weight - Mean	**CETIS Version:**	CETISv1.7.0
Analyzed:	22 Jul-10 11:56	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	00-3538-6679	**Test Type:**	Survival-Growth	**Analyst:**	
Start Date:	18 Jun-10 12:00	**Protocol:**	EPA/600/R-92/183 (1992)	**Diluent:**	Not Applicable
Ending Date:	16 Jul-10 12:00	**Species:**	Eisenia fetida	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					14.68%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-005	1.372	1.86	51.36	0.1036	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.602	2.29	0.9037	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	3589.833	3589.833	1	1.883	0.2073	Non-Significant Effect
Error	15254.04	1906.755	8			
Total	18843.87	5496.587	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.386	23.15	0.7592	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9714		0.9039	Normal Distribution

Wet Weight - Mean Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	349.8	331.9	367.7	283.9	410.3	8.741	47.07	13.45%	0.0%
19811-005	5	311.9	296.7	327.1	262.7	363	7.423	39.97	12.81%	10.83%

Wet Weight - Mean Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	283.9	331.1	372.4	410.3	351.5
19811-005	282.7	262.7	333.7	317.7	363

Eisenia 28-d Survival and Growth Soil Test — **EnviroSystems, Inc.**

Analysis ID:	14-6253-3829	**Endpoint:**	Wet Weight - Mean	**CETIS Version:**	CETISv1.7.0
Analyzed:	22 Jul-10 11:56	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	00-3538-6679	**Test Type:**	Survival-Growth	**Analyst:**	
Start Date:	18 Jun-10 12:00	**Protocol:**	EPA/600/R-92/183 (1992)	**Diluent:**	Not Applicable
Ending Date:	16 Jul-10 12:00	**Species:**	Eisenia fetida	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					13.86%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-004	1.755	1.86	48.49	0.0587	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.696	2.29	0.6899	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	5232.148	5232.148	1	3.078	0.1174	Non-Significant Effect
Error	13596.7	1699.588	8			
Total	18828.85	6931.735	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.872	23.15	0.5586	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9792		0.9609	Normal Distribution

Wet Weight - Mean Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	349.8	331.9	367.7	283.9	410.3	8.741	47.07	13.45%	0.0%
19811-004	5	304.1	291	317.2	267.3	340.2	6.389	34.4	11.31%	13.08%

Wet Weight - Mean Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	283.9	331.1	372.4	410.3	351.5
19811-004	308.5	334.3	267.3	270.2	340.2

Eisenia 28-d Survival and Growth Soil Test — **EnviroSystems, Inc.**

Analysis ID:	20-2498-7806	**Endpoint:**	Wet Weight - Mean	**CETIS Version:**	CETISv1.7.0
Analyzed:	22 Jul-10 11:56	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	00-3538-6679	**Test Type:**	Survival-Growth	**Analyst:**	
Start Date:	18 Jun-10 12:00	**Protocol:**	EPA/600/R-92/183 (1992)	**Diluent:**	Not Applicable
Ending Date:	16 Jul-10 12:00	**Species:**	Eisenia fetida	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					13.51%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-003	0.8326	1.86	47.25	0.2146	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.741	2.29	0.6023	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	1118.838	1118.838	1	0.6933	0.4292	Non-Significant Effect
Error	12911.1	1613.888	8			
Total	14029.94	2732.726	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.189	23.15	0.4667	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9828		0.9784	Normal Distribution

Wet Weight - Mean Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	349.8	331.9	367.7	283.9	410.3	8.741	47.07	13.45%	0.0%
19811-003	5	328.7	316.6	340.8	297.1	375	5.908	31.82	9.68%	6.05%

Wet Weight - Mean Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	283.9	331.1	372.4	410.3	351.5
19811-003	306.6	297.1	346.4	318.3	375

Eisenia 28-d Survival and Growth Soil Test — **EnviroSystems, Inc.**

Analysis ID:	20-2346-1994	**Endpoint:**	Wet Weight - Mean	**CETIS Version:**	CETISv1.7.0
Analyzed:	22 Jul-10 11:56	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	00-3538-6679	**Test Type:**	Survival-Growth	**Analyst:**	
Start Date:	18 Jun-10 12:00	**Protocol:**	EPA/600/R-92/183 (1992)	**Diluent:**	Not Applicable
Ending Date:	16 Jul-10 12:00	**Species:**	Eisenia fetida	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					11.43%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-002	0.9226	1.86	39.99	0.1916	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	2.057	2.29	0.1824	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	984.3252	984.3252	1	0.8513	0.3832	Non-Significant Effect
Error	9250.515	1156.314	8			
Total	10234.84	2140.64	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	22.82	23.15	0.0103	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9351		0.5001	Normal Distribution

Wet Weight - Mean Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	349.8	331.9	367.7	283.9	410.3	8.741	47.07	13.45%	0.0%
19811-002	5	330	326.2	333.7	317.2	341.9	1.83	9.853	2.99%	5.67%

Wet Weight - Mean Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	283.9	331.1	372.4	410.3	351.5
19811-002	317.2	341.9	323.8	330.3	336.7

Eisenia 28-d Survival and Growth Soil Test — **EnviroSystems, Inc.**

Analysis ID:	06-8353-3033	**Endpoint:**	Wet Weight - Mean	**CETIS Version:**	CETISv1.7.0
Analyzed:	22 Jul-10 11:56	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	00-3538-6679	**Test Type:**	Survival-Growth	**Analyst:**	
Start Date:	18 Jun-10 12:00	**Protocol:**	EPA/600/R-92/183 (1992)	**Diluent:**	Not Applicable
Ending Date:	16 Jul-10 12:00	**Species:**	Eisenia fetida	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					14.5%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-015	-0.1026	1.86	50.71	0.5396	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.622	2.29	0.8547	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	19.56831	19.56831	1	0.01052	0.9208	Non-Significant Effect
Error	14874.31	1859.289	8			
Total	14893.88	1878.857	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.474	23.15	0.7161	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9634		0.8235	Normal Distribution

Wet Weight - Mean Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	349.8	331.9	367.7	283.9	410.3	8.741	47.07	13.45%	0.0%
19811-015	5	352.6	337.9	367.4	296.4	394.5	7.199	38.77	10.99%	-0.8%

Wet Weight - Mean Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	283.9	331.1	372.4	410.3	351.5
19811-015	362.9	332.4	376.9	296.4	394.5

Eisenia 28-d Survival and Growth Soil Test — **EnviroSystems, Inc.**

Analysis ID:	10-2584-6740	**Endpoint:**	Wet Biomass - Mean	**CETIS Version:**	CETISv1.7.0
Analyzed:	22 Jul-10 11:56	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	00-3538-6679	**Test Type:**	Survival-Growth	**Analyst:**	
Start Date:	18 Jun-10 12:00	**Protocol:**	EPA/600/R-92/183 (1992)	**Diluent:**	Not Applicable
Ending Date:	16 Jul-10 12:00	**Species:**	Eisenia fetida	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					13.05%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-014	-0.6444	1.86	46.02	0.7313	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.523	2.29	1.0000	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	635.7011	635.7011	1	0.4153	0.5373	Non-Significant Effect
Error	12246.93	1530.866	8			
Total	12882.63	2166.567	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.037	23.15	0.9727	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9406		0.5599	Normal Distribution

Wet Biomass - Mean Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	352.6	337.9	367.4	296.4	394.5	7.199	38.77	10.99%	0.0%
19811-014	5	368.6	353.6	383.6	332	419.9	7.331	39.48	10.71%	-4.52%

Wet Biomass - Mean Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	362.9	332.4	376.9	296.4	394.5
19811-014	401.5	332	419.9	349.9	339.7

Eisenia 28-d Survival and Growth Soil Test — **EnviroSystems, Inc.**

Analysis ID:	04-8356-0745	**Endpoint:**	Wet Biomass - Mean	**CETIS Version:**	CETISv1.7.0
Analyzed:	22 Jul-10 11:56	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	00-3538-6679	**Test Type:**	Survival-Growth	**Analyst:**	
Start Date:	18 Jun-10 12:00	**Protocol:**	EPA/600/R-92/183 (1992)	**Diluent:**	Not Applicable
Ending Date:	16 Jul-10 12:00	**Species:**	Eisenia fetida	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					10.63%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-013	0.6	1.86	37.48	0.2826	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.87	2.29	0.3898	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	365.5045	365.5045	1	0.36	0.5651	Non-Significant Effect
Error	8123.202	1015.4	8			
Total	8488.707	1380.905	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.848	23.15	0.3350	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9456		0.6165	Normal Distribution

Wet Biomass - Mean Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	352.6	337.9	367.4	296.4	394.5	7.199	38.77	10.99%	0.0%
19811-013	5	340.5	331.8	349.3	305.1	359.8	4.266	22.97	6.75%	3.43%

Wet Biomass - Mean Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	362.9	332.4	376.9	296.4	394.5
19811-013	305.1	356.4	329.8	359.8	351.5

Eisenia 28-d Survival and Growth Soil Test — **EnviroSystems, Inc.**

Analysis ID:	17-9216-6346	**Endpoint:**	Wet Biomass - Mean	**CETIS Version:**	CETISv1.7.0
Analyzed:	22 Jul-10 11:56	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	00-3538-6679	**Test Type:**	Survival-Growth	**Analyst:**	
Start Date:	18 Jun-10 12:00	**Protocol:**	EPA/600/R-92/183 (1992)	**Diluent:**	Not Applicable
Ending Date:	16 Jul-10 12:00	**Species:**	Eisenia fetida	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					14.54%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-010	1.738	1.86	51.26	0.0602	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.746	2.29	0.5917	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	5738.538	5738.538	1	3.021	0.1204	Non-Significant Effect
Error	15196.69	1899.586	8			
Total	20935.23	7638.125	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.528	23.15	0.6914	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8822		0.1383	Normal Distribution

Wet Biomass - Mean Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	352.6	337.9	367.4	296.4	394.5	7.199	38.77	10.99%	0.0%
19811-010	5	304.7	286.5	323	233	345.2	8.898	47.92	15.73%	13.59%

Wet Biomass - Mean Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	362.9	332.4	376.9	296.4	394.5
19811-010	337.5	278.3	233	345.2	329.7

Eisenia 28-d Survival and Growth Soil Test — **EnviroSystems, Inc.**

Analysis ID:	05-4190-8353	**Endpoint:**	Wet Biomass - Mean	**CETIS Version:**	CETISv1.7.0
Analyzed:	22 Jul-10 11:55	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	00-3538-6679	**Test Type:**	Survival-Growth	**Analyst:**	
Start Date:	18 Jun-10 12:00	**Protocol:**	EPA/600/R-92/183 (1992)	**Diluent:**	Not Applicable
Ending Date:	16 Jul-10 12:00	**Species:**	Eisenia fetida	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					10.17%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-009	1.428	1.86	35.87	0.0956	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.954	2.29	0.2836	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	1897.59	1897.59	1	2.04	0.1911	Non-Significant Effect
Error	7443.105	930.3881	8			
Total	9340.695	2827.979	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	4.201	23.15	0.1934	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9741		0.9257	Normal Distribution

Wet Biomass - Mean Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	352.6	337.9	367.4	296.4	394.5	7.199	38.77	10.99%	0.0%
19811-009	5	325.1	317.9	332.3	298.8	351.3	3.512	18.91	5.82%	7.81%

Wet Biomass - Mean Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	362.9	332.4	376.9	296.4	394.5
19811-009	298.8	351.3	320.1	330.4	324.9

Eisenia 28-d Survival and Growth Soil Test — **EnviroSystems, Inc.**

Analysis ID:	07-3338-0981	**Endpoint:**	Wet Biomass - Mean	**CETIS Version:**	CETISv1.7.0
Analyzed:	22 Jul-10 11:55	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	00-3538-6679	**Test Type:**	Survival-Growth	**Analyst:**	
Start Date:	18 Jun-10 12:00	**Protocol:**	EPA/600/R-92/183 (1992)	**Diluent:**	Not Applicable
Ending Date:	16 Jul-10 12:00	**Species:**	Eisenia fetida	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					13.19%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-005	1.796	1.86	46.52	0.0551	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.506	2.29	1.0000	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	5046.218	5046.218	1	3.225	0.1103	Non-Significant Effect
Error	12518.52	1564.815	8			
Total	17564.73	6611.032	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.082	23.15	0.9408	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9625		0.8144	Normal Distribution

Wet Biomass - Mean Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	352.6	337.9	367.4	296.4	394.5	7.199	38.77	10.99%	0.0%
19811-005	5	307.7	292.4	323	262.7	363	7.489	40.33	13.11%	12.74%

Wet Biomass - Mean Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	362.9	332.4	376.9	296.4	394.5
19811-005	282.7	262.7	333.7	296.5	363

Eisenia 28-d Survival and Growth Soil Test — **EnviroSystems, Inc.**

Analysis ID:	13-4355-0194	**Endpoint:**	Wet Biomass - Mean	**CETIS Version:**	CETISv1.7.0
Analyzed:	22 Jul-10 11:55	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	00-3538-6679	**Test Type:**	Survival-Growth	**Analyst:**	
Start Date:	18 Jun-10 12:00	**Protocol:**	EPA/600/R-92/183 (1992)	**Diluent:**	Not Applicable
Ending Date:	16 Jul-10 12:00	**Species:**	Eisenia fetida	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					13.27%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-004	2.395	1.86	46.81	0.0218	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.55	2.29	1.0000	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	9086.243	9086.243	1	5.735	0.0435	Significant Effect
Error	12674.35	1584.294	8			
Total	21760.59	10670.54	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.108	23.15	0.9231	Equal Variances
Distribution	Shapiro-Wilk Normality	0.889		0.1651	Normal Distribution

Wet Biomass - Mean Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	352.6	337.9	367.4	296.4	394.5	7.199	38.77	10.99%	0.0%
19811-004	5	292.3	276.8	307.9	234.2	334.3	7.578	40.81	13.96%	17.1%

Wet Biomass - Mean Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	362.9	332.4	376.9	296.4	394.5
19811-004	308.5	334.3	267.3	234.2	317.5

Eisenia 28-d Survival and Growth Soil Test — **EnviroSystems, Inc.**

Analysis ID:	06-7056-7056	**Endpoint:**	Wet Biomass - Mean	**CETIS Version:**	CETISv1.7.0
Analyzed:	22 Jul-10 11:55	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	00-3538-6679	**Test Type:**	Survival-Growth	**Analyst:**	
Start Date:	18 Jun-10 12:00	**Protocol:**	EPA/600/R-92/183 (1992)	**Diluent:**	Not Applicable
Ending Date:	16 Jul-10 12:00	**Species:**	Eisenia fetida	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					11.83%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-003	1.068	1.86	41.71	0.1584	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.68	2.29	0.7232	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	1434.337	1434.337	1	1.141	0.3167	Non-Significant Effect
Error	10061.03	1257.629	8			
Total	11495.37	2691.966	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.485	23.15	0.7110	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9619		0.8075	Normal Distribution

Wet Biomass - Mean Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	352.6	337.9	367.4	296.4	394.5	7.199	38.77	10.99%	0.0%
19811-003	5	328.7	316.6	340.8	297.1	375	5.908	31.82	9.68%	6.79%

Wet Biomass - Mean Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	362.9	332.4	376.9	296.4	394.5
19811-003	306.6	297.1	346.4	318.3	375

Eisenia 28-d Survival and Growth Soil Test — **EnviroSystems, Inc.**

Analysis ID:	10-4270-4800	**Endpoint:**	Wet Biomass - Mean	**CETIS Version:**	CETISv1.7.0
Analyzed:	22 Jul-10 11:55	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	00-3538-6679	**Test Type:**	Survival-Growth	**Analyst:**	
Start Date:	18 Jun-10 12:00	**Protocol:**	EPA/600/R-92/183 (1992)	**Diluent:**	Not Applicable
Ending Date:	16 Jul-10 12:00	**Species:**	Eisenia fetida	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					9.7%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-002	1.47	1.86	34.22	0.0899	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	2.048	2.29	0.1896	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	1828.583	1828.583	1	2.16	0.1798	Non-Significant Effect
Error	6772.767	846.5959	8			
Total	8601.351	2675.179	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	7.904	23.15	0.0700	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9677		0.8692	Normal Distribution

Wet Biomass - Mean Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	352.6	337.9	367.4	296.4	394.5	7.199	38.77	10.99%	0.0%
19811-002	5	325.6	320.3	330.8	308.3	341.9	2.561	13.79	4.24%	7.67%

Wet Biomass - Mean Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	362.9	332.4	376.9	296.4	394.5
19811-002	317.2	341.9	323.8	308.3	336.7

Eisenia 28-d Survival and Growth Soil Test — **EnviroSystems, Inc.**

Analysis ID:	13-4876-9964	**Endpoint:**	Wet Biomass - Mean	**CETIS Version:**	CETISv1.7.0
Analyzed:	22 Jul-10 11:55	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	00-3538-6679	**Test Type:**	Survival-Growth	**Analyst:**	
Start Date:	18 Jun-10 12:00	**Protocol:**	EPA/600/R-92/183 (1992)	**Diluent:**	Not Applicable
Ending Date:	16 Jul-10 12:00	**Species:**	Eisenia fetida	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					13.68%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-014	-1.156	1.86	46.48	0.8595	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.497	2.29	1.0000	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	2088.14	2088.14	1	1.337	0.2809	Non-Significant Effect
Error	12494.62	1561.827	8			
Total	14582.75	3649.967	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.004	23.15	0.9970	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9225		0.3787	Normal Distribution

Wet Biomass - Mean Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	339.7	324.6	354.7	283.9	382.9	7.346	39.56	11.65%	0.0%
19811-014	5	368.6	353.6	383.6	332	419.9	7.331	39.48	10.71%	-8.51%

Wet Biomass - Mean Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	283.9	331.1	372.4	382.9	328.1
19811-014	401.5	332	419.9	349.9	339.7

Eisenia 28-d Survival and Growth Soil Test — **EnviroSystems, Inc.**

Analysis ID:	02-0665-5575	**Endpoint:**	Wet Biomass - Mean	**CETIS Version:**	CETISv1.7.0
Analyzed:	22 Jul-10 11:55	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	00-3538-6679	**Test Type:**	Survival-Growth	**Analyst:**	
Start Date:	18 Jun-10 12:00	**Protocol:**	EPA/600/R-92/183 (1992)	**Diluent:**	Not Applicable
Ending Date:	16 Jul-10 12:00	**Species:**	Eisenia fetida	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					11.2%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-013	-0.04219	1.86	38.04	0.5163	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.829	2.29	0.4509	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	1.862899	1.862899	1	0.00178	0.9674	Non-Significant Effect
Error	8370.889	1046.361	8			
Total	8372.752	1048.224	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.965	23.15	0.3175	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9651		0.8424	Normal Distribution

Wet Biomass - Mean Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	339.7	324.6	354.7	283.9	382.9	7.346	39.56	11.65%	0.0%
19811-013	5	340.5	331.8	349.3	305.1	359.8	4.266	22.97	6.75%	-0.25%

Wet Biomass - Mean Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	283.9	331.1	372.4	382.9	328.1
19811-013	305.1	356.4	329.8	359.8	351.5

Eisenia 28-d Survival and Growth Soil Test — **EnviroSystems, Inc.**

Analysis ID:	17-0218-8005	**Endpoint:**	Wet Biomass - Mean	**CETIS Version:**	CETISv1.7.0
Analyzed:	22 Jul-10 11:55	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	00-3538-6679	**Test Type:**	Survival-Growth	**Analyst:**	
Start Date:	18 Jun-10 12:00	**Protocol:**	EPA/600/R-92/183 (1992)	**Diluent:**	Not Applicable
Ending Date:	16 Jul-10 12:00	**Species:**	Eisenia fetida	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					15.21%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-010	1.258	1.86	51.67	0.1219	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.732	2.29	0.6183	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	3054.782	3054.782	1	1.582	0.2439	Non-Significant Effect
Error	15444.38	1930.547	8			
Total	18499.16	4985.33	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.467	23.15	0.7193	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8881		0.1616	Normal Distribution

Wet Biomass - Mean Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	339.7	324.6	354.7	283.9	382.9	7.346	39.56	11.65%	0.0%
19811-010	5	304.7	286.5	323	233	345.2	8.898	47.92	15.73%	10.29%

Wet Biomass - Mean Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	283.9	331.1	372.4	382.9	328.1
19811-010	337.5	278.3	233	345.2	329.7

Eisenia 28-d Survival and Growth Soil Test — **EnviroSystems, Inc.**

Analysis ID:	02-3799-4693	**Endpoint:**	Wet Biomass - Mean	**CETIS Version:**	CETISv1.7.0
Analyzed:	22 Jul-10 11:55	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	00-3538-6679	**Test Type:**	Survival-Growth	**Analyst:**	
Start Date:	18 Jun-10 12:00	**Protocol:**	EPA/600/R-92/183 (1992)	**Diluent:**	Not Applicable
Ending Date:	16 Jul-10 12:00	**Species:**	Eisenia fetida	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					10.74%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-009	0.7443	1.86	36.47	0.2390	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.908	2.29	0.3388	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	532.6073	532.6073	1	0.554	0.4780	Non-Significant Effect
Error	7690.792	961.349	8			
Total	8223.399	1493.956	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	4.374	23.15	0.1820	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9668		0.8597	Normal Distribution

Wet Biomass - Mean Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	339.7	324.6	354.7	283.9	382.9	7.346	39.56	11.65%	0.0%
19811-009	5	325.1	317.9	332.3	298.8	351.3	3.512	18.91	5.82%	4.3%

Wet Biomass - Mean Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	283.9	331.1	372.4	382.9	328.1
19811-009	298.8	351.3	320.1	330.4	324.9

Eisenia 28-d Survival and Growth Soil Test — **EnviroSystems, Inc.**

Analysis ID:	19-8558-3995	**Endpoint:**	Wet Biomass - Mean	**CETIS Version:**	CETISv1.7.0
Analyzed:	22 Jul-10 11:55	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	00-3538-6679	**Test Type:**	Survival-Growth	**Analyst:**	
Start Date:	18 Jun-10 12:00	**Protocol:**	EPA/600/R-92/183 (1992)	**Diluent:**	Not Applicable
Ending Date:	16 Jul-10 12:00	**Species:**	Eisenia fetida	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					13.83%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-005	1.266	1.86	46.98	0.1206	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.481	2.29	1.0000	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	2555.675	2555.675	1	1.602	0.2413	Non-Significant Effect
Error	12766.2	1595.776	8			
Total	15321.88	4151.45	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.039	23.15	0.9710	Equal Variances
Distribution	Shapiro-Wilk Normality	0.945		0.6093	Normal Distribution

Wet Biomass - Mean Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	339.7	324.6	354.7	283.9	382.9	7.346	39.56	11.65%	0.0%
19811-005	5	307.7	292.4	323	262.7	363	7.489	40.33	13.11%	9.41%

Wet Biomass - Mean Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	283.9	331.1	372.4	382.9	328.1
19811-005	282.7	262.7	333.7	296.5	363

Eisenia 28-d Survival and Growth Soil Test — **EnviroSystems, Inc.**

Analysis ID:	06-8784-5716	**Endpoint:**	Wet Biomass - Mean	**CETIS Version:**	CETISv1.7.0
Analyzed:	22 Jul-10 11:55	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	00-3538-6679	**Test Type:**	Survival-Growth	**Analyst:**	
Start Date:	18 Jun-10 12:00	**Protocol:**	EPA/600/R-92/183 (1992)	**Diluent:**	Not Applicable
Ending Date:	16 Jul-10 12:00	**Species:**	Eisenia fetida	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					13.92%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-004	1.862	1.86	47.27	0.0498	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.535	2.29	1.0000	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	5600.836	5600.836	1	3.467	0.0996	Non-Significant Effect
Error	12922.04	1615.255	8			
Total	18522.87	7216.091	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.064	23.15	0.9533	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9062		0.2557	Normal Distribution

Wet Biomass - Mean Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	339.7	324.6	354.7	283.9	382.9	7.346	39.56	11.65%	0.0%
19811-004	5	292.3	276.8	307.9	234.2	334.3	7.578	40.81	13.96%	13.93%

Wet Biomass - Mean Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	283.9	331.1	372.4	382.9	328.1
19811-004	308.5	334.3	267.3	234.2	317.5

Eisenia 28-d Survival and Growth Soil Test — **EnviroSystems, Inc.**

Analysis ID:	05-0951-1372	**Endpoint:**	Wet Biomass - Mean	**CETIS Version:**	CETISv1.7.0
Analyzed:	22 Jul-10 11:55	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	00-3538-6679	**Test Type:**	Survival-Growth	**Analyst:**	
Start Date:	18 Jun-10 12:00	**Protocol:**	EPA/600/R-92/183 (1992)	**Diluent:**	Not Applicable
Ending Date:	16 Jul-10 12:00	**Species:**	Eisenia fetida	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					12.43%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-003	0.4844	1.86	42.22	0.3205	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.648	2.29	0.7941	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	302.3979	302.3979	1	0.2347	0.6411	Non-Significant Effect
Error	10308.71	1288.589	8			
Total	10611.11	1590.987	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.546	23.15	0.6832	Equal Variances
Distribution	Shapiro-Wilk Normality	0.943		0.5865	Normal Distribution

Wet Biomass - Mean Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	339.7	324.6	354.7	283.9	382.9	7.346	39.56	11.65%	0.0%
19811-003	5	328.7	316.6	340.8	297.1	375	5.908	31.82	9.68%	3.24%

Wet Biomass - Mean Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	283.9	331.1	372.4	382.9	328.1
19811-003	306.6	297.1	346.4	318.3	375

Eisenia 28-d Survival and Growth Soil Test — **EnviroSystems, Inc.**

Analysis ID:	01-6265-0592	**Endpoint:**	Wet Biomass - Mean	**CETIS Version:**	CETISv1.7.0
Analyzed:	22 Jul-10 11:55	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	00-3538-6679	**Test Type:**	Survival-Growth	**Analyst:**	
Start Date:	18 Jun-10 12:00	**Protocol:**	EPA/600/R-92/183 (1992)	**Diluent:**	Not Applicable
Ending Date:	16 Jul-10 12:00	**Species:**	Eisenia fetida	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					10.26%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-002	0.7521	1.86	34.84	0.2368	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.997	2.29	0.2372	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	496.3488	496.3488	1	0.5656	0.4736	Non-Significant Effect
Error	7020.454	877.5568	8			
Total	7516.803	1373.906	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	8.23	23.15	0.0653	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9559		0.7377	Normal Distribution

Wet Biomass - Mean Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	339.7	324.6	354.7	283.9	382.9	7.346	39.56	11.65%	0.0%
19811-002	5	325.6	320.3	330.8	308.3	341.9	2.561	13.79	4.24%	4.15%

Wet Biomass - Mean Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	283.9	331.1	372.4	382.9	328.1
19811-002	317.2	341.9	323.8	308.3	336.7

Eisenia 28-d Survival and Growth Soil Test — **EnviroSystems, Inc.**

Analysis ID:	09-4782-2519	**Endpoint:**	Wet Biomass - Mean	**CETIS Version:**	CETISv1.7.0
Analyzed:	22 Jul-10 11:55	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	00-3538-6679	**Test Type:**	Survival-Growth	**Analyst:**	
Start Date:	18 Jun-10 12:00	**Protocol:**	EPA/600/R-92/183 (1992)	**Diluent:**	Not Applicable
Ending Date:	16 Jul-10 12:00	**Species:**	Eisenia fetida	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	In-House Culture	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					13.56%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-015	-0.523	1.86	46.06	0.6924	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.522	2.29	1.0000	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	419.5555	419.5555	1	0.2735	0.6152	Non-Significant Effect
Error	12271.92	1533.99	8			
Total	12691.47	1953.545	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.041	23.15	0.9697	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9099		0.2802	Normal Distribution

Wet Biomass - Mean Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	339.7	324.6	354.7	283.9	382.9	7.346	39.56	11.65%	0.0%
19811-015	5	352.6	337.9	367.4	296.4	394.5	7.199	38.77	10.99%	-3.81%

Wet Biomass - Mean Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	283.9	331.1	372.4	382.9	328.1
19811-015	362.9	332.4	376.9	296.4	394.5

Soil pH Record

Study Number: 19811 **Client: TetraTech NUS** **Project: Crane IN, CTO 377**

Lab ID	Field ID	As Received pH	Grams of Soil	Grams of Amendment	Final pH	New Lab ID	New Field ID
19811-002	16 SS1010001	7.82					
19811-003	16 SS1020001	7.33					
19811-004	16 SS1030001	7.55					
19811-005	16 SS1040001	7.54					
19811-009	16 SS1090002	7.41					
19811-010	16 SS1060002	6.02					
19811-012	16 SS1110002	5.13					
19811-013	16 SS1120002	RAN 6.24					
19811-018	16 SS1170002	5.50					
19811-008	16 SS1080002	5.28					
19811-011	16 SS1100002	5.13					
19811-014	16 SS1140002	RAN 5.66					
19811-015	16 SS1160002	6.96					
19811-017	16 SS1150001	5.50					
	Initials:	AM				amendment used:	
	Date:	6/16/10					
	pH meter:	#470				chemical lot used:	

Notes:

The pH of the test soils will be measured prior to the start of assays. In most cases, calcium carbonate will be used to increase pH and ammonium sulphate will be used to reduce pH.

CLIENT: Tetra Tech NUS, Inc.
PROJECT: SWMU 16, Crane, Indiana, CTO-0377
TASK: Soil Total Volatile Solids
METHOD: AASHTO T 267-86 (2004)

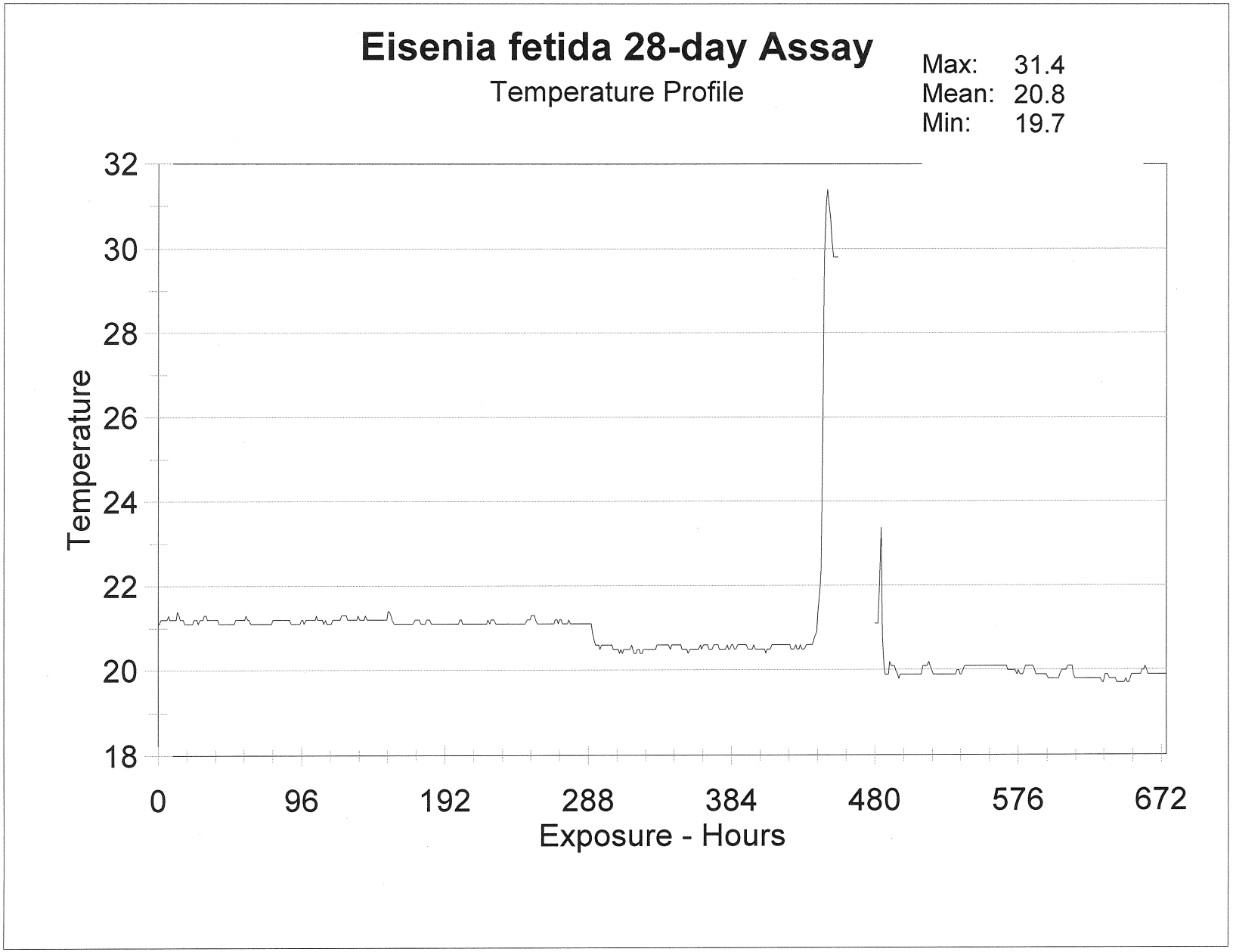
Field ID	LAB ID	MATRIX	RESULT	QLIMIT	UNITS	SAMPLED	ANALYZED
16 SS1010001	19811-002	Solid	2.7	0.1	% dry wt	06/09/10 1115	06/22/10
16 SS1020001	19811-003	Solid	3.7	0.1	% dry wt	06/09/10 1515	06/22/10
16 SS1030001	19811-004	Solid	2	0.1	% dry wt	06/09/10 1705	06/22/10
16 SS1040001	19811-005	Solid	3.28	0.1	% dry wt	06/09/10 1445	06/22/10
16 SS1090002	19811-009	Solid	3.31	0.1	% dry wt	06/10/10 0945	06/22/10
16 SS1060002	19811-010	Solid	4.9	0.1	% dry wt	06/10/10 1530	06/22/10
16 SS1120001	19811-013	Solid	3.91	0.1	% dry wt	06/10/10 1715	06/22/10
16 SS1140001	19811-014	Solid	4.03	0.1	% dry wt	06/11/10 0930	06/22/10
16 SS1160002	19811-015	Solid	2.91	0.1	% dry wt	06/10/10 2035	06/22/10

CLIENT: Tetra Tech NUS, Inc.
PROJECT: SWMU 16, Crane, Indiana, CTO-0377
TASK: Soil Cation-Exchange Capacity
METHOD: SW 846 9081

Field ID	LAB ID	MATRIX	RESULT	QLIMIT	UNITS	SAMPLED	ANALYZED
16 SS1010001	19811-002	Solid	33	1	meq per 100g	06/09/10 1115	06/29/10
16 SS1020001	19811-003	Solid	23	1	meq per 100g	06/09/10 1515	06/29/10
16 SS1030001	19811-004	Solid	55	1	meq per 100g	06/09/10 1705	06/29/10
16 SS1040001	19811-005	Solid	40	1	meq per 100g	06/09/10 1445	06/29/10
16 SS1090002	19811-009	Solid	25	1	meq per 100g	06/10/10 0945	06/29/10
16 SS1060002	19811-010	Solid	16	1	meq per 100g	06/10/10 1530	06/29/10
16 SS1120001	19811-013	Solid	31	1	meq per 100g	06/10/10 1715	06/29/10
16 SS1140001	19811-014	Solid	27	1	meq per 100g	06/11/10 0930	06/29/10
16 SS1160002	19811-015	Solid	19	1	meq per 100g	06/10/10 2035	06/29/10

Study Number 19811
Eisenia fetida
Summary of Daily Environmental Measurements

Day	Temperature (C)	Light ft-c	Light Lux
0	21	26	280
1	21	32	344
2	21	34	366
3	21	39	420
4	21	36	388
5	21	34	366
6	21	38	409
7	21	28	301
8	21	29	312
9	21	32	344
10	21	36	388
11	21	36	388
12	21	33	355
13	21	33	355
14	21	30	323
15	21	26	280
16	21	33	355
17	21	35	377
18	21	36	388
19	21	30	323
20	21	34	366
21	20	115	1238
22	20	24	258
23	21	40	431
24	21	26	280
25	20	28	301
26	21	32	344
27	20	34	366
28	20	37	398
Mean:	21	35	381
Minimum:	20	24	258
Maximum:	21	115	1238


Eisenia fetida 28-day Assay
Temperature Profile
Max: 31.4
Mean: 20.8
Min: 19.7
Temperature
32
30
28
26
24
22
20
18
0
96
192
288
384
480
576
672
Exposure - Hours

19811

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER 16-01 | PAGE 1 OF 1

PROJECT NO: 112G00041	SITE NAME: SWMU 16	PROJECT MANAGER AND PHONE NUMBER: Ralph Basinski 412-921-7090	LABORATORY NAME AND CONTACT: Envirosystems Inc.
SAMPLERS (SIGNATURE): Bet Collins		FIELD OPERATIONS LEADER AND PHONE NUMBER: Betsy Collins 412-921-8250	ADDRESS: 1 Lafayette Road
		CARRIER/WAYBILL NUMBER	CITY, STATE: Hampton, New Hampshire

STANDARD TAT ☐
RUSH TAT ☑
☑ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): P
PRESERVATIVE USED: 4°C
TYPE OF ANALYSIS: ASTM E1676-04, ASTM E1963-04

	DATE YEAR 2010	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	ASTM E1676-04	ASTM E1963-04							COMMENTS
001	6/09	1115	16SS1000001	SO	G	3	X								*HOLD*
002		1115	16SS1010001												
003		1515	16SS1020001												
004		1705	16SS1030001												
005		1445	16SS1040001												
006		1745	16SS1050001												
007		1917	16SS1070001												
008	6/10	0945	16SS1080002												
009	6/10	0945	16SS1090002												

1. RELINQUISHED BY	DATE 6/10/10	TIME 03-1500	1. RECEIVED BY Renee Quillen & Michael	DATE 06/11/10	TIME 1000
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

3/99
FORM NO. TtNUS-001

SAMPLE RECEIPT AND CONDITION DOCUMENTATION

STUDY NO:	19811		
SDG No:			
Project:	SWMU 16, CTO 377, Crane, IN		
Delivered via:	**FedEx**		
Date and Time Received:	06/11/10 1000	Date and TIme Logged into Lab:	06/11/10 1000
Recieved By:	RAM	Logged into Lab by:	RAM
Air bill / Way bill:	Yes	Air bill included in folder if received?	Yes
Cooler on ice/packs:	Yes	Custody Seals present?	Yes
Cooler Blank Temp (C) at arrival:	0-1C	Custody Seals intact?	Yes
Number of COC Pages:	1		
COC Serial Number(s):			
COC Complete:	Yes	Does the info on the COC match the samples?	Yes
Sampled Date:	Yes	Were samples received within holding time?	Yes
Field ID complete:	Yes	Were all samples properly labeled?	Yes
Sampled Time:	Yes	Were proper sample containers used?	Yes
Analysis request:	Yes	Were samples received intact? (none broken or leaking)	Yes
COC Signed and dated:	Yes	Were sample volumes sufficient for requested analysis?	Yes
Were all samples received?	Yes	Were VOC vials free of headspace?	NA
Client notification/authorization:	Not required		

Field ID	Lab ID	Mx	Analysis Requested	Bottle	Req'd Pres'n	Verified Pres'n
16 SS1000001	19811-001	S	Hold	3 x 1 gallon I	4 C	Yes
16 SS1010001	19811-002	S	Hold	3 x 1 gallon I	4 C	Yes
16 SS1020001	19811-003	S	Hold	3 x 1 gallon I	4 C	Yes
16 SS1030001	19811-004	S	Hold	3 x 1 gallon I	4 C	Yes
16 SS1040001	19811-005	S	Hold	3 x 1 gallon I	4 C	Yes
16 SS1050001	19811-006	S	Hold	3 x 1 gallon I	4 C	Yes
16 SS1070001	19811-007	S	Hold	3 x 1 gallon I	4 C	Yes
16 SS1080002	19811-008	S	Hold	3 x 1 gallon I	4 C	Yes
16 SS1090002	19811-009	S	Hold	3 x 1 gallon I	4 C	Yes

Notes and qualifications:

Hold samples until notified which samples to analyze for Ef28A, Lol28T, Tp28T, TVS

1°C, 0°C, 1°C, 0°C, 0°C, 1°C, 0°C
0°C, 0°C

Temperature Blanks
06/11/10 RAM

CUSTODY SEAL QEC
Quality Environmental Containers
800-255-3950 • 304-255-3900
DATE 6/10/10
SIGNATURE

CUSTODY SEAL QEC
Quality Environmental Containers
800-255-3950 • 304-255-3900
DATE 6/10/10
SIGNATURE

CUSTODY SEAL QEC
Quality Environmental Containers
800-255-3950 • 304-255-3900
DATE 6/10/10
SIGNATURE

FedEx. 0009 OF 0009
MPS# 0260 8650 1388 7481
Mstr# 8631 3888 3148 0215
XH IGGA
FRI - 11 JUN AA
PRIORITY OVERNIGHT
03842
NH-US
MHT
Emp# 467977 10JUN10 BMGA

CUSTODY SEAL QEC
Quality Environmental Containers
800-255-3950 • 304-255-3900
DATE 6/10/10
SIGNATURE

CUSTODY SEAL QEC
Quality Environmental Containers
800-255-3950 • 304-255-3900
DATE 6/10/10
SIGNATURE

CUSTODY SEAL QEC
Quality Environmental Containers
800-255-3950 • 304-255-3900
DATE 6/10/10
SIGNATURE

CUSTODY SEAL QEC
Quality Environmental Containers
800-255-3950 • 304-255-3900
DATE 6/10/10
SIGNATURE

CUSTODY SEAL QEC
Quality Environmental Containers
800-255-3950 • 304-255-3900
DATE 6/10/10
SIGNATURE

CUSTODY SEAL QEC
Quality Environmental Containers
800-255-3950 • 304-255-3900
DATE 6/10/10
SIGNATURE

CUSTODY SEAL QEC
Quality Environmental Containers
800-255-3950 • 304-255-3900
DATE 6/10/10
SIGNATURE

CUSTODY SEAL QEC
Quality Environmental Containers
800-255-3950 • 304-255-3900
DATE 6/10/10
SIGNATURE

CUSTODY SEAL QEC
Quality Environmental Containers
800-255-3950 • 304-255-3900
DATE 6/10/10
SIGNATURE

CUSTODY SEAL QEC
Quality Environmental Containers
800-255-3950 • 304-255-3900
DATE 6/10/10
SIGNATURE

CUSTODY SEAL QEC
Quality Environmental Containers
800-255-3950 • 304-255-3900
DATE 6/10/10
SIGNATURE

CUSTODY SEAL QEC
Quality Environmental Containe
800-255-3950 • 304-255-390
DATE 6/10/10
SIGNATURE

CUSTODY SEAL QEC
Quality Environmental Containers
800-255-3950 • 304-255-3900
DATE 6/10/10
SIGNATURE

CUSTODY SEAL QEC
Quality Environmental Containers
800-255-3950 • 304-255-3900
DATE 6/10/10
SIGNATURE

FedEx Express US Airbill

8631 3888 3148 0215

FedEx Copy

1 From

Date

Sender's FedEx Account Number 0152-0168-1

Sender's Name JANET DOX

Phone 412 921-7090

Company TETRA TECH NUS INC

Address 661 ANDERSEN DR STE 3

Dept./Floor/Suite/Room

City PITTSBURGH State PA ZIP 15220

2 Your Internal Billing Reference

3 To

Recipient's Name Sebastienne

Phone 603 926-3315

Company Systems

Address 1 Lafayette Road

We can't deliver to P.O. boxes or P.O. ZIP codes.

Dept/Floor/Suite/Room

Address

To request a package be held at a specific FedEx location, print FedEx address here.

City Hampton State NH ZIP 03842

0368125304

8631 3888 3148

4a Express Package Service — Packages up to 150 lbs.

1 ☑ FedEx Priority Overnight — Next business morning.* Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.

5 ☐ FedEx Standard Overnight — Next business afternoon.* Saturday Delivery NOT available.

6 ☐ FedEx First Overnight — Earliest next business morning delivery to select locations.* Saturday Delivery NOT available.

3 ☐ FedEx 2Day — Second business day.* Thursday shipments will be delivered on Monday unless SATURDAY Delivery is selected.

20 ☐ FedEx Express Saver — Third business day.* Saturday Delivery NOT available.

FedEx Envelope rate not available. Minimum charge: One-pound rate.

* To most locations.

4b Express Freight Service — Packages over 150 lbs.

7 ☐ FedEx 1Day Freight* — Next business day.** Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.

8 ☐ FedEx 2Day Freight — Second business day.** Thursday shipments will be delivered on Monday unless SATURDAY Delivery is selected.

23 ☐ FedEx 3Day Freight — Third business day.** Saturday Delivery NOT available.

* Call for Confirmation.

** To most locations.

5 Packaging

6 ☐ FedEx Envelope* 2 ☐ FedEx Pak* — Includes FedEx Small Pak, FedEx Large Pak, and FedEx Sturdy Pak. 3 ☐ FedEx Box 4 ☐ FedEx Tube 1 ☑ Other

* Declared value limit $500.

6 Special Handling — Include FedEx address in Section 3.

3 ☐ SATURDAY DELIVERY

1 ☐ HOLD Weekday at FedEx Location — Not available for FedEx First Overnight.

31 ☐ HOLD Saturday at FedEx Location — Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations.

Does this shipment contain dangerous goods? One box must be checked.

☑ No 4 ☐ Yes — As per attached Shipper's Declaration. ☐ Yes — Shipper's Declaration not required. 6 ☐ Dry Ice — Dry ice, 9, UN 1845 ____ x ____ kg

Dangerous goods (including dry ice) cannot be shipped in FedEx packaging.

☐ Cargo Aircraft Only

7 Payment — Bill to: Enter FedEx Acct. No. or Credit Card No. below.

1 ☑ Sender — Acct. No. in Section 1 will be billed. 2 ☐ Recipient 3 ☐ Third Party 4 ☐ Credit Card 5 ☐ Cash/Check

Obtain Recip. Acct. No. ☐

FedEx Acct. No. / Credit Card No.

Exp. Date

Total Packages	Total Weight	Total Declared Value†
9		$ .00

Credit Card Auth.

†Our liability is limited to $100 unless you declare a higher value. See the current FedEx Service Guide for details.

8 Residential Delivery Signature Options — If you require a signature, check Direct or Indirect.

☐ No Signature Required — Package may be left without obtaining a signature for delivery.

10 ☐ Direct Signature — Someone at recipient's address may sign for delivery. Fee applies.

34 ☐ Indirect Signature — If no one is available at recipient's address, someone at a neighboring address may sign for delivery. Fee applies.

519

Rev. Date 10/94 Part #150915-0194 ©1994-2000 FedEx • PRINTED IN U.S.A. • SRS

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER 16-03 | PAGE 1 OF 1

PROJECT NO: 112G00041	SITE NAME: SWMU 16	PROJECT MANAGER AND PHONE NUMBER: Ralph Basiwski 412-921-2090	LABORATORY NAME AND CONTACT: Envirosystems Inc
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER AND PHONE NUMBER: Betsy Collins 412-921-8250	ADDRESS: 1 Lafayette Road
		CARRIER/WAYBILL NUMBER: 8631 3888 3090	CITY, STATE: Hampton, New Hampshire

STANDARD TAT ☐
RUSH TAT ☑
☑ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): P
PRESERVATIVE USED: 4°C

	DATE YEAR 2010	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS: ASTM E 1676-04 / ASTM E 1963-09	COMMENTS
-010	6/10	15:30	16 SS 106 0002	SO	G	3	X	*HOLD*
-012		15:50	16 SS 111 0002					
-011		18:00	16 SS 110 0002					
-013		17:15	16 SS 112 0001					
-015		20:35	16 SS 116 0002					
-014	6/11	09:30	16 SS 114 0001					

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY	6/11/10	1500	1. RECEIVED BY	6/12/10	1100
2. RELINQUISHED BY			2. RECEIVED BY		
3. RELINQUISHED BY			3. RECEIVED BY		

COMMENTS: all samples arrived w/ custody seals intact, on ice, all temps 0°C - KC 6/12/10 1300

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

3/99
FORM NO. TtNUS-001

SAMPLE RECEIPT AND CONDITION DOCUMENTATION

STUDY NO:	19811		
SDG No:			
Project:	SWMU 16, CTO 377, Crane, IN		
Delivered via:	**Fed Ex**		
Date and Time Received:	06/12/10 1100	Date and TIme Logged into Lab:	06/12/10 1400
Recieved By:	KC	Logged into Lab by:	KC
Air bill / Way bill:	Yes	Air bill included in folder if received?	Yes
Cooler on ice/packs:	Yes	Custody Seals present?	Yes
Cooler Blank Temp (C) at arrival:	0 C	Custody Seals intact?	Yes
Number of COC Pages:	1		
COC Serial Number(s):	NA		
COC Complete:	Yes	Does the info on the COC match the samples?	Yes
Sampled Date:	Yes	Were samples received within holding time?	Yes
Field ID complete:	Yes	Were all samples properly labeled?	Yes
Sampled Time:	Yes	Were proper sample containers used?	Yes
Analysis request:	Yes	Were samples received intact? (none broken or leaking)	Yes
COC Signed and dated:	Yes	Were sample volumes sufficient for requested analysis?	Yes
Were all samples received?	Yes	Were VOC vials free of headspace?	NA
Client notification/authorization:	Not required		

Field ID	Lab ID	Mx	Analysis Requested	Bottle	Req'd Pres'n	Verified Pres'n
16 SS1060002	19811-010	S	Hold	3 x 1 gallon	4 C	Yes
16 SS1100002	19811-011	S	Hold	3 x 1 gallon	4 C	Yes
16 SS1110002	19811-012	S	Hold	3 x 1 gallon	4 C	Yes
16 SS1120002	19811-013	S	Hold	3 x 1 gallon	4 C	Yes
16 SS1140002	19811-014	S	Hold	3 x 1 gallon	4 C	Yes
16 SS1160002	19811-015	S	Hold	3 x 1 gallon	4 C	Yes

Notes and qualifications:

Hold samples until notified which samples to analyze for Ef28A, Lol28T, Tp28T, TVS

Ex® Saturday Delivery 151966 10/04 MWI

CUSTODY SEAL
DATE 6/11/10
SIGNATURE

QEC
Quality Environmental Containers
800-255-3950 • 304-255-3900

Saturday Delive

CUSTODY SEAL
DATE 6/11/10
SIGNATURE

QEC
Quality Environmental Containers
800-255-3950 • 304-255-3900

CUSTODY SEAL
DATE 6/11/10
SIGNATURE

QEC
Quality Environmental Containers
800-255-3950 • 304-255-3900

edEx® Saturda 151966 10/04 M Delivery

FedEx® Express SDR

QEC
Quality Environmental Containers
800-255-3950 • 304-255-3900

CUSTODY SEAL
DATE 6/11/10
SIGNATURE

QEC
Quality Environmental Containers
800-255-3950 • 304-255-3900

SL

QEC
Quality Environmental Containers
800-255-3950 • 304-255-3900

151966 10/04 MWI FedEx® Saturday Delivery

CUSTODY SEAL
DATE 6/4/10
SIGNATURE

QEC
Quality Environmental Containers
800-255-3950 • 304-255-3900

8677 5958 3665

FedEx Express
MPS Label
8677 5958 3665 8677 5958 3665
FedEx Tracking Number for Customer
Form ID No. 0260

FedEx Express

CUSTODY SEAL
DATE 6/4/10
SIGNATURE

QEC
Quality Environmental Containers
800-255-3950 • 304-255-3900

8677 5958 3687

FedEx Express
MPS Label
8677 5958 3687 8677 5958 3687
FedEx Tracking Number for Customer
Form ID No. 0260

CUSTODY SEAL
DATE 6/4/10
SIGNATURE

QEC
Quality Environmental Containers
55-3950 • 304-255-3900

SD

ental Containers
304-255-3900

Saturday Delivery

531

1000

FedEx Express *US Airbill*

8631 3888 3090 0215

Form ID No.

fedex.com 1.800.GoFedEx 1.800.463.3339

1 From

Date 6/11/10 Sender's FedEx Account Number [illegible]

Sender's Name JANET COX Phone 412 921-7090

Company TETRA TECH NUS, INC.

Address 661 ANDERSON DR STE 3

Dept./Floor/Suite/Room

City PITTSBURGH State PA ZIP 15220-2700

2 Your Internal Billing Reference

3 To

Recipient's Name Petra Karbe Phone 603 926-3315

Company Envirosystems

Recipient's Address 1 Lafayette Road

We cannot deliver to P.O. boxes or P.O. ZIP codes.

Dept./Floor/Suite/Room

Address

To request a package be held at a specific FedEx location, print FedEx address here.

City Hampton State NH ZIP 03842

0368125304

8631 3888 3090

4a Express Package Service

1 ☐ FedEx Priority Overnight — Next business morning.* Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.

5 ☐ FedEx Standard Overnight — Next business afternoon.* Saturday Delivery NOT available.

6 ☐

3 ☐ FedEx 2Day — Second business day.* Thursday shipments will be delivered on Monday unless SATURDAY Delivery is selected.

20 ☐ FedEx Express Saver — Third business day.* Saturday Delivery NOT available.

FedEx Envelope rate not available. Minimum charge: One-pound rate.

4b Express Freight Service

7 ☐ FedEx 1Day Freight* — Next business day.** Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.

8 ☐ FedEx 2Day Freight — Second business day.** Thursday shipments will be delivered on Monday unless SATURDAY Delivery is selected.

83 ☐

* Call for Confirmation:

5 Packaging

6 ☐ FedEx Envelope*

2 ☐ FedEx Pak* — Includes FedEx Small Pak, FedEx Large Pak, and FedEx Sturdy Pak.

3 ☐ FedEx Box

4 ☐

6 Special Handling

3 ☑ SATURDAY DELIVERY

1 ☐ HOLD Weekday at FedEx Location — Not available for FedEx First Overnight.

31 ☐

Does this shipment contain dangerous goods?

☑ No

4 ☐ Yes — As per attached Shipper's Declaration.

☐ Yes — Shipper's Declaration not required.

6 ☐ Dry Ice — Dry ice, 9, UN

Dangerous goods (including dry ice) cannot be shipped in FedEx packaging.

☐

7 Payment *Bill to:* Enter FedEx Acct. No. or Credit Card No. below.

1 ☑ Sender — Acct. No. in Section 1 will be billed.

2 ☐ Recipient

3 ☐ Third Party

4 ☐ Credit

FedEx Acct. No.
Credit Card No.

Total Packages	Total Weight	Total Declared Value
6		$

†Our liability is limited to $100 unless you declare a higher value. See the current FedEx Service Gui

8 Residential Delivery Signature Options If you require a signat

☐ No Signature Required — Package may be left without obtaining a signature for delivery.

10 ☐ Direct Signature — Someone at recipient's address may sign for delivery. *Fee applies.*

34 ☐ Indirect Signature — If no one is available at recipient's address, someone at a neighboring address may sign for delivery. *Fee applies*

Rev. Date 10/06•Part #158279•©1994–2006 FedEx•PRINTED IN U.S.A.•SRS

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER 16-05 | PAGE 1 OF 1

PROJECT NO: 112G0004	SITE NAME: SWMU 16	PROJECT MANAGER AND PHONE NUMBER: Ralph Basinski 412-921-8308	LABORATORY NAME AND CONTACT: Envirosystems Inc.
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER AND PHONE NUMBER: Betsy Collins 412-921-8250	ADDRESS: 1 Lafayette Road
		CARRIER/WAYBILL NUMBER: 8631 3888 3115	CITY, STATE: Hampton, New Hampshire

STANDARD TAT ☑
RUSH TAT ☑
☑ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): P

PRESERVATIVE USED: 4°C

TYPE OF ANALYSIS: ASTM E 1676-04, ASTM E 1963-09

	DATE YEAR 2010	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	COMMENTS
016	6/11	1313	16SS113 0001	SO	G	3	HOLD
017	↓	1700	16SS115 0001	↓	↓	3	↓
018	↓	1513	16SS117 0002	↓	↓	3	↓

1. RELINQUISHED BY	DATE 6/11/10	TIME 2200	1. RECEIVED BY	DATE 6/14	TIME 1100
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

3/99
FORM NO. TtNUS-001

ESI

SAMPLE RECEIPT AND CONDITION DOCUMENTATION

STUDY NO:	19811		
SDG No:			
Project:	SWMU 16, CTO 377, Crane, IN		
Delivered via:	**Fed Ex**		
Date and Time Received:	06/14/10 1100	Date and TIme Logged into Lab:	06/14/10 1200
Recieved By:	AM	Logged into Lab by:	AM

Air bill / Way bill:	Yes	Air bill included in folder if received?	Yes
Cooler on ice/packs:	Yes	Custody Seals present?	Yes
Cooler Blank Temp (C) at arriva	1-3 C	Custody Seals intact?	Yes
Number of COC Pages:	1		
COC Serial Number(s):			
COC Complete:		Does the info on the COC match the samples?	No
Sampled Date:	Yes	Were samples received within holding time?	Yes
Field ID complete:	Yes	Were all samples properly labeled?	No
Sampled Time:	Yes	Were proper sample containers used?	Yes
Analysis request:	Yes	Were samples received intact? (none broken or leaking)	Yes
COC Signed and dated:	Yes	Were sample volumes sufficient for requested analysis?	Yes
Were all samples received?	Yes	Were VOC vials free of headspace?	NA
Client notification/authorization:	Not required		

Field ID	Lab ID	Mx	Analysis Requested	Bottle	Req'd Pres'n	Verified Pres'n
16 SS1130001	19811-016	S	Hold	3 x 1 gallon P	4 C	Y
16 SS1150001	19811-017	S	Hold	3 x 1 gallon P	4 C	Y
16 SS1170002	19811-018	S	Hold	3 x 1 gallon P	4 C	Y

Notes and qualifications:

Field IDs on the samples did not match field IDs on the COC.

EnviroSystems, Inc. One Lafayette Road P.O. Box 778 Hampton, NH 03842-0778 (603) 926-3345 fax (603) 926-3521 www.envirosystems.com

CUSTODY SEAL
DATE 6/11/10
SIGNATURE [illegible]
QEC
Quality Environmental Containers
800-255-3950 • 304-255-3900

CUSTODY SEAL
DATE 6/11/10
SIGNATURE [illegible]
QEC
Quality Environmental Containers
800-255-3950 • 304-255-3900

CUSTODY SEAL
DATE 6/11/10
SIGNATURE [illegible]
QEC
Quality Environmental Containers
800-255-3950 • 304-255-3900

CUSTODY SEAL
DATE 6/11/10
SIGNATURE [illegible]
QEC
Quality Environmental Containers
800-255-3950 • 304-255-3900

CUSTODY SEAL
DATE 6/11/10
SIGNATURE [illegible]
QEC
Quality Environmental Containers
800-255-3950 • 304-255-3900

CUSTODY SEAL
DATE 6/11/10
SIGNATURE [illegible]
QEC
Quality Environmental Containers
800-255-3950 • 304-255-3900

FedEx Express

FedEx Tracking Number 8631 3888 3115

Form ID No.

1 From This portion can be removed for Recipient's records.

Date 6/11/10 FedEx Tracking Number 863138883115

Sender's Name JANET COX Phone 412 921-7090

Company TEYRA TECH NUS INC

Address 661 ANDERSEN DR STE 5

Dept./Floor/Suite/Room

City PITTSBURGH State PA ZIP 15220-2700

RECIPIENT PEEL HERE

2 Your Internal Billing Reference

3 To

Recipient's Name Peter Kaube Phone 603 926-3345

Company Covrosystems Inc

Recipient's Address Lafayette Road

We cannot deliver to P.O. boxes or P.O. ZIP codes.

Dept./Floor/Suite/Room

Address

To request a package be held at a specific FedEx location, print FedEx address here.

City Hampton State NH ZIP 03842

03681233304

8631 3888 3115

4a Express P

FedEx Priorit
Next business mo
shipments will be
unless SATURDAY

FedEx 2Day
Second business
shipments will be
unless SATURDAY

FedEx Envelop

4b Express Fr

FedEx 1Day
Next business day
shipments will be
unless SATURDAY

* Call for Confirmation:

5 Packaging

FedEx Envelope*

6 Special Ha

SATURDAY
Not available for
FedEx Standard Ov
FedEx First Overnig
Saver, or FedEx 3D

Does this shi

No

Dangerous goods (includi

7 Payment

Sender
Acct. No. in Sectio
1 will be billed.

Total Packages

†Our liability is limited to $1

8 Residenti

No Signature Direct Signature Indirect Signature
If no one is available at recipient's address, someone at a neighboring address may sign for delivery. *Fee applies.*

519

Part # 156297-435 RIT 11/09

FedEx MPS 12JUN 09:29 Pcs: 3 1 of 1

Emp#: 131311 Rt#: STA

MASTER TRK#: 863138883115

Pkg Trk#'s: 795535972001

795535972012

TRK# 0215 8631 3888 3115

PRIORITY OVERNIGHT

MASTER

XH IGGA

03842 NH-US MHT

emp# 131311 12JUN10 09:31

ALIGN FEDEX AIRBILL POUCH HERE

DO NOT LIFT USING THIS TAG

Subject: RE: Samples from SWMU 16 Received 06-14-10
From: "Bernhardt, Aaron" <Aaron.Bernhardt@tetratech.com>
Date: Mon, 14 Jun 2010 15:03:56 -0500
To: Renee McIsaac <r.mcisaac@envirosystems.com>, "Basinski, Ralph" <Ralph.Basinski@tetratech.com>, "Collins, Betsy" <Betsy.Collins@tetratech.com>, Kenneth Simon <ksimon@envirosystems.com>

Please refer to them as 16SS. It looks like we should have all the data by tomorrow so I should be able to give you the go-ahead before COB tomorrow.

Thanks,

Aaron

From: Renee McIsaac [mailto:r.mcisaac@envirosystems.com]
Sent: Monday, June 14, 2010 3:15 PM
To: Bernhardt, Aaron; Basinski, Ralph; Collins, Betsy; Kenneth Simon
Subject: Samples from SWMU 16 Received 06-14-10

Hello,

We received 3 samples today from the SWMU 16 site and all samples were received in good condition.
However there was a discrepancy in how the samples were identified on the sample labels.
The Chain of Custody identified samples as 16 SS and the sample container labels identified them as 16 SB.
Can you please advise as to how they should be identified.
I have attached documentation of their receipt.
Please let me know if you have any questions.

Thanks,

Renee McIsaac
ERA Project Manager
EnviroSystems, Inc.
Specialists in Environmental Toxicology and Chemistry
PO Box 778 / 1 Lafayette Road
Hampton, NH 03843-0778
Voice: 603-926-3345 ext. 212 / Fax: 603-926-3521
http://www.envirosystems.com
Please consider the environment before printing this email

This message is intended solely for the use of the individual or entity to whom it is addressed and contains information that is privileged, confidential and exempt from disclosure under applicable law. If you are not the intended recipient, be aware that any disclosure, copying, distribution or use of the contents of this material or of the attachments, is prohibited. If you receive this transmission in error, please notify us by return e-mail immediately.

ATTACHMENT 2B

RED CLOVER TOXICITY TEST LABORATORY REPORT

TOXICOLOGICAL EVALUATION
OF SOIL SAMPLES:

SWMU 16 - Cast High Explosives Fill/B146 Incinerator
Naval Surface Warfare Center Crane
Crane, Indiana
Comprehensive Long-Term Environmental Action-Navy (CLEAN)
Contract N62467-94-D-0888, Contract Task Order (CTO) NO. 0377

28 Day *Trifolium pratense* Evaluation
Germination and Growth Soil Toxicity Test

Prepared For:

Tetra Tech NUS, Inc.
661 Andersen Drive, Foster Plaza 7
Pittsburgh, Pennsylvania 15220-2745

Prepared By:

EnviroSystems, Incorporated
1 Lafayette Road
Hampton, New Hampshire 03842

June 2010
Reference Number 19811-10-06

TABLE OF CONTENTS

1.0 INTRODUCTION 3

2.0 MATERIALS AND METHODS 3
- 2.1 General Methods, Biological Evaluations 3
- 2.2 Test Species 3
- 2.3 Test Samples 3
- 2.4 *Trifolium pratense* 28 Day Germination and Growth Evaluation 3
- 2.5 Statistical Analysis 4
- 2.6 Quality Control 4
- 2.7 Protocol Deviations 4

3.0 RESULTS AND DISCUSSION 6
- 3.1 Laboratory Control and Project Reference Site Performance 6
- 3.2 Summary 6

4.0 REFERENCES 7

LIST OF TABLES

Table 1. Summary of Sample Collection Information 5
Table 2. Summary of Soil Characteristics 5
Table 3. Summary of Reference Toxicant Data 5
Table 4. Summary of Acceptable Endpoints and Measurements 6
Table 5. Summary of Project Reference Site Performance 6
Table 6. Summary of Significant Endpoints 7
Table 7. Summary of *Trifolium pratense* Day 28 Survival Data 8
Table 8. Summary of *Trifolium pratense* Mean Time to Germination Data 9
Table 8. Summary of *Trifolium pratense* Day 28 Height Data 10
Table 9. Summary of *Trifolium pratense* Day 28 Above Ground Biomass Data 11
Table 10. Summary of *Trifolium pratense* Day 28 Below Ground Biomass Data 12

APPENDIX A: RAW DATA AND STATISTICAL SUPPORT 13

TOXICOLOGICAL EVALUATION
OF SOIL SAMPLES:

SWMU 16 - Cast High Explosives Fill/B146 Incinerator
Naval Surface Warfare Center Crane
Crane, Indiana
Comprehensive Long-Term Environmental Action-Navy (CLEAN)
Contract N62467-94-D-0888, Contract Task Order (CTO) NO. 0377

28 Day *Trifolium pratense* Evaluation
Germination and Growth Toxicity Test

1.0 INTRODUCTION

This report presents the results of chronic exposure toxicity tests conducted on soil samples collected from the SWMU 16, Naval Surface Warfare Center in Crane, Indiana. Samples were provided by Tetra Tech NUS, Inc. Pittsburgh, Pennsylvania. Testing was based on programs and protocols developed by the ASTM (2009) and US EPA (1989). The toxicity of the samples was assessed by conducting 28 day exposure assays with the plant, *Trifolium pratense*. Toxicity tests and supporting analyses were performed at EnviroSystems, Incorporated (ESI), Hampton, New Hampshire.

Toxicity tests expose groups of organisms to environmental samples, a laboratory control and field reference sites for a specified period to assess potential impacts on a variety of endpoints, such as survival, growth or reproduction. Analysis of variance techniques are used to determine the relative toxicity of the samples as compared to the laboratory control and/or field reference sites. Endpoints for this study were survival, mean time to germination, plant height, above ground biomass (shoot biomass) and below ground biomass (root biomass).

2.0 MATERIALS AND METHODS

2.1 General Methods, Biological Evaluations

Toxicological and analytical protocols used in this program follow procedures outlined in *Conducting Terrestrial Plant Toxicity Tests* (ASTM 2009), and *Protocol for Short Term Toxicity Screening of Hazardous Waste Sites* (EPA 1989). These protocols provide standard approaches for the evaluation of toxicological effects of soils on terrestrial organisms.

2.2 Test Species

T. pratense seeds were obtained from a commercial supply house. Seeds were sorted prior to use to remove empty hulls and damaged seeds or seeds that appeared to be dissimilar to the majority of the population. After sorting, the seeds were placed in an airtight, waterproof container and stored in a refrigerator. The seed storage container was dried in an oven prior to storing seeds.

2.3 Test Samples

Soil samples collected from the SWMU 16 project site were received at ESI under chain of custody. Once received, samples were inspected to determine integrity, given unique sample numbers and logged into the laboratory sample management database. Once logged in, the samples were placed in a secure refrigerated, 2 - 4 °C, storage area. A listing of sample sites, sample collection, and receipt information is summarized in Table 1.

The control soil used was “Coast of Maine Cobscook Blend Gardening Soil”.

2.4 *Trifolium pratense* 28 Day Germination and Growth Evaluation

Prior to testing, pH, total volatile solids and cation exchange capacity were determined for each sample. Total volatile solids (loss on ignition) is used as an estimate of total organic content. A summary of

these soil characteristics (i.e., pH, total volatile solids and cation exchange capacity) are presented in Table 2.

Test chambers for the assay were 4 inch plastic potting squares. The bottom of the square had small drainage holes and individual squares were held in raised plastic trays. The trays were covered with translucent plastic until seedling emergence was observed. Soils were checked daily and deionized water was added as needed.

Before the addition of seeds, test chambers were randomized using the CETIS® software program. Seeds were then removed from the storage container before being randomly assigned to test vessels. The randomization work sheets are included in the data appendix. The test utilized 5 replicates with 5 seeds per replicate. Containers were placed on a table and maintained at 25 ±3°C. Full Spectrum Daylight Fluorescent Lights provided 16 hours of illumination and 8 hours of dark. Light intensity was approximately 4000 Lux. During the exposure period, room temperature was checked daily for the duration of the assay and hourly using a data logger.

During the assay daily measurements were taken for temperature, relative humidity and light intensity. Observations related to the overall health and vigor of the plants was also recorded daily. After 28 days exposure, plant height was measured and a sample of the soil was obtained for pH determination. Plants were then removed from the soil and care was taken to prevent root damage. Once the soil was removed from the roots, the root portion of the plant was cut away from the foliage. Roots and shoots for each replicate were dried separately so that biomass determinations could be made for above and below ground components. Plants were measured after drying at 60 ±2°C until a constant dry weight was achieved. Plant weight data was measured to the nearest 0.01 mg.

2.5 Statistical Analysis

Germination-survival and growth data were analyzed using CETIS® software to determine significant differences between the test soils, the laboratory control and reference site samples. Data sets were evaluated to determine normality of distribution and homogeneity of sample variance. Data sets were subsequently evaluated using the appropriate parametric or non-parametric Analysis of Variance (ANOVA) statistic. Pair-wise comparisons were made using the appropriate statistical evaluation. Statistical difference was evaluated at α=0.05.

2.6 Quality Control

As part of the laboratory quality control program, reference toxicant evaluations are completed on a regular basis for each test species. These results provide relative health and response data while allowing for comparison with historic data sets. Results were within two standard deviations of the historic mean for the species. Results are summarized in Table 3.

2.7 Protocol Deviations

Review of data collected during this assay documented the following protocol deviation.

The acceptable temperature for the assay is a mean value of 25±3°C. On Days 21 (07/08/10), 25 (07/12/10) and 26 (07/13/10) of the assay the temperature exceeded the upper bounds set by the protocol and reached a high of 29.4°C. This is well within the natural temperature range for this species and should not have had a negative impact on the outcome of this assay. All other observed temperatures were within protocol.

Table 1. Summary of Sample Collection Information. SWMU 16, Naval Surface Warfare Center Crane, Crane, Indiana. CTO-0377. June 2010.

			Sample Collected		Sample Received	
Field ID	ESI Code	Designation	Date	Time	Date	Time
16 SS1000001	19811-001	Hold	06/09/10	1115	06/11/10	1000
16 SS1010001	19811-002	Test Soil*	06/09/10	1115	06/11/10	1000
16 SS1020001	19811-003	Test Soil*	06/09/10	1515	06/11/10	1000
16 SS1030001	19811-004	Test Soil*	06/09/10	1705	06/11/10	1000
16 SS1040001	19811-005	Test Soil*	06/09/10	1445	06/11/10	1000
16 SS1050001	19811-006	Hold	06/09/10	1745	06/11/10	1000
16 SS1070001	19811-007	Hold	06/09/10	1917	06/11/10	1000
16 SS1080002	19811-008	Hold	06/10/10	0945	06/11/10	1000
16 SS1090002	19811-009	Test Soil*	06/10/10	0945	06/11/10	1000
16 SS1060002	19811-010	Test Soil*	06/10/10	1530	06/12/10	1100
16 SS1100002	19811-011	Hold	06/10/10	1800	06/12/10	1100
16 SS1110002	19811-012	Hold	06/10/10	1550	06/12/10	1100
16 SS1120001	19811-013	Test Soil*	06/10/10	1715	06/12/10	1100
16 SS1140001	19811-014	Test Soil*	06/11/10	0930	06/12/10	1100
16 SS1160002	19811-015	Reference Soil*	06/10/10	2035	06/12/10	1100
16 SS1130001	19811-016	Hold	06/11/10	1313	06/14/10	1100
16 SS1150001	19811-017	Hold	06/11/10	1700	06/14/10	1100
16 SS1170002	19811-018	Hold	06/11/10	1513	06/14/10	1100

*Per phone conversation between Aaron Bernhardt and Renee McIsaac on 06/16/10 these samples were selected to be used in the toxicity test.

Table 2. Summary of Soil Characteristics. SWMU 16, Naval Surface Warfare Center Crane, Crane, Indiana. CTO-0377. June 2010.

Field ID	ESI Code	Initial pH	Final pH	Total Volatile Solids (% dry wt)	Cation-Exchange Capacity (meq per 100g)
16 SS1010001	19811-002	7.82	7.71	2.7	33
16 SS1020001	19811-003	7.33	7.71	3.7	23
16 SS1030001	19811-004	7.55	7.96	2	55
16 SS1040001	19811-005	7.54	7.86	3.28	40
16 SS1090002	19811-009	7.41	7.97	3.31	25
16 SS1060002	19811-010	6.02	7.60	4.9	16
16 SS1120001	19811-013	6.24	6.77	3.91	31
16 SS1140001	19811-014	5.66	5.82	4.03	27
16 SS1160002	19811-015	6.96	7.42	2.91	19

Table 3. Summary of Reference Toxicant Data. SWMU 16, Naval Surface Warfare Center Crane, Crane, Indiana. CTO-0377. June 2010.

Date	Endpoint		Value	Historic Mean/ Central Tendency	Acceptable Range	Reference Toxicant
Trifolium pratense						
06/17/10	Germination	LC-50	147.0	223.3	7.0 - 439.5	Cadmium (mg/L)
06/17/10	Root Length	IC-50	108.0	118.3	90.1 - 146.4	Cadmium (mg/L)

3.0 RESULTS AND DISCUSSION

3.1 Laboratory Control and Project Reference Site Performance

At the end of the 28-day exposure period survival in the laboratory control treatment was 76% with a coefficient of variation (CV) of 22.02%. Mean above ground biomass was 18.0 mg with a CV of 14.14%. Mean below ground biomass was 6.91 mg with a CV of 18.39%. These endpoints meet or exceed the minimum protocol specification of 70% survival. Table 4 provides a summary of assay acceptability criteria and laboratory control achievement. Table 5 summarizes the reference site performance.

Based on daily observations, the mean temperature during the assay was 26.4°C with a range of 23.9 to 29.4°C. The acceptable temperature for the assay is a mean value of 25±3°C.

Table 4. Summary of Acceptable Endpoints and Measurements. SWMU 16, Naval Surface Warfare Center Crane, Crane, Indiana. CTO-0377. June 2010.

Endpoint / Measurement	Protocol		
Mean Survival	lab≥ 70%	%	76.0%
		Protocol Met	Yes
Mean Temperature	25±3°C	daily	26.4
		Protocol Met	Yes
Minimum Temperature	22°C	daily	23.9
		Protocol Met	Yes
Maximum Temperature	28°C	daily	29.4
		Protocol Met	No

Table 5. Summary of Project Reference Site Performance. SWMU 16, Naval Surface Warfare Center Crane, Crane, Indiana. CTO-0377. June 2010.

Reference Site	ESI Code	Mean Survival	Mean Time to Germination (days)	Mean Plant Height (mm)	Above Ground Biomass (mg)	Below Ground Biomass (mg)
16 SS1160002	19811-015	72.0%	3.10	28.8	7.43	6.91

3.2 Summary

This program utilized protocols developed by the U.S. EPA and ASTM to assess the potential toxicological impacts that exposure to soils from the SWMU 16 project site would have on plants. Table 6 provides a summary of sample sites that demonstrated a negative effect, based on the finding of statistically significant reduction in an endpoint as compared to the laboratory control or reference site. Tables 7 through 11 provide summaries of assay endpoints and detailed statistical results for each sample location. Laboratory bench sheets, detailed summaries of survival, wet weights and associated statistical support data are included in Appendix A.

Table 6. Summary of Significant Endpoints. SWMU 16, Naval Surface Warfare Center Crane, Crane, Indiana. CTO-0377. June 2010.

		Finding of Significant Difference(s) between Project Sites and									
		Lab Control (19811-000)					16 SS1160002 (19811-015)				
					biomass					biomass	
Field ID	ESI Code	survival	germ.	height	above	below	survival	germ.	height	above	below
16 SS1160002	19811-015			Yes	Yes						
16 SS1010001	19811-002			Yes	Yes						
16 SS1020001	19811-003		Yes	Yes	Yes	Yes		Yes			
16 SS1030001	19811-004		Yes	Yes	Yes			Yes			
16 SS1040001	19811-005			Yes	Yes	Yes					Yes
16 SS1090002	19811-009		Yes	Yes							
16 SS1060002	19811-010		Yes	Yes	Yes	Yes			Yes	Yes	Yes
16 SS1120001	19811-013	Yes		Yes	Yes	Yes			Yes	Yes	Yes
16 SS1140001	19811-014	Yes		Yes	Yes	Yes	Yes		Yes	Yes	Yes

4.0 REFERENCES

ASTM. 2009. Volume 11.06. *Conducting Terrestrial Plant Toxicity Tests*. Annual Book of ASTM Standards. E-1963-09.

US EPA. 1989. *Protocol for Short Term Toxicity Screening of Hazardous Waste Sites*. EPA/600/3-88/029.

Table 7. Summary of *Trifolium pratense* Day 28 Survival Data. SWMU 16, Naval Surface Warfare Center Crane, Crane, Indiana. CTO-0377. June 2010.

Day 28 Survival Summary

Field ID	ESI Code	Reps	Mean	Minimum	Maximum	CV
Laboratory Control	19811-000	5	76.0%	60.0%	100.0%	22.02%
16 SS1160002	19811-015	5	72.0%	60.0%	80.0%	15.21%
16 SS1010001	19811-002	5	64.0%	20.0%	100.0%	51.35%
16 SS1020001	19811-003	5	60.0%	20.0%	100.0%	52.70%
16 SS1030001	19811-004	5	60.0%	40.0%	80.0%	23.57%
16 SS1040001	19811-005	5	56.0%	0.0%	100.0%	77.43%
16 SS1090002	19811-009	5	68.0%	40.0%	100.0%	44.61%
16 SS1060002	19811-010	5	56.0%	20.0%	80.0%	46.57%
16 SS1120001	19811-013	5	56.0%	40.0%	80.0%	29.88%
16 SS1140001	19811-014	5	48.0%	20.0%	80.0%	47.51%

Day 28 Survival Statistical Summary

			Statistically Significant Difference as Compared to			
			Lab Control (19811-000)		16 SS1160002 (19811-015)	
Field ID	ESI Code	Mean	p Value	statistically significant	p Value	statistically significant
Laboratory Control	19811-000	76.0%	-	-	-	-
16 SS1160002	19811-015	72.0%	0.3333	No	-	-
16 SS1010001	19811-002	64.0%	0.2438	No	0.3098	No
16 SS1020001	19811-003	60.0%	0.1733	No	0.2229	No
16 SS1030001	19811-004	60.0%	0.0706	No	0.0860	No
16 SS1040001	19811-005	56.0%	0.1821	No	0.2234	No
16 SS1090002	19811-009	68.0%	0.3098	No	0.3943	No
16 SS1060002	19811-010	56.0%	0.0935	No	0.1208	No
16 SS1120001	19811-013	56.0%	0.0477	Yes	0.0557	No
16 SS1140001	19811-014	48.0%	0.0289	Yes	0.0333	Yes

Table 8. Summary of *Trifolium pratense* Mean Time to Germination Data. SWMU 16, Naval Surface Warfare Center Crane, Crane, Indiana. CTO-0377. June 2010.

Mean Time to Germination Summary

Field ID	ESI Code	Reps	Mean	Minimum	Maximum	CV
Laboratory Control	19811-000	5	2.69	2.25	3.33	16.07%
16 SS1160002	19811-015	5	3.10	2.50	4.00	17.67%
16 SS1010001	19811-002	5	4.26	2.25	9.00	65.33%
16 SS1020001	19811-003	5	7.03	3.00	21.00	111.30%
16 SS1030001	19811-004	5	4.98	4.00	6.67	21.44%
16 SS1040001	19811-005	5	5.11	0.00	12.00	89.27%
16 SS1090002	19811-009	5	5.28	2.80	9.00	49.58%
16 SS1060002	19811-010	5	4.95	2.50	11.00	69.47%
16 SS1120001	19811-013	5	3.15	2.50	4.25	20.70%
16 SS1140001	19811-014	5	5.28	2.33	9.33	52.53%

Mean Time to Germination Statistical Summary			Statistically Significant Difference as Compared to			
			Lab Control (19811-000)		16 SS1160002 (19811-015)	
Field ID	ESI Code	Mean	p Value	statistically significant	p Value	statistically significant
Laboratory Control	19811-000	2.69	-	-	-	-
16 SS1160002	19811-015	3.10	0.1137	No	-	-
16 SS1010001	19811-002	4.26	0.1406	No	0.2061	No
16 SS1020001	19811-003	7.03	0.0079	Yes	0.0476	Yes
16 SS1030001	19811-004	4.98	0.0011	Yes	0.0040	Yes
16 SS1040001	19811-005	5.11	0.1517	No	0.1917	No
16 SS1090002	19811-009	5.28	0.0473	Yes	0.0529	No
16 SS1060002	19811-010	4.95	0.0476	Yes	0.1111	No
16 SS1120001	19811-013	3.15	0.1134	No	0.4494	No
16 SS1140001	19811-014	5.28	0.0541	No	0.0798	No

Table 9. Summary of *Trifolium pratense* Day 28 Height Data. SWMU 16, Naval Surface Warfare Center Crane, Crane, Indiana. CTO-0377. June 2010.

Day 28 Height Summary

Field ID	ESI Code	Reps	Mean	Minimum	Maximum	CV
Laboratory Control	19811-000	5	61.8	45.8	83.3	21.90%
16 SS1160002	19811-015	5	28.8	15.8	41.3	31.57%
16 SS1010001	19811-002	5	25.7	16.0	33.0	27.19%
16 SS1020001	19811-003	5	26.0	7.0	48.2	58.87%
16 SS1030001	19811-004	5	21.4	15.7	25.5	18.64%
16 SS1040001	19811-005	5	22.3	17.4	31.3	27.74%
16 SS1090002	19811-009	5	30.8	14.5	42.6	36.64%
16 SS1060002	19811-010	5	18.0	15.0	20.0	10.39%
16 SS1120001	19811-013	5	17.3	12.0	22.7	23.72%
16 SS1140001	19811-014	5	13.8	11.0	16.0	15.16%

Day 28 Height Statistical Summary			Statistically Significant Difference as Compared to			
			Lab Control (19811-000)		16 SS1160002 (19811-015)	
Field ID	ESI Code	Mean	p Value	statistically significant	p Value	statistically significant
Laboratory Control	19811-000	61.8	-	-	-	-
16 SS1160002	19811-015	28.8	0.0010	Yes	-	-
16 SS1010001	19811-002	25.7	0.0004	Yes	0.2849	No
16 SS1020001	19811-003	26.0	0.0022	Yes	0.3670	No
16 SS1030001	19811-004	21.4	0.0001	Yes	0.0669	No
16 SS1040001	19811-005	22.3	0.0005	Yes	0.1307	No
16 SS1090002	19811-009	30.8	0.0022	Yes	0.6162	No
16 SS1060002	19811-010	18.0	0.0010	Yes	0.0301	Yes
16 SS1120001	19811-013	17.3	<0.0001	Yes	0.0164	Yes
16 SS1140001	19811-014	13.8	0.0007	Yes	0.0036	Yes

Table 10. Summary of *Trifolium pratense* Day 28 Above Ground Biomass Data. SWMU 16, Naval Surface Warfare Center Crane, Crane, Indiana. CTO-0377. June 2010.

Day 28 Above Ground Biomass Summary

Field ID	ESI Code	Reps	Mean	Minimum	Maximum	CV
Laboratory Control	19811-000	5	18.00	13.89	19.99	14.14%
16 SS1160002	19811-015	5	7.43	5.03	12.51	42.57%
16 SS1010001	19811-002	5	9.15	3.36	15.26	59.29%
16 SS1020001	19811-003	5	7.55	0.23	20.89	105.90%
16 SS1030001	19811-004	5	5.17	3.58	7.96	32.03%
16 SS1040001	19811-005	5	4.44	0.00	7.90	79.20%
16 SS1090002	19811-009	5	10.65	2.83	20.37	79.72%
16 SS1060002	19811-010	5	3.79	1.05	6.55	62.56%
16 SS1120001	19811-013	5	4.53	2.71	5.99	27.89%
16 SS1140001	19811-014	5	3.21	1.42	6.31	58.69%

Day 28 Above Ground Biomass Statistical Summary

Statistically Significant Difference as Compared to

			Lab Control (19811-000)		16 SS1160002 (19811-015)	
Field ID	ESI Code	Mean	p Value	statistically significant	p Value	statistically significant
Laboratory Control	19811-000	18.00	-	-	-	-
16 SS1160002	19811-015	7.43	0.0002	Yes	-	-
16 SS1010001	19811-002	9.15	0.0054	Yes	0.7213	No
16 SS1020001	19811-003	7.55	0.0119	Yes	0.5128	No
16 SS1030001	19811-004	5.17	<0.0001	Yes	0.0976	No
16 SS1040001	19811-005	4.44	<0.0001	Yes	0.0980	No
16 SS1090002	19811-009	10.65	0.0505	No	0.7756	No
16 SS1060002	19811-010	3.79	<0.0001	Yes	0.0367	Yes
16 SS1120001	19811-013	4.53	<0.0001	Yes	0.0467	Yes
16 SS1140001	19811-014	3.21	<0.0001	Yes	0.0168	Yes

Table 11. Summary of *Trifolium pratense* Day 28 Below Ground Biomass Data. SWMU 16, Naval Surface Warfare Center Crane, Crane, Indiana. CTO-0377. June 2010.

Day 28 Below Ground Biomass Summary

Field ID	ESI Code	Reps	Mean	Minimum	Maximum	CV
Laboratory Control	19811-000	5	6.91	5.18	8.37	18.39%
16 SS1160002	19811-015	5	5.83	3.99	7.02	23.20%
16 SS1010001	19811-002	5	5.26	0.46	8.19	65.56%
16 SS1020001	19811-003	5	3.73	0.11	8.15	84.98%
16 SS1030001	19811-004	5	5.51	2.46	14.57	93.34%
16 SS1040001	19811-005	5	2.95	0.00	5.59	85.36%
16 SS1090002	19811-009	5	8.70	2.06	22.92	98.99%
16 SS1060002	19811-010	5	1.70	0.43	2.89	60.75%
16 SS1120001	19811-013	5	1.04	0.37	2.04	61.19%
16 SS1140001	19811-014	5	0.88	0.26	1.64	57.90%

Day 28 Below Ground Biomass Statistical Summary

			Statistically Significant Difference as Compared to			
			Lab Control (19811-000)		16 SS1160002 (19811-015)	
Field ID	ESI Code	Mean	p Value	statistically significant	p Value	statistically significant
Laboratory Control	19811-000	6.91	-	-	-	-
16 SS1160002	19811-015	5.83	0.1155	No	-	-
16 SS1010001	19811-002	5.26	0.1723	No	0.3690	No
16 SS1020001	19811-003	3.73	0.0352	Yes	0.1043	No
16 SS1030001	19811-004	5.51	0.0754	No	0.1111	No
16 SS1040001	19811-005	2.95	0.0069	Yes	0.0271	Yes
16 SS1090002	19811-009	8.70	0.6649	No	0.7483	No
16 SS1060002	19811-010	1.70	<0.0001	Yes	0.0003	Yes
16 SS1120001	19811-013	1.04	<0.0001	Yes	<0.0001	Yes
16 SS1140001	19811-014	0.88	<0.0001	Yes	<0.0001	Yes

APPENDIX A:
RAW DATA AND STATISTICAL SUPPORT

Contents	Number of Pages
T. pratense 28-Day Soil Toxicity Test	
Daily Temperature and Daily Observation Bench Sheet	16
Day 28 Survival and Height Measurements	2
Day 28 Dry Weights	4
CETIS Work Sheets	2
Mean Time to Germination Summary	2
Day 28 Survival, Germination and Growth Statistical Analysis	89
Summary of Environmental Measurements	1
Soil pH Results	2
Soil Total Volatile Solids	1
Soil Cation Exchange Capacity	1
Sample Receipt Logs; Chain of Custody Records; Custody Seals	14
Sample Field Identification Clarification	1
Total Appendix Pages	135

Trifolium pratense 28 Day Assay

Study Number: 19811 **Client: TetraTech NUS** **Project: Crane IN, CTO 377**

Day	Date	Initials	Temp.	Humidity	Light	Rotate (✓)	Water (✓)	Comments
0	6/17/10	AM	26.9	53%	(E3) KAM 06/17/10 ~~400~~ 233	—	✓	
1	6/18/10	AM	27.6	43%	442	✓	✓	
2	6/19/10	JTP	26.9	40%	465	✓	✓	
3	6·20·10	DM	27.2	46%	565	✓	✓	
4	6/21/10	JTP	26.4	44%	601	✓	✓	
5	6/22/10	JTP	26.4	59%	523	✓	✓	
6	6/23/10	AM	26.6	46%	672	✓	✓	
7	6/24/10	JTP	27.2	49%	503	✓	✓	
8	6/25/10	JTP/AM	24.7	49%	623	✓	✓	
9	6/26/10	WM	WM ~~24.7~~ 25.6	48%	626	✓	✓	
10	6·27·10	DM	25.3	53%	653	✓	✓	
11	6/28/10	JTP	23.9	62%	481	✓	✓	
12	6/29/10	JEB	26.8	57%	496	✓	✓	
13	6/30/10	JEB	24.5	51%	652	✓	✓	
14	7/1/10	JTP	25.3	39%	671	✓	✓	
15	7/2/10	JTP	25.0	40%	701	✓	✓	
16	7/3/10	KC	25.3	45%	625	✓	✓	Was not aware of new observation designation.
17	7/4/10	KC	24.1	46%	565	✓	✓	
18	7/5/10	AM	24.3	53%	542	✓	✓	
19	7/6/10	JTP	27.7	52%	538	✓	✓	
20	7/7/10	AM	27.5	50%	713	✓	✓	
21	7/8/10	JTP	28.2	52%	793	✓	✓	Added water to bath to cool temperature.
22	7/9/10	JTP	26.4	49%	583	✓	✓	
23	7/10/10	KC	27.5	47%	590	✓	✓	
24	7·11·10	DM	28.0	54%	507	✓	✓	
25	7/12/10	JTP	29.4	53%	540	✓	✓	
26	7/13/10	JTP	28.3	47%	662	✓	✓	
27	7/14/10	AM	27.9	42%	624	✓	✓	
28	7/15/10	JTP	25.7	59%	637	✓	✓	

Project Notes:	Humidity 30% minimum	Light Meter ID:	1149	Temperature Data Logger ID:	19
Temperature 25±3°C	Light 4,000 lux	Humidity Meter ID:	19		

Observation Definitions
Normal Observations: no observed change

Emergence: the hypocotyl hook or first true leaves that are observed above the soil surface.

Chlorosis: the discoloration of shoots that occurs as chlorophyll is degraded as a result of disease, toxic substances, nutrient deficiencies, or senescence.

Necrosis: the presence of dead plant tissue.

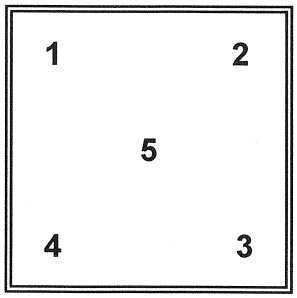
Withering: becoming limp or desiccated

Mortality: plant is completely dead

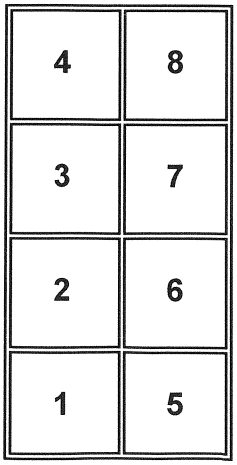
EG RAM

✔	**Normal Observations**	**N**	**Necrosis**
E	**Emergence**	**W**	**Withering**
C	**Chlorosis**	**X**	**Mortality**

Replicate Seed Position



Tray Position



Observation Key

X = Alive
√ = Nothing
D = Dead
E = Emergence
C = Chlorosis
N = Necrosis
W = Withering

Daily Observations for *Trifolium pratense* Study # 19811

Crane IN, CTO 377

				DAY													
Sample	Rep	Pos	Seed	1	2	3	4	5	6	7	8	9	10	11	12	13	14
19811-002	1	1	1	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
			2	✓	✓	E Sunlight	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
			4	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
			5	✓	E	X	X	X	X	X	X	X	X	X	X	X	X
19811-005	1	2	1	✓	✓	✓ E Sunlight	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	✓
			2	✓	✓	✓	✓	✓	✓	✓	✓	E	✓	✓	✓	✓	✓
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-013	1	3	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
			3	✓	E	X	X	X	X	X	X	X	X	X	X	X	X
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-014	1	4	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	✓	✓	✓	✓	E	X	X	X	X	X	X	X	X	X
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	E X	X	X	X	X	X	X	X	X	X	X
19811-000	1	5	1	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
			2	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
			3	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
			4	✓	E	✓	X	X	X	X	X	X	X	X	X	X	X
			5	✓	✓	E	X	X	X	X	X	X	✓	X	X	X	X
19811-009	1	6	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	E
			2	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-004	1	7	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	E	✓	W	✓	W	W	X	X	X	X	X	W
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
			5	✓	✓	✓	✓	E	X	X	X	X	X	X	X	X	X
19811-003	1	8	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Initials				AM 6/18	JTP 6/19	DM 6/20	AM 6/21	JTP 6/22	AM 6/23	JTP 6/24	JTP 6/25	WM 6/26	DM 6/27	JTP 6/28	JEB 6/29	JEB 6/30	JTP 7/1

Daily Observations for *Trifolium pratense* Study # 19811

Crane IN, CTO 377

				DAY													
Sample	Rep	Pos	Seed	15	16	17	18	19	20	21	22	23	24	25	26	27	28
19811-002	1	1	1	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Exp X	
			3	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			4	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			5	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
19811-005	1	2	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-013	1	3	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓ X	✓
			2	X	✓	X	X	X	X	X	C	C	C	C	C	C	C
			3	X	✓	X	X	X	X	X	X	X	X	X	X	N/C	N/C
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-014	1	4	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	✓	E	X	X	X	X	X	X	X	N/C	N/C
			3	X	✓	X	X	X	X	X	X	X	X	X	X	N/C	N/C
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	X	✓	X	X	X	X	X	C	C	C	C	C	C	C
19811-000	1	5	1	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			2	X	✓	X	X	X	X	X	X	X	C	N/C	N/C	N/W	N/W
			3	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			4	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			5	X	✓	X	X	X	X	X	X	X	X	C	C	N/C	N/C
19811-009	1	6	1	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			2	X	✓	X	X	X	X	X	X	X	X	X	X	N/C	N/C
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-004	1	7	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	W	✓	X	X	X	X	X	X	X	X	X	X	X	X
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	X	✓	X	X	X	X	X	X	X	X	X	X	C	C
			5	X	✓	X	X	X	X	X	X	X	X	X	X	C	C
19811-003	1	8	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	✓	✓	✓	E	X	X	X	X	X	X	X
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Initials				JTP 7/12	vc 7/13	vc 7/14	AM 7/15	JTP 7/16	AM 7/17	JTP 7/18	JTP 7/19	vc 7/10	DM 7/11	JTP 7/12	JTP 7/13	AM 7/14	JTP 7/15

Daily Observations for *Trifolium pratense* Study # 19811

Crane IN, CTO 377

				DAY													
Sample	Rep	Pos	Seed	1	2	3	4	5	6	7	8	9	10	11	12	13	14
19811-015	1	9	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	✓	✓	✓	✓	E	✓?	✓	✓	✓	✓	✓
			3	✓	✓	✓	✓	E	X	X	X	X	X	X	X	X	X
			4	✓	E	X	X	X	X	X	X	X	X	X	X	X	X
			5	✓	E	X	X	X	X	X	X	X	X	X	X	X	X
19811-010	1	10	1	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
			2	✓	✓	✓	✓	✓	E	X	X	X	X	X	X	X	X
			3	✓	E	X	X	X	X	X	X	X	X	X	X	X	X
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-003	2	11	1	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
			2	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
			3	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
			4	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
			5	✓	E	X	X	X	X	X	X	X	X	X	X	X	X
19811-014	2	12	1	✓	E	X	X	X	X	X	X	X	X	X	X	X	W
			2	✓	E	X	X	X	X	X	X	✓	✓	✓	✓	✓	✓
			3	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-004	2	13	1	✓	✓	✓	✓	✓	✓	✓	✓	E	✓	✓	✓	✓	✓
			2	✓	✓	✓	✓	✓	✓	E	X	X	X	X	X	X	X
			3	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
			4	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-015	2	14	1	✓	✓	✓	✓	✓	✓	E	X	X	X	X	X	X	X
			2	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
			5	✓	E	X	X	X	X	X	X	X	X	X	X	X	X
19811-005	2	15	1	✓	E	X	X	X	X	X	X	X	X	X	X	X	X
			2	✓	✓	E	E	X	X	X	X	X	X	X	X	X	X
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
			5	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
19811-009	2	16	1	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
			2	✓	E	X	X	X	X	X	X	X	X	X	X	X	X
			3	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
			4	✓	E	X	X	X	X	X	X	X	X	X	X	X	X
			5	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
Initials				AM 6/18	JTP 6/19	DM 6/20	AM 6/21	JTP 6/22	AM 6/23	JTP 6/24	JTP/AM 6/25	WM 6/26	DM 6/27	JTP 6/28	JEB 6/29	JEB 6/30	JTP 7/1

Daily Observations for *Trifolium pratense* Study # 19811

Crane IN, CTO 377

				DAY													
Sample	Rep	Pos	Seed	15	16	17	18	19	20	21	22	23	24	25	26	27	28
19811-015	1	9	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			4	X	✓	X	X	X	X	X	X	X	X	X	X	C	X
			5	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
19811-010	1	10	1	X	✓	X	X	X	X	X	X	X	X	C	C	N/C	N/C
			2	X	✓	X	X	X	X	X	X	X	X	X	X	N/C	N/C
			3	X	✓	X	X	X	X	X	X	X	C	C	C	N/C	N/C
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-003	2	11	1	X	✓	X	W	W	W	N/C	(V)	✓	✓	✓	✓	✓	✓
			2	X	✓	X	W	W	W	(10)	✓	✓	✓	✓	✓	✓	✓
			3	X	✓	X	W	W	X	X	X	X	X	X	X	X	X
			4	X	✓	X	W	W	W	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
			5	X	✓	X	W	W	W	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
19811-014	2	12	1	W	✓	X	X	W	X	W	W	W	X	W	W	W	W
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	X	W	X	X	X	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-004	2	13	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			3	X	✓	X	W	W	W	W	N/C	N/C	N/C	N/C	(D)	✓	✓
			4	X	✓	X	X	X	X	X	X	X	N/C	N/C	N/C	N/C	N/C
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-015	2	14	1	X	✓	X	X	X	X	X	X	X	X	X	X	N/C	N/C
			2	X	✓	X	X	X	X	X	X	X	X	X	X	N/C	N/C
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			5	X	✓	X	X	X	X	X	X	X	X	X	X	N	N/C
19811-005	2	15	1	X	✓	X	X	X	C	C	C	C	X	X	X	X	X
			2	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			5	X	✓	X	X	X	X	X	X	X	X	X	X	N	N
19811-009	2	16	1	X	✓	X	X	X	X	X	X	X	X	X	X	N	N
			2	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			3	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			4	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			5	X	✓	X	X	X	X	X	X	X	X	X	X	C	C
Initials				JTP 7/2	KC 7/3	KC 7/4	AM 7/5	JTP 7/6	AM 7/7	JTP 7/8	JTP 7/9	KC 7/10	OM 7-11	JTP 7/12	JTP 7/13	AM 7/14	JTP 7/15

Daily Observations for *Trifolium pratense* Study # 19811

Crane IN, CTO 377

				DAY													
Sample	Rep	Pos	Seed	1	2	3	4	5	6	7	8	9	10	11	12	13	14
19811-013	2	17	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	✓	E	X	X	X	X	X	X	X	X	X
			3	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
			4	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
			5	✓	✓	✓	✓	✓	E	X	X	X	X	X	X	X	W
19811-000	2	18	1	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
			4	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-010	2	19	1	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
			2	✓	✓	✓	E	✓	✓	X	X	X	X	X	X	X	X
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
			5	✓	E	X	X	X	X	X	X	X	X	X	X	X	X
19811-002	2	20	1	✓	E	X	X	X	X	X	X	X	X	X	X	X	X
			2	✓	E	X	X	X	X	X	X	X	X	X	X	X	X
			3	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
			4	✓	E	X	X	X	X	X	X	X	X	X	X	X	X
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-015	3	21	1	✓	E	X	X	X	X	X	X	X	X	X	X	X	X
			2	✓	✓	✓ (E) JTP 6/29	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
			4	✓	E	X	X	X	X	X	X	X	X	X	X	X	X
			5	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
19811-002	3	22	1	✓	E	X	X	X	X	X	X	W	X	X	X	X	X
			2	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
			3	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
			4	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
			5	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
19811-005	3	23	1	✓	✓	✓	✓	✓	✓	✓	✓	E	E	X	X	W	W
			2	✓	✓	E	X	X	X	X	X	X	X	X	X	X	W
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
			5	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
19811-004	3	24	1	✓	✓	✓	✓	✓	✓	✓	E	X	X	X	X	X	X
			2	✓	E	X	X	X	X	X	X	X	X	X	X	X	X
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
			5	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
Initials				AM 6/18	JTP 6/19	DM 6/20	AM 6/21	JTP 6/22	AM 6/23	JTP 6/24	JTP/AM 6/25	WM 6/26	DM 6/27	JTP 6/28	JEB 6/29	JEB 6/30	JTP 7/1

Daily Observations for *Trifolium pratense* Study # 19811

Crane IN, CTO 377

				DAY													
Sample	Rep	Pos	Seed	15	16	17	18	19	20	21	22	23	24	25	26	27	28
19811-013	2	17	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	X	✓	✓	X	X	X	X	N/C	N/C	N/C	N/C	N/C	N/C	N/C
			3	X	W	W	X	X	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
			4	X	W	W	X	X	C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
			5	W	W	W	X	X	C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
19811-000	2	18	1	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			4	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-010	2	19	1	X	✓	X	X	X	X	X	X	X	X	X	X	C	C
			2	X	✓	X	X	X	N	N/C	N/C	N/C	X	N/C	N/C	N/C	N/C
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	X	✓	X	X	X	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
			5	X	✓	X	X	X	X	X	N/C	N/C	X	N/C	N/C	N/C	N/C
19811-002	2	20	1	X	✓	X	X	X	X	X	X	X	X	X	X	C	X
			2	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			3	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			4	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X
19811-015	3	21	1	X	✓	X	X	X	X	X	X	X	X	X	X	C	C
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	X	✓	X	X	X	X	X	X	X	X	X	X	C	C
			4	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			5	X	✓	X	X	X	X	X	X	X	X	X	X	C	C
19811-002	3	22	1	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			2	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			3	X	✓	X	X	X	X	X	X	X	X	X	X	C	C
			4	X	✓	X	X	X	X	X	X	X	X	X	X	N/C	N/C
			5	X	✓	X	X	X	X	X	X	X	X	X	X	C	N/C
19811-005	3	23	1	W	W/A	W/C	O	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	W	W	W	X	X	X	X	W	W	X	W	W	W/C	W/C
			3	✓	E	X	X	X	X	X	X	X	X	X	X	X	X
			4	X	✓	X	X	X	X	X	X	X	X	X	N/C	N/C	N/C
			5	X	✓	X	X	X	X	X	W	W	X	W	W	W/N	W/N
19811-004	3	24	1	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			2	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			5	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
Initials				JTP 7/12	VL 7/13	VL 7/14	AM 7/15	JTP 7/16	AM 7/17	JTP 7/18	JTP 7/19	VL 7/20	OM 7-21	JTP 7/22	JTP 7/23	AM 7/24	JTP 7/25

Daily Observations for *Trifolium pratense* Study # 19811

Crane IN, CTO 377

				DAY													
Sample	Rep	Pos	Seed	1	2	3	4	5	6	7	8	9	10	11	12	13	14
19811-009	3	25	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	E	X	X	X	X	X	X	X	X	X	X	X	X
			3	✓	✓	✓	✓	✓	✓	E	X	X	X	X	X	X	X
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
19811-000	3	26	1	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	✓	E	✓	X	X	X	X	X	X	X	X	X	X	X
			4	✓	E	✓	X	X	X	X	X	X	X	X	X	X	X
			5	✓	E	✓	X	X	X	X	X	X	X	X	X	X	X
19811-010	3	27	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
			5	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
19811-013	3	28	1	✓	E	X	X	X	X	X	X	X	X	X	X	X	X
			2	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-003	3	29	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	✓	✓	✓	E	✓	✓	✓ X	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
19811-014	3	30	1	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	✓	✓	✓	✓	✓	✓	E	X	X	X	X	X	X	X
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-009	4	31	1	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
			2	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
			3	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
			4	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
			5	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
19811-000	4	32	1	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
			4	✓	E	X	X	X	X	X	X	X	X	X	X	X	X
			5	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
Initials				AM 6/18	JTP 6/19	DN 6/20	AM 6/21	JTP 6/22	AM 6/23	JTP 6/24	JTP/AM 6/25	AM 6/26	DN 6/27	JTP 6/28	JEB 6/29	JEB 6/30	JTP 7/1

Daily Observations for *Trifolium pratense* Study # 19811

Crane IN, CTO 377

				DAY													
Sample	Rep	Pos	Seed	15	16	17	18	19	20	21	22	23	24	25	26	27	28
19811-009	3	25	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			3	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
19811-000	3	26	1	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			4	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			5	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
19811-010	3	27	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	X	✓	X	X	W	X	X	W	W	X	W	W	W	W
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-013	3	28	1	X	N	N	N	N	N	N	N/W	N/W	X	N/W	N/W	N/C	N/C
			2	X	✓	X	X	X	X	X	X	X	X	X	N/C	N/C	N/C
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-003	3	29	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	X	C	X	X	X	X	X	X	X	X	X	X	N/C	N/C
19811-014	3	30	1	X	N	N	N	N	N	N	N	N	X	N	N	N	N
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	X	✓	X	X	X	X	X	X	X	X	X	X	N	N
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-009	4	31	1	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			2	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			3	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			4	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			5	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
19811-000	4	32	1	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			4	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			5	X	N/C	~~X~~ N/C	N	N	N	N	N	N	X	N	N	N	N
Initials				JTP 7/12	VC 7/13	VC 7/14	AM 7/15	JTP 7/16	AM 7/17	JTP 7/18	JTP 7/19	VC 7/20	OM 7/21	JTP 7/22	JTP 7/23	AM 7/24	JTP 7/25

Daily Observations for *Trifolium pratense* Study # 19811

Crane IN, CTO 377

				DAY													
Sample	Rep	Pos	Seed	1	2	3	4	5	6	7	8	9	10	11	12	13	14
19811-010	4	33	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	E	X	X	X	X	X	X	X	X	X	X	X	X
			3	✓	E	X	X	X	X	X	X	X	X	X	X	X	X
			4	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
			5	✓	E	X	X	X	X	X	X	X	X	X	X	X	X
19811-014	4	34	1	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
			4	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
			5	✓	E	X	X	X	X	X	X	X	X	X	X	X	X
19811-005	4	35	1	✓	✓	✓	✓	✓	✓	✓	✓	E	X	X	X	X	X
			2	✓	E	X	X	X	X	X	X	X	X	X	X	X	X
			3	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
			4	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
			5	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
19811-015	4	36	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
			3	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
			4	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-003	4	37	1	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
			2	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
			3	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
			4	✓	✓ MK	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	✓	E	X	X	X	X	X	X	X	X	X
19811-004	4	38	1	✓	E	X	X	X	X	X	X	X	X	X	X	X	X
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-002	4	39	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	✓	✓	E	X	X	X	X	X	X	X	X
19811-013	4	40	1	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
			2	✓	E	X	X	X	X	X	X	X	X	X	X	X	X
			3	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Initials				AM 6/18	JTP 6/19	DM 6/20	AM 6/21	JTP 6/22	AM 6/23	JTP 6/24	JTP/AM 6/25	MM 6/26	DM 6/27	JTP 6/28	JEB 6/29	JEB 6/30	JTP 7/1

Daily Observations for *Trifolium pratense* Study # 19811

Crane IN, CTO 377

				DAY													
Sample	Rep	Pos	Seed	15	16	17	18	19	20	21	22	23	24	25	26	27	28
19811-010	4	33	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	X	C	(X)	X	X	X	X	W	W	X	W	W	W	W
			3	X	C	C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
			4	X	✓	X	X	X	X	X	X	X	X	X	X	N/C	N/C
			5	X	C	C	C	C	C	C	C	C	X	X	X	N/C	N/C
19811-014	4	34	1	X	N/W	N/W	N	N	N	N	N	N	X	N	N	N	N
			2	✓	N/C ✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	X	LN	N	N	N	N	N/C	N/C	N/C	C	N/C	N/C	N/C	N/C
			4	X	C	C	N/C	N/C	C	C	C	C	C	C	N/C	N/C	N/C
			5	X	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	C	N/C	N/C	N/C	N/C
19811-005	4	35	1	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			2	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			3	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			4	X	✓	X	X	X	X	X	X	X	X	X	X	N	N
			5	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
19811-015	4	36	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	X	✓	X	X	X	X	X	X	X	X	X	X	N	N
			3	X	✓	X	X	X	X	X	X	X	X	X	X	N/W	N/W
			4	X	✓	X	X	X	X	X	X	X	X	X	X	C	N/C
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-003	4	37	1	X	✓	X	X	X	X	X	X	X	X	X	X	N	N
			2	X	✓	X	X	X	X	X	X	X	X	X	X	N/C	N/C
			3	X	✓	X	X	X	X	X	X	X	X	X	X	N/C	N/C
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	X	C	X	X	X	X	X	X	X	X	X	X	N	N
19811-004	4	38	1	X	✓	X	X	X	X	X	X	X	X	X	X	N/C	N/C
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	X	✓	X	X	X	X	X	X	X	X	N/C	N/C	X	X
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	E	✓	X	X	X	X	X	X	X	X	X	X	X	X
19811-002	4	39	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X
			5	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
19811-013	4	40	1	X	✓	X	X	X	X	X	N/C	N/C	N/C	N/C	N/C	N/C	N/C
			2	X	N/W	N/W	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
			3	X	W	W	W	W	W	W	N/C/W	N/C/W	N/C	N/C	N/C	N/C	N/C
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Initials				JTP 7/2	VC 7/3	VC 7/4	AM 7/5	JTP 7/6	AM 7/07	JTP 7/8	JTP 7/9	VC 7/10	DM 7/11	JTP 7/12	JTP 7/13	AM 7/14	JTP 7/15

(E) AM 7/7

Daily Observations for *Trifolium pratense* Study # 19811

Crane IN, CTO 377

				DAY													
Sample	Rep	Pos	Seed	1	2	3	4	5	6	7	8	9	10	11	12	13	14
19811-003	5	41	1	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
			2	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
			3	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
			4	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
			5	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
19811-000	5	42	1	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
			2	✓	E	X	X	X	X	X	X	X	X	X	X	X	X
			3	✓	E	X	X	X	X	X	X	X	X	X	X	X	X
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
19811-015	5	43	1	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
			4	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
			5	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
19811-010	5	44	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-002	5	45	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	✓	✓	✓	✓	✓	✓	✓	✓	E	X	X	X	X	X
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-009	5	46	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
			3	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-004	5	47	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	E	X	X	X	X
			4	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
			5	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
19811-014	5	48	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	E	X	X	X	X
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Initials				AM 6/18	JTP 6/19	DM 6/20	AM 6/21	JTP 6/22	AM 6/23	JTP 6/24	JTP/AM 6/25	WM 6/26	DM 6/27	JTP 6/28	JEB 6/29	JEB 6/30	JTP 7/1

Daily Observations for *Trifolium pratense* Study # 19811

Crane IN, CTO 377

				DAY													
Sample	Rep	Pos	Seed	15	16	17	18	19	20	21	22	23	24	25	26	27	28
19811-003	5	41	1	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			2	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			3	X	✓	X	X	X	X	X	X	X	X	N	N/C	N/C	N/C
			4	X	C/N	C/N	C	X	X	X	X	X	X	N/C	N/C	N/C	N/C
			5	X	✓	X	X	X	X	X	X	X	✓	N/C	N/C	N/C	N/C
19811-000	5	42	1	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			2	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			3	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-015	5	43	1	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			4	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			5	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
19811-010	5	44	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	X	C	C	C	C	C	C	C	C	X	C	C	N/C	N/C
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
19811-002	5	45	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	X	✓	X	✓	W	X	X	N/C/W	N/C/W	X	N/C/W	N/C/W	N/C/W	N/C/W
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-009	5	46	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	X	✓	X	X	X	X	X	X	X	X	X	C	C	C
			3	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			4	E	✓	X	X	X	X	X	X	X	X	X	X	X	X
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-004	5	47	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	X	E	X	X	X	X	X	W	W	X	W	W	C	W
			4	X	✓	X	X	X	X	X	X	X	X	X	X	N	N
			5	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
19811-014	5	48	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	X	N/C/W	N/C/W	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
			4	X	E/N/W	E/N/W	W	W	(N)	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Initials				JTP 7/12	KC 7/13	KC 7/14	AA 7/15	JTP 7/16	AA 7/17	JTP 7/18	JTP 7/19	KC 7/10	[illegible] 7-11	JTP 7/12	JTP 7/13	AA 7/14	JTP 7/15

Daily Observations for *Trifolium pratense* Study # 19811

Crane IN, CTO 377

				DAY													
Sample	Rep	Pos	Seed	1	2	3	4	5	6	7	8	9	10	11	12	13	14
19811-005	5	49	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	E	X	✓	✓	✓
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	E	X	X	X	X	X	X	X	X	X	X	X	X
19811-013	5	50	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
			3	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	E	X	X	X	X	X	X	X	X	X	X	X
Initials				AM 6/18	JTP 6/19	DM 6/20	AM 6/21	JTP 6/22	AM 6/23	JTP 6/24	JTP/AM 6/25	WM 6/26	DM 6/27	JTP 6/28	JEB 6/29	JEB 6/30	JTP 7/1

Daily Observations for *Trifolium pratense* Study # 19811

Crane IN, CTO 377

				DAY													
Sample	Rep	Pos	Seed	15	16	17	18	19	20	21	22	23	24	25	26	27	28
19811-005	5	49	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	E	X	N/C	N/C	D	✓	✓	✓	✓	✓	✓	✓	✓
			3	✓	E	X	X	X	X	✓	✓	✓	✓	✓	✓	✓	✓
			4	✓	E/C	C	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓
			5	X	N	N	N	N	N	N	N	N	N	N	N	N	N
19811-013	5	50	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	X	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
			3	X	E/C ✓ N	N	N	N	N	N	N/C	N/C	N/C	N/C	N/C	N/C	N/C
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	X	✓	X	C	C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
Initials				JTP 7/2	VC 7/3	VC 7/4	AM 7/5	JTP 7/6	AM 7/7	JTP 7/8	JTP 7/9	VC 7/10	DM 7/11	JTP 7/12	JTP 7/13	AM 7/14	JTP 7/15

Trifolium pratense 28 Day Assay

STUDY NUMBER: 19811 **PROJECT: Crane IN, CTO 377**

DATE: 07/15/10 **CLIENT: Tetra Tech NUS**

Sample Code	Rep	Pos	# Alive	Pan Count	Initials	Above Ground Height of Each Plant (mm)					Initials	
						1	2	3	4	5		
19811-002	1	1	4	4	JTP	26	16	42	38	—	JTP	
19811-005	1	2	0	0	JTP	—	—	—	—	—	JTP	
19811-013	1	3	2	2	JTP	16	23	—	—	—	JTP	
19811-014	1	4	3	3	JTP	11	13	16	—	—	JTP	
19811-000	1	5	5	5	JTP	75	37	52	44	21	JTP	
19811-009	1	6	2	2	JTP	25	4	—	—	—	JTP	
19811-004	1	7	3	3	JTP	22	26	20	—	—	JTP	
19811-003	1	8	1	1	JTP	7	—	—	—	—	JTP	
19811-015	1	9	3	3	JTP	37	22	26	—	—	JTP	
19811-010	1	10	3	3	JTP	19	14	12	—	—	JTP	
19811-003	2	11	3	3	JTP	15	18	20	—	—	JTP	
19811-014	2	12	2	2	JTP	10	16	—	—	—	JTP	
19811-004	2	13	2	2	JTP	25	26	—	—	—	JTP	
19811-015	2	14	4	4	JTP	8	15	21	19	—	JTP	
19811-005	2	15	4	4	JTP	25	40	41	19	—	JTP	
19811-009	2	16	5	5	JTP	41	25	31	33	41	JTP	
19811-013	2	17	4	4	JTP	31	12	19	7	—	JTP	Pan 45, 3R
19811-000	2	18	3	3	JTP	31	79	66	—	—	JTP	
19811-010	2	19	4	4	JTP	27	27	12	14	—	JTP	
19811-002	2	20	4	4	JTP	31	27	27	47	—	JTP	
19811-015	3	21	4	4	JTP	23	40	69	33	—	JTP	
19811-002	3	22	5	5	JTP	25	31	16	21	13	JTP	
19811-005	3	23	4	4	JTP	18	34	18	11	—	JTP	
19811-004	3	24	4	4	JTP	25	16	28	27	—	JTP	
19811-009	3	25	3	3	JTP	25	50	39	—	—	JTP	
19811-000	3	26	4	4	JTP	70	57	70	47	—	JTP	
19811-010	3	27	1	1	JTP	19	—	—	—	—	JTP	
19811-013	3	28	2	2	JTP	15	15	—	—	—	JTP	
19811-003	3	29	2	2	JTP	34	22	—	—	—	JTP	
19811-014	3	30	2	2	JTP	16	16	—	—	—	JTP	
19811-009	4	31	5	5	JTP	51	50	21	52	39	JTP	
19811-000	4	32	4	4	JTP	77	68	76	19	—	JTP	
19811-010	4	33	4	4	JTP	20	12	19	21	—	JTP	
19811-014	4	34	4	4	JTP	13	19	22	9	—	JTP	
19811-005	4	35	5	5	JTP	24	21	21	15	6	JTP	
19811-015	4	36	3	3	JTP	31	25	36	—	—	JTP	
19811-003	4	37	4	4	JTP	32	31	18	35	—	JTP	
19811-004	4	38	3	3	JTP	6	26	25	—	—	JTP	
19811-002	4	39	2	2	JTP	27	29	—	—	—	JTP	
19811-013	4	40	3	3	JTP	39	19	10	—	—	JTP	
19811-003	5	41	5	5	JTP	54	83	57	20	27	JTP	
19811-000	5	42	3	3	JTP	85	88	77	—	—	JTP	
19811-015	5	43	4	4	JTP	25	26	31	29	—	JTP	

Trifolium pratense 28 Day Assay

STUDY NUMBER: 19811 **PROJECT:** Crane IN, CTO 377

DATE: 07/15/10 **CLIENT:** Tetra Tech NUS

Sample Code	Rep	Pos	# Alive	Pan Count	Initials	Above Ground Height of Each Plant (mm)					Initials
						1	2	3	4	5	
19811-010	5	44	2	2	JTP	25	11	—	—	—	JTP
19811-002	5	45	1	1	JTP	16	—	—	—	—	JTP
19811-009	5	46	2	2	JTP	15	34	—	—	—	JTP
19811-004	5	47	3	3	JTP	5	27	15	—	—	JTP
19811-014	5	48	1	1	JTP	11	—	—	—	—	JTP
19811-005	5	49	1	1	JTP	20	—	—	—	—	JTP
19811-013	5	50	3	3	JTP	5	19	12	—	—	JTP

STUDY: 19811
CLIENT: Tetra Tech NUS, Inc.
PROJECT: SWMU 16, Crane Indiana, CTO 377
ASSAY: T. pratense - Shoots
TASK: Wet Weight Data - Balance Output File
BALANCE: AccuSeries Model 225D, SN# 17008376

Date / Init:	07/16/10 JL		Total Wt.	Tare Wt.	Duplicates	
Sample Code	Rep	Pos.	(mg)	(mg)	Total Wt.	Tare Wt.
19811-002	1	1	1068.87	1007.64		
19811-005	1	2	1006.83	1006.94		
19811-013	1	3	1029.41	1015.85		
19811-014	1	4	1041.65	1024.12		
19811-000	1	5	1131.16	1044.84		
19811-009	1	6	1023.88	1008.49		
19811-004	1	7	1034.53	1011.36		
19811-003	1	8	1009.10	1007.95		
19811-015	1	9	1034.98	1006.04		
19811-010	1	10	1038.53	1021.36		
19811-003	2	11	1007.38	991.11		
19811-014	2	12	1007.13	995.09		
19811-004	2	13	1048.08	1030.20		
19811-015	2	14	1025.87	1000.70		
19811-005	2	15	1038.08	998.60		
19811-009	2	16	1133.46	1031.63		
19811-013	2	17	1029.30	999.33		
19811-000	2	18	1072.94	1003.47		
19811-010	2	19	1030.27	1001.05		
19811-002	2	20	1079.64	1022.73	1079.75	1022.76
19811-015	3	21	1078.40	1015.83		
19811-002	3	22	1060.94	984.64		
19811-005	3	23	1058.88	1029.69		
19811-004	3	24	1046.30	1006.49		
19811-009	3	25	1068.99	1028.73		
19811-000	3	26	1128.62	1028.67		
19811-010	3	27	1011.45	1006.19		
19811-013	3	28	1033.20	1013.80		
19811-003	3	29	1031.35	1005.58		
19811-014	3	30	1006.05	994.03		
19811-009	4	31	1109.46	1014.71		
19811-000	4	32	1101.70	1006.90		
19811-010	4	33	1043.56	1010.81		
19811-014	4	34	1044.95	1013.40		
19811-005	4	35	1047.09	1011.86		
19811-015	4	36	1049.78	1023.30		
19811-003	4	37	1045.41	1004.18		
19811-004	4	38	1035.58	1012.64		
19811-002	4	39	1024.56	1007.17		
19811-013	4	40	1046.96	1021.43	1046.97	1021.46
19811-003	5	41	1123.58	1019.15		

Date / Init:	07/16/10 JL		Total Wt.	Tare Wt.	Duplicates	
Sample Code	Rep	Pos.	(mg)	(mg)	Total Wt.	Tare Wt.
19811-000	5	42	1100.04	1000.50		
19811-015	5	43	1029.11	986.60		
19811-010	5	44	1020.08	1009.79		
19811-002	5	45	1026.47	1009.67		
19811-009	5	46	1016.60	1002.47		
19811-004	5	47	1008.50	983.05		
19811-014	5	48	1004.54	997.44		
19811-005	5	49	1031.91	1024.64		
19811-013	5	50	1042.75	1017.99		

STUDY: 19811
CLIENT: Tetra Tech NUS, Inc.
PROJECT: SWMU 16, Crane Indiana, CTO 377
ASSAY: T. pratense - Roots
TASK: Wet Weight Data - Balance Output File
BALANCE: AccuSeries Model 225D, SN# 17008376

Date / Init:	07/16/10 JL		Total Wt.	Tare Wt.	Duplicates	
Sample Code	Rep	Pos.	(mg)	(mg)	Total Wt.	Tare Wt.
19811-002	1	1	1063.56	1022.59		
19811-005	1	2	1022.14	1022.13		
19811-013	1	3	1016.40	1014.57		
19811-014	1	4	1000.23	996.16		
19811-000	1	5	1064.30	1029.96		
19811-009	1	6	1037.39	1027.09		
19811-004	1	7	1089.15	1016.32		
19811-003	1	8	997.53	996.97		
19811-015	1	9	1025.45	1001.42		
19811-010	1	10	1026.22	1016.64		
19811-003	2	11	1004.51	994.08		
19811-014	2	12	989.35	984.43		
19811-004	2	13	1043.56	1031.25		
19811-015	2	14	1020.77	1000.83		
19811-005	2	15	1047.22	1019.29		
19811-009	2	16	1126.05	1011.44		
19811-013	2	17	1031.43	1021.23		
19811-000	2	18	1035.89	1010.01		
19811-010	2	19	1014.50	1000.03		
19811-002	2	20	1061.84	1024.36	1061.84	1024.37
19811-015	3	21	1014.08	978.96		
19811-002	3	22	1059.62	1022.62		
19811-005	3	23	1014.53	1000.10		
19811-004	3	24	1040.54	1016.91		
19811-009	3	25	1047.64	1023.33		
19811-000	3	26	1071.22	1031.91		
19811-010	3	27	1007.11	1004.96		
19811-013	3	28	1036.28	1032.84		
19811-003	3	29	1029.29	1016.05		
19811-014	3	30	1003.76	1000.38		
19811-009	4	31	1062.89	1010.03		
19811-000	4	32	1063.27	1031.91		
19811-010	4	33	1010.37	998.50		
19811-014	4	34	1011.76	1003.54		
19811-005	4	35	1049.55	1022.87		
19811-015	4	36	1019.31	986.58		
19811-003	4	37	1034.38	1006.17		
19811-004	4	38	1017.57	1002.98		
19811-002	4	39	1024.26	1010.50		
19811-013	4	40	1014.45	1008.53	1014.47	1008.57
19811-003	5	41	1039.44	998.71		

Date / Init:	07/16/10 JL		Total Wt.	Tare Wt.	Duplicates	
Sample Code	Rep	Pos.	(mg)	(mg)	Total Wt.	Tare Wt.
19811-000	5	42	1044.34	1002.48		
19811-015	5	43	1041.25	1007.23		
19811-010	5	44	1012.27	1007.96		
19811-002	5	45	1030.07	1027.79		
19811-009	5	46	1039.27	1023.96		
19811-004	5	47	1015.85	1001.55		
19811-014	5	48	1016.46	1015.17		
19811-005	5	49	1033.82	1029.11		
19811-013	5	50	1014.17	1009.60		

STUDY: 19811
CLIENT: Tetra Tech NUS, Inc.
PROJECT: SWMU 16, Crane Indiana, CTO 377
ASSAY: T. pratense
TASK: Mean Time to Germination

			Plant					Mean
Sample Code	Rep	Pos	1	2	3	4	5	
19811-002	1	1	3		3	3	2	2.75
19811-005	1	2						0.00
19811-013	1	3		3	2			2.50
19811-014	1	4		19	5		4	9.33
19811-000	1	5	3	3	3	2	3	2.80
19811-009	1	6	14	4				9.00
19811-004	1	7		3		4	5	4.00
19811-003	1	8		21				21.00
19811-015	1	9			5	2	2	3.00
19811-010	1	10	4	6	2			4.00
19811-003	2	11	3	4	4	4	2	3.40
19811-014	2	12	2	2	3			2.33
19811-004	2	13		7	4	3		4.67
19811-015	2	14	7	4		3	2	4.00
19811-005	2	15	2	3		3	3	2.75
19811-009	2	16	3	2	3	2	4	2.80
19811-013	2	17		5	3	3	6	4.25
19811-000	2	18	4		3	3		3.33
19811-010	2	19	3	4		4	2	3.25
19811-002	2	20	2	2	3	2		2.25
19811-015	3	21	2		3	2	3	2.50
19811-002	3	22	2	3	3	3	3	2.80
19811-005	3	23	9	3	16	3	3	6.80
19811-004	3	24	8	2		4	3	4.25
19811-009	3	25		2	7		3	4.00
19811-000	3	26	3		2	2	2	2.25
19811-010	3	27				4		4.00
19811-013	3	28	2	4				3.00
19811-003	3	29		4			3	3.50
19811-014	3	30	3		7			5.00
19811-009	4	31	3	4	4	4	3	3.60
19811-000	4	32	3		3	2	3	2.75
19811-010	4	33		2	2	4	2	2.50
19811-014	4	34	4		3	4	2	3.25
19811-005	4	35	9	2	3	3	3	4.00
19811-015	4	36		3	3	3		3.00
19811-003	4	37	4	4	4		5	4.25
19811-004	4	38	2		3		15	6.67
19811-002	4	39			3		6	4.50
19811-013	4	40	4	2	3			3.00
19811-003	5	41	3	3	3	3	3	3.00

Sample Code	Rep	Pos	Plant 1	2	3	4	5	Mean
19811-000	5	42	3	2	2			2.33
19811-015	5	43	3		3	3	3	3.00
19811-010	5	44		4			18	11.00
19811-002	5	45				9		9.00
19811-009	5	46		3	3	15		7.00
19811-004	5	47			10	3	3	5.33
19811-014	5	48			3	10		6.50
19811-005	5	49	10	16	16	16	2	12.00
19811-013	5	50		3	3		3	3.00

Notes:

The following Emergences noted on the observation records have been determined to be weeds and were eliminated from analysis.

Sample Code	Rep	Pos	Day
19811-002	1	1	27
19811-005	1	2	9
19811-015	1	9	8
19811-004	2	13	3
19811-004	2	13	9

CETIS Test Data Worksheet

Report Date: 20 Jul-10 10:56 (p 1 of 2)
Test Code: 09-7862-7274/19811Tp

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Start Date: 17 Jun-10 13:00 **Species:** Trifolium pratense **Sample Code:** 19811-000
End Date: 15 Jul-10 13:00 **Protocol:** ASTM E1963-09 (2009) **Sample Source:** Crane Indiana
Sample Date: 16 Jun-10 12:00 **Material:** Soil **Sample Station:** Laboratory Control Sample; 19811-0

Sample Code	Rep	Pos	xpo	Germinat	urviv	ys to Ge	Plant Height (mm	oot Length (mr	lant Tare (mg	Plant Final (mg	oot Tare (m	oot Final (mg	Co	oot Pan Cou
19811-002	1	1	5	4	4		30.5		1007.64	1068.87	1022.59	1063.56	4	4
19811-005	1	2	5	0	0				1006.94	1006.83	1022.13	1022.14		
19811-013	1	3	5	2	2		19.5		1015.85	1029.41	1014.57	1016.4	2	2
19811-014	1	4	5	3	3		13.3		1024.12	1041.65	996.16	1000.23	3	3
19811-000	1	5	5	5	5		45.8		1044.84	1131.16	1029.96	1064.3	5	5
19811-009	1	6	5	2	2		14.5		1008.49	1023.88	1027.09	1037.39	2	2
19811-004	1	7	5	3	3		22.7		1011.36	1034.53	1016.32	1089.15	3	3
19811-003	1	8	5	1	1		7		1007.95	1009.1	996.97	997.53	1	1
19811-015	1	9	5	3	3		28.3		1006.04	1034.98	1001.42	1025.45	3	3
19811-010	1	10	5	3	3		15		1021.36	1038.53	1016.64	1026.22	3	3
19811-003	2	11	5	3	3		17.7		991.11	1007.38	994.08	1004.51	3	3
19811-014	2	12	5	2	2		13		995.09	1007.13	984.43	989.35	2	2
19811-004	2	13	5	2	2		25.5		1030.2	1048.08	1031.25	1043.56	2	2
19811-015	2	14	5	4	4		15.8		1000.7	1025.87	1000.83	1020.77	4	4
19811-005	2	15	5	4	4		31.3		998.6	1038.08	1019.29	1047.22	4	4
19811-009	2	16	5	5	5		34.2		1031.63	1133.46	1011.44	1126.05	5	5
19811-013	2	17	5	4	4		17.3		999.33	1029.3	1021.23	1031.43	4	3
19811-000	2	18	5	3	3		58.7		1003.47	1072.94	1010.01	1035.89	3	3
19811-010	2	19	5	4	4		20		1001.05	1030.27	1000.03	1014.5	4	4
19811-002	2	20	5	4	4		33		1022.73	1079.64	1024.36	1061.84	4	4
19811-015	3	21	5	4	4		41.3		1015.83	1078.4	978.96	1014.08	4	4
19811-002	3	22	5	5	5		21.2		984.64	1060.94	1022.62	1059.62	5	5
19811-005	3	23	5	4	4		20.3		1029.69	1058.88	1000.1	1014.53	4	4
19811-004	3	24	5	4	4		24		1006.49	1046.3	1016.91	1040.54	4	4
19811-009	3	25	5	3	3		38		1028.73	1068.99	1023.33	1047.64	3	3
19811-000	3	26	5	4	4		61		1028.67	1128.62	1031.91	1071.22	4	4
19811-010	3	27	5	1	1		19		1006.19	1011.45	1004.96	1007.11	1	1
19811-013	3	28	5	2	2		15		1013.8	1033.2	1032.84	1036.28	2	2
19811-003	3	29	5	2	2		28		1005.58	1031.35	1016.05	1029.29	2	2
19811-014	3	30	5	2	2		16		994.03	1006.05	1000.38	1003.76	2	2
19811-009	4	31	5	5	5		42.6		1014.71	1109.46	1010.03	1062.89	5	5
19811-000	4	32	5	4	4		60		1006.9	1101.7	1031.91	1063.27	4	4
19811-010	4	33	5	4	4		18		1010.81	1043.56	998.5	1010.37	4	4
19811-014	4	34	5	4	4		15.8		1013.4	1044.95	1003.54	1011.76	4	4
19811-005	4	35	5	5	5		17.4		1011.86	1047.09	1022.87	1049.55	5	5
19811-015	4	36	5	3	3		30.7		1023.3	1049.78	986.58	1019.31	3	3
19811-003	4	37	5	4	4		29		1004.18	1045.41	1006.17	1034.38	4	4
19811-004	4	38	5	3	3		19		1012.64	1035.58	1002.98	1017.57	3	3
19811-002	4	39	5	2	2		28		1007.17	1024.56	1010.5	1024.26	2	2
19811-013	4	40	5	3	3		22.7		1021.43	1046.96	1008.53	1014.45	3	3
19811-003	5	41	5	5	5		48.2		1019.15	1123.58	998.71	1039.44	5	5
19811-000	5	42	5	3	3		83.3		1000.5	1100.04	1002.48	1044.34	3	3
19811-015	5	43	5	4	4		27.8		986.6	1029.11	1007.23	1041.25	4	4
19811-010	5	44	5	2	2		18		1009.79	1020.08	1007.96	1012.27	2	2
19811-002	5	45	5	1	1		16		1009.67	1026.47	1027.79	1030.07	1	1
19811-009	5	46	5	2	2		24.5		1002.47	1016.6	1023.96	1039.27	2	2
19811-004	5	47	5	3	3		15.7		983.05	1008.5	1001.55	1015.85	3	3

Sample Code	Rep	Pos	xpo	Germinat	urviv	ys to Ge	Plant Height (mm	oot Length (mr	lant Tare (mg	Plant Final (mg	oot Tare (m	oot Final (mg		oot Pan Cou
19811-014	5	48	5	1	1		11	997.44	1004.54	1015.17	1016.46	1	1
19811-005	5	49	5	1	1		20	1024.64	1031.91	1029.11	1033.82	1	1
19811-013	5	50	5	3	3		12	1017.99	1042.75	1009.6	1014.17	3	3

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Sample Code	Sample ID	Sample Date	Receive Date	Sample Age	Client Name	Project
19811-000	16-3877-0522	16 Jun-10 12:00	16 Jun-10 12:00	25h	Tetra Tech NUS	Ecological Risk Assessme
19811-015	01-2243-1399	10 Jun-10 20:35	12 Jun-10 11:00	6d 16h		
19811-002	17-6880-6936	09 Jun-10 11:15	11 Jun-10 10:00	8d 2h		
19811-003	18-3180-8748	09 Jun-10 15:15	11 Jun-10 10:00	7d 22h		
19811-004	00-2207-8607	09 Jun-10 17:05	11 Jun-10 10:00	7d 20h		
19811-005	03-5602-2744	09 Jun-10 14:45	11 Jun-10 10:00	7d 22h		
19811-009	09-3929-1612	10 Jun-10 09:45	11 Jun-10 10:00	7d 3h		
19811-010	06-3043-2289	10 Jun-10 15:30	12 Jun-10 11:00	6d 21h		
19811-013	11-7434-4542	10 Jun-10 17:15	12 Jun-10 11:00	6d 20h		
19811-014	20-8714-0719	11 Jun-10 09:30	12 Jun-10 11:00	6d 3h		

Sample Code	Material Type	Sample Source	Station Location	Latitude	Longitude
19811-000	Soil	Crane Indiana	Laboratory Control Sample; 1981		
19811-015	Soil	Crane Indiana	16 SS1160002; 19811-015		
19811-002	Soil	Crane Indiana	16 SS1010001; 19811-002		
19811-003	Soil	Crane Indiana	16 SS1020001; 19811-003		
19811-004	Soil	Crane Indiana	16 SS1030001; 19811-004		
19811-005	Soil	Crane Indiana	16 SS1040001; 19811-005		
19811-009	Soil	Crane Indiana	16 SS1090002; 19811-009		
19811-010	Soil	Crane Indiana	16 SS1060002; 19811-010		
19811-013	Soil	Crane Indiana	16 SS1120001; 19811-013		
19811-014	Soil	Crane Indiana	16 SS1140001; 19811-014		

Biomass-Above Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	18	17.05	18.95	13.89	19.99	0.4648	2.546	14.14%	0.0%
19811-015	5	7.427	6.246	8.607	5.034	12.51	0.5773	3.162	42.57%	58.75%
19811-002	5	9.145	7.121	11.17	3.36	15.26	0.9899	5.422	59.29%	49.2%
19811-003	5	7.554	4.566	10.54	0.23	20.89	1.461	8.002	105.9%	58.04%
19811-004	5	5.17	4.552	5.788	3.576	7.962	0.3023	1.656	32.03%	71.28%
19811-005	5	4.442	3.129	5.756	-0.022	7.896	0.6424	3.518	79.2%	75.32%
19811-009	5	10.65	7.483	13.83	2.826	20.37	1.551	8.494	79.72%	40.82%
19811-010	5	3.788	2.903	4.672	1.052	6.55	0.4326	2.37	62.56%	78.96%
19811-013	5	4.529	4.057	5	2.712	5.994	0.2306	1.263	27.89%	74.84%
19811-014	5	3.21	2.506	3.913	1.42	6.31	0.3439	1.884	58.69%	82.17%

Biomass-Below Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	6.91	6.435	7.385	5.176	8.372	0.232	1.271	18.39%	0.0%
19811-015	5	5.834	5.328	6.339	3.988	7.024	0.2471	1.354	23.2%	15.58%
19811-002	5	5.26	3.972	6.547	0.456	8.194	0.6295	3.448	65.56%	23.88%
19811-003	5	3.727	2.544	4.909	0.112	8.146	0.5782	3.167	84.98%	46.07%
19811-004	5	5.506	3.587	7.426	2.462	14.57	0.9383	5.139	93.34%	20.31%
19811-005	5	2.95	2.01	3.891	0.002002	5.586	0.4598	2.518	85.36%	57.3%
19811-009	5	8.696	5.481	11.91	2.06	22.92	1.572	8.608	98.99%	-25.84%
19811-010	5	1.695	1.311	2.08	0.43	2.894	0.188	1.03	60.75%	75.47%
19811-013	5	1.038	0.8012	1.276	0.366	2.04	0.116	0.6354	61.19%	84.97%
19811-014	5	0.8752	0.686	1.064	0.258	1.644	0.09252	0.5068	57.9%	87.33%

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Percent Survival Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	0.76	0.6975	0.8225	0.6	1	0.03055	0.1673	22.02%	0.0%
19811-015	5	0.72	0.6791	0.7609	0.6	0.8	0.02	0.1095	15.21%	5.26%
19811-002	5	0.64	0.5173	0.7627	0.2	1	0.06	0.3286	51.35%	15.79%
19811-003	5	0.6	0.4819	0.7181	0.2	1	0.05774	0.3162	52.7%	21.05%
19811-004	5	0.6	0.5472	0.6528	0.4	0.8	0.02582	0.1414	23.57%	21.05%
19811-005	5	0.56	0.3981	0.7219	0	1	0.07916	0.4336	77.43%	26.32%
19811-009	5	0.68	0.5667	0.7933	0.4	1	0.05538	0.3033	44.61%	10.53%
19811-010	5	0.56	0.4626	0.6574	0.2	0.8	0.04761	0.2608	46.57%	26.32%
19811-013	5	0.56	0.4975	0.6225	0.4	0.8	0.03055	0.1673	29.88%	26.32%
19811-014	5	0.48	0.3949	0.5651	0.2	0.8	0.04163	0.228	47.51%	36.84%

Plant Height Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	61.76	56.71	66.81	45.8	83.3	2.469	13.53	21.9%	0.0%
19811-015	5	28.78	25.39	32.17	15.8	41.3	1.659	9.084	31.57%	53.4%
19811-002	5	25.74	23.13	28.35	16	33	1.278	6.999	27.19%	58.32%
19811-003	5	25.98	20.27	31.69	7	48.2	2.792	15.29	58.87%	57.93%
19811-004	5	21.38	19.89	22.87	15.7	25.5	0.7275	3.985	18.64%	65.38%
19811-005	4	22.25	19.95	24.55	17.4	31.3	1.127	6.172	27.74%	63.97%
19811-009	5	30.76	26.55	34.97	14.5	42.6	2.058	11.27	36.64%	50.19%
19811-010	5	18	17.3	18.7	15	20	0.3416	1.871	10.39%	70.85%
19811-013	5	17.3	15.77	18.83	12	22.7	0.7493	4.104	23.72%	71.99%
19811-014	5	13.82	13.04	14.6	11	16	0.3826	2.096	15.16%	77.62%

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Biomass-Above Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	17.26	13.89	19.99	18.96	19.91
19811-015	5.788	5.034	12.51	5.296	8.502
19811-002	12.25	11.38	15.26	3.478	3.36
19811-003	0.23	3.254	5.154	8.246	20.89
19811-004	4.634	3.576	7.962	4.588	5.09
19811-005	-0.022	7.896	5.838	7.046	1.454
19811-009	3.078	20.37	8.052	18.95	2.826
19811-010	3.434	5.844	1.052	6.55	2.058
19811-013	2.712	5.994	3.88	5.106	4.952
19811-014	3.506	2.408	2.404	6.31	1.42

Biomass-Below Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	6.868	5.176	7.862	6.272	8.372
19811-015	4.806	3.988	7.024	6.546	6.804
19811-002	8.194	7.496	7.4	2.752	0.456
19811-003	0.112	2.086	2.648	5.642	8.146
19811-004	14.57	2.462	4.726	2.918	2.86
19811-005	0.002002	5.586	2.886	5.336	0.942
19811-009	2.06	22.92	4.862	10.57	3.062
19811-010	1.916	2.894	0.43	2.374	0.862
19811-013	0.366	2.04	0.688	1.184	0.914
19811-014	0.814	0.984	0.676	1.644	0.258

Percent Survival Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	1	0.6	0.8	0.8	0.6
19811-015	0.6	0.8	0.8	0.6	0.8
19811-002	0.8	0.8	1	0.4	0.2
19811-003	0.2	0.6	0.4	0.8	1
19811-004	0.6	0.4	0.8	0.6	0.6
19811-005	0	0.8	0.8	1	0.2
19811-009	0.4	1	0.6	1	0.4
19811-010	0.6	0.8	0.2	0.8	0.4
19811-013	0.4	0.8	0.4	0.6	0.6
19811-014	0.6	0.4	0.4	0.8	0.2

Plant Height Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	45.8	58.7	61	60	83.3
19811-015	28.3	15.8	41.3	30.7	27.8
19811-002	30.5	33	21.2	28	16
19811-003	7	17.7	28	29	48.2
19811-004	22.7	25.5	24	19	15.7
19811-005		31.3	20.3	17.4	20
19811-009	14.5	34.2	38	42.6	24.5
19811-010	15	20	19	18	18
19811-013	19.5	17.3	15	22.7	12
19811-014	13.3	13	16	15.8	11

CETIS Summary Report

Report Date: 26 Jul-10 12:12 (p 1 of 1)
Test Code: 09-7862-7274/19811Tp

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Sample Code	Sample ID	Sample Date	Receive Date	Sample Age	Client Name	Project
19811-000	16-3877-0522	16 Jun-10 12:00	16 Jun-10 12:00	25h	Tetra Tech NUS	Ecological Risk Assessme
19811-015	01-2243-1399	10 Jun-10 20:35	12 Jun-10 11:00	6d 16h		
19811-002	17-6880-6936	09 Jun-10 11:15	11 Jun-10 10:00	8d 2h		
19811-003	18-3180-8748	09 Jun-10 15:15	11 Jun-10 10:00	7d 22h		
19811-004	00-2207-8607	09 Jun-10 17:05	11 Jun-10 10:00	7d 20h		
19811-005	03-5602-2744	09 Jun-10 14:45	11 Jun-10 10:00	7d 22h		
19811-009	09-3929-1612	10 Jun-10 09:45	11 Jun-10 10:00	7d 3h		
19811-010	06-3043-2289	10 Jun-10 15:30	12 Jun-10 11:00	6d 21h		
19811-013	11-7434-4542	10 Jun-10 17:15	12 Jun-10 11:00	6d 20h		
19811-014	20-8714-0719	11 Jun-10 09:30	12 Jun-10 11:00	6d 3h		

Sample Code	Material Type	Sample Source	Station Location	Latitude	Longitude
19811-000	Soil	Crane Indiana	Laboratory Control Sample; 1981		
19811-015	Soil	Crane Indiana	16 SS1160002; 19811-015		
19811-002	Soil	Crane Indiana	16 SS1010001; 19811-002		
19811-003	Soil	Crane Indiana	16 SS1020001; 19811-003		
19811-004	Soil	Crane Indiana	16 SS1030001; 19811-004		
19811-005	Soil	Crane Indiana	16 SS1040001; 19811-005		
19811-009	Soil	Crane Indiana	16 SS1090002; 19811-009		
19811-010	Soil	Crane Indiana	16 SS1060002; 19811-010		
19811-013	Soil	Crane Indiana	16 SS1120001; 19811-013		
19811-014	Soil	Crane Indiana	16 SS1140001; 19811-014		

Days to Germination Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	2.692	2.53	2.854	2.25	3.33	0.07898	0.4326	16.07%	0.0%
19811-015	5	3.1	2.895	3.305	2.5	4	0.1	0.5477	17.67%	-15.16%
19811-002	5	4.26	3.221	5.299	2.25	9	0.5081	2.783	65.33%	-58.25%
19811-003	5	7.03	4.109	9.951	3	21	1.428	7.823	111.3%	-161.1%
19811-004	5	4.984	4.585	5.383	4	6.67	0.1951	1.069	21.44%	-85.14%
19811-005	5	5.11	3.407	6.813	0	12	0.8329	4.562	89.27%	-89.82%
19811-009	5	5.28	4.303	6.257	2.8	9	0.4779	2.618	49.58%	-96.14%
19811-010	5	4.95	3.666	6.234	2.5	11	0.6278	3.439	69.47%	-83.88%
19811-013	5	3.15	2.907	3.393	2.5	4.25	0.119	0.6519	20.7%	-17.01%
19811-014	5	5.282	4.246	6.318	2.33	9.33	0.5066	2.775	52.53%	-96.21%

Days to Germination Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	2.8	3.33	2.25	2.75	2.33
19811-015	3	4	2.5	3	3
19811-002	2.75	2.25	2.8	4.5	9
19811-003	21	3.4	3.5	4.25	3
19811-004	4	4.67	4.25	6.67	5.33
19811-005	0	2.75	6.8	4	12
19811-009	9	2.8	4	3.6	7
19811-010	4	3.25	4	2.5	11
19811-013	2.5	4.25	3	3	3
19811-014	9.33	2.33	5	3.25	6.5

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	18-2953-5411	**Endpoint:**	Percent Survival	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:10	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					29.22%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-014	2.121	1.86	0.2104	0.0333	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.144	0.144	1	4.5	0.0667	Non-Significant Effect
Error	0.256	0.032	8			
Total	0.4	0.176	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	4.333	23.15	0.1846	Equal Variances
Distribution	Shapiro-Wilk Normality	0.946		0.6214	Normal Distribution

Percent Survival Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	0.72	0.6783	0.7617	0.6	0.8	0.02034	0.1095	15.21%	0.0%
19811-014	5	0.48	0.3933	0.5667	0.2	0.8	0.04235	0.228	47.51%	33.33%

Percent Survival Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	0.6	0.8	0.8	0.6	0.8
19811-014	0.6	0.4	0.4	0.8	0.2

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	20-4295-1318	**Endpoint:**	Percent Survival	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:10	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					23.1%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-013	1.789	1.86	0.1663	0.0557	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.064	0.064	1	3.2	0.1114	Non-Significant Effect
Error	0.16	0.02	8			
Total	0.224	0.08400001	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.333	23.15	0.4320	Equal Variances
Distribution	Shapiro-Wilk Normality	0.883		0.1411	Normal Distribution

Percent Survival Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	0.72	0.6783	0.7617	0.6	0.8	0.02034	0.1095	15.21%	0.0%
19811-013	5	0.56	0.4964	0.6236	0.4	0.8	0.03107	0.1673	29.88%	22.22%

Percent Survival Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	0.6	0.8	0.8	0.6	0.8
19811-013	0.4	0.8	0.4	0.6	0.6

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	05-3541-0816	**Endpoint:**	Percent Survival	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:10	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					32.67%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-010	1.265	1.86	0.2352	0.1208	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.064	0.064	1	1.6	0.2415	Non-Significant Effect
Error	0.32	0.04	8			
Total	0.384	0.104	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	5.667	23.15	0.1215	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9277		0.4255	Normal Distribution

Percent Survival Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	0.72	0.6783	0.7617	0.6	0.8	0.02034	0.1095	15.21%	0.0%
19811-010	5	0.56	0.4608	0.6592	0.2	0.8	0.04842	0.2608	46.57%	22.22%

Percent Survival Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	0.6	0.8	0.8	0.6	0.8
19811-010	0.6	0.8	0.2	0.8	0.4

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	11-8065-7710	**Endpoint:**	Percent Survival	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:10	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					37.25%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-009	0.2774	1.86	0.2682	0.3943	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.004	0.004	1	0.07692	0.7885	Non-Significant Effect
Error	0.416	0.052	8			
Total	0.42	0.056	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	7.667	23.15	0.0737	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9105		0.2847	Normal Distribution

Percent Survival Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	0.72	0.6783	0.7617	0.6	0.8	0.02034	0.1095	15.21%	0.0%
19811-009	5	0.68	0.5646	0.7954	0.4	1	0.05632	0.3033	44.61%	5.56%

Percent Survival Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	0.6	0.8	0.8	0.6	0.8
19811-009	0.4	1	0.6	1	0.4

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	10-0815-6600	**Endpoint:**	Percent Survival	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:10	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					51.65%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-005	0.8	1.86	0.3719	0.2234	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.064	0.064	1	0.64	0.4468	Non-Significant Effect
Error	0.8	0.1	8			
Total	0.864	0.164	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	15.67	23.15	0.0207	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9523		0.6954	Normal Distribution

Percent Survival Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	0.72	0.6783	0.7617	0.6	0.8	0.02034	0.1095	15.21%	0.0%
19811-005	5	0.56	0.3951	0.7249	0	1	0.08052	0.4336	77.43%	22.22%

Percent Survival Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	0.6	0.8	0.8	0.6	0.8
19811-005	0	0.8	0.8	1	0.2

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	18-7321-5017	**Endpoint:**	Percent Survival	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:10	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					20.66%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-004	1.5	1.86	0.1488	0.0860	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.036	0.036	1	2.25	0.1720	Non-Significant Effect
Error	0.128	0.016	8			
Total	0.164	0.052	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.667	23.15	0.6328	Equal Variances
Distribution	Shapiro-Wilk Normality	0.946		0.6212	Normal Distribution

Percent Survival Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	0.72	0.6783	0.7617	0.6	0.8	0.02034	0.1095	15.21%	0.0%
19811-004	5	0.6	0.5462	0.6538	0.4	0.8	0.02626	0.1414	23.57%	16.67%

Percent Survival Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	0.6	0.8	0.8	0.6	0.8
19811-004	0.6	0.4	0.8	0.6	0.6

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	16-7126-0905	**Endpoint:**	Percent Survival	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:09	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					38.65%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-003	0.8018	1.86	0.2783	0.2229	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.036	0.036	1	0.6429	0.4458	Non-Significant Effect
Error	0.448	0.056	8			
Total	0.484	0.092	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	8.333	23.15	0.0640	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9758		0.9391	Normal Distribution

Percent Survival Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	0.72	0.6783	0.7617	0.6	0.8	0.02034	0.1095	15.21%	0.0%
19811-003	5	0.6	0.4797	0.7203	0.2	1	0.05872	0.3162	52.7%	16.67%

Percent Survival Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	0.6	0.8	0.8	0.6	0.8
19811-003	0.2	0.6	0.4	0.8	1

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	07-5666-2730	**Endpoint:**	Percent Survival	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:09	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					40.01%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-002	0.5164	1.86	0.2881	0.3098	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.016	0.016	1	0.2667	0.6195	Non-Significant Effect
Error	0.48	0.06	8			
Total	0.496	0.076	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	9	23.15	0.0560	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9496		0.6638	Normal Distribution

Percent Survival Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	0.72	0.6783	0.7617	0.6	0.8	0.02034	0.1095	15.21%	0.0%
19811-002	5	0.64	0.515	0.765	0.2	1	0.06103	0.3286	51.35%	11.11%

Percent Survival Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	0.6	0.8	0.8	0.6	0.8
19811-002	0.8	0.8	1	0.4	0.2

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	16-6394-9090	**Endpoint:**	Percent Survival	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:09	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					30.95%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-014	2.214	1.86	0.2352	0.0289	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.196	0.196	1	4.9	0.0578	Non-Significant Effect
Error	0.32	0.04	8			
Total	0.516	0.236	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.857	23.15	0.5635	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9639		0.8292	Normal Distribution

Percent Survival Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	0.76	0.6964	0.8236	0.6	1	0.03107	0.1673	22.02%	0.0%
19811-014	5	0.48	0.3933	0.5667	0.2	0.8	0.04235	0.228	47.51%	36.84%

Percent Survival Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	1	0.6	0.8	0.8	0.6
19811-014	0.6	0.4	0.4	0.8	0.2

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	09-5604-3569	**Endpoint:**	Percent Survival	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:09	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					25.89%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-013	1.89	1.86	0.1968	0.0477	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.1	0.1	1	3.571	0.0955	Non-Significant Effect
Error	0.224	0.028	8			
Total	0.324	0.128	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1	23.15	1.0000	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8197		0.0251	Normal Distribution

Percent Survival Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	0.76	0.6964	0.8236	0.6	1	0.03107	0.1673	22.02%	0.0%
19811-013	5	0.56	0.4964	0.6236	0.4	0.8	0.03107	0.1673	29.88%	26.32%

Percent Survival Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	1	0.6	0.8	0.8	0.6
19811-013	0.4	0.8	0.4	0.6	0.6

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	17-7814-6501	**Endpoint:**	Percent Survival	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:09	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					33.9%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-010	1.443	1.86	0.2577	0.0935	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.1	0.1	1	2.083	0.1869	Non-Significant Effect
Error	0.384	0.048	8			
Total	0.484	0.148	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.429	23.15	0.4112	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8946		0.1910	Normal Distribution

Percent Survival Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	0.76	0.6964	0.8236	0.6	1	0.03107	0.1673	22.02%	0.0%
19811-010	5	0.56	0.4608	0.6592	0.2	0.8	0.04842	0.2608	46.57%	26.32%

Percent Survival Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	1	0.6	0.8	0.8	0.6
19811-010	0.6	0.8	0.2	0.8	0.4

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	20-3678-9871	**Endpoint:**	Percent Survival	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:09	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					37.91%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-009	0.5164	1.86	0.2881	0.3098	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.016	0.016	1	0.2667	0.6195	Non-Significant Effect
Error	0.48	0.06	8			
Total	0.496	0.076	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	3.286	23.15	0.2759	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8985		0.2109	Normal Distribution

Percent Survival Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	0.76	0.6964	0.8236	0.6	1	0.03107	0.1673	22.02%	0.0%
19811-009	5	0.68	0.5646	0.7954	0.4	1	0.05632	0.3033	44.61%	10.53%

Percent Survival Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	1	0.6	0.8	0.8	0.6
19811-009	0.4	1	0.6	1	0.4

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	05-2374-8832	**Endpoint:**	Percent Survival	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:09	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					50.86%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-005	0.9623	1.86	0.3865	0.1821	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.1	0.1	1	0.9259	0.3641	Non-Significant Effect
Error	0.864	0.108	8			
Total	0.964	0.208	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	6.714	23.15	0.0921	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9499		0.6678	Normal Distribution

Percent Survival Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	0.76	0.6964	0.8236	0.6	1	0.03107	0.1673	22.02%	0.0%
19811-005	5	0.56	0.3951	0.7249	0	1	0.08052	0.4336	77.43%	26.32%

Percent Survival Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	1	0.6	0.8	0.8	0.6
19811-005	0	0.8	0.8	1	0.2

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	02-4151-0606	**Endpoint:**	Percent Survival	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:09	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					23.97%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-004	1.633	1.86	0.1822	0.0706	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.064	0.064	1	2.667	0.1411	Non-Significant Effect
Error	0.192	0.024	8			
Total	0.256	0.088	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.4	23.15	0.7523	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9128		0.3010	Normal Distribution

Percent Survival Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	0.76	0.6964	0.8236	0.6	1	0.03107	0.1673	22.02%	0.0%
19811-004	5	0.6	0.5462	0.6538	0.4	0.8	0.02626	0.1414	23.57%	21.05%

Percent Survival Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	1	0.6	0.8	0.8	0.6
19811-004	0.6	0.4	0.8	0.6	0.6

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	04-2760-8306	**Endpoint:**	Percent Survival	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:08	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					39.15%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-003	1	1.86	0.2975	0.1733	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.064	0.064	1	1	0.3466	Non-Significant Effect
Error	0.512	0.064	8			
Total	0.576	0.128	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	3.571	23.15	0.2452	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9764		0.9430	Normal Distribution

Percent Survival Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	0.76	0.6964	0.8236	0.6	1	0.03107	0.1673	22.02%	0.0%
19811-003	5	0.6	0.4797	0.7203	0.2	1	0.05872	0.3162	52.7%	21.05%

Percent Survival Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	1	0.6	0.8	0.8	0.6
19811-003	0.2	0.6	0.4	0.8	1

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	01-5991-0798	**Endpoint:**	Percent Survival	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:08	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					40.35%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-002	0.7276	1.86	0.3067	0.2438	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.036	0.036	1	0.5294	0.4876	Non-Significant Effect
Error	0.544	0.068	8			
Total	0.58	0.104	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	3.857	23.15	0.2194	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9656		0.8472	Normal Distribution

Percent Survival Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	0.76	0.6964	0.8236	0.6	1	0.03107	0.1673	22.02%	0.0%
19811-002	5	0.64	0.515	0.765	0.2	1	0.06103	0.3286	51.35%	15.79%

Percent Survival Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	1	0.6	0.8	0.8	0.6
19811-002	0.8	0.8	1	0.4	0.2

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	12-2417-9675	**Endpoint:**	Percent Survival	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:08	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					21.88%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-015	0.4472	1.86	0.1663	0.3333	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.004	0.004	1	0.2	0.6666	Non-Significant Effect
Error	0.16	0.02	8			
Total	0.164	0.024	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.333	23.15	0.4320	Equal Variances
Distribution	Shapiro-Wilk Normality	0.883		0.1411	Normal Distribution

Percent Survival Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	0.76	0.6964	0.8236	0.6	1	0.03107	0.1673	22.02%	0.0%
19811-015	5	0.72	0.6783	0.7617	0.6	0.8	0.02034	0.1095	15.21%	5.26%

Percent Survival Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	1	0.6	0.8	0.8	0.6
19811-015	0.6	0.8	0.8	0.6	0.8

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	10-9398-9827	**Endpoint:**	Days to Germination	**CETIS Version:**	CETISv1.7.0
Analyzed:	26 Jul-10 12:11	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C < T	Not Run					86.98%

Unequal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-014	1.725	2.132	2.696	0.0798	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	2.147	2.29	0.1169	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	11.90281	11.90281	1	2.976	0.1228	Non-Significant Effect
Error	31.99268	3.999085	8			
Total	43.89549	15.9019	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	25.66	23.15	0.0082	Unequal Variances
Distribution	Shapiro-Wilk Normality	0.9213		0.3678	Normal Distribution

Days to Germination Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	3.1	2.892	3.308	2.5	4	0.1017	0.5477	17.67%	0.0%
19811-014	5	5.282	4.227	6.337	2.33	9.33	0.5152	2.775	52.53%	-70.39%

Days to Germination Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	3	4	2.5	3	3
19811-014	9.33	2.33	5	3.25	6.5

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	20-0896-4668	**Endpoint:**	Days to Germination	**CETIS Version:**	CETISv1.7.0
Analyzed:	26 Jul-10 12:11	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C < T	Not Run					22.84%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-013	0.1313	1.86	0.7081	0.4494	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.938	2.29	0.3020	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.00625	0.00625	1	0.01724	0.8988	Non-Significant Effect
Error	2.9	0.3625	8			
Total	2.90625	0.36875	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.417	23.15	0.7439	Equal Variances
Distribution	Shapiro-Wilk Normality	0.7928		0.0119	Normal Distribution

Days to Germination Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	3.1	2.892	3.308	2.5	4	0.1017	0.5477	17.67%	0.0%
19811-013	5	3.15	2.902	3.398	2.5	4.25	0.1211	0.6519	20.7%	-1.61%

Days to Germination Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	3	4	2.5	3	3
19811-013	2.5	4.25	3	3	3

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	14-9852-9426	**Endpoint:**	Days to Germination	**CETIS Version:**	CETISv1.7.0
Analyzed:	26 Jul-10 12:11	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C < T	Not Run					93.41%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
19811-015		19811-010	21.5		2	0.1111	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	2.606	2.29	0.0020	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	8.55625	8.55625	1	1.411	0.2689	Non-Significant Effect
Error	48.5	6.0625	8			
Total	57.05625	14.61875	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	39.42	23.15	0.0036	Unequal Variances
Distribution	Shapiro-Wilk Normality	0.7518		0.0038	Non-normal Distribution

Days to Germination Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	3.1	2.892	3.308	2.5	4	0.1017	0.5477	17.67%	0.0%
19811-010	5	4.95	3.642	6.258	2.5	11	0.6386	3.439	69.47%	-59.68%

Days to Germination Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	3	4	2.5	3	3
19811-010	4	3.25	4	2.5	11

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	15-2337-4761	**Endpoint:**	Days to Germination	**CETIS Version:**	CETISv1.7.0
Analyzed:	26 Jul-10 12:11	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C < T	Not Run					71.74%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-009	1.823	1.86	2.224	0.0529	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	2.087	2.29	0.1585	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	11.881	11.881	1	3.322	0.1058	Non-Significant Effect
Error	28.608	3.576	8			
Total	40.489	15.457	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	22.84	23.15	0.0103	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9467		0.6299	Normal Distribution

Days to Germination Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	3.1	2.892	3.308	2.5	4	0.1017	0.5477	17.67%	0.0%
19811-009	5	5.28	4.284	6.276	2.8	9	0.4861	2.618	49.58%	-70.32%

Days to Germination Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	3	4	2.5	3	3
19811-009	9	2.8	4	3.6	7

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	03-8708-5383	**Endpoint:**	Days to Germination	**CETIS Version:**	CETISv1.7.0
Analyzed:	26 Jul-10 12:11	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C < T	Not Run					141.3%

Unequal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-005	0.9782	2.132	4.38	0.1917	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	2.249	2.29	0.0651	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	10.10025	10.10025	1	0.9569	0.3566	Non-Significant Effect
Error	84.442	10.55525	8			
Total	94.54225	20.6555	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	69.37	23.15	0.0012	Unequal Variances
Distribution	Shapiro-Wilk Normality	0.8982		0.2095	Normal Distribution

Days to Germination Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	3.1	2.892	3.308	2.5	4	0.1017	0.5477	17.67%	0.0%
19811-005	5	5.11	3.375	6.845	0	12	0.8471	4.562	89.27%	-64.84%

Days to Germination Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	3	4	2.5	3	3
19811-005	0	2.75	6.8	4	12

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	16-2892-4422	**Endpoint:**	Days to Germination	**CETIS Version:**	CETISv1.7.0
Analyzed:	26 Jul-10 12:11	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C < T	Not Run					32.21%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-004	3.508	1.86	0.9986	0.0040	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	2.106	2.29	0.1441	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	8.87364	8.87364	1	12.31	0.0080	Significant Effect
Error	5.76792	0.72099	8			
Total	14.64156	9.59463	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	3.807	23.15	0.2237	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9159		0.3238	Normal Distribution

Days to Germination Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	3.1	2.892	3.308	2.5	4	0.1017	0.5477	17.67%	0.0%
19811-004	5	4.984	4.578	5.39	4	6.67	0.1984	1.069	21.44%	-60.77%

Days to Germination Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	3	4	2.5	3	3
19811-004	4	4.67	4.25	6.67	5.33

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	03-7384-2473	**Endpoint:**	Days to Germination	**CETIS Version:**	CETISv1.7.0
Analyzed:	26 Jul-10 12:10	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C < T	Not Run					210.4%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
19811-015		19811-003	19.5		1	0.0476	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	2.672	2.29	0.0006	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	38.61225	38.61225	1	1.256	0.2949	Non-Significant Effect
Error	245.968	30.746	8			
Total	284.5803	69.35825	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	204	23.15	0.0001	Unequal Variances
Distribution	Shapiro-Wilk Normality	0.6767		0.0005	Non-normal Distribution

Days to Germination Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	3.1	2.892	3.308	2.5	4	0.1017	0.5477	17.67%	0.0%
19811-003	5	7.03	4.054	10.01	3	21	1.453	7.823	111.3%	-126.8%

Days to Germination Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	3	4	2.5	3	3
19811-003	21	3.4	3.5	4.25	3

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	18-4974-2892	**Endpoint:**	Days to Germination	**CETIS Version:**	CETISv1.7.0
Analyzed:	26 Jul-10 12:10	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C < T	Not Run					87.23%

Unequal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-002	0.9145	2.132	2.704	0.2061	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	2.507	2.29	0.0076	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	3.364	3.364	1	0.8364	0.3872	Non-Significant Effect
Error	32.177	4.022125	8			
Total	35.541	7.386125	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	25.81	23.15	0.0081	Unequal Variances
Distribution	Shapiro-Wilk Normality	0.8055		0.0169	Normal Distribution

Days to Germination Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	3.1	2.892	3.308	2.5	4	0.1017	0.5477	17.67%	0.0%
19811-002	5	4.26	3.201	5.319	2.25	9	0.5168	2.783	65.33%	-37.42%

Days to Germination Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	3	4	2.5	3	3
19811-002	2.75	2.25	2.8	4.5	9

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	01-3253-5616	**Endpoint:**	Days to Germination	**CETIS Version:**	CETISv1.7.0
Analyzed:	26 Jul-10 12:10	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C < T	Not Run					99.45%

Unequal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-014	2.062	2.132	2.677	0.0541	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	2.162	2.29	0.1078	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	16.77025	16.77025	1	4.254	0.0731	Non-Significant Effect
Error	31.54116	3.942645	8			
Total	48.31141	20.71289	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	41.14	23.15	0.0033	Unequal Variances
Distribution	Shapiro-Wilk Normality	0.9204		0.3603	Normal Distribution

Days to Germination Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	2.692	2.527	2.857	2.25	3.33	0.08033	0.4326	16.07%	0.0%
19811-014	5	5.282	4.227	6.337	2.33	9.33	0.5152	2.775	52.53%	-96.21%

Days to Germination Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	2.8	3.33	2.25	2.75	2.33
19811-014	9.33	2.33	5	3.25	6.5

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	17-0319-0222	**Endpoint:**	Days to Germination	**CETIS Version:**	CETISv1.7.0
Analyzed:	26 Jul-10 12:10	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C < T	Not Run					24.17%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-013	1.309	1.86	0.6506	0.1134	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	2.109	2.29	0.1420	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.5244101	0.5244101	1	1.713	0.2269	Non-Significant Effect
Error	2.44848	0.30606	8			
Total	2.97289	0.8304701	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.271	23.15	0.4464	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9013		0.2267	Normal Distribution

Days to Germination Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	2.692	2.527	2.857	2.25	3.33	0.08033	0.4326	16.07%	0.0%
19811-013	5	3.15	2.902	3.398	2.5	4.25	0.1211	0.6519	20.7%	-17.01%

Days to Germination Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	2.8	3.33	2.25	2.75	2.33
19811-013	2.5	4.25	3	3	3

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	06-3093-1181	**Endpoint:**	Days to Germination	**CETIS Version:**	CETISv1.7.0
Analyzed:	26 Jul-10 12:10	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C < T	Not Run					107.1%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
19811-000		19811-010	19		0	0.0476	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	2.618	2.29	0.0016	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	12.74641	12.74641	1	2.122	0.1833	Non-Significant Effect
Error	48.04848	6.00606	8			
Total	60.79489	18.75247	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	63.19	23.15	0.0014	Unequal Variances
Distribution	Shapiro-Wilk Normality	0.7491		0.0035	Non-normal Distribution

Days to Germination Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	2.692	2.527	2.857	2.25	3.33	0.08033	0.4326	16.07%	0.0%
19811-010	5	4.95	3.642	6.258	2.5	11	0.6386	3.439	69.47%	-83.88%

Days to Germination Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	2.8	3.33	2.25	2.75	2.33
19811-010	4	3.25	4	2.5	11

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	15-1647-3100	**Endpoint:**	Days to Germination	**CETIS Version:**	CETISv1.7.0
Analyzed:	26 Jul-10 12:10	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C < T	Not Run					93.96%

Unequal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-009	2.181	2.132	2.529	0.0473	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	2.103	2.29	0.1461	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	16.74436	16.74436	1	4.758	0.0608	Non-Significant Effect
Error	28.15648	3.51956	8			
Total	44.90084	20.26392	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	36.62	23.15	0.0042	Unequal Variances
Distribution	Shapiro-Wilk Normality	0.9497		0.6646	Normal Distribution

Days to Germination Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	2.692	2.527	2.857	2.25	3.33	0.08033	0.4326	16.07%	0.0%
19811-009	5	5.28	4.284	6.276	2.8	9	0.4861	2.618	49.58%	-96.14%

Days to Germination Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	2.8	3.33	2.25	2.75	2.33
19811-009	9	2.8	4	3.6	7

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	07-7274-6090	**Endpoint:**	Days to Germination	**CETIS Version:**	CETISv1.7.0
Analyzed:	26 Jul-10 12:10	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C < T	Not Run					162.3%

Unequal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-005	1.18	2.132	4.369	0.1517	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	2.255	2.29	0.0626	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	14.61681	14.61681	1	1.392	0.2719	Non-Significant Effect
Error	83.99048	10.49881	8			
Total	98.60729	25.11562	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	111.2	23.15	0.0005	Unequal Variances
Distribution	Shapiro-Wilk Normality	0.8962		0.1989	Normal Distribution

Days to Germination Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	2.692	2.527	2.857	2.25	3.33	0.08033	0.4326	16.07%	0.0%
19811-005	5	5.11	3.375	6.845	0	12	0.8471	4.562	89.27%	-89.82%

Days to Germination Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	2.8	3.33	2.25	2.75	2.33
19811-005	0	2.75	6.8	4	12

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	20-2912-3669	**Endpoint:**	Days to Germination	**CETIS Version:**	CETISv1.7.0
Analyzed:	26 Jul-10 12:10	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C < T	Not Run					35.61%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-004	4.446	1.86	0.9587	0.0011	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	2.194	2.29	0.0906	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	13.13316	13.13316	1	19.76	0.0022	Significant Effect
Error	5.3164	0.66455	8			
Total	18.44956	13.79771	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	6.103	23.15	0.1078	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9309		0.4573	Normal Distribution

Days to Germination Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	2.692	2.527	2.857	2.25	3.33	0.08033	0.4326	16.07%	0.0%
19811-004	5	4.984	4.578	5.39	4	6.67	0.1984	1.069	21.44%	-85.14%

Days to Germination Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	2.8	3.33	2.25	2.75	2.33
19811-004	4	4.67	4.25	6.67	5.33

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	12-8411-4279	**Endpoint:**	Days to Germination	**CETIS Version:**	CETISv1.7.0
Analyzed:	26 Jul-10 12:10	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C < T	Not Run					242.0%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
19811-000		19811-003	16		0	0.0079	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	2.675	2.29	0.0005	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	47.04561	47.04561	1	1.533	0.2508	Non-Significant Effect
Error	245.5165	30.68956	8			
Total	292.5621	77.73517	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	327	23.15	<0.0001	Unequal Variances
Distribution	Shapiro-Wilk Normality	0.6738		0.0004	Non-normal Distribution

Days to Germination Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	2.692	2.527	2.857	2.25	3.33	0.08033	0.4326	16.07%	0.0%
19811-003	5	7.03	4.054	10.01	3	21	1.453	7.823	111.3%	-161.1%

Days to Germination Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	2.8	3.33	2.25	2.75	2.33
19811-003	21	3.4	3.5	4.25	3

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	10-8058-6982	**Endpoint:**	Days to Germination	**CETIS Version:**	CETISv1.7.0
Analyzed:	26 Jul-10 12:10	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C < T	Not Run					99.74%

Unequal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-002	1.245	2.132	2.685	0.1406	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	2.525	2.29	0.0062	Outlier Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	6.14656	6.14656	1	1.55	0.2484	Non-Significant Effect
Error	31.72548	3.965685	8			
Total	37.87204	10.11225	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	41.39	23.15	0.0033	Unequal Variances
Distribution	Shapiro-Wilk Normality	0.7969		0.0133	Normal Distribution

Days to Germination Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	2.692	2.527	2.857	2.25	3.33	0.08033	0.4326	16.07%	0.0%
19811-002	5	4.26	3.201	5.319	2.25	9	0.5168	2.783	65.33%	-58.25%

Days to Germination Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	2.8	3.33	2.25	2.75	2.33
19811-002	2.75	2.25	2.8	4.5	9

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	16-0953-9490	**Endpoint:**	Days to Germination	**CETIS Version:**	CETISv1.7.0
Analyzed:	26 Jul-10 12:10	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C < T	Not Run					21.56%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-015	1.307	1.86	0.5804	0.1137	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.934	2.29	0.3063	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.4161601	0.4161601	1	1.709	0.2275	Non-Significant Effect
Error	1.94848	0.24356	8			
Total	2.36464	0.6597201	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.603	23.15	0.6586	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9161		0.3252	Normal Distribution

Days to Germination Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	2.692	2.527	2.857	2.25	3.33	0.08033	0.4326	16.07%	0.0%
19811-015	5	3.1	2.892	3.308	2.5	4	0.1017	0.5477	17.67%	-15.16%

Days to Germination Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	2.8	3.33	2.25	2.75	2.33
19811-015	3	4	2.5	3	3

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	02-2410-2353	**Endpoint:**	Plant Height	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:13	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					26.94%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-014	3.588	1.86	7.753	0.0036	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	559.504	559.504	1	12.87	0.0071	Significant Effect
Error	347.676	43.4595	8			
Total	907.1799	602.9634	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	18.79	23.15	0.0148	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8556		0.0676	Normal Distribution

Plant Height Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	28.78	25.32	32.24	15.8	41.3	1.687	9.084	31.57%	0.0%
19811-014	5	13.82	13.02	14.62	11	16	0.3892	2.096	15.16%	51.98%

Plant Height Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	28.3	15.8	41.3	30.7	27.8
19811-014	13.3	13	16	15.8	11

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	12-5694-6497	**Endpoint:**	Plant Height	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:13	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					28.8%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-013	2.575	1.86	8.29	0.0164	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	329.476	329.476	1	6.631	0.0329	Significant Effect
Error	397.488	49.686	8			
Total	726.964	379.162	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	4.899	23.15	0.1529	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9556		0.7349	Normal Distribution

Plant Height Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	28.78	25.32	32.24	15.8	41.3	1.687	9.084	31.57%	0.0%
19811-013	5	17.3	15.74	18.86	12	22.7	0.7621	4.104	23.72%	39.89%

Plant Height Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	28.3	15.8	41.3	30.7	27.8
19811-013	19.5	17.3	15	22.7	12

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	10-4709-0862	**Endpoint:**	Plant Height	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:12	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					30.73%

Unequal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-010	2.599	2.132	8.843	0.0301	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	290.521	290.521	1	6.754	0.0317	Significant Effect
Error	344.108	43.0135	8			
Total	634.629	333.5345	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	23.58	23.15	0.0097	Unequal Variances
Distribution	Shapiro-Wilk Normality	0.8476		0.0543	Normal Distribution

Plant Height Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	28.78	25.32	32.24	15.8	41.3	1.687	9.084	31.57%	0.0%
19811-010	5	18	17.29	18.71	15	20	0.3474	1.871	10.39%	37.46%

Plant Height Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	28.3	15.8	41.3	30.7	27.8
19811-010	15	20	19	18	18

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	20-5147-5255	**Endpoint:**	Plant Height	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:12	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					41.83%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-009	-0.3059	1.86	12.04	0.6162	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	9.801002	9.801002	1	0.09355	0.7675	Non-Significant Effect
Error	838.1199	104.765	8			
Total	847.921	114.566	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.539	23.15	0.6864	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9495		0.6621	Normal Distribution

Plant Height Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	28.78	25.32	32.24	15.8	41.3	1.687	9.084	31.57%	0.0%
19811-009	5	30.76	26.47	35.05	14.5	42.6	2.093	11.27	36.64%	-6.88%

Plant Height Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	28.3	15.8	41.3	30.7	27.8
19811-009	14.5	34.2	38	42.6	24.5

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	01-6591-2385	**Endpoint:**	Plant Height	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:12	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					35.19%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-005	1.222	1.895	10.13	0.1307	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	94.75756	94.75756	1	1.493	0.2614	Non-Significant Effect
Error	444.398	63.48542	7			
Total	539.1555	158.243	8			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.166	46.19	0.5515	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9442		0.6272	Normal Distribution

Plant Height Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	28.78	25.32	32.24	15.8	41.3	1.687	9.084	31.57%	0.0%
19811-005	4	22.25	19.9	24.6	17.4	31.3	1.146	6.172	27.74%	22.69%

Plant Height Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	28.3	15.8	41.3	30.7	27.8
19811-005	31.3	20.3	17.4	20	

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	00-1843-6474	**Endpoint:**	Plant Height	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:12	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					28.66%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-004	1.668	1.86	8.25	0.0669	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	136.9	136.9	1	2.782	0.1339	Non-Significant Effect
Error	393.616	49.202	8			
Total	530.516	186.102	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	5.198	23.15	0.1394	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9516		0.6874	Normal Distribution

Plant Height Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	28.78	25.32	32.24	15.8	41.3	1.687	9.084	31.57%	0.0%
19811-004	5	21.38	19.86	22.9	15.7	25.5	0.7399	3.985	18.64%	25.71%

Plant Height Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	28.3	15.8	41.3	30.7	27.8
19811-004	22.7	25.5	24	19	15.7

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	19-3027-3044	**Endpoint:**	Plant Height	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:12	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					51.4%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-003	0.352	1.86	14.79	0.3670	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	19.59999	19.59999	1	0.1239	0.7340	Non-Significant Effect
Error	1265.836	158.2295	8			
Total	1285.436	177.8295	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.835	23.15	0.3371	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9629		0.8185	Normal Distribution

Plant Height Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	28.78	25.32	32.24	15.8	41.3	1.687	9.084	31.57%	0.0%
19811-003	5	25.98	20.16	31.8	7	48.2	2.84	15.29	58.87%	9.73%

Plant Height Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	28.3	15.8	41.3	30.7	27.8
19811-003	7	17.7	28	29	48.2

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	02-8561-4360	**Endpoint:**	Plant Height	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:12	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					33.14%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-002	0.5927	1.86	9.537	0.2849	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	23.10399	23.10399	1	0.3514	0.5697	Non-Significant Effect
Error	526.06	65.7575	8			
Total	549.164	88.8615	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.685	23.15	0.6258	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9804		0.9671	Normal Distribution

Plant Height Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	28.78	25.32	32.24	15.8	41.3	1.687	9.084	31.57%	0.0%
19811-002	5	25.74	23.08	28.4	16	33	1.3	6.999	27.19%	10.56%

Plant Height Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	28.3	15.8	41.3	30.7	27.8
19811-002	30.5	33	21.2	28	16

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	16-9175-0697	**Endpoint:**	Plant Height	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:12	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					21.13%

Unequal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-014	7.832	2.132	13.05	0.0007	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	5745.609	5745.609	1	61.34	<0.0001	Significant Effect
Error	749.3002	93.66252	8			
Total	6494.909	5839.271	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	41.65	23.15	0.0032	Unequal Variances
Distribution	Shapiro-Wilk Normality	0.796		0.0130	Normal Distribution

Plant Height Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	61.76	56.62	66.9	45.8	83.3	2.512	13.53	21.9%	0.0%
19811-014	5	13.82	13.02	14.62	11	16	0.3892	2.096	15.16%	77.62%

Plant Height Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	45.8	58.7	61	60	83.3
19811-014	13.3	13	16	15.8	11

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	06-7144-6053	**Endpoint:**	Plant Height	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:12	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					19.03%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-013	7.034	1.86	11.75	<0.0001	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	4941.729	4941.729	1	49.47	0.0001	Significant Effect
Error	799.1122	99.88902	8			
Total	5740.841	5041.618	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	10.86	23.15	0.0403	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8777		0.1229	Normal Distribution

Plant Height Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	61.76	56.62	66.9	45.8	83.3	2.512	13.53	21.9%	0.0%
19811-013	5	17.3	15.74	18.86	12	22.7	0.7621	4.104	23.72%	71.99%

Plant Height Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	45.8	58.7	61	60	83.3
19811-013	19.5	17.3	15	22.7	12

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	11-6118-3683	**Endpoint:**	Plant Height	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:11	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					21.08%

Unequal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-010	7.166	2.132	13.02	0.0010	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	4787.344	4787.344	1	51.36	<0.0001	Significant Effect
Error	745.7322	93.21652	8			
Total	5533.076	4880.561	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	52.27	23.15	0.0021	Unequal Variances
Distribution	Shapiro-Wilk Normality	0.7907		0.0112	Normal Distribution

Plant Height Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	61.76	56.62	66.9	45.8	83.3	2.512	13.53	21.9%	0.0%
19811-010	5	18	17.29	18.71	15	20	0.3474	1.871	10.39%	70.85%

Plant Height Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	45.8	58.7	61	60	83.3
19811-010	15	20	19	18	18

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	14-5706-8383	**Endpoint:**	Plant Height	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:11	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					23.71%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-009	3.937	1.86	14.64	0.0022	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	2402.5	2402.5	1	15.5	0.0043	Significant Effect
Error	1239.744	154.968	8			
Total	3642.244	2557.468	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.44	23.15	0.7323	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9636		0.8263	Normal Distribution

Plant Height Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	61.76	56.62	66.9	45.8	83.3	2.512	13.53	21.9%	0.0%
19811-009	5	30.76	26.47	35.05	14.5	42.6	2.093	11.27	36.64%	50.19%

Plant Height Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	45.8	58.7	61	60	83.3
19811-009	14.5	34.2	38	42.6	24.5

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	16-7271-9170	**Endpoint:**	Plant Height	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:11	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					22.62%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-005	5.357	1.895	13.97	0.0005	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	3468.978	3468.978	1	28.7	0.0011	Significant Effect
Error	846.0222	120.8603	7			
Total	4315	3589.839	8			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	4.802	46.19	0.2281	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8671		0.1145	Normal Distribution

Plant Height Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	61.76	56.62	66.9	45.8	83.3	2.512	13.53	21.9%	0.0%
19811-005	4	22.25	19.9	24.6	17.4	31.3	1.146	6.172	27.74%	63.97%

Plant Height Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	45.8	58.7	61	60	83.3
19811-005	31.3	20.3	17.4	20	

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	03-8810-2677	**Endpoint:**	Plant Height	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:11	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					18.99%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-004	6.404	1.86	11.73	0.0001	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	4076.361	4076.361	1	41.01	0.0002	Significant Effect
Error	795.2402	99.40502	8			
Total	4871.601	4175.766	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	11.52	23.15	0.0362	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8797		0.1296	Normal Distribution

Plant Height Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	61.76	56.62	66.9	45.8	83.3	2.512	13.53	21.9%	0.0%
19811-004	5	21.38	19.86	22.9	15.7	25.5	0.7399	3.985	18.64%	65.38%

Plant Height Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	45.8	58.7	61	60	83.3
19811-004	22.7	25.5	24	19	15.7

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	04-2972-4419	**Endpoint:**	Plant Height	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:11	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					27.49%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-003	3.919	1.86	16.98	0.0022	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	3200.521	3200.521	1	15.36	0.0044	Significant Effect
Error	1667.46	208.4325	8			
Total	4867.981	3408.954	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.279	23.15	0.8174	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9149		0.3167	Normal Distribution

Plant Height Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	61.76	56.62	66.9	45.8	83.3	2.512	13.53	21.9%	0.0%
19811-003	5	25.98	20.16	31.8	7	48.2	2.84	15.29	58.87%	57.93%

Plant Height Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	45.8	58.7	61	60	83.3
19811-003	7	17.7	28	29	48.2

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	17-8472-3394	**Endpoint:**	Plant Height	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:11	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					20.51%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-002	5.289	1.86	12.66	0.0004	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	3243.601	3243.601	1	27.97	0.0007	Significant Effect
Error	927.6841	115.9605	8			
Total	4171.285	3359.562	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	3.734	23.15	0.2300	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9569		0.7495	Normal Distribution

Plant Height Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	61.76	56.62	66.9	45.8	83.3	2.512	13.53	21.9%	0.0%
19811-002	5	25.74	23.08	28.4	16	33	1.3	6.999	27.19%	58.32%

Plant Height Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	45.8	58.7	61	60	83.3
19811-002	30.5	33	21.2	28	16

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	19-5300-3918	**Endpoint:**	Plant Height	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:11	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					21.94%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-015	4.526	1.86	13.55	0.0010	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	2719.201	2719.201	1	20.49	0.0019	Significant Effect
Error	1061.84	132.73	8			
Total	3781.041	2851.931	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.217	23.15	0.4597	Equal Variances
Distribution	Shapiro-Wilk Normality	0.913		0.3024	Normal Distribution

Plant Height Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	61.76	56.62	66.9	45.8	83.3	2.512	13.53	21.9%	0.0%
19811-015	5	28.78	25.32	32.24	15.8	41.3	1.687	9.084	31.57%	53.4%

Plant Height Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	45.8	58.7	61	60	83.3
19811-015	28.3	15.8	41.3	30.7	27.8

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	10-1238-6709	**Endpoint:**	Biomass-Above Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:15	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					41.21%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-014	2.562	1.86	3.061	0.0168	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	44.46209	44.46209	1	6.565	0.0335	Significant Effect
Error	54.18163	6.772704	8			
Total	98.64372	51.23479	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.817	23.15	0.3399	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8696		0.0989	Normal Distribution

Biomass-Above Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	7.427	6.224	8.629	5.034	12.51	0.5871	3.162	42.57%	0.0%
19811-014	5	3.21	2.493	3.926	1.42	6.31	0.3498	1.884	58.69%	56.78%

Biomass-Above Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	5.788	5.034	12.51	5.296	8.502
19811-014	3.506	2.408	2.404	6.31	1.42

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	04-8296-5813	**Endpoint:**	Biomass-Above Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:15	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					38.12%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-013	1.903	1.86	2.831	0.0467	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	20.99602	20.99602	1	3.623	0.0935	Non-Significant Effect
Error	46.36788	5.795985	8			
Total	67.36389	26.792	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	6.267	23.15	0.1032	Equal Variances
Distribution	Shapiro-Wilk Normality	0.886		0.1526	Normal Distribution

Biomass-Above Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	7.427	6.224	8.629	5.034	12.51	0.5871	3.162	42.57%	0.0%
19811-013	5	4.529	4.048	5.009	2.712	5.994	0.2345	1.263	27.89%	39.02%

Biomass-Above Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	5.788	5.034	12.51	5.296	8.502
19811-013	2.712	5.994	3.88	5.106	4.952

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	03-4805-4057	**Endpoint:**	Biomass-Above Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:15	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					44.24%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-010	2.06	1.86	3.286	0.0367	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	33.10934	33.10934	1	4.242	0.0734	Non-Significant Effect
Error	62.44687	7.805859	8			
Total	95.55621	40.9152	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.78	23.15	0.5900	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8953		0.1946	Normal Distribution

Biomass-Above Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	7.427	6.224	8.629	5.034	12.51	0.5871	3.162	42.57%	0.0%
19811-010	5	3.788	2.886	4.689	1.052	6.55	0.44	2.37	62.56%	49.0%

Biomass-Above Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	5.788	5.034	12.51	5.296	8.502
19811-010	3.434	5.844	1.052	6.55	2.058

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	21-0406-7450	**Endpoint:**	Biomass-Above Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:15	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					101.5%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-009	-0.7963	1.86	7.537	0.7756	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	26.04343	26.04343	1	0.6341	0.4488	Non-Significant Effect
Error	328.577	41.07212	8			
Total	354.6204	67.11555	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	7.217	23.15	0.0817	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9191		0.3497	Normal Distribution

Biomass-Above Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	7.427	6.224	8.629	5.034	12.51	0.5871	3.162	42.57%	0.0%
19811-009	5	10.65	7.423	13.89	2.826	20.37	1.577	8.494	79.72%	-43.46%

Biomass-Above Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	5.788	5.034	12.51	5.296	8.502
19811-009	3.078	20.37	8.052	18.95	2.826

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	05-0801-1364	**Endpoint:**	Biomass-Above Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:15	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					52.97%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-005	1.411	1.86	3.934	0.0980	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	22.2666	22.2666	1	1.99	0.1960	Non-Significant Effect
Error	89.50225	11.18778	8			
Total	111.7689	33.45438	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.238	23.15	0.8409	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9481		0.6463	Normal Distribution

Biomass-Above Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	7.427	6.224	8.629	5.034	12.51	0.5871	3.162	42.57%	0.0%
19811-005	5	4.442	3.104	5.781	-0.022	7.896	0.6533	3.518	79.2%	40.18%

Biomass-Above Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	5.788	5.034	12.51	5.296	8.502
19811-005	-0.022	7.896	5.838	7.046	1.454

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	18-9845-7167	**Endpoint:**	Biomass-Above Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:14	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					39.97%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-004	1.414	1.86	2.968	0.0976	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	12.73286	12.73286	1	1.999	0.1951	Non-Significant Effect
Error	50.95572	6.369464	8			
Total	63.68857	19.10232	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	3.646	23.15	0.2381	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8758		0.1167	Normal Distribution

Biomass-Above Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	7.427	6.224	8.629	5.034	12.51	0.5871	3.162	42.57%	0.0%
19811-004	5	5.17	4.54	5.8	3.576	7.962	0.3075	1.656	32.03%	30.39%

Biomass-Above Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	5.788	5.034	12.51	5.296	8.502
19811-004	4.634	3.576	7.962	4.588	5.09

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	18-1627-8401	**Endpoint:**	Biomass-Above Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:14	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					96.34%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-003	-0.03306	1.86	7.155	0.5128	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.04044626	0.04044626	1	0.001093	0.9744	Non-Significant Effect
Error	296.0989	37.01237	8			
Total	296.1394	37.05281	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	6.405	23.15	0.0996	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8735		0.1097	Normal Distribution

Biomass-Above Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	7.427	6.224	8.629	5.034	12.51	0.5871	3.162	42.57%	0.0%
19811-003	5	7.554	4.51	10.6	0.23	20.89	1.486	8.002	105.9%	-1.71%

Biomass-Above Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	5.788	5.034	12.51	5.296	8.502
19811-003	0.23	3.254	5.154	8.246	20.89

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	08-4053-3233	**Endpoint:**	Biomass-Above Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:14	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					70.28%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-002	-0.6122	1.86	5.22	0.7213	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	7.382233	7.382233	1	0.3748	0.5574	Non-Significant Effect
Error	157.5815	19.69769	8			
Total	164.9637	27.07992	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.941	23.15	0.3210	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9426		0.5826	Normal Distribution

Biomass-Above Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	7.427	6.224	8.629	5.034	12.51	0.5871	3.162	42.57%	0.0%
19811-002	5	9.145	7.083	11.21	3.36	15.26	1.007	5.422	59.29%	-23.14%

Biomass-Above Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	5.788	5.034	12.51	5.296	8.502
19811-002	12.25	11.38	15.26	3.478	3.36

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	13-3379-1911	**Endpoint:**	Biomass-Above Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:14	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					14.63%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-014	10.45	1.86	2.634	<0.0001	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	547.1268	547.1268	1	109.1	<0.0001	Significant Effect
Error	40.11754	5.014693	8			
Total	587.2443	552.1415	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.826	23.15	0.5740	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9634		0.8242	Normal Distribution

Biomass-Above Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	18	17.03	18.97	13.89	19.99	0.4727	2.546	14.14%	0.0%
19811-014	5	3.21	2.493	3.926	1.42	6.31	0.3498	1.884	58.69%	82.17%

Biomass-Above Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	17.26	13.89	19.99	18.96	19.91
19811-014	3.506	2.408	2.404	6.31	1.42

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	16-1532-4915	**Endpoint:**	Biomass-Above Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:14	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					13.13%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-013	10.6	1.86	2.363	<0.0001	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	453.8984	453.8984	1	112.4	<0.0001	Significant Effect
Error	32.30379	4.037974	8			
Total	486.2022	457.9364	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	4.063	23.15	0.2033	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9018		0.2295	Normal Distribution

Biomass-Above Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	18	17.03	18.97	13.89	19.99	0.4727	2.546	14.14%	0.0%
19811-013	5	4.529	4.048	5.009	2.712	5.994	0.2345	1.263	27.89%	74.84%

Biomass-Above Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	17.26	13.89	19.99	18.96	19.91
19811-013	2.712	5.994	3.88	5.106	4.952

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	19-1912-5090	**Endpoint:**	Biomass-Above Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:14	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					16.07%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-010	9.14	1.86	2.892	<0.0001	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	505.2076	505.2076	1	83.54	<0.0001	Significant Effect
Error	48.38278	6.047847	8			
Total	553.5903	511.2554	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.154	23.15	0.8928	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9258		0.4074	Normal Distribution

Biomass-Above Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	18	17.03	18.97	13.89	19.99	0.4727	2.546	14.14%	0.0%
19811-010	5	3.788	2.886	4.689	1.052	6.55	0.44	2.37	62.56%	78.96%

Biomass-Above Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	17.26	13.89	19.99	18.96	19.91
19811-010	3.434	5.844	1.052	6.55	2.058

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	21-0266-8961	**Endpoint:**	Biomass-Above Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:14	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					40.96%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-009	1.853	1.86	7.374	0.0505	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	135.0122	135.0122	1	3.434	0.1010	Non-Significant Effect
Error	314.5129	39.31411	8			
Total	449.5251	174.3263	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	11.13	23.15	0.0385	Equal Variances
Distribution	Shapiro-Wilk Normality	0.942		0.5754	Normal Distribution

Biomass-Above Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	18	17.03	18.97	13.89	19.99	0.4727	2.546	14.14%	0.0%
19811-009	5	10.65	7.423	13.89	2.826	20.37	1.577	8.494	79.72%	40.82%

Biomass-Above Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	17.26	13.89	19.99	18.96	19.91
19811-009	3.078	20.37	8.052	18.95	2.826

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	07-6527-6165	**Endpoint:**	Biomass-Above Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:14	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					20.06%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-005	6.982	1.86	3.612	<0.0001	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	459.738	459.738	1	48.75	0.0001	Significant Effect
Error	75.43816	9.42977	8			
Total	535.1761	469.1678	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.91	23.15	0.5462	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8826		0.1397	Normal Distribution

Biomass-Above Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	18	17.03	18.97	13.89	19.99	0.4727	2.546	14.14%	0.0%
19811-005	5	4.442	3.104	5.781	-0.022	7.896	0.6533	3.518	79.2%	75.32%

Biomass-Above Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	17.26	13.89	19.99	18.96	19.91
19811-005	-0.022	7.896	5.838	7.046	1.454

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	16-6284-8954	**Endpoint:**	Biomass-Above Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:13	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					14.03%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-004	9.449	1.86	2.526	<0.0001	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	411.7273	411.7273	1	89.28	<0.0001	Significant Effect
Error	36.89162	4.611453	8			
Total	448.6189	416.3387	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.363	23.15	0.4253	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9472		0.6353	Normal Distribution

Biomass-Above Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	18	17.03	18.97	13.89	19.99	0.4727	2.546	14.14%	0.0%
19811-004	5	5.17	4.54	5.8	3.576	7.962	0.3075	1.656	32.03%	71.28%

Biomass-Above Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	17.26	13.89	19.99	18.96	19.91
19811-004	4.634	3.576	7.962	4.588	5.09

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	09-3885-4557	**Endpoint:**	Biomass-Above Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:13	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					38.79%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-003	2.783	1.86	6.983	0.0119	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	272.9645	272.9645	1	7.743	0.0238	Significant Effect
Error	282.0349	35.25436	8			
Total	554.9994	308.2189	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	9.88	23.15	0.0476	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8715		0.1040	Normal Distribution

Biomass-Above Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	18	17.03	18.97	13.89	19.99	0.4727	2.546	14.14%	0.0%
19811-003	5	7.554	4.51	10.6	0.23	20.89	1.486	8.002	105.9%	58.04%

Biomass-Above Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	17.26	13.89	19.99	18.96	19.91
19811-003	0.23	3.254	5.154	8.246	20.89

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	11-5492-2153	**Endpoint:**	Biomass-Above Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:13	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					27.67%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-002	3.307	1.86	4.981	0.0054	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	196.1603	196.1603	1	10.93	0.0108	Significant Effect
Error	143.5174	17.93968	8			
Total	339.6778	214.1	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	4.536	23.15	0.1722	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9126		0.2996	Normal Distribution

Biomass-Above Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	18	17.03	18.97	13.89	19.99	0.4727	2.546	14.14%	0.0%
19811-002	5	9.145	7.083	11.21	3.36	15.26	1.007	5.422	59.29%	49.2%

Biomass-Above Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	17.26	13.89	19.99	18.96	19.91
19811-002	12.25	11.38	15.26	3.478	3.36

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	16-4423-7980	**Endpoint:**	Biomass-Above Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:13	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					18.75%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-015	5.826	1.86	3.376	0.0002	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	279.6504	279.6504	1	33.94	0.0004	Significant Effect
Error	65.91016	8.23877	8			
Total	345.5606	287.8892	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.543	23.15	0.6848	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9669		0.8610	Normal Distribution

Biomass-Above Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	18	17.03	18.97	13.89	19.99	0.4727	2.546	14.14%	0.0%
19811-015	5	7.427	6.224	8.629	5.034	12.51	0.5871	3.162	42.57%	58.75%

Biomass-Above Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	17.26	13.89	19.99	18.96	19.91
19811-015	5.788	5.034	12.51	5.296	8.502

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	04-9629-9386	**Endpoint:**	Biomass-Below Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:19	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					20.6%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-014	7.671	1.86	1.202	<0.0001	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	61.46423	61.46423	1	58.85	<0.0001	Significant Effect
Error	8.355706	1.044463	8			
Total	69.81993	62.50869	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	7.134	23.15	0.0833	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9483		0.6485	Normal Distribution

Biomass-Below Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	5.834	5.319	6.348	3.988	7.024	0.2513	1.354	23.2%	0.0%
19811-014	5	0.8752	0.6824	1.068	0.258	1.644	0.0941	0.5068	57.9%	85.0%

Biomass-Below Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	4.806	3.988	7.024	6.546	6.804
19811-014	0.814	0.984	0.676	1.644	0.258

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	21-1204-7434	**Endpoint:**	Biomass-Below Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:18	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					21.32%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-013	7.171	1.86	1.243	<0.0001	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	57.48468	57.48468	1	51.42	<0.0001	Significant Effect
Error	8.943249	1.117906	8			
Total	66.42793	58.60259	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	4.538	23.15	0.1721	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9422		0.5777	Normal Distribution

Biomass-Below Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	5.834	5.319	6.348	3.988	7.024	0.2513	1.354	23.2%	0.0%
19811-013	5	1.038	0.7967	1.28	0.366	2.04	0.118	0.6354	61.19%	82.2%

Biomass-Below Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	4.806	3.988	7.024	6.546	6.804
19811-013	0.366	2.04	0.688	1.184	0.914

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	04-2633-2424	**Endpoint:**	Biomass-Below Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:18	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					24.25%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-010	5.441	1.86	1.414	0.0003	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	42.81596	42.81596	1	29.6	0.0006	Significant Effect
Error	11.57005	1.446257	8			
Total	54.38601	44.26221	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.728	23.15	0.6093	Equal Variances
Distribution	Shapiro-Wilk Normality	0.88		0.1305	Normal Distribution

Biomass-Below Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	5.834	5.319	6.348	3.988	7.024	0.2513	1.354	23.2%	0.0%
19811-010	5	1.695	1.303	2.087	0.43	2.894	0.1912	1.03	60.75%	70.94%

Biomass-Below Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	4.806	3.988	7.024	6.546	6.804
19811-010	1.916	2.894	0.43	2.374	0.862

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	06-6396-2028	**Endpoint:**	Biomass-Below Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:18	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					142.4%

Unequal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-009	-0.7344	2.132	8.307	0.7483	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	20.47767	20.47767	1	0.5394	0.4836	Non-Significant Effect
Error	303.705	37.96313	8			
Total	324.1827	58.4408	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	40.44	23.15	0.0034	Unequal Variances
Distribution	Shapiro-Wilk Normality	0.8358		0.0392	Normal Distribution

Biomass-Below Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	5.834	5.319	6.348	3.988	7.024	0.2513	1.354	23.2%	0.0%
19811-009	5	8.696	5.421	11.97	2.06	22.92	1.598	8.608	98.99%	-49.06%

Biomass-Below Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	4.806	3.988	7.024	6.546	6.804
19811-009	2.06	22.92	4.862	10.57	3.062

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	10-1851-6818	**Endpoint:**	Biomass-Below Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:18	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					40.76%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-005	2.255	1.86	2.378	0.0271	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	20.78205	20.78205	1	5.085	0.0541	Non-Significant Effect
Error	32.69687	4.087109	8			
Total	53.47892	24.86915	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	3.462	23.15	0.2564	Equal Variances
Distribution	Shapiro-Wilk Normality	0.951		0.6807	Normal Distribution

Biomass-Below Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	5.834	5.319	6.348	3.988	7.024	0.2513	1.354	23.2%	0.0%
19811-005	5	2.95	1.992	3.908	0.002002	5.586	0.4676	2.518	85.36%	49.42%

Biomass-Below Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	4.806	3.988	7.024	6.546	6.804
19811-005	0.002002	5.586	2.886	5.336	0.942

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	21-1874-8132	**Endpoint:**	Biomass-Below Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:18	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					75.76%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
19811-015		19811-004	21		0	0.1111	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.2676369	0.2676369	1	0.01895	0.8939	Non-Significant Effect
Error	112.9854	14.12318	8			
Total	113.2531	14.39081	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	14.42	23.15	0.0242	Equal Variances
Distribution	Shapiro-Wilk Normality	0.7644		0.0053	Non-normal Distribution

Biomass-Below Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	5.834	5.319	6.348	3.988	7.024	0.2513	1.354	23.2%	0.0%
19811-004	5	5.506	3.551	7.461	2.462	14.57	0.9544	5.139	93.34%	5.61%

Biomass-Below Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	4.806	3.988	7.024	6.546	6.804
19811-004	14.57	2.462	4.726	2.918	2.86

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	10-4587-7557	**Endpoint:**	Biomass-Below Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:18	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					49.1%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-003	1.368	1.86	2.864	0.1043	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	11.09648	11.09648	1	1.871	0.2086	Non-Significant Effect
Error	47.44836	5.931045	8			
Total	58.54484	17.02753	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	5.475	23.15	0.1284	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9673		0.8645	Normal Distribution

Biomass-Below Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	5.834	5.319	6.348	3.988	7.024	0.2513	1.354	23.2%	0.0%
19811-003	5	3.727	2.522	4.931	0.112	8.146	0.5881	3.167	84.98%	36.11%

Biomass-Below Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	4.806	3.988	7.024	6.546	6.804
19811-003	0.112	2.086	2.648	5.642	8.146

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	10-3647-2548	**Endpoint:**	Biomass-Below Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:18	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					52.81%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-002	0.3465	1.86	3.08	0.3690	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.8236943	0.8236943	1	0.1201	0.7379	Non-Significant Effect
Error	54.88477	6.860597	8			
Total	55.70847	7.684291	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	6.489	23.15	0.0975	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9281		0.4295	Normal Distribution

Biomass-Below Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	5.834	5.319	6.348	3.988	7.024	0.2513	1.354	23.2%	0.0%
19811-002	5	5.26	3.948	6.571	0.456	8.194	0.6403	3.448	65.56%	9.84%

Biomass-Below Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	4.806	3.988	7.024	6.546	6.804
19811-002	8.194	7.496	7.4	2.752	0.456

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	15-4434-2262	**Endpoint:**	Biomass-Below Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:18	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					16.46%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-014	9.864	1.86	1.138	<0.0001	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	91.04694	91.04694	1	97.29	<0.0001	Significant Effect
Error	7.486529	0.9358161	8			
Total	98.53347	91.98276	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	6.288	23.15	0.1026	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9682		0.8739	Normal Distribution

Biomass-Below Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	6.91	6.427	7.393	5.176	8.372	0.236	1.271	18.39%	0.0%
19811-014	5	0.8752	0.6824	1.068	0.258	1.644	0.0941	0.5068	57.9%	87.33%

Biomass-Below Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	6.868	5.176	7.862	6.272	8.372
19811-014	0.814	0.984	0.676	1.644	0.258

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	11-1755-7869	**Endpoint:**	Biomass-Below Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:17	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					17.1%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-013	9.241	1.86	1.182	<0.0001	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	86.18905	86.18905	1	85.4	<0.0001	Significant Effect
Error	8.074071	1.009259	8			
Total	94.26312	87.19831	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	4	23.15	0.2080	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9636		0.8261	Normal Distribution

Biomass-Below Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	6.91	6.427	7.393	5.176	8.372	0.236	1.271	18.39%	0.0%
19811-013	5	1.038	0.7967	1.28	0.366	2.04	0.118	0.6354	61.19%	84.97%

Biomass-Below Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	6.868	5.176	7.862	6.272	8.372
19811-013	0.366	2.04	0.688	1.184	0.914

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	01-3676-6128	**Endpoint:**	Biomass-Below Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:17	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					19.68%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-010	7.129	1.86	1.36	<0.0001	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	67.98547	67.98547	1	50.83	<0.0001	Significant Effect
Error	10.70087	1.337609	8			
Total	78.68634	69.32307	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.523	23.15	0.6936	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9564		0.7437	Normal Distribution

Biomass-Below Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	6.91	6.427	7.393	5.176	8.372	0.236	1.271	18.39%	0.0%
19811-010	5	1.695	1.303	2.087	0.43	2.894	0.1912	1.03	60.75%	75.47%

Biomass-Below Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	6.868	5.176	7.862	6.272	8.372
19811-010	1.916	2.894	0.43	2.374	0.862

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	16-4170-4576	**Endpoint:**	Biomass-Below Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:17	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					120.1%

Unequal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-009	-0.4589	2.132	8.296	0.6649	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	7.970944	7.970944	1	0.2106	0.6585	Non-Significant Effect
Error	302.8358	37.85448	8			
Total	310.8068	45.82542	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	45.88	23.15	0.0027	Unequal Variances
Distribution	Shapiro-Wilk Normality	0.8378		0.0415	Normal Distribution

Biomass-Below Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	6.91	6.427	7.393	5.176	8.372	0.236	1.271	18.39%	0.0%
19811-009	5	8.696	5.421	11.97	2.06	22.92	1.598	8.608	98.99%	-25.84%

Biomass-Below Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	6.868	5.176	7.862	6.272	8.372
19811-009	2.06	22.92	4.862	10.57	3.062

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	06-2282-3127	**Endpoint:**	Biomass-Below Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:17	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					33.95%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-005	3.139	1.86	2.346	0.0069	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	39.19602	39.19602	1	9.852	0.0138	Significant Effect
Error	31.8277	3.978462	8			
Total	71.02372	43.17448	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	3.927	23.15	0.2137	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9609		0.7965	Normal Distribution

Biomass-Below Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	6.91	6.427	7.393	5.176	8.372	0.236	1.271	18.39%	0.0%
19811-005	5	2.95	1.992	3.908	0.002002	5.586	0.4676	2.518	85.36%	57.3%

Biomass-Below Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	6.868	5.176	7.862	6.272	8.372
19811-005	0.002002	5.586	2.886	5.336	0.942

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	19-2187-4636	**Endpoint:**	Biomass-Below Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:17	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					63.72%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
19811-000		19811-004	20		0	0.0754	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	4.925188	4.925188	1	0.3514	0.5697	Non-Significant Effect
Error	112.1162	14.01453	8			
Total	117.0414	18.93972	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	16.36	23.15	0.0192	Equal Variances
Distribution	Shapiro-Wilk Normality	0.7662		0.0056	Non-normal Distribution

Biomass-Below Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	6.91	6.427	7.393	5.176	8.372	0.236	1.271	18.39%	0.0%
19811-004	5	5.506	3.551	7.461	2.462	14.57	0.9544	5.139	93.34%	20.31%

Biomass-Below Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	6.868	5.176	7.862	6.272	8.372
19811-004	14.57	2.462	4.726	2.918	2.86

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	13-4466-2946	**Endpoint:**	Biomass-Below Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:17	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					41.07%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-003	2.086	1.86	2.838	0.0352	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	25.33188	25.33188	1	4.351	0.0705	Non-Significant Effect
Error	46.57918	5.822398	8			
Total	71.91106	31.15427	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	6.211	23.15	0.1047	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9776		0.9510	Normal Distribution

Biomass-Below Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	6.91	6.427	7.393	5.176	8.372	0.236	1.271	18.39%	0.0%
19811-003	5	3.727	2.522	4.931	0.112	8.146	0.5881	3.167	84.98%	46.07%

Biomass-Below Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	6.868	5.176	7.862	6.272	8.372
19811-003	0.112	2.086	2.648	5.642	8.146

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	19-4494-8313	**Endpoint:**	Biomass-Below Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:17	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					44.23%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-002	1.004	1.86	3.056	0.1723	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	6.809574	6.809574	1	1.009	0.3447	Non-Significant Effect
Error	54.01559	6.751949	8			
Total	60.82517	13.56152	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	7.362	23.15	0.0790	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9407		0.5607	Normal Distribution

Biomass-Below Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	6.91	6.427	7.393	5.176	8.372	0.236	1.271	18.39%	0.0%
19811-002	5	5.26	3.948	6.571	0.456	8.194	0.6403	3.448	65.56%	23.88%

Biomass-Below Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	6.868	5.176	7.862	6.272	8.372
19811-002	8.194	7.496	7.4	2.752	0.456

Trifolium pratense 28 Day — **EnviroSystems, Inc.**

Analysis ID:	11-1576-5888	**Endpoint:**	Biomass-Below Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	20 Jul-10 5:17	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	11-0232-0431	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 13:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 13:00	**Species:**	Trifolium pratense	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					22.34%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-015	1.296	1.86	1.544	0.1155	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	2.8966	2.8966	1	1.681	0.2310	Non-Significant Effect
Error	13.78773	1.723467	8			
Total	16.68433	4.620066	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.135	23.15	0.9056	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8953		0.1943	Normal Distribution

Biomass-Below Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	6.91	6.427	7.393	5.176	8.372	0.236	1.271	18.39%	0.0%
19811-015	5	5.834	5.319	6.348	3.988	7.024	0.2513	1.354	23.2%	15.58%

Biomass-Below Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	6.868	5.176	7.862	6.272	8.372
19811-015	4.806	3.988	7.024	6.546	6.804

Study Number 19811
Trifolium pratense
Summary of Daily Environmental Measurements

Day	Temperature (C)	Humidity Percent	Light ft-c	Light Lux
0	26.9	53	400	4306
1	27.6	43	442	4758
2	26.9	40	465	5005
3	27.2	46	565	6082
4	26.4	44	601	6469
5	26.4	59	523	5630
6	26.6	46	672	7233
7	27.2	49	503	5414
8	24.7	49	623	6706
9	25.6	48	626	6738
10	25.3	53	653	7029
11	23.9	62	481	5177
12	26.8	57	496	5339
13	24.5	51	652	7018
14	25.3	39	671	7223
15	25.0	40	701	7546
16	25.3	45	625	6728
17	24.1	46	565	6082
18	24.3	53	542	5834
19	27.7	52	538	5791
20	27.5	50	713	7675
21	28.2	52	793	8536
22	26.4	49	583	6275
23	27.5	47	590	6351
24	28.0	54	507	5457
25	29.4	53	540	5813
26	28.3	47	662	7126
27	27.9	42	624	6717
28	25.7	59	637	6857
Mean:	26.4	49	586	6307
Minimum:	23.9	39	400	4306
Maximum:	29.4	62	793	8536

Soil pH Record

Study Number: 19811 **Client: TetraTech NUS** **Project: Crane IN, CTO 377**

Lab ID	Field ID	As Received pH	Grams of Soil	Grams of Amendment	Final pH	New Lab ID	New Field ID
19811-002	16 SS1010001	7.82					
19811-003	16 SS1020001	7.33					
19811-004	16 SS1030001	7.55					
19811-005	16 SS1040001	7.54					
19811-009	16 SS1090002	7.41					
19811-010	16 SS1060002	6.02					
19811-012	16 SS1110002	5.13					
19811-013	16 SS1120002	RAN 6.24					
19811-018	16 SS1170002	5.50					
19811-008	16 SS1080002	5.28					
19811-011	16 SS1100002	5.13					
19811-014	16 SS1140002	RAN 5.66					
19811-015	16 SS1160002	6.96					
19811-017	16 SS1150001	5.50					
	Initials:	AM				amendment used:	
	Date:	6/16/10					
	pH meter:	#470				chemical lot used:	

Notes:

The pH of the test soils will be measured prior to the start of assays. In most cases, calcium carbonate will be used to increase pH and ammonium sulphate will be used to reduce pH.

Trifolium pratense Day 28 Soil pH Record

Study Number: 19811 **Client: TetraTech NUS** **Project: Crane IN, CTO 377**

Lab ID	Field ID	pH
19811-000	Laboratory Control	6.43
19811-002	16 SS1010001	7.71
19811-003	16 SS1020001	7.71
19811-004	16 SS1030001	7.96
19811-005	16 SS1040001	7.86
19811-009	16 SS1090002	7.97
19811-010	16 SS1060002	7.60
19811-013	16 SS1120002, E3 RAM	6.77
19811-014	16 SS1140002, E2 RAM	5.82
19811-015	16 SS1160002	7.42
	Initials:	Am
	Date:	7/15/10
	pH meter:	# 1097

Notes:

CLIENT: Tetra Tech NUS, Inc.
PROJECT: SWMU 16, Crane, Indiana, CTO-0377
TASK: Soil Total Volatile Solids
METHOD: AASHTO T 267-86 (2004)

Field ID	LAB ID	MATRIX	RESULT	QLIMIT	UNITS	SAMPLED	ANALYZED
16 SS1010001	19811-002	Solid	2.7	0.1	% dry wt	06/09/10 1115	06/22/10
16 SS1020001	19811-003	Solid	3.7	0.1	% dry wt	06/09/10 1515	06/22/10
16 SS1030001	19811-004	Solid	2	0.1	% dry wt	06/09/10 1705	06/22/10
16 SS1040001	19811-005	Solid	3.28	0.1	% dry wt	06/09/10 1445	06/22/10
16 SS1090002	19811-009	Solid	3.31	0.1	% dry wt	06/10/10 0945	06/22/10
16 SS1060002	19811-010	Solid	4.9	0.1	% dry wt	06/10/10 1530	06/22/10
16 SS1120001	19811-013	Solid	3.91	0.1	% dry wt	06/10/10 1715	06/22/10
16 SS1140001	19811-014	Solid	4.03	0.1	% dry wt	06/11/10 0930	06/22/10
16 SS1160002	19811-015	Solid	2.91	0.1	% dry wt	06/10/10 2035	06/22/10

CLIENT: Tetra Tech NUS, Inc.
PROJECT: SWMU 16, Crane, Indiana, CTO-0377
TASK: Soil Cation-Exchange Capacity
METHOD: SW 846 9081

Field ID	LAB ID	MATRIX	RESULT	QLIMIT	UNITS	SAMPLED	ANALYZED
16 SS1010001	19811-002	Solid	33	1	meq per 100g	06/09/10 1115	06/29/10
16 SS1020001	19811-003	Solid	23	1	meq per 100g	06/09/10 1515	06/29/10
16 SS1030001	19811-004	Solid	55	1	meq per 100g	06/09/10 1705	06/29/10
16 SS1040001	19811-005	Solid	40	1	meq per 100g	06/09/10 1445	06/29/10
16 SS1090002	19811-009	Solid	25	1	meq per 100g	06/10/10 0945	06/29/10
16 SS1060002	19811-010	Solid	16	1	meq per 100g	06/10/10 1530	06/29/10
16 SS1120001	19811-013	Solid	31	1	meq per 100g	06/10/10 1715	06/29/10
16 SS1140001	19811-014	Solid	27	1	meq per 100g	06/11/10 0930	06/29/10
16 SS1160002	19811-015	Solid	19	1	meq per 100g	06/10/10 2035	06/29/10

ATTACHMENT 2C

RYEGRASS TOXICITY TEST LABORATORY REPORT

TOXICOLOGICAL EVALUATION
OF SOIL SAMPLES:

SWMU 16 - Cast High Explosives Fill/B146 Incinerator
Naval Surface Warfare Center Crane
Crane, Indiana
Comprehensive Long-Term Environmental Action-Navy (CLEAN)
Contract N62467-94-D-0888, Contract Task Order (CTO) NO. 0377

28 Day *Lolium perenne* Evaluation
Germination and Growth Toxicity Test

Prepared For:

Tetra Tech NUS, Inc.
661 Andersen Drive, Foster Plaza 7
Pittsburgh, Pennsylvania 15220-2745

Prepared By:

EnviroSystems, Incorporated
1 Lafayette Road
Hampton, New Hampshire 03842

June 2010
Reference Number 19811-10-06

TABLE OF CONTENTS

1.0 INTRODUCTION 3

2.0 MATERIALS AND METHODS 3
- 2.1 General Methods, Biological Evaluations 3
- 2.2 Test Species 3
- 2.3 Test Samples 3
- 2.4 *Lolium perenne* 28 Day Germination and Growth Evaluation 3
- 2.5 Statistical Analysis 4
- 2.6 Quality Control 4
- 2.7 Protocol Deviations 4

3.0 RESULTS AND DISCUSSION 6
- 3.1 Laboratory Control and Project Reference Site Performance 6
- 3.2 Summary 6

4.0 REFERENCES 7

LIST OF TABLES

Table 1. Summary of Sample Collection Information 5
Table 2. Summary of Soil Characteristics 5
Table 3. Summary of Reference Toxicant Data 5
Table 4. Summary of Acceptable Endpoints and Measurements 6
Table 5. Summary of Project Reference Site Performance 6
Table 6. Summary of Significant Endpoints 7
Table 7. Summary of *Lolium perenne* Day 28 Survival Data 8
Table 8. Summary of *Lolium perenne* Mean Time to Germination Data 9
Table 9. Summary of *Lolium perenne* Day 28 Height Data 10
Table 10. Summary of *Lolium perenne* Day 28 Above Ground Biomass Data 11
Table 11. Summary of *Lolium perenne* Day 28 Below Ground Biomass Data 12

APPENDIX A: RAW DATA AND STATISTICAL SUPPORT 13

TOXICOLOGICAL EVALUATION
OF SOIL SAMPLES:

SWMU 16 - Cast High Explosives Fill/B146 Incinerator
Naval Surface Warfare Center Crane
Crane, Indiana
Comprehensive Long-Term Environmental Action-Navy (CLEAN)
Contract N62467-94-D-0888, Contract Task Order (CTO) NO. 0377

28 Day *Lolium perenne* Evaluation
Germination and Growth Toxicity Tests

1.0 INTRODUCTION

This report presents the results of chronic exposure toxicity tests conducted on soil samples collected from the SWMU 16, Naval Surface Warfare Center in Crane, Indiana. Samples were provided by Tetra Tech NUS, Inc. Pittsburgh, Pennsylvania. Testing was based on programs and protocols developed by the ASTM (2009) and US EPA (1989). The toxicity of the samples was assessed by conducting 28 day exposure assays with the plant, *Lolium perenne*. Toxicity tests and supporting analyses were performed at EnviroSystems, Incorporated (ESI), Hampton, New Hampshire.

Toxicity tests expose groups of organisms to environmental samples, a laboratory control and field reference sites for a specified period to assess potential impacts on a variety of endpoints, such as survival, growth or reproduction. Analysis of variance techniques are used to determine the relative toxicity of the samples as compared to the laboratory control and/or field reference sites. Endpoints for this study were survival, mean time to germination, plant height, above ground biomass (shoot biomass) and below ground biomass (root biomass).

2.0 MATERIALS AND METHODS

2.1 General Methods, Biological Evaluations

Toxicological and analytical protocols used in this program follow procedures outlined in *Conducting Terrestrial Plant Toxicity Tests* (ASTM 2009), and *Protocol for Short Term Toxicity Screening of Hazardous Waste Sites* (EPA 1989). These protocols provide standard approaches for the evaluation of toxicological effects of soils on terrestrial organisms.

2.2 Test Species

L. perenne seeds were obtained from a commercial supply house. Seeds were sorted prior to use to remove empty hulls and damaged seeds or seeds that appeared to be dissimilar to the majority of the population. After sorting, the seeds were placed in an airtight, waterproof container and stored in a refrigerator. The seed storage container was dried in an oven prior to storing seeds.

2.3 Test Samples

Soil samples collected from the SWMU 16 project site were received at ESI under chain of custody. Once received, samples were inspected to determine integrity, given unique sample numbers and logged into the laboratory sample management database. Once logged in, the samples were placed in a secure refrigerated, 2 - 4 °C, storage area. A listing of sample sites, sample collection, and receipt information is summarized in Table 1.

The control soil used was “Coast of Maine Cobscook Blend Gardening Soil”.

2.4 *Lolium perenne* 28 Day Germination and Growth Evaluation

Prior to testing, pH, total volatile solids and cation exchange capacity were determined for each sample. Total volatile solids (loss on ignition) is used as an estimate of total organic content. A summary of

these soil characteristics (i.e., pH, total volatile solids and cation exchange capacity) are presented in Table 2.

Test chambers for the assay were 4 inch plastic potting squares. The bottom of the square had small drainage holes and individual squares were held in raised plastic trays. The trays were covered with translucent plastic until seedling emergence was observed. Soils were checked daily and deionized water was added as needed.

Before the addition of seeds, test chambers were randomized using the CETIS® software program. Seeds were then removed from the storage container before being randomly assigned to test vessels. The randomization work sheets are included in the data appendix. The test utilized 5 replicates with 5 seeds per replicate. Containers were placed on a table and maintained at 25 ±3°C. Full Spectrum Daylight Fluorescent Lights provided 16 hours of illumination and 8 hours of dark. Light intensity was approximately 4000 Lux. During the exposure period, room temperature was checked daily for the duration of the assay and hourly using a data logger.

During the assay daily measurements were taken for temperature, relative humidity and light intensity. Observations related to the overall health and vigor of the plants was also recorded daily. After 28 days exposure, plant height was measured and a sample of the soil was obtained for pH determination. Plants were then removed from the soil and care was taken to prevent root damage. Once the soil was removed from the roots, the root portion of the plant was cut away from the foliage. Roots and shoots for each replicate were dried separately so that biomass determinations could be made for above and below ground components. Plants were measured after drying at 60 ±2°C until a constant dry weight was achieved. Plant weight data was measured to the nearest 0.01 mg.

2.5 Statistical Analysis

Germination-survival and growth data were analyzed using CETIS® software to determine significant differences between the test soils, the laboratory control and the reference site sample. Data sets were evaluated to determine normality of distribution and homogeneity of sample variance. Data sets were subsequently evaluated using the appropriate parametric or non-parametric Analysis of Variance (ANOVA) statistic. Pair-wise comparisons were made using the appropriate statistical evaluation. Statistical difference was evaluated at α=0.05.

2.6 Quality Control

As part of the laboratory quality control program, reference toxicant evaluations are completed on a regular basis for each test species. These results provide relative health and response data while allowing for comparison with historic data sets. Results were within two standard deviations of the historic mean for the species. Results are summarized in Table 3.

2.7 Protocol Deviations

Review of data collected during this assay documented the following protocol deviation.

The acceptable temperature for the assay is a mean value of 25±3°C. On Days 21 (07/08/10), 25 (07/12/10) and 26 (07/13/10) of the assay the temperature exceeded the upper bounds set by the protocol and reached a high of 29.4°C. This is well within the natural temperature range for this species and should not have had a negative impact on the outcome of this assay. All other observed temperatures were within protocol.

Table 1. Summary of Sample Collection Information. SWMU 16, Naval Surface Warfare Center Crane, Crane, Indiana. CTO-0377. June 2010.

			Sample Collected		Sample Received	
Field ID	ESI Code	Designation	Date	Time	Date	Time
16 SS1000001	19811-001	Hold	06/09/10	1115	06/11/10	1000
16 SS1010001	19811-002	Test Soil*	06/09/10	1115	06/11/10	1000
16 SS1020001	19811-003	Test Soil*	06/09/10	1515	06/11/10	1000
16 SS1030001	19811-004	Test Soil*	06/09/10	1705	06/11/10	1000
16 SS1040001	19811-005	Test Soil*	06/09/10	1445	06/11/10	1000
16 SS1050001	19811-006	Hold	06/09/10	1745	06/11/10	1000
16 SS1070001	19811-007	Hold	06/09/10	1917	06/11/10	1000
16 SS1080002	19811-008	Hold	06/10/10	0945	06/11/10	1000
16 SS1090002	19811-009	Test Soil*	06/10/10	0945	06/11/10	1000
16 SS1060002	19811-010	Test Soil*	06/10/10	1530	06/12/10	1100
16 SS1100002	19811-011	Hold	06/10/10	1800	06/12/10	1100
16 SS1110002	19811-012	Hold	06/10/10	1550	06/12/10	1100
16 SS1120001	19811-013	Test Soil*	06/10/10	1715	06/12/10	1100
16 SS1140001	19811-014	Test Soil*	06/11/10	0930	06/12/10	1100
16 SS1160002	19811-015	Reference Soil*	06/10/10	2035	06/12/10	1100
16 SS1130001	19811-016	Hold	06/11/10	1313	06/14/10	1100
16 SS1150001	19811-017	Hold	06/11/10	1700	06/14/10	1100
16 SS1170002	19811-018	Hold	06/11/10	1513	06/14/10	1100

*Per phone conversation between Aaron Bernhardt and Renee McIsaac on 06/16/10 these samples were selected to be used in the toxicity test.

Table 2. Summary of Soil Characteristics. SWMU 16, Naval Surface Warfare Center Crane, Crane, Indiana. CTO-0377. June 2010.

Field ID	ESI Code	Initial pH	Final pH	Total Volatile Solids (% dry wt)	Cation-Exchange Capacity (meq per 100g)
16 SS1010001	19811-002	7.82	7.70	2.7	33
16 SS1020001	19811-003	7.33	7.51	3.7	23
16 SS1030001	19811-004	7.55	8.17	2	55
16 SS1040001	19811-005	7.54	7.89	3.28	40
16 SS1090002	19811-009	7.41	7.90	3.31	25
16 SS1060002	19811-010	6.02	7.83	4.9	16
16 SS1120001	19811-013	6.24	6.42	3.91	31
16 SS1140001	19811-014	5.66	5.34	4.03	27
16 SS1160002	19811-015	6.96	6.74	2.91	19

Table 3. Summary of Reference Toxicant Data. SWMU 16, Naval Surface Warfare Center Crane, Crane, Indiana. CTO-0377. June 2010.

Date	Endpoint		Value	Historic Mean/ Central Tendency	Acceptable Range	Reference Toxicant
Lolium perenne						
06/17/10	Germination	LC-50	344.7	192.8	0-515.9	Cadmium (mg/L)
06/17/10	Root Length	IC-50	18.7	56.9	0-189.7	Cadmium (mg/L)

3.0 RESULTS AND DISCUSSION

3.1 Laboratory Control and Project Reference Site Performance

At the end of the 28-day exposure period survival in the laboratory control treatment was 84% with a coefficient of variation (CV) of 19.92%. Mean above ground biomass was 3.22 mg with a CV of 55.20%. Mean below ground biomass was 9.42 mg with a CV of 50.72%. These endpoints meet or exceed the minimum protocol specification of 75% germination-survival. Table 4 provides a summary of assay acceptability criteria and laboratory control achievement. Table 5 summarizes the reference site performance.

Based on daily observations, the mean temperature during the assay was 26.4°C with a range of 23.9 to 29.4°C. The acceptable temperature for the assay is a mean value of 25±3°C.

Table 4. Summary of Acceptable Endpoints and Measurements. SWMU 16, Naval Surface Warfare Center Crane, Crane, Indiana. CTO-0377. June 2010.

Endpoint / Measurement	Protocol		
Mean Survival	lab≥ 75%	%	84.0%
		Protocol Met	Yes
Mean Temperature	25±3°C	daily	26.4
		Protocol Met	Yes
Minimum Temperature	22°C	daily	23.9
		Protocol Met	Yes
Maximum Temperature	28°C	daily	29.4
		Protocol Met	No

Table 5. Summary of Project Reference Site Performance. SWMU 16, Naval Surface Warfare Center Crane, Crane, Indiana. CTO-0377. June 2010.

Reference Site	ESI Code	Mean Survival	Mean Time to Germination (days)	Mean Plant Height (mm)	Above Ground Biomass (mg)	Below Ground Biomass (mg)
16 SS1160002	19811-015	56.0%	7.04	131.9	4.32	8.79

3.2 Summary

This program utilized protocols developed by the U.S. EPA and ASTM to assess the potential toxicological impacts that exposure to soils from the SWMU 16 project site would have on plants. Table 6 provides a summary of sample sites that demonstrated a negative effect, based on the finding of statistically significant reduction in an endpoint as compared to the laboratory control or reference site. Tables 7 through 11 provide summaries of assay endpoints and detailed statistical results for each sample location. Laboratory bench sheets, detailed summaries of survival, wet weights and associated statistical support data are included in Appendix A.

Table 6. Summary of Significant Endpoints. SWMU 16, Naval Surface Warfare Center Crane, Crane, Indiana. CTO-0377. June 2010.

		Finding of Significant Difference(s) between Project Sites and									
		Lab Control (19811-000)					16 SS1160002 (19811-015)				
					biomass					biomass	
Field ID	ESI Code	survival	germ.	height	above	below	survival	germ.	height	above	below
16 SS1160002	19811-015										
16 SS1010001	19811-002	Yes	Yes			Yes			Yes		
16 SS1020001	19811-003	Yes				Yes			Yes		
16 SS1030001	19811-004	Yes	Yes			Yes			Yes		
16 SS1040001	19811-005					Yes			Yes		
16 SS1090002	19811-009	Yes				Yes					
16 SS1060002	19811-010								Yes		
16 SS1120001	19811-013										
16 SS1140001	19811-014	Yes	Yes		Yes	Yes			Yes	Yes	

4.0 REFERENCES

ASTM. 2009. Volume 11.06. *Conducting Terrestrial Plant Toxicity Tests*. Annual Book of ASTM Standards. E-1963-09.

US EPA. 1989. *Protocol for Short Term Toxicity Screening of Hazardous Waste Sites*. EPA/600/3-88/029.

Table 7. Summary of *Lolium perenne* Day 28 Survival Data. SWMU 16, Naval Surface Warfare Center Crane, Crane, Indiana. CTO-0377. June 2010.

Day 28 Survival Summary

Field ID	ESI Code	Reps	Mean	Minimum	Maximum	CV
Laboratory Control	19811-000	5	84.0%	60.0%	100.0%	19.92%
16 SS1160002	19811-015	5	56.0%	20.0%	100.0%	58.68%
16 SS1010001	19811-002	5	64.0%	40.0%	80.0%	26.15%
16 SS1020001	19811-003	5	60.0%	40.0%	80.0%	23.57%
16 SS1030001	19811-004	5	40.0%	20.0%	80.0%	61.24%
16 SS1040001	19811-005	5	56.0%	20.0%	100.0%	63.89%
16 SS1090002	19811-009	5	44.0%	20.0%	100.0%	81.31%
16 SS1060002	19811-010	5	84.0%	60.0%	100.0%	19.92%
16 SS1120001	19811-013	5	76.0%	60.0%	100.0%	22.02%
16 SS1140001	19811-014	5	28.0%	0.0%	60.0%	81.44%

Day 28 Survival Statistical Summary

			Statistically Significant Difference as Compared to			
			Lab Control (19811-000)		16 SS1160002 (19811-015)	
Field ID	ESI Code	Mean	p Value	statistically significant	p Value	statistically significant
Laboratory Control	19811-000	84.0%	-	-	-	-
16 SS1160002	19811-015	56.0%	0.0640	No	-	-
16 SS1010001	19811-002	64.0%	0.0477	Yes	0.6797	No
16 SS1020001	19811-003	60.0%	0.0200	Yes	0.5956	No
16 SS1030001	19811-004	40.0%	0.0053	Yes	0.2041	No
16 SS1040001	19811-005	56.0%	0.0758	No	0.5000	No
16 SS1090002	19811-009	44.0%	0.0267	Yes	0.2979	No
16 SS1060002	19811-010	84.0%	0.5000	No	0.9360	No
16 SS1120001	19811-013	76.0%	0.2357	No	0.8701	No
16 SS1140001	19811-014	28.0%	0.0011	Yes	0.0781	No

Table 8. Summary of *Lolium perenne* Mean Time to Germination Data. SWMU 16, Naval Surface Warfare Center Crane, Crane, Indiana. CTO-0377. June 2010.

Mean Time to Germination Summary

Field ID	ESI Code	Reps	Mean	Minimum	Maximum	CV
Laboratory Control	19811-000	5	5.36	4.00	10.33	51.96%
16 SS1160002	19811-015	5	7.04	4.20	12.00	49.88%
16 SS1010001	19811-002	5	8.87	5.00	15.75	45.98%
16 SS1020001	19811-003	5	9.98	5.00	19.67	62.42%
16 SS1030001	19811-004	5	12.05	4.50	22.00	62.35%
16 SS1040001	19811-005	5	12.29	4.00	22.00	64.52%
16 SS1090002	19811-009	5	7.97	4.67	13.00	43.14%
16 SS1060002	19811-010	5	7.11	4.60	9.50	30.86%
16 SS1120001	19811-013	5	5.40	4.33	9.25	39.88%
16 SS1140001	19811-014	5	14.87	0.00	22.00	66.51%

Mean Time to Germination Statistical Summary			Statistically Significant Difference as Compared to			
			Lab Control (19811-000)		16 SS1160002 (19811-015)	
Field ID	ESI Code	Mean	p Value	statistically significant	p Value	statistically significant
Laboratory Control	19811-000	5.36	-	-	-	-
16 SS1160002	19811-015	7.04	0.2126	No	-	-
16 SS1010001	19811-002	8.87	0.0476	Yes	0.2349	No
16 SS1020001	19811-003	9.98	0.0840	No	0.1922	No
16 SS1030001	19811-004	12.05	0.0493	Yes	0.1069	No
16 SS1040001	19811-005	12.29	0.0511	No	0.1064	No
16 SS1090002	19811-009	7.97	0.1112	No	0.3411	No
16 SS1060002	19811-010	7.11	0.1503	No	0.4854	No
16 SS1120001	19811-013	5.40	0.0754	No	0.8000	No
16 SS1140001	19811-014	14.87	0.0361	Yes	0.0670	No

Table 9. Summary of *Lolium perenne* Day 28 Height Data. SWMU 16, Naval Surface Warfare Center Crane, Crane, Indiana. CTO-0377. June 2010.

Day 28 Height Summary

Field ID	ESI Code	Reps	Mean	Minimum	Maximum	CV
Laboratory Control	19811-000	5	106.6	82.8	153.5	29.37%
16 SS1160002	19811-015	5	131.9	122.0	142.5	6.32%
16 SS1010001	19811-002	5	103.1	77.8	132.8	19.52%
16 SS1020001	19811-003	5	80.3	54.3	109.7	25.18%
16 SS1030001	19811-004	5	91.5	53.0	135.3	33.04%
16 SS1040001	19811-005	5	89.7	68.5	112.0	20.54%
16 SS1090002	19811-009	5	122.1	75.0	170.0	28.48%
16 SS1060002	19811-010	5	107.8	101.7	119.4	6.48%
16 SS1120001	19811-013	5	131.9	108.2	158.7	17.94%
16 SS1140001	19811-014	5	81.4	68.0	117.0	29.27%

Day 28 Height Statistical Summary			Statistically Significant Difference as Compared to			
			Lab Control (19811-000)		16 SS1160002 (19811-015)	
Field ID	ESI Code	Mean	p Value	statistically significant	p Value	statistically significant
Laboratory Control	19811-000	106.6	-	-	-	-
16 SS1160002	19811-015	131.9	0.9402	No	-	-
16 SS1010001	19811-002	103.1	0.4180	No	0.0091	Yes
16 SS1020001	19811-003	80.3	0.0768	No	0.0004	Yes
16 SS1030001	19811-004	91.5	0.2292	No	0.0102	Yes
16 SS1040001	19811-005	89.7	0.1644	No	0.0008	Yes
16 SS1090002	19811-009	122.1	0.7599	No	0.2793	No
16 SS1060002	19811-010	107.8	0.5323	No	0.0006	Yes
16 SS1120001	19811-013	131.9	0.9064	No	0.5021	No
16 SS1140001	19811-014	81.4	0.1130	No	0.0014	Yes

Table 10. Summary of *Lolium perenne* Day 28 Above Ground Biomass Data. SWMU 16, Naval Surface Warfare Center Crane, Crane, Indiana. CTO-0377. June 2010.

Day 28 Above Ground Biomass Summary

Field ID	ESI Code	Reps	Mean	Minimum	Maximum	CV
Laboratory Control	19811-000	5	3.22	1.58	6.14	55.20%
16 SS1160002	19811-015	5	4.32	0.81	8.08	75.35%
16 SS1010001	19811-002	5	3.56	1.71	9.63	96.09%
16 SS1020001	19811-003	5	1.75	0.69	3.32	59.04%
16 SS1030001	19811-004	5	2.10	0.11	5.70	104.00%
16 SS1040001	19811-005	5	1.87	0.33	4.85	92.78%
16 SS1090002	19811-009	5	2.45	0.42	6.10	103.10%
16 SS1060002	19811-010	5	3.58	2.18	6.53	49.52%
16 SS1120001	19811-013	5	5.21	3.51	7.14	25.11%
16 SS1140001	19811-014	5	0.74	0.08	2.45	132.30%

Day 28 Above Ground Biomass Statistical Summary

Statistically Significant Difference as Compared to

			Lab Control (19811-000)		16 SS1160002 (19811-015)	
Field ID	ESI Code	Mean	p Value	statistically significant	p Value	statistically significant
Laboratory Control	19811-000	3.22	-	-	-	-
16 SS1160002	19811-015	4.32	0.7373	No	-	-
16 SS1010001	19811-002	3.56	0.4206	No	0.3640	No
16 SS1020001	19811-003	1.75	0.0747	No	0.0656	No
16 SS1030001	19811-004	2.10	0.1991	No	0.1200	No
16 SS1040001	19811-005	1.87	0.1281	No	0.0872	No
16 SS1090002	19811-009	2.45	0.2970	No	0.1702	No
16 SS1060002	19811-010	3.58	0.6206	No	0.3325	No
16 SS1120001	19811-013	5.21	0.9608	No	0.7065	No
16 SS1140001	19811-014	0.74	0.0128	Yes	0.0231	Yes

Table 11. Summary of *Lolium perenne* Day 28 Below Ground Biomass Data. SWMU 16, Naval Surface Warfare Center Crane, Crane, Indiana. CTO-0377. June 2010.

Day 28 Below Ground Biomass Summary

Field ID	ESI Code	Reps	Mean	Minimum	Maximum	CV
Laboratory Control	19811-000	5	9.42	2.12	15.13	50.72%
16 SS1160002	19811-015	5	8.79	1.53	24.18	115.00%
16 SS1010001	19811-002	5	2.80	1.69	6.17	68.24%
16 SS1020001	19811-003	5	3.51	1.22	9.89	103.50%
16 SS1030001	19811-004	5	3.29	0.17	7.60	98.55%
16 SS1040001	19811-005	5	2.20	0.55	5.02	80.65%
16 SS1090002	19811-009	5	3.02	0.43	5.84	80.06%
16 SS1060002	19811-010	5	8.51	5.19	19.28	70.96%
16 SS1120001	19811-013	5	6.20	2.39	13.06	68.01%
16 SS1140001	19811-014	5	1.44	0.00	3.75	109.80%

Day 28 Below Ground Biomass Statistical Summary

			Statistically Significant Difference as Compared to			
			Lab Control (19811-000)		16 SS1160002 (19811-015)	
Field ID	ESI Code	Mean	p Value	statistically significant	p Value	statistically significant
Laboratory Control	19811-000	9.42	-	-	-	-
16 SS1160002	19811-015	8.79	0.4520	No	-	-
16 SS1010001	19811-002	2.80	0.0103	Yes	0.1312	No
16 SS1020001	19811-003	3.51	0.0294	Yes	0.1516	No
16 SS1030001	19811-004	3.29	0.0225	Yes	0.1399	No
16 SS1040001	19811-005	2.20	0.0066	Yes	0.1121	No
16 SS1090002	19811-009	3.02	0.0141	Yes	0.1247	No
16 SS1060002	19811-010	8.51	0.3996	No	0.4792	No
16 SS1120001	19811-013	6.20	0.1461	No	0.3056	No
16 SS1140001	19811-014	1.44	0.0038	Yes	0.0917	No

APPENDIX A:
RAW DATA AND STATISTICAL SUPPORT

Contents	Number of Pages
L. perenne 28-Day Soil Toxicity Test	
Daily Temperature and Daily Observation Bench Sheet	16
Day 28 Survival and Height Measurements	2
Day 28 Dry Weights	4
CETIS Work Sheets	2
Mean Time to Germination Summary	2
Day 28 Survival, Germination and Growth Statistical Analysis	89
Summary of Environmental Measurements	1
Soil pH Results	2
Soil Total Volatile Solids	1
Soil Cation Exchange Capacity	1
Sample Receipt Logs; Chain of Custody Records; Custody Seals	14
Sample Field Identification Clarification	1
Total Appendix Pages	135

Lolium perenne 28 Day Assay

Study Number: 19811 **Client: TetraTech NUS** **Project: Crane IN, CTO 377**

Day	Date	Initials	Temp.	Humidity	Light	Rotate (✓)	Water (✓)	Comments
0	6/17/10	AM	26.9	53%	RAM 06/17/10 ~~343~~ 400	—	✓	
1	6/18/10	AM	27.6	43%	442	✓	—	
2	6/19/10	JTP	26.9	40%	465	✓	✓	
3	6-20	DM	27.2	46%	565	✓	—	
4	6/21/10	AM	26.5	45%	645	✓	✓	
5	6/22/10	JTP	26.5	47%	523	✓	✓	
6	6/23/10	AM	26.5	46%	672	✓	✓	
7	6/24/10	JTP	27.2	48%	493	✓	✓	
8	6/25/10	JTP/AM	24.7	50%	623	✓	✓	
9	6/26/10	WM	24.8	53%	536	✓	✓	
10	6-27-10	DM	25.3	53%	498	✓	✓	
11	6/28/10	JTP	23.9	62%	481	✓	✓	
12	6/29/10	JEB	26.1	57%	468	✓	✓	
13	6/30/10	JEB	24.5	52%	633	✓	✓	
14	7/1/10	JTP	25.3	39%	671	✓	✓	
15	7/2/10	JTP	25.0	40%	701	✓	✓	
16	7/3/10	KC	25.3	43%	622	✓	✓	Was not aware of new observation detection
17	7/4/10	KC	24.4	47%	587	✓	✓	
18	7/5/10	AM	24.3	52%	542	✓	✓	
19	7/6/10	JTP	27.7	52%	538	✓	✓	
20	7/7/10	AM	27.5	50%	713	✓	✓	
21	7/8/10	JTP	28.2	52%	793	✓	✓	Added water to cool temperature
22	7/9/10	JTP	26.9	49%	583	✓	✓	
23	7/10/10	KC	27.4	49%	506	✓	✓	
24	7-11	DM	28.0	54%	507	✓	✓	
25	7/12/10	JTP	29.4	53%	540	✓	✓	
26	7/13/10	JTP	28.3	47%	662	✓	✓	
27	7/14/10	AM	27.9	42%	624	✓	✓	
28	7/15/10	JTP	25.7	59%	637	✓	✓	

Project Notes:	Humidity 30% minimum	Light Meter ID:	1149	Temperature Data Logger ID:	19
Temperature 25±3°C	Light 4,000 lux	Humidity Meter ID:	19		

Observation Definitions
Normal Observations: no observed change

Emergence: the hypocotyl hook or first true leaves that are observed above the soil surface.

Chlorosis: the discoloration of shoots that occurs as chlorophyll is degraded as a result of disease, toxic substances, nutrient deficiencies, or senescence.

Necrosis: the presence of dead plant tissue.

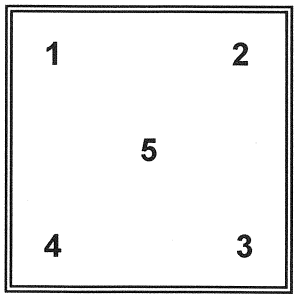
Withering: becoming limp or desiccated

Mortality: plant is completely dead

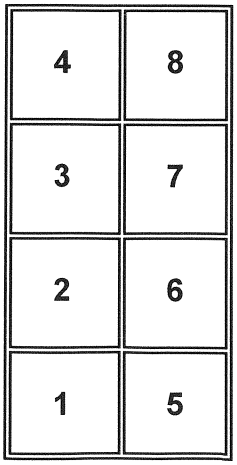
EG RAM

✔	**Normal Observations**	**N**	**Necrosis**
E	**Emergence**	**W**	**Withering**
C	**Chlorosis**	**X**	**Mortality**

Replicate Seed Position



Tray Position



Observation Key

X = Alive
√ = Nothing
D = Dead
E = Emergence
C = Chlorosis
N = Necrosis
W = Withering

Daily Observations for *Lolium perenne* Study # 19811

Crane IN, CTO 377

				DAY													
Sample	Rep	Pos	Seed	1	2	3	4	5	6	7	8	9	10	11	12	13	14
19811-003	1	1	1	/	✓	✓	E	E	X	X	X	X	X	X	X	X	X
			2	/	✓	✓	/	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	/	✓	✓	E	✓	E	X	X	X	X	X	X	X	X
			4	/	✓	✓	E	E	X	X	X	X	X	X	X	X	X
			5	/	✓	✓	E	E	X	X	X	X	X	X	W	W	W
19811-005	1	2	1	/	✓	✓	/	E	E	X	X	X	X	X	X	X	X
			2	/	✓	✓	E	✓	X	X	X	X	X	X	X	X	X
			3	/	✓	✓	E	✓	X	X	X	X	X	X	X	X	X
			4	/	✓	✓	E	✓	X	X	X	X	X	X	X	X	X
			5	/	✓	✓	E	✓	X	X	X	X	X	X	X	X	X
19811-004	1	3	1	/	✓	✓	E	✓	X	X	X	X	X	X	X	X	X
			2	/	✓	✓	E	✓	E	X	X	X	X	X	X	X	X
			3	/	✓	✓	✓	E	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	/	✓	✓	E	✓	X	X	X	X	X	X	X	X	X
			5	/	✓	✓		✓	E	X	X	X	X	X	X	X	X
19811-000	1	4	1	/	✓	✓	E	✓	X	X	X	X	X	X	X	X	X
			2	/	✓	✓	✓	✓	E	X	X	X	X	X	X	X	X
			3	/	✓	✓	E	✓	X	X	X	X	X	X	X	X	X
			4	/	✓	✓	E	✓	X	X	X	X	X	X	X	X	X
			5	/	✓	✓	E	E	X	X	X	X	X	X	X	X	X
19811-013	1	5	1	/	✓	✓	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	/	✓	✓	E	E	X	X	X	X	X	X	X	X	X
			3	/	✓	✓	E	X	X	X	X	X	X	X	X	X	X
			4	/	✓	✓	E	X	X	X	X	X	X	X	X	X	X
			5	/	✓	✓	E	E	X	X	X	X	X	X	X	X	X
19811-010	1	6	1	/	✓	✓	/	✓	/	✓	✓	✓	✓	✓	✓	✓	✓
			2	/	✓	✓	/	✓	/	✓	✓	✓	✓	✓	✓	✓	✓
			3	/	✓	✓	E	X	X	X	X	X	X	X	X	X	X
			4	/	✓	✓	E	X	X	X	X	X	X	X	X	X	X
			5	/	✓	✓	/	E	X	X	X	X	X	X	X	X	X
19811-015	1	7	1	/	✓	✓	/	✓	✓	✓	✓	✓	✓	✓	E	X	X
			2	/	✓	✓	/	✓	/	✓	✓	✓	/	✓	✓	✓	✓
			3	/	✓	✓	/	✓	/	E	X	X	X	X	X	X	X
			4	/	✓	✓	/	✓	/	✓	✓	✓	✓	✓	✓	✓	✓
			5	/	✓	✓	E	✓	/	✓	✓	✓	✓	✓	✓	✓	✓
19811-009	1	8	1	/	✓	✓	/	✓	/	✓	✓	✓	✓	✓	✓	✓	✓
			2	/	✓	✓	/	✓	/	✓	✓	✓	E	X	X	X	X
			3	/	✓	✓	/	✓	/	✓	✓	✓	✓	✓	✓	✓	✓
			4	/	✓	✓	/	✓	/	✓	✓	✓	✓	✓	✓	✓	✓
			5	/	✓	✓	/	✓	/	✓	✓	✓	✓	✓	✓	✓	✓
Initials				AM 6/18	JTP 6/19	DM 6/20	AM 6/21	JTP 6/22	AM 6/23	JTP 6/24	JTP/AM 6/25	VM 6/26	DM 6/27	JTP 6/28	JEB 6/29	JEB 6/30	JTP 7/1

Daily Observations for *Lolium perenne* Study # 19811

Crane IN, CTO 377

				DAY													
Sample	Rep	Pos	Seed	15	16	17	18	19	20	21	22	23	24	25	26	27	28
19811-003	1	1	1	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	X	✓	X	X	X	X	X	X	X	X	N	N	N	N
			4	X	✓	X	X	X	X	X	X	X	X	N	N	N	N
			5	W	✓	X	X	X	X	W	W	W	X	W	W	W	W
19811-005	1	2	1	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			2	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			3	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			4	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			5	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
19811-004	1	3	1	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			2	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			5	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
19811-000	1	4	1	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			2	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			3	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			4	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			5	X	✓	X	X	X	X	X	X	X	X	N	N	X	N
19811-013	1	5	1	✓	✓	EDX ✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	X	✓	X	X	X	X	X	X	X	X	N	N	N	N
			3	X	✓	X	X	X	X	X	X	X	X	X	N	N	N
			4	X	✓	X	X	X	X	X	X	X	X	N	N	N	N
			5	X	✓	X	X	X	X	X	X	X	X	X	X	N	N
19811-010	1	6	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	E	X	X	X
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	X	✓	X	X	X	X	X	X	X	X	N	N	N	N
			4	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			5	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
19811-015	1	7	1	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-009	1	8	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Initials				JTP 7/2	7/3	7/4	7/5	JTP 7/6	7/7	JTP 7/8	JTP 7/9	7/10	DM 7-11	JTP 7/12	JTP 7/13	7/14	JTP 7/15

Daily Observations for *Lolium perenne* Study # 19811

Crane IN, CTO 377

				DAY													
Sample	Rep	Pos	Seed	1	2	3	4	5	6	7	8	9	10	11	12	13	14
19811-002	1	9	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	✓	✓	✓	E ✓	X	X	X	X	X	X	X	X	X	X
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-014	1	10	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-003	2	11	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-005	2	12	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	E
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-009	2	13	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	E	X
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-004	2	14	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-013	2	15	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	E	X	X	X	X
			4	✓	✓	✓	✓	E	X	X	X	X	X	X	X	X	X
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-000	2	16	1	✓	✓	✓	E	E	X	X	X	X	X	X	X	X	X
			2	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
			3	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	E	E	X	X	X	X	X	X	X	X	X	X
Initials				AT 6/18	JTP 6/19	DM 6/20	AT 6/21	JTP 6/22	AT 6/23	JTP 6/24	JTP/AM 6/25	WM 6/26	DM 6/27	JTP 6/28	JEB 6/29	JEB 6/30	JTP 7/1

Daily Observations for *Lolium perenne* Study # 19811

Crane IN, CTO 377

				DAY													
Sample	Rep	Pos	Seed	15	16	17	18	19	20	21	22	23	24	25	26	27	28
19811-002	1	9	1	✓	✓	✓	✓	E	X	X	X	X	X	X	X	X	X
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	E	X	X	X
			3	X	✓	X	X	X	X	X	X	X	X	N	N	N	N
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	E	✓	X	X	X	X	X	X	X	X	X	X	X	X
19811-014	1	10	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-003	2	11	1	✓	✓	✓	✓	E✓ EB 7/6	JTP X	X	X	X	X	X	X	X	X
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	✓	✓	✓	✓	E✓ EB 7/6	JTP X	X	X	X	X	X	X	X	X
			4	✓	✓	✓	✓	✓	✓	E	X	X	X	X	X	X	X
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-005	2	12	1	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
			2	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
			5	E	✓	X	X	X	X	X	X	X	X	X	X	X	X
19811-009	2	13	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-004	2	14	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	X	N/W	N/W	X	X	X	X	X	X	X	X	X	X	X
			5	✓	✓	✓	✓	✓	✓	✓	E✓ EB 7/11	E✓ EB 7/11	X	X	X	X	X
19811-013	2	15	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			3	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			4	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			5	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
19811-000	2	16	1	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			2	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			3	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
Initials				JTP 7/12	KC 7/13	KC 7/14	AM 7/15	JTP 7/16	AM 7/17	JTP 7/18	JTP 7/19	KC 7/20	DM 7-21	JTP 7/22	JTP 7/23	AM 7/24	JTP 7/25

Daily Observations for *Lolium perenne* Study # 19811

Crane IN, CTO 377

				DAY													
Sample	Rep	Pos	Seed	1	2	3	4	5	6	7	8	9	10	11	12	13	14
19811-010	2	17	1	✓	✓	✓	✓	E	X	X	X	X	X	X	X	X	X
			2	✓	✓	✓	✓	✓	✓	E	X	X	X	X	X	X	X
			3	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
			4	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
			5	✓	✓	✓	✓	✓	✓	X	X	X	X	X	X	X	X
19811-014	2	18	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	E	X	X
			3	✓	✓	✓	✓	✓	✓	E	X	X	X	X	X	X	X
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	✓	✓	✓	✓	✓	E	X	X	X	X	X
19811-002	2	19	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	E	✓	✓	✓	E	X	X	X	X	X	X
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	F	X	X	X	X
			4	✓	✓	✓	E	✓	✓	E	X	X	X	X	X	X	X
			5	✓	✓	✓	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-015	2	20	1	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
			2	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
			3	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
			4	✓	✓	✓	E	E	X	X	X	X	X	X	X	X	X
			5	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
19811-002	3	21	1	✓	✓	✓	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	✓	E	X	X	X	X	X	X	X	X	X
			3	✓	✓	✓	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	✓	✓	✓	E	E	X	X	X	X	X	X	X	X	X
			5	✓	✓	✓	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-003	3	22	1	✓	✓	✓	E	E	X	X	X	X	X	X	X	X	X
			2	✓	✓	✓	E	E	X	X	X	X	X	X	X	X	X
			3	✓	✓	✓	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	✓	✓	✓	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-004	3	23	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	✓	E	X	X	X	X	X	X	X	X	X
19811-014	3	24	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	✓	✓	✓	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Initials				AM 6/18	JTP 6/19	OM 6/20	AM 6/21	JTP 6/22	AM 6/23	JTP 6/24	JTP/AM 6/25	WM 6/26	OM 6/27	JTP 6/28	JEB 6/29	JEB 6/30	JTP 7/1

Daily Observations for *Lolium perenne* Study # 19811

Crane IN, CTO 377

				DAY													
Sample	Rep	Pos	Seed	15	16	17	18	19	20	21	22	23	24	25	26	27	28
19811-010	2	17	1	X	✓	X	X	X	X	X	W	W	X	W	W	W	W
			2	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			3	X	✓	X	X	X	X	X	X	X	X	X	X	W	W
			4	X	✓	X	X	X	X	X	N	N	N	N	N	N/W	N/W
			5	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
19811-014	2	18	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	X	✓	X	X	X	X	X	X	X	X	X	X	N	N
			3	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
19811-002	2	19	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			3	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			4	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-015	2	20	1	X	✓	X	X	X	X	X	N	N	X	N	N	N	N
			2	X	✓	X	X	X	X	X	X	X	X	X	X	N	N
			3	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			4	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			5	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
19811-002	3	21	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	X	✓	X	X	X	X	X	X	X	X	N	N	N	N
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	X	✓	X	X	X	X	X	X	X	X	X	N	N	N
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-003	3	22	1	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			2	X	✓	X	X	X	X	X	X	X	X	N	N	N	N
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	X	X	X	X	X	X	X	X	X	X	X
19811-004	3	23	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	X	✓	X	X	X	X	N/C	N/C	N/C	C	N/C	N/C	N/C	N/C
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	X	✓	X	X	X	X	X	X	X	X	X	X	N	N
19811-014	3	24	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	✓	✓	✓	✓	✓	✓	✓	E	X ✓ 7/10	X	X	X	X	X
			5	✓	✓	✓	✓	✓	✓	✓	E	E X	X	X	X	X	X
Initials				JTP 7/12	VL 7/13	VL 7/14	AM 7/15	JTP 7/16	AM 7/17	JTP 7/18	JTP 7/19	VL 7/20	AM 7-21	JTP 7/22	JTP 7/23	AM 7/24	JTP 7/25

Daily Observations for *Lolium perenne* Study # 19811

Crane IN, CTO 377

				DAY													
Sample	Rep	Pos	Seed	1	2	3	4	5	6	7	8	9	10	11	12	13	14
19811-005	3	25	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	✓	✓	✓	✓	✓	E	X	X	X	X	X	X	X	X
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-013	3	26	1	✓	✓	✓	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	✓	E	X	X	X	X	X	X	X	X	X
			3	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
			4	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
			5	✓	✓	✓	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-009	3	27	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	✓	✓	✓	E	✓	E	X	X	X	X	X	X	X	X
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-010	3	28	1	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
			2	✓	✓	✓	E	E	X	X	X	X	X	X	X	X	X
			3	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
			4	✓	✓	✓	✓	E	X	X	X	X	X	X	X	X	X
			5	✓	✓	✓	✓	E	X	X	X	X	X	X	X	X	X
19811-015	3	29	1	✓	✓	✓	✓	E	X	X	X	W	X	W	W	W	W
			2	✓	✓	✓	E	✓	✓	✓	✓	E	✓	✓	✓	✓	✓
			3	✓	✓	✓	✓	E	X	X	X	X	X	X	X	X	X
			4	✓	✓	✓	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-000	3	30	1	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
			2	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
			3	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
			4	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-009	4	31	1	✓	✓	✓	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
			4	✓	✓	✓	E	E	X	X	X	X	X	X	X	X	X
			5	✓	✓	✓	E	E	X	X	X	X	X	X	X	X	X
19811-013	4	32	1	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
			2	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
			3	✓	✓	✓	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	✓	✓	✓	E	E	X	X	X	X	X	X	X	X	X
			5	✓	✓	✓	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Initials				AM 6/18	JTP 6/19	DM 6/20	AM 6/21	JTP 6/22	AM 6/23	JTP 6/24	JTP/AM 6/25	WM 6/26	DM 6/27	JTP 6/28	JEB 6/29	JEB 6/30	JTP 7/1

Daily Observations for *Lolium perenne* Study # 19811

Crane IN, CTO 377

				DAY													
Sample	Rep	Pos	Seed	15	16	17	18	19	20	21	22	23	24	25	26	27	28
19811-005	3	25	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			4	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
			5	✓	✓	✓	✓	✓	✓	E	X	X	X	X	X	X	X
19811-013	3	26	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			3	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			4	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-009	3	27	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	X	✓	X	X	X	X	X	N/C	N/C	N/C	N/C	N/C	N/C	N/C
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-010	3	28	1	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			2	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			3	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			4	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			5	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
19811-015	3	29	1	W	✓	X	X	X	X	W	W	W	X	W	W	W	W
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-000	3	30	1	X	✓	X	X	X	X	X	X	X	X	X	N	X	X
			2	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			3	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			4	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-009	4	31	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			4	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			5	X	✓	X	X	X	X	N/C	N/C	N/C	X	N	N	X	X
19811-013	4	32	1	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			2	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Initials				JTP 7/2	VL 7/3	VL 7/4	AM 7/5	JTP 7/6	AM 7/7	JTP 7/8	JTP 7/9	VL 7/10	AM 7/11	JTP 7/12	JTP 7/13	AM 7/14	JTP 7/15

Daily Observations for *Lolium perenne* Study # 19811

Crane IN, CTO 377

				DAY													
Sample	Rep	Pos	Seed	1	2	3	4	5	6	7	8	9	10	11	12	13	14
19811-010	4	33	1	✓	✓	✓	✓	E	X	X	X	X	X	X	X	X	X
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	E	X
			3	✓	✓	✓	✓	✓	✓	X	X	X	X	X	X	X	X
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	E	X	X
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-000	4	34	1	✓	✓	✓	✓	E	X	X	X	X	X	X	X	X	X
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	✓	✓	✓	✓	E	X	X	X	X	X	X	X	X	X
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-002	4	35	1	✓	✓	✓	✓	E	X	X	X	X	X	X	X	X	X
			2	✓	✓	✓	✓	E	X	X	X	X	X	X	X	X	X
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	✓	✓	✓	✓	E	X	X	X	X	X	X	X	X	X
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-005	4	36	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-015	4	37	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	E	X	X
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-004	4	38	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-003	4	39	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	E	X	X
			2	✓	✓	✓	✓	E	X	X	X	X	X	X	X	X	X
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	✓	E	X	X	X	X	✓	X	X	X	X
19811-014	4	40	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Initials				AM 6/18	JTP 6/19	DM 6/20	AM 6/21	JTP 6/22	AM 6/23	JTP 6/24	JTP/AM 6/25	MM 6/26	DM 6/27	JTP 6/28	JEB 6/29	JEB 6/30	JTP 7/1

Daily Observations for *Lolium perenne* Study # 19811

Crane IN, CTO 377

				DAY													
Sample	Rep	Pos	Seed	15	16	17	18	19	20	21	22	23	24	25	26	27	28
19811-010	4	33	1	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			2	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			3	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			4	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-000	4	34	1	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			2	✓	✓	✓	✓	✓	✓	E	X	X	X	X	X	X	X
			3	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-002	4	35	1	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			2	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			5	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	E
19811-005	4	36	1	✓	✓	✓	✓	✓	✓	✓	E	X	X	X	X	X	X
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-015	4	37	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-004	4	38	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	E	X	X	X	X	X	X	✓	X	X	X	X	X
19811-003	4	39	1	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			2	X	✓	X	X	X	W	N/C	N/C	N/C	C	N/C	N/C	N/C/W	N/C/W
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	X	✓	X	X	X	X	X	X	X	X	X	C	X	X
19811-014	4	40	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	✓	✓	✓	✓	✓	✓	✓	E	X	X	X	X	X	X
			4	✓	✓	✓	✓	✓	✓	✓	✓	X	X	✓	✓	✓	✓
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Initials				JTP 7/12	KC 7/13	KC 7/14	AM 7/15	JTP 7/16	AM 7/17	JTP 7/18	JTP 7/19	KC 7/10	QM 7/21	JTP 7/12	JTP 7/13	AM 7/14	JTP 7/15

Daily Observations for *Lolium perenne* Study # 19811

Crane IN, CTO 377

				DAY													
Sample	Rep	Pos	Seed	1	2	3	4	5	6	7	8	9	10	11	12	13	14
19811-002	5	41	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	E	✓	✓	✓	E	X	X	X	X	X	X
			3	✓	✓	✓	E	✓	✓	✓	E	X	X	X	X	X	X
			4	✓	✓	✓	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	E	E	X	X	X	X	X	X	X	X	X
19811-009	5	42	1	✓	✓	✓	E	✓	✓	✓	✓	E	X	X	X	X	X
			2	✓	✓	✓	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	✓	✓	✓	E	✓	✓	✓	✓	E	X	X	X	X	X
			4	✓	✓	✓	✓	E	X	X	X	X	X	X	X	X	X
			5	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
19811-015	5	43	1	✓	✓	✓	E	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	✓	E	X	X	X	X	X	X	X	X	X
			3	✓	✓	✓	E	E	X	X	X	X	X	X	X	X	X
			4	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
			5	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
19811-000	5	44	1	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
			2	✓	✓	✓	E	E	X	X	X	X	X	X	X	X	X
			3	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
			4	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-005	5	45	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	A (3)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	✓	✓	✓	X (3)	X	X	X	X	X	X	X	X	X	X
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
19811-010	5	46	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	E	X	X
			2	✓	✓	✓	E	✓	✓	✓	E	X	X	X	X	X	X
			3	✓	✓	✓	E	E	X	X	X	X	X	X	X	X	X
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
19811-004	5	47	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-013	5	48	1	✓	✓	✓	✓	E	X	X	X	X	X	X	X	X	X
			2	✓	✓	✓	✓	E	X	X	X	X	X	X	X	X	X
			3	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
			4	✓	✓	✓	✓	E	X	X	X	X	X	X	X	X	X
			5	✓	✓	✓	E	X	X	X	X	X	X	X	X	X	X
Initials				AT 6/18	JTP 6/19	DM 6/20	AM 6/21	JTP 6/22	AM 6/23	JTP 6/24	JTP/AM 6/25	MM 6/26	DM 6/27	JTP 6/28	JEB 6/29	JEB 6/30	JTP 7/1

Daily Observations for *Lolium perenne* Study # 19811

Crane IN, CTO 377

				DAY													
Sample	Rep	Pos	Seed	15	16	17	18	19	20	21	22	23	24	25	26	27	28
19811-002	5	41	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	X	✓	X	X	X	X	X	X	X	X	X	X	C	C
			3	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	X	✓	X	X	X	X	N/C	N/C	N/C	X	N/C	N/C	N/C	N/C
19811-009	5	42	1	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			2	✓	✓	✓	✓	✓	✓	E	X	X	X	X	X	X	X
			3	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			4	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			5	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
19811-015	5	43	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			3	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			4	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			5	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
19811-000	5	44	1	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			2	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
			3	X	✓	X	X	X	X	X	X	X	X	X	N	N	N
			4	X	✓	X	X	X	X	X	X	X	X	X	N	N	N
			5	✓	✓	✓	X	X	X	X	X	X	X	X	X	X	X
19811-005	5	45	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	X	✓	X	X	X	X	X	X	X	X	X	X	N	N
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	X	✓	X	X	X	(P)	✓	✓	✓	✓	✓	✓	✓	✓
19811-010	5	46	1	X	✓	X	X	X	X	X	X	X	X	N	N	N	N
			2	X	✓	X	X	X	X	X	X	X	X	X	X	N	N
			3	X	✓	X	X	X	X	X	X	X	X	X	N	N	N
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
19811-004	5	47	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	✓	✓	✓	✓	✓	✓	✓	E	X	X	X	X	X	X
			5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-013	5	48	1	X	✓	X	X	X	X	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
			2	X	✓	X	X	X	X	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
			3	X	✓	X	X	X	X	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
			4	X	✓	X	X	X	X	X	X	X	X	X	X	N/C	N/C
			5	X	✓	X	X	X	X	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
Initials				JTP 7/12	KC 7/13	KC 7/14	AM 7/15	JTP 7/16	AM 7/17	JTP 7/18	JTP 7/19	KC 7/20	DM 7/21	JTP 7/22	JTP 7/23	AM 7/24	JTP 7/25

Daily Observations for *Lolium perenne* Study # 19811

Crane IN, CTO 377

				DAY													
Sample	Rep	Pos	Seed	1	2	3	4	5	6	7	8	9	10	11	12	13	14
19811-014	5	49	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	G	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19811-003	5	50	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	G	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	✓	✓	✓	G	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	✓	✓	✓	✓	✓	✓	E	X	X	X	X	X	X	X
			5	✓	✓	✓	G	✓	✓	✓	✓	✓	E	X	X	X	X
Initials				AM 6/18	JTP 6/19	DM 6/20	AM 6/21	JTP 6/22	AM 6/23	JTP 6/24	JTP/AM 6/25	WM 6/26	DM 6/27	JTP 6/28	JEB 6/29	JEB 6/30	JTP 7/1

Daily Observations for *Lolium perenne* Study # 19811

Crane IN, CTO 377

				DAY													
Sample	Rep	Pos	Seed	15	16	17	18	19	20	21	22	23	24	25	26	27	28
19811-014	5	49	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			5	✓	✓	✓	✓	✓	✓	E	X	X	X	X	X	X	X
19811-003	5	50	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			2	✓	✓	✓	✓	✓	✓	E	X	X	X	X	X	X	X
			3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			4	X	✓	X	X	X	✓	X	X	X	X	X	X	X	X
			5	X	✓	X	X	X	✓	X	X	X	X	X	X	X	X
Initials				JTP 7/12	KL 7/13	KL 7/14	AM 7/15	JTP 7/16	AM 7/17	JTP 7/18	JTP 7/19	KL 7/20	DM 7/21	JTP 7/22	JTP 7/23	AM 7/24	JTP 7/25

Lolium perenne 28 Day Assay

STUDY NUMBER: 19811 **PROJECT: Crane IN, CTO 377**

DATE: 07/15/10 **CLIENT: Tetra Tech NUS**

Sample Code	Rep	Pos	# Alive	Pan Count	Initials	Above Ground Height of Each Plant (mm)					Initials
						1	2	3	4	5	
19811-003	1	1	4	4	JTP	85	90	58	107	—	JTP
19811-005	1	2	5	5	JTP	87	82	105	103	135	JTP
19811-004	1	3	4	4	JTP	173	118	138	112	—	JTP
19811-000	1	4	5	5	JTP	67	102	105	69	85	JTP
19811-013	1	5	4	4	JTP	119	113	114	116	—	JTP
19811-010	1	6	3	3	JTP	126	95	84	—	—	JTP
19811-015	1	7	2	2	JTP	95	149	—	—	—	JTP
19811-009	1	8	1	1	JTP	134	—	—	—	—	JTP
19811-002	1	9	JTP 7/23 ~~3~~ 4	4	JTP	80	115	77	39	—	JTP
19811-014	1	10	7/23 0	0	JTP	—	—	—	—	—	JTP
19811-003	2	11	3	3	JTP	39	70	54	—	—	JTP
19811-005	2	12	4	4	JTP	65	82	69	58	—	JTP
19811-009	2	13	1	1	JTP	170	—	—	—	—	JTP
19811-004	2	14	2	2	JTP	110	81	—	—	—	JTP
19811-013	2	15	JTP 7/23 ~~3~~ 4	4	JTP	36	150	120	179	—	JTP
19811-000	2	16	7/23 4	4	JTP	150	103	141	104	—	JTP
19811-010	2	17	5	5	JTP	121	115	118	96	95	JTP
19811-014	2	18	3	3	JTP	95	118	138	—	—	JTP
19811-002	2	19	3	3	JTP	150	100	70	—	—	JTP
19811-015	2	20	5	5	JTP	105	122	160	145	130	JTP
19811-002	3	21	2	2	JTP	96	112	—	—	—	JTP
19811-003	3	22	3	3	JTP	75	79	61	—	—	JTP
19811-004	3	23	2	2	JTP	123	70	—	—	—	JTP
19811-014	3	24	2	2	JTP	76	61	—	—	—	JTP
19811-005	3	25	3	3	JTP	109	85	81	—	—	JTP
19811-013	3	26	3	3	JTP	179	171	118	—	—	JTP
19811-009	3	27	1	1	JTP	75	—	—	—	—	JTP
19811-010	3	28	5	5	JTP	134	108	114	133	108	JTP
19811-015	3	29	2	2	JTP	163	122	—	—	—	JTP
19811-000	3	30	4	4	JTP	124	166	163	161	—	JTP
19811-009	4	31	3	3	JTP	126	97	146	—	—	JTP
19811-013	4	32	3	3	JTP	162	156	158	—	—	JTP
19811-010	4	33	4	4	JTP	113	106	110	91	—	JTP
19811-000	4	34	3	3	JTP	41	106	113	—	—	JTP
19811-002	4	35	4	4	JTP	119	158	171	83	—	JTP
19811-005	4	36	1	1	JTP	74	—	—	—	—	JTP
19811-015	4	37	1	1	JTP	137	—	—	—	—	JTP
19811-004	4	38	1	1	JTP	77	—	—	—	—	JTP
19811-003	4	39	3	3	JTP	107	110	112	—	—	JTP
19811-014	4	40	1	1	JTP	68	—	—	—	—	JTP
19811-002	5	41	3	3	JTP	120	78	84	—	—	JTP
19811-009	5	42	5	5	JTP	116	111	113	94	109	JTP
19811-015	5	43	4	4	JTP	117	109	168	108	—	JTP

Lolium perenne 28 Day Assay

STUDY NUMBER: **19811** **PROJECT:** **Crane IN, CTO 377**

DATE: **07/15/10** **CLIENT:** **Tetra Tech NUS**

Sample Code	Rep	Pos	# Alive	Pan Count	Initials	Above Ground Height of Each Plant (mm)					Initials
						1	2	3	4	5	
19811-000	5	44	5	5	JTP	82	102	79	66	85	JTP
19811-005	5	45	1	1	JTP	112	—	—	—	—	JTP
19811-010	5	46	4	4	JTP	110	120	74	112	—	JTP
19811-004	5	47	0 1	1	JTP	53	—	—	—	—	JTP
19811-013	5	48	5	5	JTP	91	113	97	121	119	JTP
19811-014	5	49	1	1	JTP	72	—	—	—	—	JTP
19811-003	5	50	2	2	JTP	98	64	—	—	—	JTP

STUDY: 19811
CLIENT: Tetra Tech NUS, Inc.
PROJECT: SWMU 16, Crane Indiana, CTO 377
ASSAY: L. perenne - Shoots
TASK: Wet Weight Data - Balance Output File
BALANCE: AccuSeries Model 225D, SN# 17008376

Date / Init:	07/16/10 JL		Total Wt.	Tare Wt.	Duplicates	
Sample Code	Rep	Pos.	(mg)	(mg)	Total Wt.	Tare Wt.
19811-003	1	1	1029.36	1012.78		
19811-005	1	2	1027.30	1003.05		
19811-004	1	3	1000.19	971.67		
19811-000	1	4	1015.43	1002.34		
19811-013	1	5	1012.04	994.47		
19811-010	1	6	1012.67	1001.78		
19811-015	1	7	1030.18	1020.55		
19811-009	1	8	1047.93	1043.44		
19811-002	1	9	1007.23	998.70		
19811-014	1	10	1016.53	1016.14		
19811-003	2	11	1021.17	1017.73		
19811-005	2	12	998.35	991.59		
19811-009	2	13	1055.23	1051.59		
19811-004	2	14	1055.60	1043.68		
19811-013	2	15	1047.58	1020.13		
19811-000	2	16	1019.48	1001.83		
19811-010	2	17	1031.12	1011.75		
19811-014	2	18	1038.41	1026.16		
19811-002	2	19	1038.62	1024.50		
19811-015	2	20	1070.10	1029.68	1070.27	1029.71
19811-002	3	21	1014.22	1005.29		
19811-003	3	22	987.54	980.71		
19811-004	3	23	1001.00	993.69		
19811-014	3	24	1013.57	1010.43		
19811-005	3	25	1002.29	994.99		
19811-013	3	26	1061.29	1037.38		
19811-009	3	27	1022.99	1020.88		
19811-010	3	28	1049.27	1016.60		
19811-015	3	29	1043.18	1026.12		
19811-000	3	30	1028.44	997.73		
19811-009	4	31	1072.69	1042.20		
19811-013	4	32	1050.36	1014.68		
19811-010	4	33	1028.24	1014.02		
19811-000	4	34	1023.73	1015.85		
19811-002	4	35	1051.12	1002.95		
19811-005	4	36	1011.74	1010.10		
19811-015	4	37	1016.64	1012.59		
19811-004	4	38	1007.35	1003.20		
19811-003	4	39	1015.90	1004.76		
19811-014	4	40	1018.99	1017.99	1018.99	1018.01
19811-002	5	41	1035.11	1025.78		

Date / Init:	07/16/10 JL		Total Wt.	Tare Wt.	Duplicates	
Sample Code	Rep	Pos.	(mg)	(mg)	Total Wt.	Tare Wt.
19811-009	5	42	1033.83	1013.20		
19811-015	5	43	1040.18	1003.23		
19811-000	5	44	1011.50	1000.28		
19811-005	5	45	1048.92	1042.24		
19811-010	5	46	1051.59	1039.27		
19811-004	5	47	997.33	996.77		
19811-013	5	48	1080.82	1055.10		
19811-014	5	49	1005.62	1003.92		
19811-003	5	50	1002.83	996.97		

STUDY: 19811
CLIENT: Tetra Tech NUS, Inc.
PROJECT: SWMU 16, Crane Indiana, CTO 377
ASSAY: L. perenne - Roots
TASK: Wet Weight Data - Balance Output File
BALANCE: AccuSeries Model 225D, SN# 17008376

Date / Init:	07/16/10 JL		Total Wt.	Tare Wt.	Duplicates	
Sample Code	Rep	Pos.	(mg)	(mg)	Total Wt.	Tare Wt.
19811-003	1	1	1033.18	1018.10		
19811-005	1	2	1022.79	997.70		
19811-004	1	3	1040.43	1011.34		
19811-000	1	4	1048.48	1001.27		
19811-013	1	5	1016.98	995.03		
19811-010	1	6	1037.58	1008.70		
19811-015	1	7	1043.65	1035.24		
19811-009	1	8	1042.55	1027.00		
19811-002	1	9	1002.70	993.11		
19811-014	1	10	1044.65	1044.67		
19811-003	2	11	1024.70	1015.94		
19811-005	2	12	1019.22	1005.63		
19811-009	2	13	1037.15	1033.27		
19811-004	2	14	1029.41	991.43		
19811-013	2	15	1048.57	1029.02		
19811-000	2	16	1044.32	1000.49		
19811-010	2	17	1102.67	1006.27		
19811-014	2	18	1029.49	1010.75		
19811-002	2	19	1036.15	1024.04		
19811-015	2	20	1098.97	1028.32	1099.29	1028.36
19811-002	3	21	1041.00	1032.07		
19811-003	3	22	1018.71	1010.45		
19811-004	3	23	1018.03	1008.31		
19811-014	3	24	1025.00	1012.95		
19811-005	3	25	994.12	985.69		
19811-013	3	26	1028.39	1016.44		
19811-009	3	27	1037.12	1034.96		
19811-010	3	28	1062.57	1029.84		
19811-015	3	29	1044.98	1032.72		
19811-000	3	30	1070.00	1011.84		
19811-009	4	31	1071.86	1042.67		
19811-013	4	32	1061.39	1025.05		
19811-010	4	33	1045.63	1016.82		
19811-000	4	34	1059.36	1048.78		
19811-002	4	35	1056.37	1025.50		
19811-005	4	36	999.55	996.82		
19811-015	4	37	1007.30	999.67		
19811-004	4	38	1028.58	1023.95		
19811-003	4	39	1075.90	1026.44		
19811-014	4	40	1020.67	1017.43	1020.66	1017.41
19811-002	5	41	1035.31	1026.88		

Date / Init:	07/16/10 JL		Total Wt.	Tare Wt.	Duplicates	
Sample Code	Rep	Pos.	(mg)	(mg)	Total Wt.	Tare Wt.
19811-009	5	42	1041.19	1016.48		
19811-015	5	43	1137.44	1016.54		
19811-000	5	44	1103.61	1027.98		
19811-005	5	45	1048.70	1043.56		
19811-010	5	46	1044.41	1018.46		
19811-004	5	47	1003.56	1002.71		
19811-013	5	48	1104.57	1039.29		
19811-014	5	49	996.18	994.12		
19811-003	5	50	1009.95	1003.83		

STUDY: 19811
CLIENT: Tetra Tech NUS, Inc.
PROJECT: SWMU 16, Crane Indiana, CTO 377
ASSAY: L. perenne
TASK: Mean Time to Emergence

			Plant					Mean
Sample Code	Rep	Pos	1	2	3	4	5	
19811-003	1	1	5		6	5	5	5.25
19811-005	1	2	5	4	4	4	4	4.20
19811-004	1	3	4	6		4	5	4.75
19811-000	1	4	4	5	4	4	4	4.20
19811-013	1	5		5	4	4	5	4.50
19811-010	1	6	25		4	4	5	9.50
19811-015	1	7	12		7			9.50
19811-009	1	8		10				10.00
19811-002	1	9	19	25	4		15	15.75
19811-014	1	10						0.00
19811-003	2	11	19		19	21		19.67
19811-005	2	12	18	14		18	15	16.25
19811-009	2	13		13				13.00
19811-004	2	14				4	22	13.00
19811-013	2	15		4	10	5	18	9.25
19811-000	2	16	5	4	4		3	4.00
19811-010	2	17	5	7	4	4	6	5.20
19811-014	2	18		12	7		9	9.33
19811-002	2	19		8	10	7		8.33
19811-015	2	20	4	4	4	5	4	4.20
19811-002	3	21		5		5		5.00
19811-003	3	22	5	5				5.00
19811-004	3	23			4		5	4.50
19811-014	3	24				22	22	22.00
19811-005	3	25			6	18	21	15.00
19811-013	3	26		5	4	4		4.33
19811-009	3	27				6		6.00
19811-010	3	28	4	5	4	5	5	4.60
19811-015	3	29	5		5			5.00
19811-000	3	30	4	4	4	4		4.00
19811-009	4	31			4	5	5	4.67
19811-013	4	32	4	4		5		4.33
19811-010	4	33	5	13	6	12		9.00
19811-000	4	34	5	21	5			10.33
19811-002	4	35	5	5		5	18	8.25
19811-005	4	36	22					22.00
19811-015	4	37			12			12.00
19811-004	4	38					16	16.00
19811-003	4	39	12	5			5	7.33
19811-014	4	40			22			22.00
19811-002	5	41		8	8		5	7.00

Sample Code	Rep	Pos	Plant 1	2	3	4	5	Mean
19811-009	5	42	9	4	9	5	4	6.20
19811-015	5	43		5	5	4	4	4.50
19811-000	5	44	4	5	4	4		4.25
19811-005	5	45					4	4.00
19811-010	5	46	12	8	5		4	7.25
19811-004	5	47				22		22.00
19811-013	5	48	5	5	4	5	4	4.60
19811-014	5	49					21	21.00
19811-003	5	50		21		7	10	12.67

Notes:

Emergences noted for 19811-015 replicates 1 and 3 on days 4 and 9 were determined to be weeds and were eliminated from analysis.

Lolium perenne 28 Day **EnviroSystems, Inc.**

Start Date: 17 Jun-10 12:00 **Species:** Lolium perenne **Sample Code:** 19811-000
End Date: 15 Jul-10 12:00 **Protocol:** ASTM E1963-09 (2009) **Sample Source:** Crane Indiana
Sample Date: 16 Jun-10 12:00 **Material:** Soil **Sample Station:** Laboratory Control Sample; 19811-0

Sample Code	Rep	Pos	xpo	Germinat	urviv	ys to Ge	Plant Height (mm	oot Length (mr	lant Tare (mg	Plant Final (mg	oot Tare (m	oot Final (mg	Co	oot Pan Cou
19811-003	1	1	5	4	4		85		1012.78	1029.36	1018.1	1033.18	4	4
19811-005	1	2	5	5	5		102.4		1003.05	1027.3	997.7	1022.79	5	5
19811-004	1	3	5	4	4		135.3		971.67	1000.19	1011.34	1040.43	4	4
19811-000	1	4	5	5	5		85.6		1002.34	1015.43	1001.27	1048.48	5	5
19811-013	1	5	5	4	4		115.5		994.47	1012.04	995.03	1016.98	4	4
19811-010	1	6	5	3	3		101.7		1001.78	1012.67	1008.7	1037.58	3	3
19811-015	1	7	5	2	2		122		1020.55	1030.18	1035.24	1043.65	2	2
19811-009	1	8	5	1	1		134		1043.44	1047.93	1027	1042.55	1	1
19811-002	1	9	5	4	4		77.8		998.7	1007.23	993.11	1002.7	4	4
19811-014	1	10	5	0	0				1016.14	1016.53	1044.67	1044.65		
19811-003	2	11	5	3	3		54.3		1017.73	1021.17	1015.94	1024.7	3	3
19811-005	2	12	5	4	4		68.5		991.59	998.35	1005.63	1019.22	4	4
19811-009	2	13	5	1	1		170		1051.59	1055.23	1033.27	1037.15	1	1
19811-004	2	14	5	2	2		95.5		1043.68	1055.6	991.43	1029.41	2	2
19811-013	2	15	5	4	4		121.3		1020.13	1047.58	1029.02	1048.57	4	4
19811-000	2	16	5	4	4		124.5		1001.83	1019.48	1000.49	1044.32	4	4
19811-010	2	17	5	5	5		109		1011.75	1031.12	1006.27	1102.67	5	5
19811-014	2	18	5	3	3		117		1026.16	1038.41	1010.75	1029.49	3	3
19811-002	2	19	5	3	3		106.7		1024.5	1038.62	1024.04	1036.15	3	3
19811-015	2	20	5	5	5		132.4		1029.68	1070.1	1028.32	1098.97	5	5
19811-002	3	21	5	2	2		104		1005.29	1014.22	1032.07	1041	2	2
19811-003	3	22	5	3	3		71.7		980.71	987.54	1010.45	1018.71	3	3
19811-004	3	23	5	2	2		96.5		993.69	1001	1008.31	1018.03	2	2
19811-014	3	24	5	2	2		68.5		1010.43	1013.57	1012.95	1025	2	2
19811-005	3	25	5	3	3		91.7		994.99	1002.29	985.69	994.12	3	3
19811-013	3	26	5	3	3		156		1037.38	1061.29	1016.44	1028.39	3	3
19811-009	3	27	5	1	1		75		1020.88	1022.99	1034.96	1037.12	1	1
19811-010	3	28	5	5	5		119.4		1016.6	1049.27	1029.84	1062.57	5	5
19811-015	3	29	5	2	2		142.5		1026.12	1043.18	1032.72	1044.98	2	2
19811-000	3	30	5	4	4		153.5		997.73	1028.44	1011.84	1070	4	4
19811-009	4	31	5	3	3		123		1042.2	1072.69	1042.67	1071.86	3	3
19811-013	4	32	5	3	3		158.7		1014.68	1050.36	1025.05	1061.39	3	3
19811-010	4	33	5	4	4		105		1014.02	1028.24	1016.82	1045.63	4	4
19811-000	4	34	5	3	3		86.7		1015.85	1023.73	1048.78	1059.36	3	3
19811-002	4	35	5	4	4		132.8		1002.95	1051.12	1025.5	1056.37	4	4
19811-005	4	36	5	1	1		74		1010.1	1011.74	996.82	999.55	1	1
19811-015	4	37	5	1	1		137		1012.59	1016.64	999.67	1007.3	1	1
19811-004	4	38	5	1	1		77		1003.2	1007.35	1023.95	1028.58	1	1
19811-003	4	39	5	3	3		109.7		1004.76	1015.9	1026.44	1075.9	3	3
19811-014	4	40	5	1	1		68		1017.99	1018.99	1017.43	1020.67	1	1
19811-002	5	41	5	3	3		94		1025.78	1035.11	1026.88	1035.31	3	3
19811-009	5	42	5	5	5		108.6		1013.2	1033.83	1016.48	1041.19	5	5
19811-015	5	43	5	4	4		125.5		1003.23	1040.18	1016.54	1137.44	4	4
19811-000	5	44	5	5	5		82.8		1000.28	1011.5	1027.98	1103.61	5	5
19811-005	5	45	5	1	1		112		1042.24	1048.92	1043.56	1048.7	1	1
19811-010	5	46	5	4	4		104		1039.27	1051.59	1018.46	1044.41	4	4
19811-004	5	47	5	1	1		53		996.77	997.33	1002.71	1003.56	1	1

CETIS Test Data Worksheet

Report Date: 20 Jul-10 10:54 (p 2 of 2)
Test Code: 15-3234-5438/19811Lol

Sample Code	Rep	Pos	xpo	Germinat	urviv	ys to Ge	Plant Height (mm	oot Length (mr	lant Tare (mg	Plant Final (mg	oot Tare (m	oot Final (mg		oot Pan Cou
19811-013	5	48	5	5	5		108.2	1055.1	1080.82	1039.29	1104.57	5	5
19811-014	5	49	5	1	1		72	1003.92	1005.62	994.12	996.18	1	1
19811-003	5	50	5	2	2		81	996.97	1002.83	1003.83	1009.95	2	2

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Sample Code	Sample ID	Sample Date	Receive Date	Sample Age	Client Name	Project
19811-000	16-3877-0522	16 Jun-10 12:00	16 Jun-10 12:00	24h	Tetra Tech NUS	Ecological Risk Assessme
19811-015	01-2243-1399	10 Jun-10 20:35	12 Jun-10 11:00	6d 15h		
19811-002	17-6880-6936	09 Jun-10 11:15	11 Jun-10 10:00	8d 1h		
19811-003	18-3180-8748	09 Jun-10 15:15	11 Jun-10 10:00	7d 21h		
19811-004	00-2207-8607	09 Jun-10 17:05	11 Jun-10 10:00	7d 19h		
19811-005	03-5602-2744	09 Jun-10 14:45	11 Jun-10 10:00	7d 21h		
19811-009	09-3929-1612	10 Jun-10 09:45	11 Jun-10 10:00	7d 2h		
19811-010	06-3043-2289	10 Jun-10 15:30	12 Jun-10 11:00	6d 20h		
19811-013	11-7434-4542	10 Jun-10 17:15	12 Jun-10 11:00	6d 19h		
19811-014	20-8714-0719	11 Jun-10 09:30	12 Jun-10 11:00	6d 2h		

Sample Code	Material Type	Sample Source	Station Location	Latitude	Longitude
19811-000	Soil	Crane Indiana	Laboratory Control Sample; 1981		
19811-015	Soil	Crane Indiana	16 SS1160002; 19811-015		
19811-002	Soil	Crane Indiana	16 SS1010001; 19811-002		
19811-003	Soil	Crane Indiana	16 SS1020001; 19811-003		
19811-004	Soil	Crane Indiana	16 SS1030001; 19811-004		
19811-005	Soil	Crane Indiana	16 SS1040001; 19811-005		
19811-009	Soil	Crane Indiana	16 SS1090002; 19811-009		
19811-010	Soil	Crane Indiana	16 SS1060002; 19811-010		
19811-013	Soil	Crane Indiana	16 SS1120001; 19811-013		
19811-014	Soil	Crane Indiana	16 SS1140001; 19811-014		

Biomass-Above Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	3.222	2.558	3.886	1.576	6.142	0.3247	1.778	55.2%	0.0%
19811-015	5	4.324	3.108	5.541	0.81	8.084	0.5949	3.258	75.35%	-34.22%
19811-002	5	3.563	2.285	4.842	1.706	9.634	0.6251	3.424	96.09%	-10.59%
19811-003	5	1.754	1.367	2.141	0.688	3.316	0.1891	1.036	59.04%	45.56%
19811-004	5	2.098	1.284	2.913	0.112	5.704	0.3983	2.182	104.0%	34.87%
19811-005	5	1.865	1.219	2.511	0.328	4.85	0.316	1.731	92.78%	42.11%
19811-009	5	2.454	1.51	3.399	0.422	6.098	0.4619	2.53	103.1%	23.82%
19811-010	5	3.579	2.917	4.241	2.178	6.534	0.3236	1.772	49.52%	-11.07%
19811-013	5	5.213	4.724	5.702	3.514	7.136	0.239	1.309	25.11%	-61.8%
19811-014	5	0.7392	0.374	1.104	0.078	2.45	0.1786	0.9781	132.3%	77.06%

Biomass-Below Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	9.416	7.633	11.2	2.116	15.13	0.8719	4.776	50.72%	0.0%
19811-015	5	8.794	5.019	12.57	1.526	24.18	1.846	10.11	115.0%	6.61%
19811-002	5	2.797	2.084	3.51	1.686	6.174	0.3485	1.909	68.24%	70.29%
19811-003	5	3.507	2.151	4.863	1.224	9.892	0.663	3.631	103.5%	62.75%
19811-004	5	3.291	2.08	4.502	0.17	7.596	0.5921	3.243	98.55%	65.05%
19811-005	5	2.199	1.537	2.861	0.546	5.018	0.3238	1.774	80.65%	76.65%
19811-009	5	3.02	2.117	3.922	0.432	5.838	0.4414	2.417	80.06%	67.93%
19811-010	5	8.511	6.256	10.77	5.19	19.28	1.103	6.039	70.96%	9.62%
19811-013	5	6.203	4.628	7.778	2.39	13.06	0.7702	4.218	68.01%	34.13%
19811-014	5	1.443	0.8513	2.034	-0.004004	3.748	0.2892	1.584	109.8%	84.68%

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Percent Survival Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	0.84	0.7775	0.9025	0.6	1	0.03055	0.1673	19.92%	0.0%
19811-015	5	0.56	0.4373	0.6827	0.2	1	0.06	0.3286	58.68%	33.33%
19811-002	5	0.64	0.5775	0.7025	0.4	0.8	0.03055	0.1673	26.15%	23.81%
19811-003	5	0.6	0.5472	0.6528	0.4	0.8	0.02582	0.1414	23.57%	28.57%
19811-004	5	0.4	0.3085	0.4915	0.2	0.8	0.04472	0.2449	61.24%	52.38%
19811-005	5	0.56	0.4264	0.6936	0.2	1	0.06532	0.3578	63.89%	33.33%
19811-009	5	0.44	0.3064	0.5736	0.2	1	0.06532	0.3578	81.31%	47.62%
19811-010	5	0.84	0.7775	0.9025	0.6	1	0.03055	0.1673	19.92%	0.0%
19811-013	5	0.76	0.6975	0.8225	0.6	1	0.03055	0.1673	22.02%	9.52%
19811-014	5	0.28	0.1949	0.3651	0	0.6	0.04163	0.228	81.44%	66.67%

Plant Height Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	106.6	94.93	118.3	82.8	153.5	5.718	31.32	29.37%	0.0%
19811-015	5	131.9	128.8	135	122	142.5	1.521	8.33	6.32%	-23.69%
19811-002	5	103.1	95.55	110.6	77.8	132.8	3.673	20.12	19.52%	3.34%
19811-003	5	80.34	72.79	87.89	54.3	109.7	3.693	20.23	25.18%	24.65%
19811-004	5	91.46	80.18	102.7	53	135.3	5.517	30.22	33.04%	14.22%
19811-005	5	89.72	82.84	96.6	68.5	112	3.365	18.43	20.54%	15.85%
19811-009	5	122.1	109.1	135.1	75	170	6.349	34.78	28.48%	-14.54%
19811-010	5	107.8	105.2	110.4	101.7	119.4	1.276	6.991	6.48%	-1.13%
19811-013	5	131.9	123.1	140.8	108.2	158.7	4.322	23.68	17.94%	-23.75%
19811-014	4	81.38	72.48	90.27	68	117	4.348	23.82	29.27%	23.68%

Lolium perenne 28 Day | **EnviroSystems, Inc.**

Biomass-Above Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	2.618	3.53	6.142	1.576	2.244
19811-015	1.926	8.084	3.412	0.81	7.39
19811-002	1.706	2.824	1.786	9.634	1.866
19811-003	3.316	0.688	1.366	2.228	1.172
19811-004	5.704	2.384	1.462	0.83	0.112
19811-005	4.85	1.352	1.46	0.328	1.336
19811-009	0.898	0.728	0.422	6.098	4.126
19811-010	2.178	3.874	6.534	2.844	2.464
19811-013	3.514	5.49	4.782	7.136	5.144
19811-014	0.078	2.45	0.628	0.2	0.34

Biomass-Below Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	9.442	8.766	11.63	2.116	15.13
19811-015	1.682	14.13	2.452	1.526	24.18
19811-002	1.918	2.422	1.786	6.174	1.686
19811-003	3.016	1.752	1.652	9.892	1.224
19811-004	5.818	7.596	1.944	0.926	0.17
19811-005	5.018	2.718	1.686	0.546	1.028
19811-009	3.11	0.776	0.432	5.838	4.942
19811-010	5.776	19.28	6.546	5.762	5.19
19811-013	4.39	3.91	2.39	7.268	13.06
19811-014	-0.004004	3.748	2.41	0.648	0.412

Percent Survival Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	1	0.8	0.8	0.6	1
19811-015	0.4	1	0.4	0.2	0.8
19811-002	0.8	0.6	0.4	0.8	0.6
19811-003	0.8	0.6	0.6	0.6	0.4
19811-004	0.8	0.4	0.4	0.2	0.2
19811-005	1	0.8	0.6	0.2	0.2
19811-009	0.2	0.2	0.2	0.6	1
19811-010	0.6	1	1	0.8	0.8
19811-013	0.8	0.8	0.6	0.6	1
19811-014	0	0.6	0.4	0.2	0.2

Plant Height Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	85.6	124.5	153.5	86.7	82.8
19811-015	122	132.4	142.5	137	125.5
19811-002	77.8	106.7	104	132.8	94
19811-003	85	54.3	71.7	109.7	81
19811-004	135.3	95.5	96.5	77	53
19811-005	102.4	68.5	91.7	74	112
19811-009	134	170	75	123	108.6
19811-010	101.7	109	119.4	105	104
19811-013	115.5	121.3	156	158.7	108.2
19811-014		117	68.5	68	72

CETIS Summary Report

Report Date: 26 Jul-10 12:20 (p 1 of 1)
Test Code: 15-3234-5438/19811Lol

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Sample Code	Sample ID	Sample Date	Receive Date	Sample Age	Client Name	Project
19811-000	16-3877-0522	16 Jun-10 12:00	16 Jun-10 12:00	24h	Tetra Tech NUS	Ecological Risk Assessme
19811-015	01-2243-1399	10 Jun-10 20:35	12 Jun-10 11:00	6d 15h		
19811-002	17-6880-6936	09 Jun-10 11:15	11 Jun-10 10:00	8d 1h		
19811-003	18-3180-8748	09 Jun-10 15:15	11 Jun-10 10:00	7d 21h		
19811-004	00-2207-8607	09 Jun-10 17:05	11 Jun-10 10:00	7d 19h		
19811-005	03-5602-2744	09 Jun-10 14:45	11 Jun-10 10:00	7d 21h		
19811-009	09-3929-1612	10 Jun-10 09:45	11 Jun-10 10:00	7d 2h		
19811-010	06-3043-2289	10 Jun-10 15:30	12 Jun-10 11:00	6d 20h		
19811-013	11-7434-4542	10 Jun-10 17:15	12 Jun-10 11:00	6d 19h		
19811-014	20-8714-0719	11 Jun-10 09:30	12 Jun-10 11:00	6d 2h		

Sample Code	Material Type	Sample Source	Station Location	Latitude	Longitude
19811-000	Soil	Crane Indiana	Laboratory Control Sample; 1981		
19811-015	Soil	Crane Indiana	16 SS1160002; 19811-015		
19811-002	Soil	Crane Indiana	16 SS1010001; 19811-002		
19811-003	Soil	Crane Indiana	16 SS1020001; 19811-003		
19811-004	Soil	Crane Indiana	16 SS1030001; 19811-004		
19811-005	Soil	Crane Indiana	16 SS1040001; 19811-005		
19811-009	Soil	Crane Indiana	16 SS1090002; 19811-009		
19811-010	Soil	Crane Indiana	16 SS1060002; 19811-010		
19811-013	Soil	Crane Indiana	16 SS1120001; 19811-013		
19811-014	Soil	Crane Indiana	16 SS1140001; 19811-014		

Days to Germination Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	5.356	4.317	6.395	4	10.33	0.5081	2.783	51.96%	0.0%
19811-015	5	7.04	5.729	8.351	4.2	12	0.6412	3.512	49.88%	-31.44%
19811-002	5	8.866	7.344	10.39	5	15.75	0.7443	4.077	45.98%	-65.53%
19811-003	5	9.984	7.657	12.31	5	19.67	1.138	6.232	62.42%	-86.41%
19811-004	5	12.05	9.244	14.86	4.5	22	1.372	7.513	62.35%	-125.0%
19811-005	5	12.29	9.329	15.25	4	22	1.448	7.929	64.52%	-129.5%
19811-009	5	7.974	6.69	9.258	4.67	13	0.628	3.44	43.14%	-48.88%
19811-010	5	7.11	6.291	7.929	4.6	9.5	0.4005	2.194	30.86%	-32.75%
19811-013	5	5.402	4.598	6.206	4.33	9.25	0.3933	2.154	39.88%	-0.86%
19811-014	5	14.87	11.17	18.56	0	22	1.805	9.888	66.51%	-177.6%

Days to Germination Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	4.2	4	4	10.33	4.25
19811-015	9.5	4.2	5	12	4.5
19811-002	15.75	8.33	5	8.25	7
19811-003	5.25	19.67	5	7.33	12.67
19811-004	4.75	13	4.5	16	22
19811-005	4.2	16.25	15	22	4
19811-009	10	13	6	4.67	6.2
19811-010	9.5	5.2	4.6	9	7.25
19811-013	4.5	9.25	4.33	4.33	4.6
19811-014	0	9.33	22	22	21

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	07-7190-5131	**Endpoint:**	Percent Survival	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:49	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					59.4%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-014	1.565	1.86	0.3326	0.0781	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.196	0.196	1	2.45	0.1562	Non-Significant Effect
Error	0.64	0.08	8			
Total	0.836	0.276	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.077	23.15	0.4964	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9421		0.5761	Normal Distribution

Percent Survival Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	0.56	0.435	0.685	0.2	1	0.06103	0.3286	58.68%	0.0%
19811-014	5	0.28	0.1933	0.3667	0	0.6	0.04235	0.228	81.44%	50.0%

Percent Survival Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	0.4	1	0.4	0.2	0.8
19811-014	0	0.6	0.4	0.2	0.2

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	11-0591-8306	**Endpoint:**	Percent Survival	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:49	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					54.77%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-013	-1.213	1.86	0.3067	0.8701	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.1	0.1	1	1.471	0.2598	Non-Significant Effect
Error	0.544	0.068	8			
Total	0.6440001	0.168	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	3.857	23.15	0.2194	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9237		0.3890	Normal Distribution

Percent Survival Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	0.56	0.435	0.685	0.2	1	0.06103	0.3286	58.68%	0.0%
19811-013	5	0.76	0.6964	0.8236	0.6	1	0.03107	0.1673	22.02%	-35.71%

Percent Survival Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	0.4	1	0.4	0.2	0.8
19811-013	0.8	0.8	0.6	0.6	1

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	14-2229-2775	**Endpoint:**	Percent Survival	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:49	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					54.77%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-010	-1.698	1.86	0.3067	0.9360	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.196	0.196	1	2.882	0.1280	Non-Significant Effect
Error	0.544	0.068	8			
Total	0.74	0.264	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	3.857	23.15	0.2194	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9656		0.8472	Normal Distribution

Percent Survival Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	0.56	0.435	0.685	0.2	1	0.06103	0.3286	58.68%	0.0%
19811-010	5	0.84	0.7764	0.9036	0.6	1	0.03107	0.1673	19.92%	-50.0%

Percent Survival Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	0.4	1	0.4	0.2	0.8
19811-010	0.6	1	1	0.8	0.8

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	02-8641-6591	**Endpoint:**	Percent Survival	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:49	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					72.14%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-009	0.5523	1.86	0.404	0.2979	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.036	0.036	1	0.3051	0.5958	Non-Significant Effect
Error	0.944	0.118	8			
Total	0.98	0.154	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.185	23.15	0.8732	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8648		0.0869	Normal Distribution

Percent Survival Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	0.56	0.435	0.685	0.2	1	0.06103	0.3286	58.68%	0.0%
19811-009	5	0.44	0.3039	0.5761	0.2	1	0.06644	0.3578	81.31%	21.43%

Percent Survival Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	0.4	1	0.4	0.2	0.8
19811-009	0.2	0.2	0.2	0.6	1

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	00-0978-5680	**Endpoint:**	Percent Survival	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:49	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					72.14%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-005	0	1.86	0.404	0.5000	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	4.440892E-16	4.440892E-16	1	3.763E-15	1.0000	Non-Significant Effect
Error	0.944	0.118	8			
Total	0.944	0.118	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.185	23.15	0.8732	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8732		0.1088	Normal Distribution

Percent Survival Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	0.56	0.435	0.685	0.2	1	0.06103	0.3286	58.68%	0.0%
19811-005	5	0.56	0.4239	0.6961	0.2	1	0.06644	0.3578	63.89%	0.0%

Percent Survival Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	0.4	1	0.4	0.2	0.8
19811-005	1	0.8	0.6	0.2	0.2

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	20-4752-9956	**Endpoint:**	Percent Survival	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:49	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					60.87%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-004	0.8729	1.86	0.3409	0.2041	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.064	0.064	1	0.7619	0.4082	Non-Significant Effect
Error	0.672	0.084	8			
Total	0.736	0.148	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.8	23.15	0.5831	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8978		0.2071	Normal Distribution

Percent Survival Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	0.56	0.435	0.685	0.2	1	0.06103	0.3286	58.68%	0.0%
19811-004	5	0.4	0.3068	0.4932	0.2	0.8	0.04549	0.2449	61.24%	28.57%

Percent Survival Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	0.4	1	0.4	0.2	0.8
19811-004	0.8	0.4	0.4	0.2	0.2

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	16-7980-2645	**Endpoint:**	Percent Survival	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:48	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					53.13%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-003	-0.25	1.86	0.2975	0.5956	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.004	0.004	1	0.0625	0.8089	Non-Significant Effect
Error	0.512	0.064	8			
Total	0.516	0.068	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	5.4	23.15	0.1312	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9585		0.7684	Normal Distribution

Percent Survival Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	0.56	0.435	0.685	0.2	1	0.06103	0.3286	58.68%	0.0%
19811-003	5	0.6	0.5462	0.6538	0.4	0.8	0.02626	0.1414	23.57%	-7.14%

Percent Survival Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	0.4	1	0.4	0.2	0.8
19811-003	0.8	0.6	0.6	0.6	0.4

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	18-0213-6448	**Endpoint:**	Percent Survival	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:48	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					54.77%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-002	-0.4851	1.86	0.3067	0.6797	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.016	0.016	1	0.2353	0.6406	Non-Significant Effect
Error	0.544	0.068	8			
Total	0.56	0.08400001	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	3.857	23.15	0.2194	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9656		0.8472	Normal Distribution

Percent Survival Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	0.56	0.435	0.685	0.2	1	0.06103	0.3286	58.68%	0.0%
19811-002	5	0.64	0.5764	0.7036	0.4	0.8	0.03107	0.1673	26.15%	-14.29%

Percent Survival Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	0.4	1	0.4	0.2	0.8
19811-002	0.8	0.6	0.4	0.8	0.6

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	19-2532-0440	**Endpoint:**	Percent Survival	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:48	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					28.0%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-014	4.427	1.86	0.2352	0.0011	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.784	0.784	1	19.6	0.0022	Significant Effect
Error	0.32	0.04	8			
Total	1.104	0.824	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.857	23.15	0.5635	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9516		0.6872	Normal Distribution

Percent Survival Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	0.84	0.7764	0.9036	0.6	1	0.03107	0.1673	19.92%	0.0%
19811-014	5	0.28	0.1933	0.3667	0	0.6	0.04235	0.228	81.44%	66.67%

Percent Survival Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	1	0.8	0.8	0.6	1
19811-014	0	0.6	0.4	0.2	0.2

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	20-2118-7434	**Endpoint:**	Percent Survival	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:48	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					23.43%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-013	0.7559	1.86	0.1968	0.2357	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.016	0.016	1	0.5714	0.4714	Non-Significant Effect
Error	0.224	0.028	8			
Total	0.24	0.044	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1	23.15	1.0000	Equal Variances
Distribution	Shapiro-Wilk Normality	0.954		0.7160	Normal Distribution

Percent Survival Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	0.84	0.7764	0.9036	0.6	1	0.03107	0.1673	19.92%	0.0%
19811-013	5	0.76	0.6964	0.8236	0.6	1	0.03107	0.1673	22.02%	9.52%

Percent Survival Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	1	0.8	0.8	0.6	1
19811-013	0.8	0.8	0.6	0.6	1

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	12-2701-3342	**Endpoint:**	Percent Survival	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:48	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					23.43%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-010	0	1.86	0.1968	0.5000	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0	0	1	0	1.0000	Non-Significant Effect
Error	0.224	0.028	8			
Total	0.224	0.028	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1	23.15	1.0000	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8197		0.0251	Normal Distribution

Percent Survival Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	0.84	0.7764	0.9036	0.6	1	0.03107	0.1673	19.92%	0.0%
19811-010	5	0.84	0.7764	0.9036	0.6	1	0.03107	0.1673	19.92%	0.0%

Percent Survival Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	1	0.8	0.8	0.6	1
19811-010	0.6	1	1	0.8	0.8

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	20-9600-0976	**Endpoint:**	Percent Survival	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:48	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					39.1%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-009	2.265	1.86	0.3285	0.0267	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.4	0.4	1	5.128	0.0533	Non-Significant Effect
Error	0.624	0.078	8			
Total	1.024	0.478	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	4.571	23.15	0.1702	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8433		0.0483	Normal Distribution

Percent Survival Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	0.84	0.7764	0.9036	0.6	1	0.03107	0.1673	19.92%	0.0%
19811-009	5	0.44	0.3039	0.5761	0.2	1	0.06644	0.3578	81.31%	47.62%

Percent Survival Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	1	0.8	0.8	0.6	1
19811-009	0.2	0.2	0.2	0.6	1

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	18-3310-2114	**Endpoint:**	Percent Survival	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:48	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					39.1%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-005	1.585	1.86	0.3285	0.0758	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.196	0.196	1	2.513	0.1516	Non-Significant Effect
Error	0.624	0.078	8			
Total	0.82	0.274	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	4.571	23.15	0.1702	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9498		0.6663	Normal Distribution

Percent Survival Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	0.84	0.7764	0.9036	0.6	1	0.03107	0.1673	19.92%	0.0%
19811-005	5	0.56	0.4239	0.6961	0.2	1	0.06644	0.3578	63.89%	33.33%

Percent Survival Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	1	0.8	0.8	0.6	1
19811-005	1	0.8	0.6	0.2	0.2

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	03-7699-9392	**Endpoint:**	Percent Survival	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:48	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					29.37%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-004	3.317	1.86	0.2467	0.0053	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.484	0.484	1	11	0.0106	Significant Effect
Error	0.352	0.044	8			
Total	0.836	0.528	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.143	23.15	0.4786	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9207		0.3629	Normal Distribution

Percent Survival Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	0.84	0.7764	0.9036	0.6	1	0.03107	0.1673	19.92%	0.0%
19811-004	5	0.4	0.3068	0.4932	0.2	0.8	0.04549	0.2449	61.24%	52.38%

Percent Survival Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	1	0.8	0.8	0.6	1
19811-004	0.8	0.4	0.4	0.2	0.2

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	01-2396-6227	**Endpoint:**	Percent Survival	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:48	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					21.69%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-003	2.449	1.86	0.1822	0.0200	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.144	0.144	1	6	0.0400	Significant Effect
Error	0.192	0.024	8			
Total	0.336	0.168	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.4	23.15	0.7523	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9128		0.3010	Normal Distribution

Percent Survival Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	0.84	0.7764	0.9036	0.6	1	0.03107	0.1673	19.92%	0.0%
19811-003	5	0.6	0.5462	0.6538	0.4	0.8	0.02626	0.1414	23.57%	28.57%

Percent Survival Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	1	0.8	0.8	0.6	1
19811-003	0.8	0.6	0.6	0.6	0.4

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	02-6368-1223	**Endpoint:**	Percent Survival	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:47	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					23.43%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-002	1.89	1.86	0.1968	0.0477	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.1	0.1	1	3.571	0.0955	Non-Significant Effect
Error	0.224	0.028	8			
Total	0.324	0.128	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1	23.15	1.0000	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8197		0.0251	Normal Distribution

Percent Survival Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	0.84	0.7764	0.9036	0.6	1	0.03107	0.1673	19.92%	0.0%
19811-002	5	0.64	0.5764	0.7036	0.4	0.8	0.03107	0.1673	26.15%	23.81%

Percent Survival Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	1	0.8	0.8	0.6	1
19811-002	0.8	0.6	0.4	0.8	0.6

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	03-5443-7925	**Endpoint:**	Percent Survival	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:47	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					36.51%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-015	1.698	1.86	0.3067	0.0640	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.196	0.196	1	2.882	0.1280	Non-Significant Effect
Error	0.544	0.068	8			
Total	0.74	0.264	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	3.857	23.15	0.2194	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9656		0.8472	Normal Distribution

Percent Survival Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	0.84	0.7764	0.9036	0.6	1	0.03107	0.1673	19.92%	0.0%
19811-015	5	0.56	0.435	0.685	0.2	1	0.06103	0.3286	58.68%	33.33%

Percent Survival Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	1	0.8	0.8	0.6	1
19811-015	0.4	1	0.4	0.2	0.8

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	03-2181-7856	**Endpoint:**	Days to Germination	**CETIS Version:**	CETISv1.7.0
Analyzed:	26 Jul-10 12:18	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C < T	Not Run					123.9%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-014	1.668	1.86	8.726	0.0670	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	2.125	2.29	0.1309	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	153.1157	153.1157	1	2.781	0.1339	Non-Significant Effect
Error	440.3911	55.04889	8			
Total	593.5068	208.1646	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	7.927	23.15	0.0697	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8915		0.1764	Normal Distribution

Days to Germination Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	7.04	5.704	8.376	4.2	12	0.6521	3.512	49.88%	0.0%
19811-014	5	14.87	11.1	18.63	0	22	1.836	9.888	66.51%	-111.2%

Days to Germination Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	9.5	4.2	5	12	4.5
19811-014	0	9.33	22	22	21

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	04-5802-3838	**Endpoint:**	Days to Germination	**CETIS Version:**	CETISv1.7.0
Analyzed:	26 Jul-10 12:18	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C < T	Not Run					48.67%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-013	-0.889	1.86	3.426	0.8000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.806	2.29	0.4877	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	6.70761	6.70761	1	0.7904	0.3999	Non-Significant Effect
Error	67.89428	8.486785	8			
Total	74.60189	15.1944	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.658	23.15	0.3667	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8465		0.0527	Normal Distribution

Days to Germination Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	7.04	5.704	8.376	4.2	12	0.6521	3.512	49.88%	0.0%
19811-013	5	5.402	4.583	6.221	4.33	9.25	0.4	2.154	39.88%	23.27%

Days to Germination Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	9.5	4.2	5	12	4.5
19811-013	4.5	9.25	4.33	4.33	4.6

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	10-6926-7531	**Endpoint:**	Days to Germination	**CETIS Version:**	CETISv1.7.0
Analyzed:	26 Jul-10 12:18	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C < T	Not Run					48.91%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-010	0.0378	1.86	3.444	0.4854	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.797	2.29	0.5027	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.01224999	0.01224999	1	0.001429	0.9708	Non-Significant Effect
Error	68.584	8.573	8			
Total	68.59625	8.58525	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.562	23.15	0.3843	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8723		0.1064	Normal Distribution

Days to Germination Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	7.04	5.704	8.376	4.2	12	0.6521	3.512	49.88%	0.0%
19811-010	5	7.11	6.276	7.944	4.6	9.5	0.4074	2.194	30.86%	-0.99%

Days to Germination Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	9.5	4.2	5	12	4.5
19811-010	9.5	5.2	4.6	9	7.25

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	07-0964-8482	**Endpoint:**	Days to Germination	**CETIS Version:**	CETISv1.7.0
Analyzed:	26 Jul-10 12:18	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C < T	Not Run					58.07%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-009	0.4249	1.86	4.088	0.3411	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.534	2.29	1.0000	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	2.18089	2.18089	1	0.1805	0.6821	Non-Significant Effect
Error	96.65752	12.08219	8			
Total	98.83842	14.26308	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.042	23.15	0.9689	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8239		0.0283	Normal Distribution

Days to Germination Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	7.04	5.704	8.376	4.2	12	0.6521	3.512	49.88%	0.0%
19811-009	5	7.974	6.666	9.282	4.67	13	0.6387	3.44	43.14%	-13.27%

Days to Germination Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	9.5	4.2	5	12	4.5
19811-009	10	13	6	4.67	6.2

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	09-4883-7764	**Endpoint:**	Days to Germination	**CETIS Version:**	CETISv1.7.0
Analyzed:	26 Jul-10 12:18	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C < T	Not Run					102.4%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-005	1.354	1.86	7.212	0.1064	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.68	2.29	0.7250	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	68.90625	68.90625	1	1.833	0.2128	Non-Significant Effect
Error	300.814	37.60175	8			
Total	369.7202	106.508	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	5.098	23.15	0.1437	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9497		0.6655	Normal Distribution

Days to Germination Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	7.04	5.704	8.376	4.2	12	0.6521	3.512	49.88%	0.0%
19811-005	5	12.29	9.274	15.31	4	22	1.472	7.929	64.52%	-74.57%

Days to Germination Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	9.5	4.2	5	12	4.5
19811-005	4.2	16.25	15	22	4

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	00-6323-7428	**Endpoint:**	Days to Germination	**CETIS Version:**	CETISv1.7.0
Analyzed:	26 Jul-10 12:18	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C < T	Not Run					97.97%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-004	1.351	1.86	6.897	0.1069	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.8	2.29	0.4980	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	62.75025	62.75025	1	1.825	0.2137	Non-Significant Effect
Error	275.132	34.3915	8			
Total	337.8822	97.14175	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	4.577	23.15	0.1698	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9612		0.7999	Normal Distribution

Days to Germination Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	7.04	5.704	8.376	4.2	12	0.6521	3.512	49.88%	0.0%
19811-004	5	12.05	9.192	14.91	4.5	22	1.395	7.513	62.35%	-71.16%

Days to Germination Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	9.5	4.2	5	12	4.5
19811-004	4.75	13	4.5	16	22

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	06-4497-2957	**Endpoint:**	Days to Germination	**CETIS Version:**	CETISv1.7.0
Analyzed:	26 Jul-10 12:18	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C < T	Not Run					84.5%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-003	0.9203	1.86	5.949	0.1922	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	2.031	2.29	0.2045	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	21.66784	21.66784	1	0.847	0.3843	Non-Significant Effect
Error	204.6599	25.58249	8			
Total	226.3278	47.25033	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	3.149	23.15	0.2926	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8823		0.1388	Normal Distribution

Days to Germination Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	7.04	5.704	8.376	4.2	12	0.6521	3.512	49.88%	0.0%
19811-003	5	9.984	7.614	12.35	5	19.67	1.157	6.232	62.42%	-41.82%

Days to Germination Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	9.5	4.2	5	12	4.5
19811-003	5.25	19.67	5	7.33	12.67

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	15-3614-5661	**Endpoint:**	Days to Germination	**CETIS Version:**	CETISv1.7.0
Analyzed:	26 Jul-10 12:18	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C < T	Not Run					63.56%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-002	0.7588	1.86	4.475	0.2349	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.919	2.29	0.3249	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	8.33569	8.33569	1	0.5758	0.4697	Non-Significant Effect
Error	115.8161	14.47702	8			
Total	124.1518	22.81271	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.348	23.15	0.7795	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8703		0.1009	Normal Distribution

Days to Germination Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	7.04	5.704	8.376	4.2	12	0.6521	3.512	49.88%	0.0%
19811-002	5	8.866	7.315	10.42	5	15.75	0.7571	4.077	45.98%	-25.94%

Days to Germination Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	9.5	4.2	5	12	4.5
19811-002	15.75	8.33	5	8.25	7

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	17-7617-8306	**Endpoint:**	Days to Germination	**CETIS Version:**	CETISv1.7.0
Analyzed:	26 Jul-10 12:18	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C < T	Not Run					159.5%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-014	2.07	1.86	8.542	0.0361	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	2.171	2.29	0.1029	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	226.1003	226.1003	1	4.286	0.0722	Non-Significant Effect
Error	422.0368	52.7546	8			
Total	648.1371	278.8549	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	12.62	23.15	0.0307	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8712		0.1031	Normal Distribution

Days to Germination Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	5.356	4.297	6.415	4	10.33	0.5168	2.783	51.96%	0.0%
19811-014	5	14.87	11.1	18.63	0	22	1.836	9.888	66.51%	-177.6%

Days to Germination Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	4.2	4	4	10.33	4.25
19811-014	0	9.33	22	22	21

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	01-6210-7330	**Endpoint:**	Days to Germination	**CETIS Version:**	CETISv1.7.0
Analyzed:	26 Jul-10 12:18	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C < T	Not Run					54.64%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
19811-000		19811-013	20		0	0.0754	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	2.12	2.29	0.1343	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.005290001	0.005290001	1	0.0008543	0.9774	Non-Significant Effect
Error	49.54	6.1925	8			
Total	49.54529	6.19779	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.669	23.15	0.6319	Equal Variances
Distribution	Shapiro-Wilk Normality	0.5984		<0.0001	Non-normal Distribution

Days to Germination Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	5.356	4.297	6.415	4	10.33	0.5168	2.783	51.96%	0.0%
19811-013	5	5.402	4.583	6.221	4.33	9.25	0.4	2.154	39.88%	-0.86%

Days to Germination Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	4.2	4	4	10.33	4.25
19811-013	4.5	9.25	4.33	4.33	4.6

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	07-6217-2840	**Endpoint:**	Days to Germination	**CETIS Version:**	CETISv1.7.0
Analyzed:	26 Jul-10 12:18	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C < T	Not Run					55.02%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-010	1.107	1.86	2.947	0.1503	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	2.105	2.29	0.1445	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	7.69129	7.69129	1	1.225	0.3006	Non-Significant Effect
Error	50.22972	6.278715	8			
Total	57.92101	13.97001	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.609	23.15	0.6562	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8645		0.0862	Normal Distribution

Days to Germination Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	5.356	4.297	6.415	4	10.33	0.5168	2.783	51.96%	0.0%
19811-010	5	7.11	6.276	7.944	4.6	9.5	0.4074	2.194	30.86%	-32.75%

Days to Germination Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	4.2	4	4	10.33	4.25
19811-010	9.5	5.2	4.6	9	7.25

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	09-2326-0483	**Endpoint:**	Days to Germination	**CETIS Version:**	CETISv1.7.0
Analyzed:	26 Jul-10 12:17	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C < T	Not Run					68.7%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-009	1.323	1.86	3.679	0.1112	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.704	2.29	0.6743	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	17.13481	17.13481	1	1.751	0.2224	Non-Significant Effect
Error	78.30324	9.787905	8			
Total	95.43805	26.92271	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.528	23.15	0.6914	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8007		0.0148	Normal Distribution

Days to Germination Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	5.356	4.297	6.415	4	10.33	0.5168	2.783	51.96%	0.0%
19811-009	5	7.974	6.666	9.282	4.67	13	0.6387	3.44	43.14%	-48.88%

Days to Germination Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	4.2	4	4	10.33	4.25
19811-009	10	13	6	4.67	6.2

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	07-9697-9807	**Endpoint:**	Days to Germination	**CETIS Version:**	CETISv1.7.0
Analyzed:	26 Jul-10 12:17	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C < T	Not Run					130.5%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-005	1.845	1.86	6.988	0.0511	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.733	2.29	0.6166	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	120.2009	120.2009	1	3.404	0.1022	Non-Significant Effect
Error	282.4597	35.30746	8			
Total	402.6606	155.5084	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	8.118	23.15	0.0669	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9366		0.5161	Normal Distribution

Days to Germination Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	5.356	4.297	6.415	4	10.33	0.5168	2.783	51.96%	0.0%
19811-005	5	12.29	9.274	15.31	4	22	1.472	7.929	64.52%	-129.5%

Days to Germination Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	4.2	4	4	10.33	4.25
19811-005	4.2	16.25	15	22	4

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	03-4959-9358	**Endpoint:**	Days to Germination	**CETIS Version:**	CETISv1.7.0
Analyzed:	26 Jul-10 12:17	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C < T	Not Run					124.4%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-004	1.868	1.86	6.663	0.0493	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.863	2.29	0.4002	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	112.0241	112.0241	1	3.49	0.0987	Non-Significant Effect
Error	256.7777	32.09721	8			
Total	368.8018	144.1213	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	7.289	23.15	0.0803	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9357		0.5059	Normal Distribution

Days to Germination Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	5.356	4.297	6.415	4	10.33	0.5168	2.783	51.96%	0.0%
19811-004	5	12.05	9.192	14.91	4.5	22	1.395	7.513	62.35%	-125.0%

Days to Germination Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	4.2	4	4	10.33	4.25
19811-004	4.75	13	4.5	16	22

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	01-6861-2955	**Endpoint:**	Days to Germination	**CETIS Version:**	CETISv1.7.0
Analyzed:	26 Jul-10 12:17	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C < T	Not Run					106.0%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-003	1.516	1.86	5.676	0.0840	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	2.129	2.29	0.1285	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	53.54596	53.54596	1	2.299	0.1679	Non-Significant Effect
Error	186.3056	23.28821	8			
Total	239.8516	76.83417	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	5.014	23.15	0.1475	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8785		0.1254	Normal Distribution

Days to Germination Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	5.356	4.297	6.415	4	10.33	0.5168	2.783	51.96%	0.0%
19811-003	5	9.984	7.614	12.35	5	19.67	1.157	6.232	62.42%	-86.41%

Days to Germination Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	4.2	4	4	10.33	4.25
19811-003	5.25	19.67	5	7.33	12.67

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	00-5325-5759	**Endpoint:**	Days to Germination	**CETIS Version:**	CETISv1.7.0
Analyzed:	26 Jul-10 12:17	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C < T	Not Run					76.64%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
19811-000		19811-002	19		0	0.0476	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	2.092	2.29	0.1544	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	30.80025	30.80025	1	2.528	0.1505	Non-Significant Effect
Error	97.46184	12.18273	8			
Total	128.2621	42.98298	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.146	23.15	0.4777	Equal Variances
Distribution	Shapiro-Wilk Normality	0.7742		0.0070	Non-normal Distribution

Days to Germination Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	5.356	4.297	6.415	4	10.33	0.5168	2.783	51.96%	0.0%
19811-002	5	8.866	7.315	10.42	5	15.75	0.7571	4.077	45.98%	-65.53%

Days to Germination Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	4.2	4	4	10.33	4.25
19811-002	15.75	8.33	5	8.25	7

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	11-8335-0726	**Endpoint:**	Days to Germination	**CETIS Version:**	CETISv1.7.0
Analyzed:	26 Jul-10 12:17	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C < T	Not Run					69.57%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-015	0.8404	1.86	3.726	0.2126	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	1.665	2.29	0.7562	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	7.08964	7.08964	1	0.7062	0.4251	Non-Significant Effect
Error	80.30972	10.03872	8			
Total	87.39936	17.12836	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.592	23.15	0.6632	Equal Variances
Distribution	Shapiro-Wilk Normality	0.7877		0.0103	Normal Distribution

Days to Germination Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	5.356	4.297	6.415	4	10.33	0.5168	2.783	51.96%	0.0%
19811-015	5	7.04	5.704	8.376	4.2	12	0.6521	3.512	49.88%	-31.44%

Days to Germination Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	4.2	4	4	10.33	4.25
19811-015	9.5	4.2	5	12	4.5

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	09-8677-1693	**Endpoint:**	Plant Height	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:52	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					16.2%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-014	4.477	1.895	21.37	0.0014	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	5668.344	5668.344	1	20.05	0.0029	Significant Effect
Error	1979.276	282.7536	7			
Total	7647.62	5951.098	8			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	8.174	24.26	0.0702	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8237		0.0379	Normal Distribution

Plant Height Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	131.9	128.7	135	122	142.5	1.547	8.33	6.32%	0.0%
19811-014	4	81.38	72.32	90.43	68	117	4.423	23.82	29.27%	38.3%

Plant Height Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	122	132.4	142.5	137	125.5
19811-014	117	68.5	68	72	

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	19-1884-9986	**Endpoint:**	Plant Height	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:52	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					15.83%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-013	-0.005346	1.86	20.87	0.5021	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.009000183	0.009000183	1	2.858E-05	0.9959	Non-Significant Effect
Error	2519.64	314.955	8			
Total	2519.649	314.964	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	8.077	23.15	0.0675	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9518		0.6899	Normal Distribution

Plant Height Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	131.9	128.7	135	122	142.5	1.547	8.33	6.32%	0.0%
19811-013	5	131.9	122.9	140.9	108.2	158.7	4.396	23.68	17.94%	-0.05%

Plant Height Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	122	132.4	142.5	137	125.5
19811-013	115.5	121.3	156	158.7	108.2

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	15-2285-1360	**Endpoint:**	Plant Height	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:51	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					6.86%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-010	4.947	1.86	9.044	0.0006	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	1447.209	1447.209	1	24.47	0.0011	Significant Effect
Error	473.0761	59.13451	8			
Total	1920.285	1506.343	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.42	23.15	0.7423	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9377		0.5274	Normal Distribution

Plant Height Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	131.9	128.7	135	122	142.5	1.547	8.33	6.32%	0.0%
19811-010	5	107.8	105.2	110.5	101.7	119.4	1.298	6.991	6.48%	18.24%

Plant Height Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	122	132.4	142.5	137	125.5
19811-010	101.7	109	119.4	105	104

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	09-4210-3375	**Endpoint:**	Plant Height	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:51	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					22.55%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-009	0.6103	1.86	29.74	0.2793	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	238.144	238.144	1	0.3725	0.5586	Non-Significant Effect
Error	5115.076	639.3845	8			
Total	5353.22	877.5284	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	17.43	23.15	0.0170	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9221		0.3752	Normal Distribution

Plant Height Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	131.9	128.7	135	122	142.5	1.547	8.33	6.32%	0.0%
19811-009	5	122.1	108.9	135.3	75	170	6.458	34.78	28.48%	7.4%

Plant Height Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	122	132.4	142.5	137	125.5
19811-009	134	170	75	123	108.6

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	16-7803-0683	**Endpoint:**	Plant Height	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:51	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					12.75%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-005	4.661	1.86	16.82	0.0008	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	4443.664	4443.664	1	21.73	0.0016	Significant Effect
Error	1636.096	204.512	8			
Total	6079.76	4648.176	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	4.894	23.15	0.1532	Equal Variances
Distribution	Shapiro-Wilk Normality	0.986		0.9891	Normal Distribution

Plant Height Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	131.9	128.7	135	122	142.5	1.547	8.33	6.32%	0.0%
19811-005	5	89.72	82.71	96.73	68.5	112	3.422	18.43	20.54%	31.97%

Plant Height Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	122	132.4	142.5	137	125.5
19811-005	102.4	68.5	91.7	74	112

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	09-2827-9948	**Endpoint:**	Plant Height	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:51	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					19.76%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-004	2.884	1.86	26.07	0.0102	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	4084.441	4084.441	1	8.315	0.0204	Significant Effect
Error	3929.52	491.19	8			
Total	8013.961	4575.631	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	13.16	23.15	0.0285	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9231		0.3831	Normal Distribution

Plant Height Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	131.9	128.7	135	122	142.5	1.547	8.33	6.32%	0.0%
19811-004	5	91.46	79.97	103	53	135.3	5.611	30.22	33.04%	30.65%

Plant Height Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	122	132.4	142.5	137	125.5
19811-004	135.3	95.5	96.5	77	53

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	20-2870-6754	**Endpoint:**	Plant Height	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:51	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					13.8%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-003	5.268	1.86	18.19	0.0004	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	6640.929	6640.929	1	27.75	0.0008	Significant Effect
Error	1914.48	239.31	8			
Total	8555.409	6880.239	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	5.897	23.15	0.1139	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9585		0.7692	Normal Distribution

Plant Height Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	131.9	128.7	135	122	142.5	1.547	8.33	6.32%	0.0%
19811-003	5	80.34	72.65	88.03	54.3	109.7	3.756	20.23	25.18%	39.08%

Plant Height Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	122	132.4	142.5	137	125.5
19811-003	85	54.3	71.7	109.7	81

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	16-3170-6584	**Endpoint:**	Plant Height	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:51	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					13.73%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-002	2.96	1.86	18.11	0.0091	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	2076.481	2076.481	1	8.76	0.0182	Significant Effect
Error	1896.34	237.0425	8			
Total	3972.821	2313.523	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	5.831	23.15	0.1160	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9563		0.7430	Normal Distribution

Plant Height Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	131.9	128.7	135	122	142.5	1.547	8.33	6.32%	0.0%
19811-002	5	103.1	95.41	110.7	77.8	132.8	3.736	20.12	19.52%	21.85%

Plant Height Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	122	132.4	142.5	137	125.5
19811-002	77.8	106.7	104	132.8	94

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	04-6163-7530	**Endpoint:**	Plant Height	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:51	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					33.79%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-014	1.328	1.895	36.03	0.1130	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	1416.245	1416.245	1	1.762	0.2260	Non-Significant Effect
Error	5625.156	803.5936	7			
Total	7041.4	2219.838	8			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.729	46.19	0.6809	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8186		0.0332	Normal Distribution

Plant Height Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	106.6	94.71	118.5	82.8	153.5	5.816	31.32	29.37%	0.0%
19811-014	4	81.38	72.32	90.43	68	117	4.423	23.82	29.27%	23.68%

Plant Height Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	85.6	124.5	153.5	86.7	82.8
19811-014	117	68.5	68	72	

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	13-3247-2396	**Endpoint:**	Plant Height	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:51	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					30.62%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-013	-1.442	1.86	32.65	0.9064	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	1602.756	1602.756	1	2.08	0.1873	Non-Significant Effect
Error	6165.52	770.69	8			
Total	7768.276	2373.446	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.75	23.15	0.6011	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8341		0.0375	Normal Distribution

Plant Height Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	106.6	94.71	118.5	82.8	153.5	5.816	31.32	29.37%	0.0%
19811-013	5	131.9	122.9	140.9	108.2	158.7	4.396	23.68	17.94%	-23.75%

Plant Height Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	85.6	124.5	153.5	86.7	82.8
19811-013	115.5	121.3	156	158.7	108.2

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	18-6349-7538	**Endpoint:**	Plant Height	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:50	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					25.03%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-010	-0.08362	1.86	26.69	0.5323	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	3.6	3.6	1	0.006992	0.9354	Non-Significant Effect
Error	4118.956	514.8695	8			
Total	4122.556	518.4695	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	20.07	23.15	0.0131	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9048		0.2470	Normal Distribution

Plant Height Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	106.6	94.71	118.5	82.8	153.5	5.816	31.32	29.37%	0.0%
19811-010	5	107.8	105.2	110.5	101.7	119.4	1.298	6.991	6.48%	-1.13%

Plant Height Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	85.6	124.5	153.5	86.7	82.8
19811-010	101.7	109	119.4	105	104

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	10-7017-6369	**Endpoint:**	Plant Height	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:50	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					36.5%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-009	-0.7406	1.86	38.92	0.7599	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	600.625	600.625	1	0.5485	0.4801	Non-Significant Effect
Error	8760.956	1095.12	8			
Total	9361.581	1695.745	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.233	23.15	0.8441	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9365		0.5152	Normal Distribution

Plant Height Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	106.6	94.71	118.5	82.8	153.5	5.816	31.32	29.37%	0.0%
19811-009	5	122.1	108.9	135.3	75	170	6.458	34.78	28.48%	-14.54%

Plant Height Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	85.6	124.5	153.5	86.7	82.8
19811-009	134	170	75	123	108.6

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	06-3018-4294	**Endpoint:**	Plant Height	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:50	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					28.34%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-005	1.04	1.86	30.22	0.1644	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	714.025	714.025	1	1.081	0.3288	Non-Significant Effect
Error	5281.976	660.247	8			
Total	5996.001	1374.272	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.888	23.15	0.3288	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8734		0.1096	Normal Distribution

Plant Height Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	106.6	94.71	118.5	82.8	153.5	5.816	31.32	29.37%	0.0%
19811-005	5	89.72	82.71	96.73	68.5	112	3.422	18.43	20.54%	15.85%

Plant Height Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	85.6	124.5	153.5	86.7	82.8
19811-005	102.4	68.5	91.7	74	112

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	08-5709-5135	**Endpoint:**	Plant Height	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:50	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					33.94%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-004	0.779	1.86	36.19	0.2292	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	574.5639	574.5639	1	0.6068	0.4584	Non-Significant Effect
Error	7575.4	946.925	8			
Total	8149.964	1521.489	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.074	23.15	0.9463	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9174		0.3356	Normal Distribution

Plant Height Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	106.6	94.71	118.5	82.8	153.5	5.816	31.32	29.37%	0.0%
19811-004	5	91.46	79.97	103	53	135.3	5.611	30.22	33.04%	14.22%

Plant Height Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	85.6	124.5	153.5	86.7	82.8
19811-004	135.3	95.5	96.5	77	53

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	02-5270-3192	**Endpoint:**	Plant Height	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:50	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					29.08%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-003	1.576	1.86	31.01	0.0768	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	1726.596	1726.596	1	2.484	0.1536	Non-Significant Effect
Error	5560.36	695.045	8			
Total	7286.956	2421.641	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.397	23.15	0.4179	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9081		0.2682	Normal Distribution

Plant Height Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	106.6	94.71	118.5	82.8	153.5	5.816	31.32	29.37%	0.0%
19811-003	5	80.34	72.65	88.03	54.3	109.7	3.756	20.23	25.18%	24.65%

Plant Height Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	85.6	124.5	153.5	86.7	82.8
19811-003	85	54.3	71.7	109.7	81

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	10-5267-6087	**Endpoint:**	Plant Height	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:50	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					29.03%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-002	0.2139	1.86	30.96	0.4180	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	31.68398	31.68398	1	0.04573	0.8360	Non-Significant Effect
Error	5542.22	692.7775	8			
Total	5573.904	724.4615	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.424	23.15	0.4122	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9003		0.2210	Normal Distribution

Plant Height Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	106.6	94.71	118.5	82.8	153.5	5.816	31.32	29.37%	0.0%
19811-002	5	103.1	95.41	110.7	77.8	132.8	3.736	20.12	19.52%	3.34%

Plant Height Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	85.6	124.5	153.5	86.7	82.8
19811-002	77.8	106.7	104	132.8	94

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	13-4359-8828	**Endpoint:**	Plant Height	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:49	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					25.28%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-015	-1.743	1.86	26.95	0.9402	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	1595.169	1595.169	1	3.038	0.1195	Non-Significant Effect
Error	4201.056	525.132	8			
Total	5796.225	2120.301	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	14.13	23.15	0.0250	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9157		0.3224	Normal Distribution

Plant Height Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	106.6	94.71	118.5	82.8	153.5	5.816	31.32	29.37%	0.0%
19811-015	5	131.9	128.7	135	122	142.5	1.547	8.33	6.32%	-23.69%

Plant Height Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	85.6	124.5	153.5	86.7	82.8
19811-015	122	132.4	142.5	137	125.5

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	12-4405-1727	**Endpoint:**	Biomass-Above Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:54	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					65.42%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-014	2.356	1.86	2.829	0.0231	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	32.13419	32.13419	1	5.553	0.0462	Significant Effect
Error	46.29468	5.786835	8			
Total	78.42888	37.92103	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	11.1	23.15	0.0387	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9427		0.5831	Normal Distribution

Biomass-Above Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	4.324	3.085	5.564	0.81	8.084	0.6051	3.258	75.35%	0.0%
19811-014	5	0.7392	0.3672	1.111	0.078	2.45	0.1816	0.9781	132.3%	82.91%

Biomass-Above Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	1.926	8.084	3.412	0.81	7.39
19811-014	0.078	2.45	0.628	0.2	0.34

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	20-5846-8042	**Endpoint:**	Biomass-Above Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:54	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					67.53%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-013	-0.566	1.86	2.92	0.7065	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	1.974887	1.974887	1	0.3203	0.5869	Non-Significant Effect
Error	49.31997	6.164996	8			
Total	51.29485	8.139883	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	6.198	23.15	0.1051	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9675		0.8663	Normal Distribution

Biomass-Above Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	4.324	3.085	5.564	0.81	8.084	0.6051	3.258	75.35%	0.0%
19811-013	5	5.213	4.715	5.711	3.514	7.136	0.243	1.309	25.11%	-20.55%

Biomass-Above Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	1.926	8.084	3.412	0.81	7.39
19811-013	3.514	5.49	4.782	7.136	5.144

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	05-1679-0761	**Endpoint:**	Biomass-Above Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:54	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					71.33%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-010	0.4495	1.86	3.085	0.3325	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	1.389828	1.389828	1	0.202	0.6650	Non-Significant Effect
Error	55.03362	6.879202	8			
Total	56.42344	8.26903	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	3.38	23.15	0.2652	Equal Variances
Distribution	Shapiro-Wilk Normality	0.912		0.2952	Normal Distribution

Biomass-Above Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	4.324	3.085	5.564	0.81	8.084	0.6051	3.258	75.35%	0.0%
19811-010	5	3.579	2.905	4.253	2.178	6.534	0.3291	1.772	49.52%	17.24%

Biomass-Above Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	1.926	8.084	3.412	0.81	7.39
19811-010	2.178	3.874	6.534	2.844	2.464

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	04-7136-0650	**Endpoint:**	Biomass-Above Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:53	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					79.33%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-009	1.014	1.86	3.431	0.1702	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	8.742272	8.742272	1	1.027	0.3404	Non-Significant Effect
Error	68.07164	8.508955	8			
Total	76.81391	17.25123	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.659	23.15	0.6360	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8702		0.1006	Normal Distribution

Biomass-Above Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	4.324	3.085	5.564	0.81	8.084	0.6051	3.258	75.35%	0.0%
19811-009	5	2.454	1.492	3.417	0.422	6.098	0.4698	2.53	103.1%	43.24%

Biomass-Above Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	1.926	8.084	3.412	0.81	7.39
19811-009	0.898	0.728	0.422	6.098	4.126

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	03-6715-7387	**Endpoint:**	Biomass-Above Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:53	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					70.95%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-005	1.49	1.86	3.068	0.0872	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	15.11918	15.11918	1	2.221	0.1744	Non-Significant Effect
Error	54.4479	6.805987	8			
Total	69.56708	21.92517	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	3.545	23.15	0.2479	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9007		0.2229	Normal Distribution

Biomass-Above Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	4.324	3.085	5.564	0.81	8.084	0.6051	3.258	75.35%	0.0%
19811-005	5	1.865	1.207	2.523	0.328	4.85	0.3214	1.731	92.78%	56.87%

Biomass-Above Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	1.926	8.084	3.412	0.81	7.39
19811-005	4.85	1.352	1.46	0.328	1.336

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	15-6117-6878	**Endpoint:**	Biomass-Above Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:53	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					75.41%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-004	1.269	1.86	3.261	0.1200	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	12.38778	12.38778	1	1.611	0.2400	Non-Significant Effect
Error	61.50979	7.688724	8			
Total	73.89758	20.07651	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.23	23.15	0.4563	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8982		0.2096	Normal Distribution

Biomass-Above Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	4.324	3.085	5.564	0.81	8.084	0.6051	3.258	75.35%	0.0%
19811-004	5	2.098	1.268	2.928	0.112	5.704	0.4052	2.182	104.0%	51.48%

Biomass-Above Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	1.926	8.084	3.412	0.81	7.39
19811-004	5.704	2.384	1.462	0.83	0.112

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	18-3120-6617	**Endpoint:**	Biomass-Above Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:53	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					65.75%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-003	1.681	1.86	2.843	0.0656	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	16.51746	16.51746	1	2.826	0.1313	Non-Significant Effect
Error	46.75832	5.84479	8			
Total	63.27578	22.36225	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	9.899	23.15	0.0474	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9635		0.8248	Normal Distribution

Biomass-Above Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	4.324	3.085	5.564	0.81	8.084	0.6051	3.258	75.35%	0.0%
19811-003	5	1.754	1.36	2.148	0.688	3.316	0.1923	1.036	59.04%	59.44%

Biomass-Above Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	1.926	8.084	3.412	0.81	7.39
19811-003	3.316	0.688	1.366	2.228	1.172

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	10-3391-2491	**Endpoint:**	Biomass-Above Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:53	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					90.89%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-002	0.3601	1.86	3.931	0.3640	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	1.448596	1.448596	1	0.1297	0.7281	Non-Significant Effect
Error	89.35738	11.16967	8			
Total	90.80597	12.61827	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.104	23.15	0.9258	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8547		0.0660	Normal Distribution

Biomass-Above Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	4.324	3.085	5.564	0.81	8.084	0.6051	3.258	75.35%	0.0%
19811-002	5	3.563	2.261	4.866	1.706	9.634	0.6358	3.424	96.09%	17.6%

Biomass-Above Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	1.926	8.084	3.412	0.81	7.39
19811-002	1.706	2.824	1.786	9.634	1.866

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	02-6056-8269	**Endpoint:**	Biomass-Above Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:53	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					52.39%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-014	2.735	1.86	1.688	0.0128	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	15.41065	15.41065	1	7.482	0.0256	Significant Effect
Error	16.47832	2.059791	8			
Total	31.88898	17.47044	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	3.306	23.15	0.2735	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8662		0.0902	Normal Distribution

Biomass-Above Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	3.222	2.546	3.898	1.576	6.142	0.3303	1.778	55.2%	0.0%
19811-014	5	0.7392	0.3672	1.111	0.078	2.45	0.1816	0.9781	132.3%	77.06%

Biomass-Above Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	2.618	3.53	6.142	1.576	2.244
19811-014	0.078	2.45	0.628	0.2	0.34

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	04-9858-7286	**Endpoint:**	Biomass-Above Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:53	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					56.99%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-013	-2.016	1.86	1.836	0.9608	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	9.91223	9.91223	1	4.066	0.0785	Non-Significant Effect
Error	19.50361	2.437951	8			
Total	29.41584	12.35018	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.847	23.15	0.5671	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9141		0.3107	Normal Distribution

Biomass-Above Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	3.222	2.546	3.898	1.576	6.142	0.3303	1.778	55.2%	0.0%
19811-013	5	5.213	4.715	5.711	3.514	7.136	0.243	1.309	25.11%	-61.8%

Biomass-Above Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	2.618	3.53	6.142	1.576	2.244
19811-013	3.514	5.49	4.782	7.136	5.144

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	10-3009-7172	**Endpoint:**	Biomass-Above Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:53	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					64.81%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-010	-0.3178	1.86	2.088	0.6206	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.3182689	0.3182689	1	0.101	0.7588	Non-Significant Effect
Error	25.21726	3.152157	8			
Total	25.53553	3.470426	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.007	23.15	0.9949	Equal Variances
Distribution	Shapiro-Wilk Normality	0.813		0.0208	Normal Distribution

Biomass-Above Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	3.222	2.546	3.898	1.576	6.142	0.3303	1.778	55.2%	0.0%
19811-010	5	3.579	2.905	4.253	2.178	6.534	0.3291	1.772	49.52%	-11.07%

Biomass-Above Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	2.618	3.53	6.142	1.576	2.244
19811-010	2.178	3.874	6.534	2.844	2.464

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	01-1646-1146	**Endpoint:**	Biomass-Above Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:52	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					79.82%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-009	0.555	1.86	2.572	0.2970	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	1.472996	1.472996	1	0.308	0.5941	Non-Significant Effect
Error	38.25528	4.78191	8			
Total	39.72828	6.254907	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.024	23.15	0.5116	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8612		0.0789	Normal Distribution

Biomass-Above Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	3.222	2.546	3.898	1.576	6.142	0.3303	1.778	55.2%	0.0%
19811-009	5	2.454	1.492	3.417	0.422	6.098	0.4698	2.53	103.1%	23.82%

Biomass-Above Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	2.618	3.53	6.142	1.576	2.244
19811-009	0.898	0.728	0.422	6.098	4.126

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	04-7646-2513	**Endpoint:**	Biomass-Above Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:52	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					64.05%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-005	1.223	1.86	2.064	0.1281	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	4.602211	4.602211	1	1.495	0.2563	Non-Significant Effect
Error	24.63154	3.078943	8			
Total	29.23375	7.681153	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.056	23.15	0.9591	Equal Variances
Distribution	Shapiro-Wilk Normality	0.7945		0.0124	Normal Distribution

Biomass-Above Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	3.222	2.546	3.898	1.576	6.142	0.3303	1.778	55.2%	0.0%
19811-005	5	1.865	1.207	2.523	0.328	4.85	0.3214	1.731	92.78%	42.11%

Biomass-Above Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	2.618	3.53	6.142	1.576	2.244
19811-005	4.85	1.352	1.46	0.328	1.336

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	03-5108-1536	**Endpoint:**	Biomass-Above Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:52	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					72.65%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-004	0.8926	1.86	2.341	0.1991	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	3.156185	3.156185	1	0.7967	0.3981	Non-Significant Effect
Error	31.69343	3.961679	8			
Total	34.84962	7.117864	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.505	23.15	0.7017	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8547		0.0661	Normal Distribution

Biomass-Above Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	3.222	2.546	3.898	1.576	6.142	0.3303	1.778	55.2%	0.0%
19811-004	5	2.098	1.268	2.928	0.112	5.704	0.4052	2.182	104.0%	34.87%

Biomass-Above Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	2.618	3.53	6.142	1.576	2.244
19811-004	5.704	2.384	1.462	0.83	0.112

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	07-6548-3277	**Endpoint:**	Biomass-Above Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:52	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					53.12%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-003	1.595	1.86	1.711	0.0747	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	5.387527	5.387527	1	2.544	0.1494	Non-Significant Effect
Error	16.94196	2.117745	8			
Total	22.32949	7.505272	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.949	23.15	0.3198	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9047		0.2468	Normal Distribution

Biomass-Above Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	3.222	2.546	3.898	1.576	6.142	0.3303	1.778	55.2%	0.0%
19811-003	5	1.754	1.36	2.148	0.688	3.316	0.1923	1.036	59.04%	45.56%

Biomass-Above Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	2.618	3.53	6.142	1.576	2.244
19811-003	3.316	0.688	1.366	2.228	1.172

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	21-3537-4356	**Endpoint:**	Biomass-Above Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:52	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					99.58%

Wilcoxon Rank Sum Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	Ties	P-Value	Decision(5%)
19811-000		19811-002	26		0	0.4206	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.2910458	0.2910458	1	0.03911	0.8482	Non-Significant Effect
Error	59.54102	7.442627	8			
Total	59.83207	7.733673	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	3.706	23.15	0.2325	Equal Variances
Distribution	Shapiro-Wilk Normality	0.7452		0.0031	Non-normal Distribution

Biomass-Above Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	3.222	2.546	3.898	1.576	6.142	0.3303	1.778	55.2%	0.0%
19811-002	5	3.563	2.261	4.866	1.706	9.634	0.6358	3.424	96.09%	-10.59%

Biomass-Above Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	2.618	3.53	6.142	1.576	2.244
19811-002	1.706	2.824	1.786	9.634	1.866

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	04-5907-0197	**Endpoint:**	Biomass-Above Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:52	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					95.81%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-015	-0.6641	1.86	3.087	0.7373	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	3.038268	3.038268	1	0.441	0.5253	Non-Significant Effect
Error	55.12005	6.890006	8			
Total	58.15832	9.928274	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	3.357	23.15	0.2677	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9196		0.3538	Normal Distribution

Biomass-Above Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	3.222	2.546	3.898	1.576	6.142	0.3303	1.778	55.2%	0.0%
19811-015	5	4.324	3.085	5.564	0.81	8.084	0.6051	3.258	75.35%	-34.22%

Biomass-Above Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	2.618	3.53	6.142	1.576	2.244
19811-015	1.926	8.084	3.412	0.81	7.39

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	04-5571-1812	**Endpoint:**	Biomass-Below Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:56	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					110.9%

Unequal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-014	1.606	2.132	9.756	0.0917	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	135.1005	135.1005	1	2.58	0.1469	Non-Significant Effect
Error	418.8638	52.35798	8			
Total	553.9644	187.4585	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	40.73	23.15	0.0034	Unequal Variances
Distribution	Shapiro-Wilk Normality	0.8848		0.1481	Normal Distribution

Biomass-Below Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	8.794	4.948	12.64	1.526	24.18	1.877	10.11	115.0%	0.0%
19811-014	5	1.443	0.8403	2.045	-0.004004	3.748	0.2942	1.584	109.8%	83.59%

Biomass-Below Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	1.682	14.13	2.452	1.526	24.18
19811-014	-0.004004	3.748	2.41	0.648	0.412

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	05-5028-0301	**Endpoint:**	Biomass-Below Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:56	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					103.6%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-013	0.5289	1.86	9.11	0.3056	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	16.78593	16.78593	1	0.2798	0.6112	Non-Significant Effect
Error	480.0084	60.00105	8			
Total	496.7943	76.78698	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	5.743	23.15	0.1189	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8937		0.1868	Normal Distribution

Biomass-Below Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	8.794	4.948	12.64	1.526	24.18	1.877	10.11	115.0%	0.0%
19811-013	5	6.203	4.598	7.807	2.39	13.06	0.7833	4.218	68.01%	29.47%

Biomass-Below Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	1.682	14.13	2.452	1.526	24.18
19811-013	4.39	3.91	2.39	7.268	13.06

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	07-4722-0216	**Endpoint:**	Biomass-Below Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:56	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					111.4%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-010	0.05377	1.86	9.793	0.4792	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.2005102	0.2005102	1	0.002892	0.9584	Non-Significant Effect
Error	554.726	69.34074	8			
Total	554.9265	69.54125	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.802	23.15	0.3423	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8371		0.0408	Normal Distribution

Biomass-Below Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	8.794	4.948	12.64	1.526	24.18	1.877	10.11	115.0%	0.0%
19811-010	5	8.511	6.214	10.81	5.19	19.28	1.121	6.039	70.96%	3.22%

Biomass-Below Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	1.682	14.13	2.452	1.526	24.18
19811-010	5.776	19.28	6.546	5.762	5.19

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	03-3705-8910	**Endpoint:**	Biomass-Below Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:56	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					98.3%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-009	1.242	1.86	8.644	0.1247	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	83.35929	83.35929	1	1.543	0.2494	Non-Significant Effect
Error	432.2034	54.02542	8			
Total	515.5627	137.3847	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	17.49	23.15	0.0169	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8982		0.2093	Normal Distribution

Biomass-Below Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	8.794	4.948	12.64	1.526	24.18	1.877	10.11	115.0%	0.0%
19811-009	5	3.02	2.1	3.939	0.432	5.838	0.4489	2.417	80.06%	65.66%

Biomass-Below Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	1.682	14.13	2.452	1.526	24.18
19811-009	3.11	0.776	0.432	5.838	4.942

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	19-5108-0278	**Endpoint:**	Biomass-Below Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:56	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					111.3%

Unequal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-005	1.437	2.132	9.786	0.1121	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	108.7288	108.7288	1	2.064	0.1887	Non-Significant Effect
Error	421.4099	52.67624	8			
Total	530.1387	161.405	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	32.49	23.15	0.0052	Unequal Variances
Distribution	Shapiro-Wilk Normality	0.8884		0.1626	Normal Distribution

Biomass-Below Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	8.794	4.948	12.64	1.526	24.18	1.877	10.11	115.0%	0.0%
19811-005	5	2.199	1.525	2.874	0.546	5.018	0.3294	1.774	80.65%	74.99%

Biomass-Below Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	1.682	14.13	2.452	1.526	24.18
19811-005	5.018	2.718	1.686	0.546	1.028

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	10-8312-4515	**Endpoint:**	Biomass-Below Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:55	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					100.4%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-004	1.159	1.86	8.829	0.1399	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	75.71304	75.71304	1	1.343	0.2799	Non-Significant Effect
Error	450.8941	56.36176	8			
Total	526.6072	132.0748	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	9.718	23.15	0.0490	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8968		0.2019	Normal Distribution

Biomass-Below Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	8.794	4.948	12.64	1.526	24.18	1.877	10.11	115.0%	0.0%
19811-004	5	3.291	2.057	4.524	0.17	7.596	0.6022	3.243	98.55%	62.58%

Biomass-Below Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	1.682	14.13	2.452	1.526	24.18
19811-004	5.818	7.596	1.944	0.926	0.17

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	07-5208-1773	**Endpoint:**	Biomass-Below Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:55	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					101.6%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-003	1.1	1.86	8.933	0.1516	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	69.87556	69.87556	1	1.211	0.3031	Non-Significant Effect
Error	461.5696	57.6962	8			
Total	531.4451	127.5718	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	7.751	23.15	0.0724	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8809		0.1336	Normal Distribution

Biomass-Below Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	8.794	4.948	12.64	1.526	24.18	1.877	10.11	115.0%	0.0%
19811-003	5	3.507	2.126	4.888	1.224	9.892	0.6743	3.631	103.5%	60.12%

Biomass-Below Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	1.682	14.13	2.452	1.526	24.18
19811-003	3.016	1.752	1.652	9.892	1.224

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	07-2617-3835	**Endpoint:**	Biomass-Below Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:55	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					111.5%

Unequal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-015		19811-002	1.303	2.132	9.809	0.1312	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	89.90393	89.90393	1	1.699	0.2287	Non-Significant Effect
Error	423.4007	52.92509	8			
Total	513.3046	142.829	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	28.05	23.15	0.0069	Unequal Variances
Distribution	Shapiro-Wilk Normality	0.8771		0.1208	Normal Distribution

Biomass-Below Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-015	5	8.794	4.948	12.64	1.526	24.18	1.877	10.11	115.0%	0.0%
19811-002	5	2.797	2.071	3.523	1.686	6.174	0.3545	1.909	68.24%	68.19%

Biomass-Below Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-015	1.682	14.13	2.452	1.526	24.18
19811-002	1.918	2.422	1.786	6.174	1.686

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	09-3657-3671	**Endpoint:**	Biomass-Below Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:55	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					44.44%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-014	3.544	1.86	4.184	0.0038	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	158.9456	158.9456	1	12.56	0.0076	Significant Effect
Error	101.265	12.65812	8			
Total	260.2106	171.6037	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	9.089	23.15	0.0550	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9172		0.3345	Normal Distribution

Biomass-Below Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	9.416	7.6	11.23	2.116	15.13	0.8868	4.776	50.72%	0.0%
19811-014	5	1.443	0.8403	2.045	-0.004004	3.748	0.2942	1.584	109.8%	84.68%

Biomass-Below Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	9.442	8.766	11.63	2.116	15.13
19811-014	-0.004004	3.748	2.41	0.648	0.412

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	08-2030-2583	**Endpoint:**	Biomass-Below Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:55	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					56.27%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-013	1.128	1.86	5.299	0.1461	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	25.81812	25.81812	1	1.272	0.2921	Non-Significant Effect
Error	162.4095	20.30119	8			
Total	188.2276	46.1193	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.282	23.15	0.8158	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9775		0.9502	Normal Distribution

Biomass-Below Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	9.416	7.6	11.23	2.116	15.13	0.8868	4.776	50.72%	0.0%
19811-013	5	6.203	4.598	7.807	2.39	13.06	0.7833	4.218	68.01%	34.13%

Biomass-Below Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	9.442	8.766	11.63	2.116	15.13
19811-013	4.39	3.91	2.39	7.268	13.06

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	02-7241-7237	**Endpoint:**	Biomass-Below Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:55	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					68.0%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-010	0.263	1.86	6.403	0.3996	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	2.050259	2.050259	1	0.06917	0.7992	Non-Significant Effect
Error	237.1271	29.64088	8			
Total	239.1773	31.69114	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.599	23.15	0.6603	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9229		0.3817	Normal Distribution

Biomass-Below Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	9.416	7.6	11.23	2.116	15.13	0.8868	4.776	50.72%	0.0%
19811-010	5	8.511	6.214	10.81	5.19	19.28	1.121	6.039	70.96%	9.62%

Biomass-Below Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	9.442	8.766	11.63	2.116	15.13
19811-010	5.776	19.28	6.546	5.762	5.19

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	18-1935-9237	**Endpoint:**	Biomass-Below Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:55	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					47.27%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-009	2.672	1.86	4.451	0.0141	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	102.2974	102.2974	1	7.141	0.0283	Significant Effect
Error	114.6045	14.32556	8			
Total	216.902	116.623	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	3.903	23.15	0.2157	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9651		0.8419	Normal Distribution

Biomass-Below Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	9.416	7.6	11.23	2.116	15.13	0.8868	4.776	50.72%	0.0%
19811-009	5	3.02	2.1	3.939	0.432	5.838	0.4489	2.417	80.06%	67.93%

Biomass-Below Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	9.442	8.766	11.63	2.116	15.13
19811-009	3.11	0.776	0.432	5.838	4.942

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	03-8437-4901	**Endpoint:**	Biomass-Below Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:55	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					44.99%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-005	3.168	1.86	4.237	0.0066	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	130.22	130.22	1	10.04	0.0132	Significant Effect
Error	103.811	12.97638	8			
Total	234.031	143.1964	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	7.25	23.15	0.0810	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9301		0.4490	Normal Distribution

Biomass-Below Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	9.416	7.6	11.23	2.116	15.13	0.8868	4.776	50.72%	0.0%
19811-005	5	2.199	1.525	2.874	0.546	5.018	0.3294	1.774	80.65%	76.65%

Biomass-Below Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	9.442	8.766	11.63	2.116	15.13
19811-005	5.018	2.718	1.686	0.546	1.028

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	20-4917-4589	**Endpoint:**	Biomass-Below Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:55	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					50.98%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-004	2.373	1.86	4.801	0.0225	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	93.80723	93.80723	1	5.63	0.0451	Significant Effect
Error	133.2953	16.66191	8			
Total	227.1025	110.4691	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	2.169	23.15	0.4719	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9784		0.9561	Normal Distribution

Biomass-Below Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	9.416	7.6	11.23	2.116	15.13	0.8868	4.776	50.72%	0.0%
19811-004	5	3.291	2.057	4.524	0.17	7.596	0.6022	3.243	98.55%	65.05%

Biomass-Below Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	9.442	8.766	11.63	2.116	15.13
19811-004	5.818	7.596	1.944	0.926	0.17

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	04-4856-0264	**Endpoint:**	Biomass-Below Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:54	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					52.98%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-003	2.202	1.86	4.989	0.0294	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	87.2963	87.2963	1	4.851	0.0588	Non-Significant Effect
Error	143.9707	17.99634	8			
Total	231.267	105.2926	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	1.73	23.15	0.6086	Equal Variances
Distribution	Shapiro-Wilk Normality	0.9312		0.4594	Normal Distribution

Biomass-Below Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	9.416	7.6	11.23	2.116	15.13	0.8868	4.776	50.72%	0.0%
19811-003	5	3.507	2.126	4.888	1.224	9.892	0.6743	3.631	103.5%	62.75%

Biomass-Below Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	9.442	8.766	11.63	2.116	15.13
19811-003	3.016	1.752	1.652	9.892	1.224

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	02-2092-8231	**Endpoint:**	Biomass-Below Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:54	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					45.42%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-002	2.878	1.86	4.277	0.0103	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	109.5342	109.5342	1	8.282	0.0206	Significant Effect
Error	105.8018	13.22523	8			
Total	215.336	122.7594	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	6.26	23.15	0.1034	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8993		0.2151	Normal Distribution

Biomass-Below Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	9.416	7.6	11.23	2.116	15.13	0.8868	4.776	50.72%	0.0%
19811-002	5	2.797	2.071	3.523	1.686	6.174	0.3545	1.909	68.24%	70.29%

Biomass-Below Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	9.442	8.766	11.63	2.116	15.13
19811-002	1.918	2.422	1.786	6.174	1.686

Lolium perenne 28 Day — **EnviroSystems, Inc.**

Analysis ID:	01-5649-0680	**Endpoint:**	Biomass-Below Ground	**CETIS Version:**	CETISv1.7.0
Analyzed:	18 Jul-10 20:54	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-0061-8448	**Test Type:**	Plant Survival and Growth	**Analyst:**	
Start Date:	17 Jun-10 12:00	**Protocol:**	ASTM E1963-09 (2009)	**Diluent:**	Not Applicable
Ending Date:	15 Jul-10 12:00	**Species:**	Lolium perenne	**Brine:**	Not Applicable
Duration:	28d 0h	**Source:**	Other	**Age:**	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C > T	Not Run					98.75%

Equal Variance t Two-Sample Test

Sample Code	vs	Sample Code	Test Stat	Critical	MSD	P-Value	Decision(5%)
19811-000		19811-015	0.1245	1.86	9.298	0.4520	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	0.9684309	0.9684309	1	0.01549	0.9040	Non-Significant Effect
Error	500.055	62.50687	8			
Total	501.0234	63.4753	9			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Variance Ratio F	4.481	23.15	0.1754	Equal Variances
Distribution	Shapiro-Wilk Normality	0.8845		0.1469	Normal Distribution

Biomass-Below Ground Summary

Sample Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
19811-000	5	9.416	7.6	11.23	2.116	15.13	0.8868	4.776	50.72%	0.0%
19811-015	5	8.794	4.948	12.64	1.526	24.18	1.877	10.11	115.0%	6.61%

Biomass-Below Ground Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
19811-000	9.442	8.766	11.63	2.116	15.13
19811-015	1.682	14.13	2.452	1.526	24.18

Study Number 19811
Lolium perenne
Summary of Daily Environmental Measurements

Day	Temperature (C)	Humidity Percent	Light ft-c	Light Lux
0	26.9	53	400	4306
1	27.6	43	442	4758
2	26.9	40	465	5005
3	27.2	46	565	6082
4	26.5	45	645	6943
5	26.5	47	523	5630
6	26.5	46	672	7233
7	27.2	48	493	5307
8	24.7	50	623	6706
9	24.8	53	536	5770
10	25.3	53	498	5360
11	23.9	62	481	5177
12	26.1	57	460	4951
13	24.5	52	633	6814
14	25.3	39	671	7223
15	25.0	40	701	7546
16	25.3	43	622	6695
17	24.4	47	587	6318
18	24.3	52	542	5834
19	27.7	52	538	5791
20	27.5	50	713	7675
21	28.2	52	793	8536
22	26.4	49	583	6275
23	27.4	49	506	5447
24	28.0	54	507	5457
25	29.4	53	540	5813
26	28.3	47	662	7126
27	27.9	42	624	6717
28	25.7	59	637	6857
Mean:	26.4	49	575	6184
Minimum:	23.9	39	400	4306
Maximum:	29.4	62	793	8536

Soil pH Record

Study Number: 19811 **Client: TetraTech NUS** **Project: Crane IN, CTO 377**

Lab ID	Field ID	As Received pH	Grams of Soil	Grams of Amendment	Final pH	New Lab ID	New Field ID
19811-002	16 SS1010001	7.82					
19811-003	16 SS1020001	7.33					
19811-004	16 SS1030001	7.55					
19811-005	16 SS1040001	7.54					
19811-009	16 SS1090002	7.41					
19811-010	16 SS1060002	6.02					
19811-012	16 SS1110002	5.13					
19811-013	16 SS1120002	RAN 6.24					
19811-018	16 SS1170002	5.50					
19811-008	16 SS1080002	5.28					
19811-011	16 SS1100002	5.13					
19811-014	16 SS1140002	RAN 5.66					
19811-015	16 SS1160002	6.96					
19811-017	16 SS1150001	5.50					
	Initials:	AM				amendment used:	
	Date:	6/16/10					
	pH meter:	#470				chemical lot used:	

Notes:

The pH of the test soils will be measured prior to the start of assays. In most cases, calcium carbonate will be used to increase pH and ammonium sulphate will be used to reduce pH.

Lolium perenne Day 28 Soil pH Record

Study Number: 19811 **Client: TetraTech NUS** **Project: Crane IN, CTO 377**

Lab ID	Field ID	pH
19811-000	Laboratory Control	6.44
19811-002	16 SS1010001	7.70
19811-003	16 SS1020001	7.51
19811-004	16 SS1030001	8.17
19811-005	16 SS1040001	7.89
19811-009	16 SS1090002	7.90
19811-010	16 SS1060002	7.83
19811-013	16 SS1120002 ③ RAM	6.42
19811-014	16 SS1140002 ③ RAM	③ AM 7/15 ~~6.19~~ 5.34
19811-015	16 SS1160002	6.74
	Initials:	AM
	Date:	7/15/10
	pH meter:	# 1097

Notes:

CLIENT: Tetra Tech NUS, Inc.
PROJECT: SWMU 16, Crane, Indiana, CTO-0377
TASK: Soil Total Volatile Solids
METHOD: AASHTO T 267-86 (2004)

Field ID	LAB ID	MATRIX	RESULT	QLIMIT	UNITS	SAMPLED	ANALYZED
16 SS1010001	19811-002	Solid	2.7	0.1	% dry wt	06/09/10 1115	06/22/10
16 SS1020001	19811-003	Solid	3.7	0.1	% dry wt	06/09/10 1515	06/22/10
16 SS1030001	19811-004	Solid	2	0.1	% dry wt	06/09/10 1705	06/22/10
16 SS1040001	19811-005	Solid	3.28	0.1	% dry wt	06/09/10 1445	06/22/10
16 SS1090002	19811-009	Solid	3.31	0.1	% dry wt	06/10/10 0945	06/22/10
16 SS1060002	19811-010	Solid	4.9	0.1	% dry wt	06/10/10 1530	06/22/10
16 SS1120001	19811-013	Solid	3.91	0.1	% dry wt	06/10/10 1715	06/22/10
16 SS1140001	19811-014	Solid	4.03	0.1	% dry wt	06/11/10 0930	06/22/10
16 SS1160002	19811-015	Solid	2.91	0.1	% dry wt	06/10/10 2035	06/22/10

CLIENT: Tetra Tech NUS, Inc.
PROJECT: SWMU 16, Crane, Indiana, CTO-0377
TASK: Soil Cation-Exchange Capacity
METHOD: SW 846 9081

Field ID	LAB ID	MATRIX	RESULT	QLIMIT	UNITS	SAMPLED	ANALYZED
16 SS1010001	19811-002	Solid	33	1	meq per 100g	06/09/10 1115	06/29/10
16 SS1020001	19811-003	Solid	23	1	meq per 100g	06/09/10 1515	06/29/10
16 SS1030001	19811-004	Solid	55	1	meq per 100g	06/09/10 1705	06/29/10
16 SS1040001	19811-005	Solid	40	1	meq per 100g	06/09/10 1445	06/29/10
16 SS1090002	19811-009	Solid	25	1	meq per 100g	06/10/10 0945	06/29/10
16 SS1060002	19811-010	Solid	16	1	meq per 100g	06/10/10 1530	06/29/10
16 SS1120001	19811-013	Solid	31	1	meq per 100g	06/10/10 1715	06/29/10
16 SS1140001	19811-014	Solid	27	1	meq per 100g	06/11/10 0930	06/29/10
16 SS1160002	19811-015	Solid	19	1	meq per 100g	06/10/10 2035	06/29/10

ATTACHMENT 3

FLOW CHARTS FROM SAMPLING AND ANALYSIS PLAN

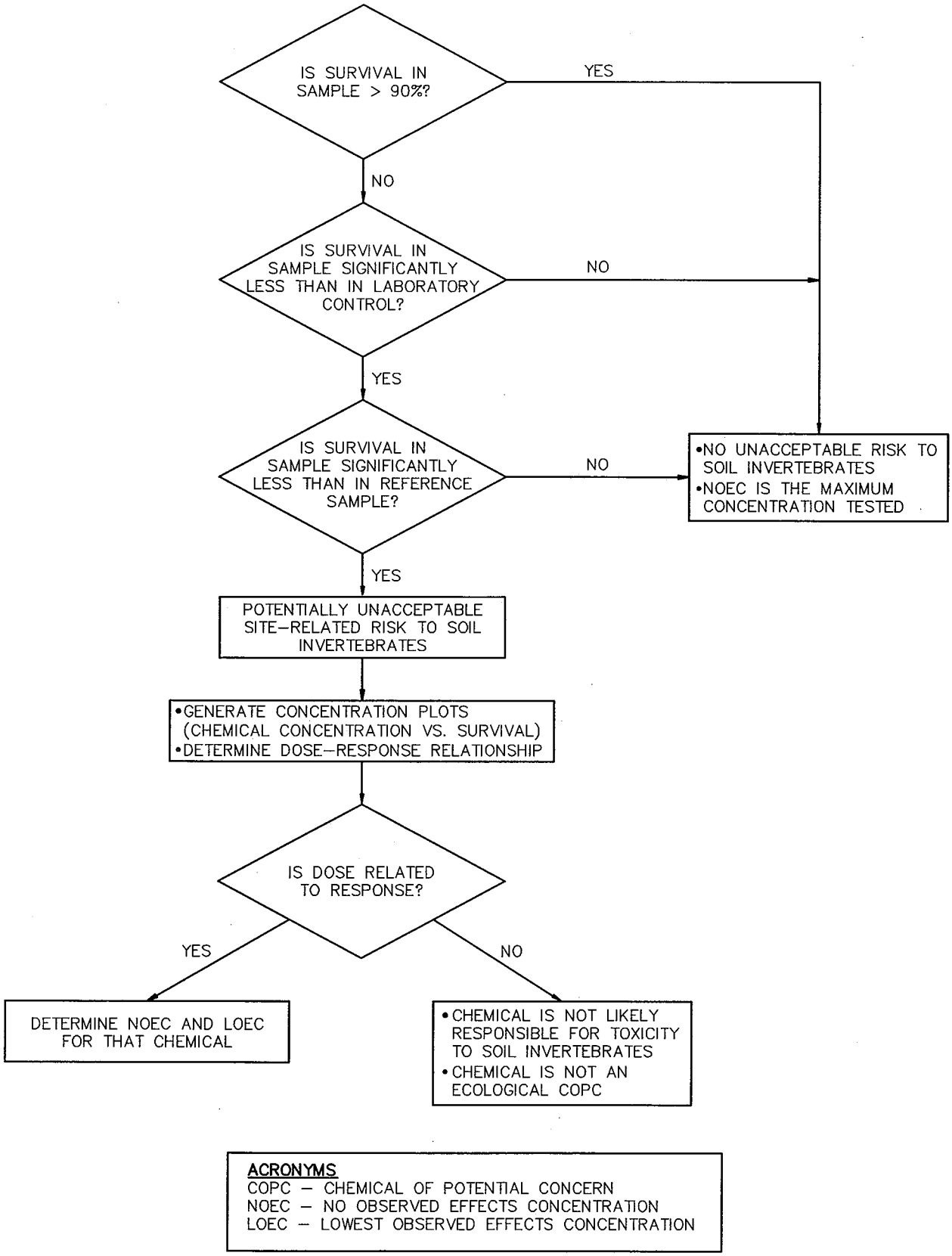


FIGURE D–1

GENERAL PROCESS FOR DEVELOPMENT OF NOECs AND LOECs FOR INVERTEBRATE SURVIVAL

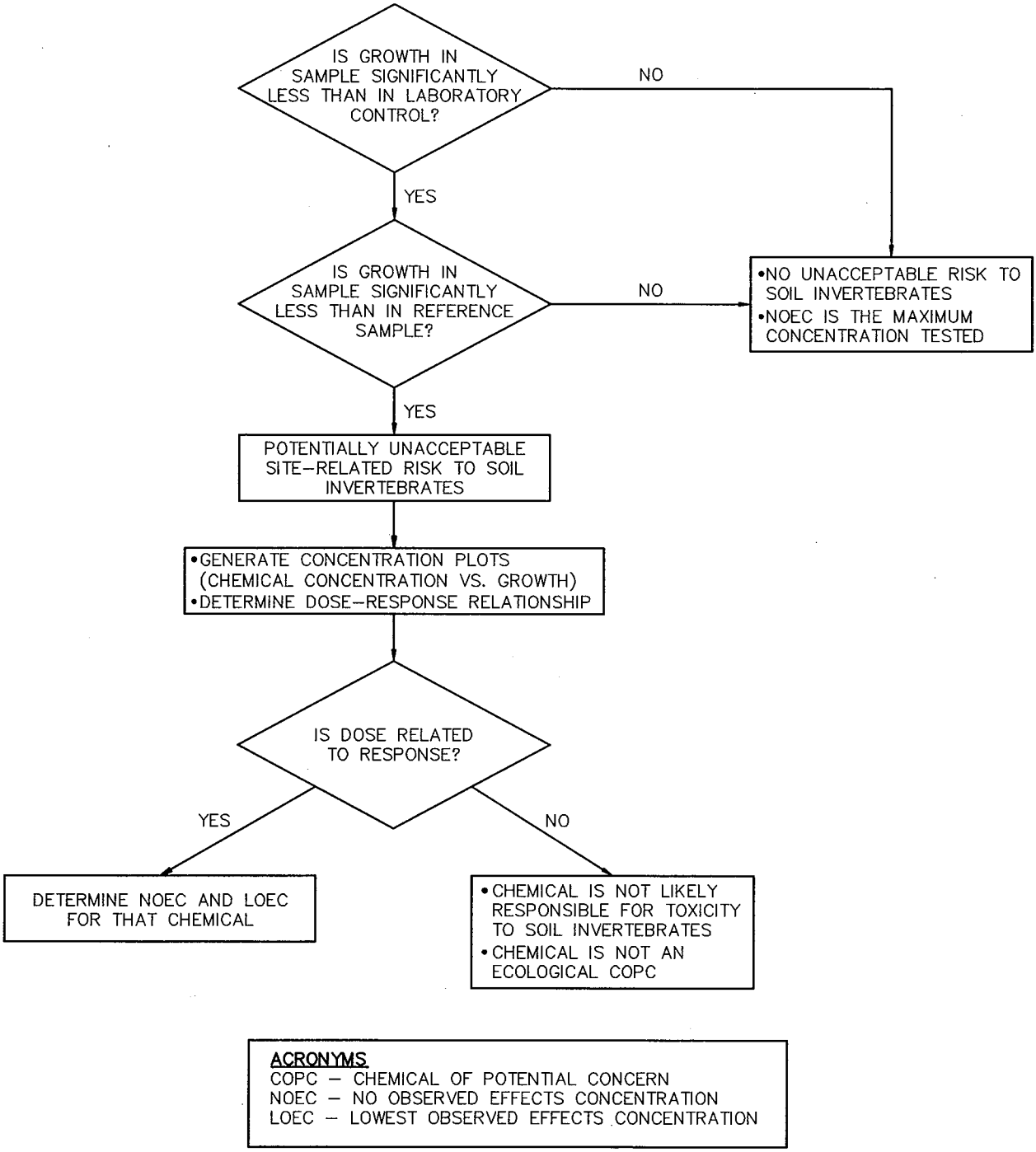


FIGURE D–2

GENERAL PROCESS FOR DEVELOPMENT OF NOECs AND LOECs FOR INVERTEBRATE GROWTH

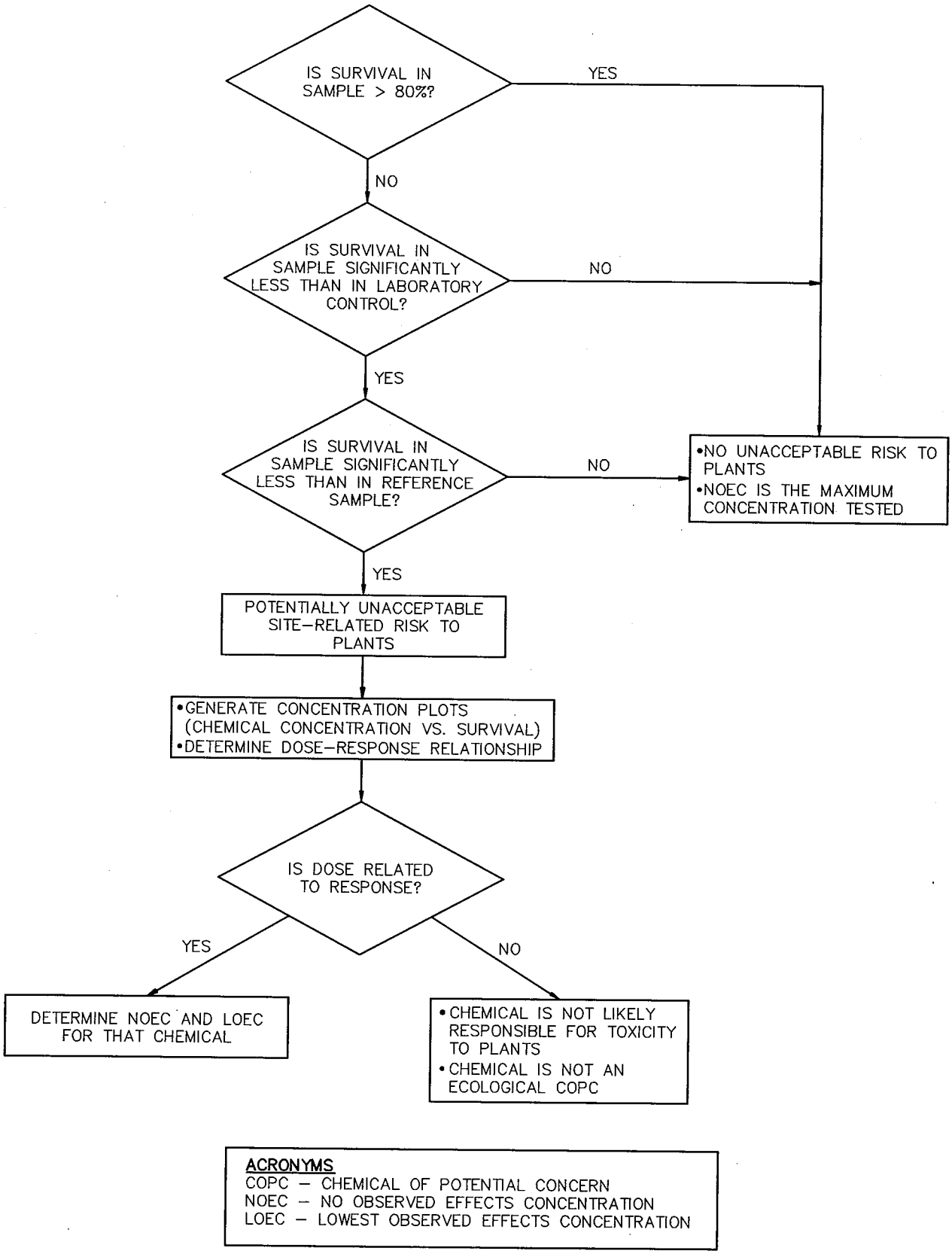


FIGURE D–3

GENERAL PROCESS FOR DEVELOPMENT OF NOECs AND LOECs FOR PLANT SURVIVAL

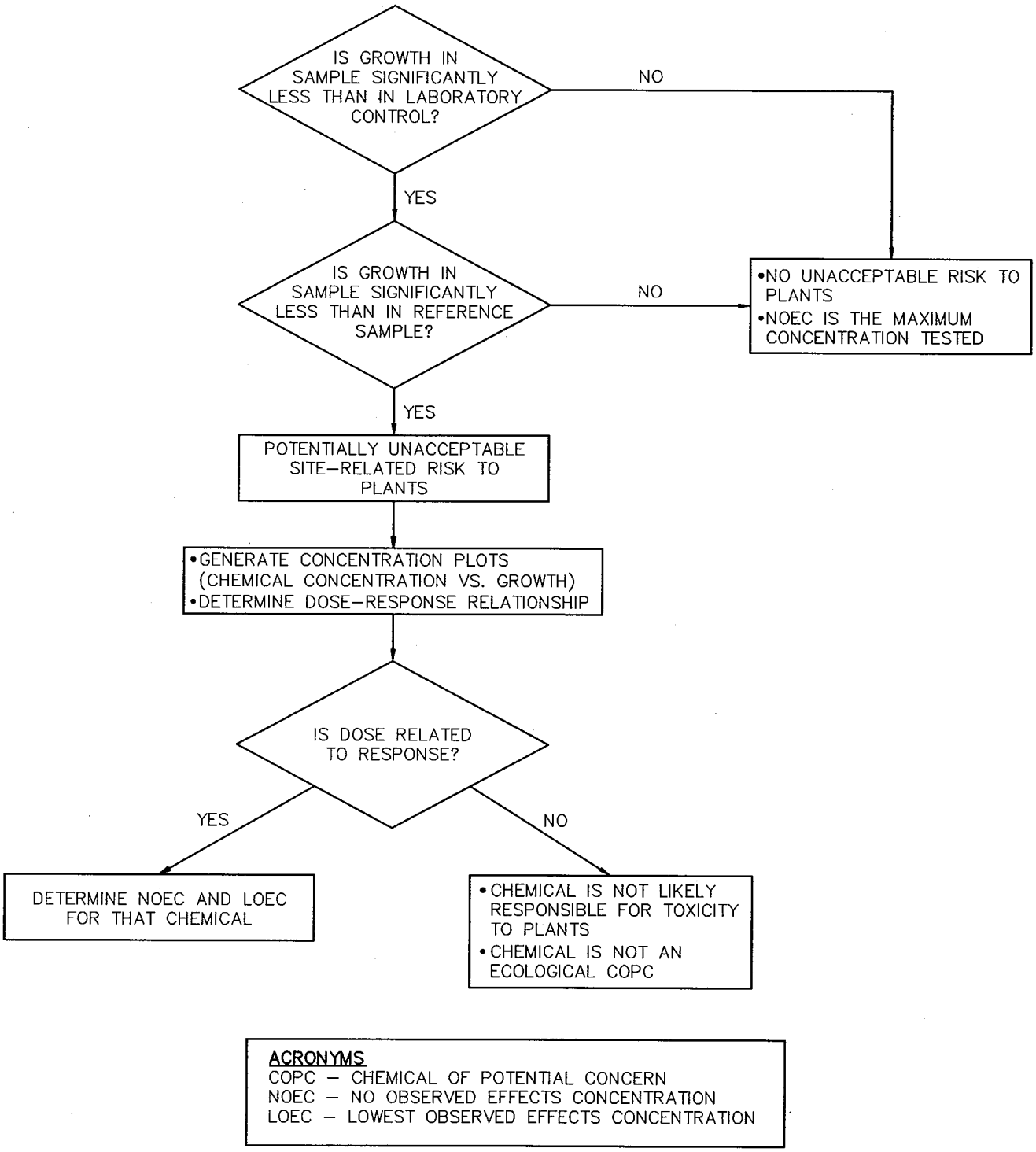


FIGURE D–4

GENERAL PROCESS FOR DEVELOPMENT OF NOECs AND LOECs FOR PLANT GROWTH

ATTACHMENT 4

EARTHWORM TISSUE REGRESSION ANALYSIS

Summary of Regression Analysis

Ordinary Leas Squares (OLS) was performed to understand if there is a relationship between the amount of lead or zinc in earthworm tissue and the amount of lead or zinc in soil concentrations. To use the OLS model the following assumptions are associated with the linear regression model:

1) Linear relationship between tissue concentration and soil concentration.
2) Independence of errors
3) Homoscedasticity of errors (constant variance of errors)
4) Normality of errors

To check for linearity, the earthworm tissue concentration versus the soil concentration is plotted to verify that the relationship appears to be linear. To check for independence, the residuals versus location is plotted and if the plot shows curvature or any pattern then the independence assumption is not met. To check for homoscedasticity of errors, the residuals versus the predicted values of the model is plotted and if the plot shows curvature or a pattern (increasing or decreasing variance) then this assumption is not met. To check for normality of the error, a normality plot of the residuals and the Shapiro Wilks normality test is inspected. If the normality plot is roughly linear and the p-value associated with the Shapiro Wilks test is greater than 0.05 the normality assumption is valid.

Lead Regression

A OLS model was computed to determine if there is a relationship between the lead concentrations found in earthworm tissue and lead concentrations found in soil. Figure 1 displays the plots for the assumption checking. The scatterplot does not show a nonlinear relationship between the tissue and soil concentrations. The plot of the residuals versus the location does not show any pattern or curvature. The plot of the residuals versus the predicted values does not show any pattern, or changing variance. The normality plot of the residuals is roughly linear. Therefore the assumptions of the regression model have been met. Figure 2 presents the scatterplot of the earthworm tissue concentration versus the soil concentration, R^2 (coefficient of determination) and the linear regression equation. The scatterplot shows that there appears to be a very weak linear relationship between the two variable. The R^2 value tells how much of the variation about the regression line can be explained by the regression model. The R^2 value of 0.2023 indicates that not much of the variation about the regression line can be explained by the regression model. Table 1 presents the T tests associated with the regression model. From the table it can be seen that the intercept and slope value are not statistically different from zero at the 5 percent significance level (pvalues greater than 0.05). This means that the relationship between the earthworm tissue concentrations and soil concentrations are not statistically significant. This means that the observed relationship is no stronger than what is likely to arise by chance alone in the absence of any real linear relationship.

Table 1 Lead Regression Results				
Parameter	Estimate	Std. Error	T	P-value
Intercept	21.0	19.4	1.087	0.313
Slope	0.06	0.05	1.332	0.224

Zinc Regression

A OLS model was computed to determine if there is a relationship between the lead concentrations found in earthworm tissue and lead concentrations found in soil. Figure 3 displays the plots for the assumption checking. The scatterplot does not show a nonlinear relationship between the tissue and soil concentrations. The plot of the residuals versus the location does not show any pattern or curvature. The plot of the residuals versus the predicted values does not show any pattern, or changing variance. The normality plot of the residuals is roughly linear. Therefore the assumptions of the regression model have been met. Figure 4 presents the scatterplot of the earthworm tissue concentration versus the soil concentration, R^2 (coefficient of determination) and the linear regression equation. The scatterplot shows that there appears to be a linear relationship between the two variable. The R^2 value tells how much of the variation about the regression line can be explained by the regression model. The R^2 value of 0.7879 indicates that much of the variation about the regression line can be explained by the regression model. Table 2 presents the T tests associated with the regression model. From the table it can be seen that the intercept and slope value are statistically different from zero at the 5 percent significance level (pvalues less than 0.05). This means that the relationship between the earthworm tissue concentrations and soil concentrations is statistically significant. The means that the observed relationship is stronger than what is likely to arise by chance alone in the absence of any real linear relationship.

Table 2 Zinc Regression Results				
Parameter	Estimate	Std. Error	T	P-value
Intercept	86.8	14.4	6.03	0.000524
Slope	0.067	0.013	5.099	0.001401

FIGURE 1
LEAD REGRESSION ASSUMPTIONS
SWMU 16 TOXICITY TESTING
NSA CRANE, CRANE, INDIANA

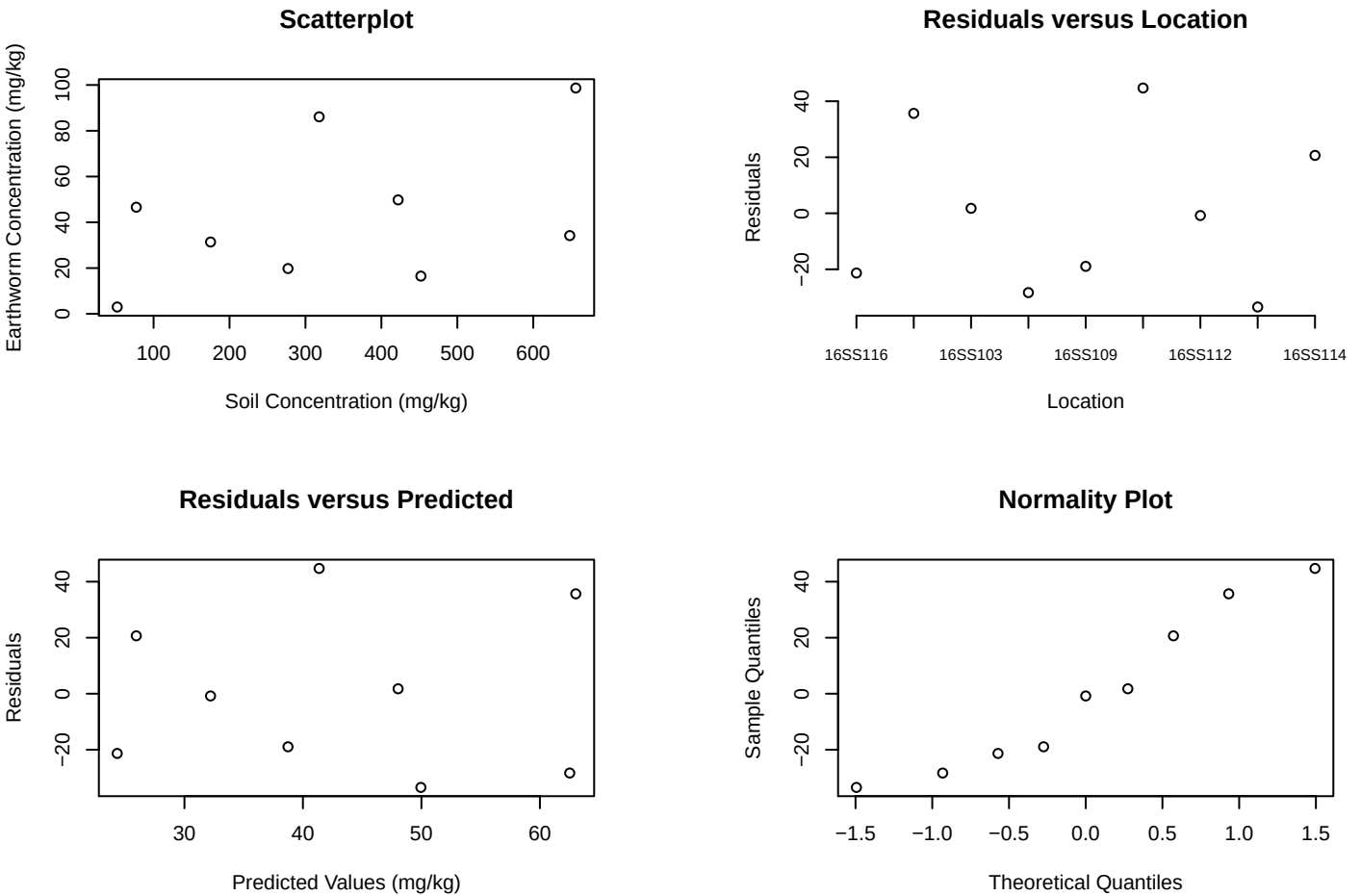


FIGURE 2
LEAD REGRESSION
SWMU 16 TOXICITY TESTING
NSA CRANE, CRANE, INDIANA

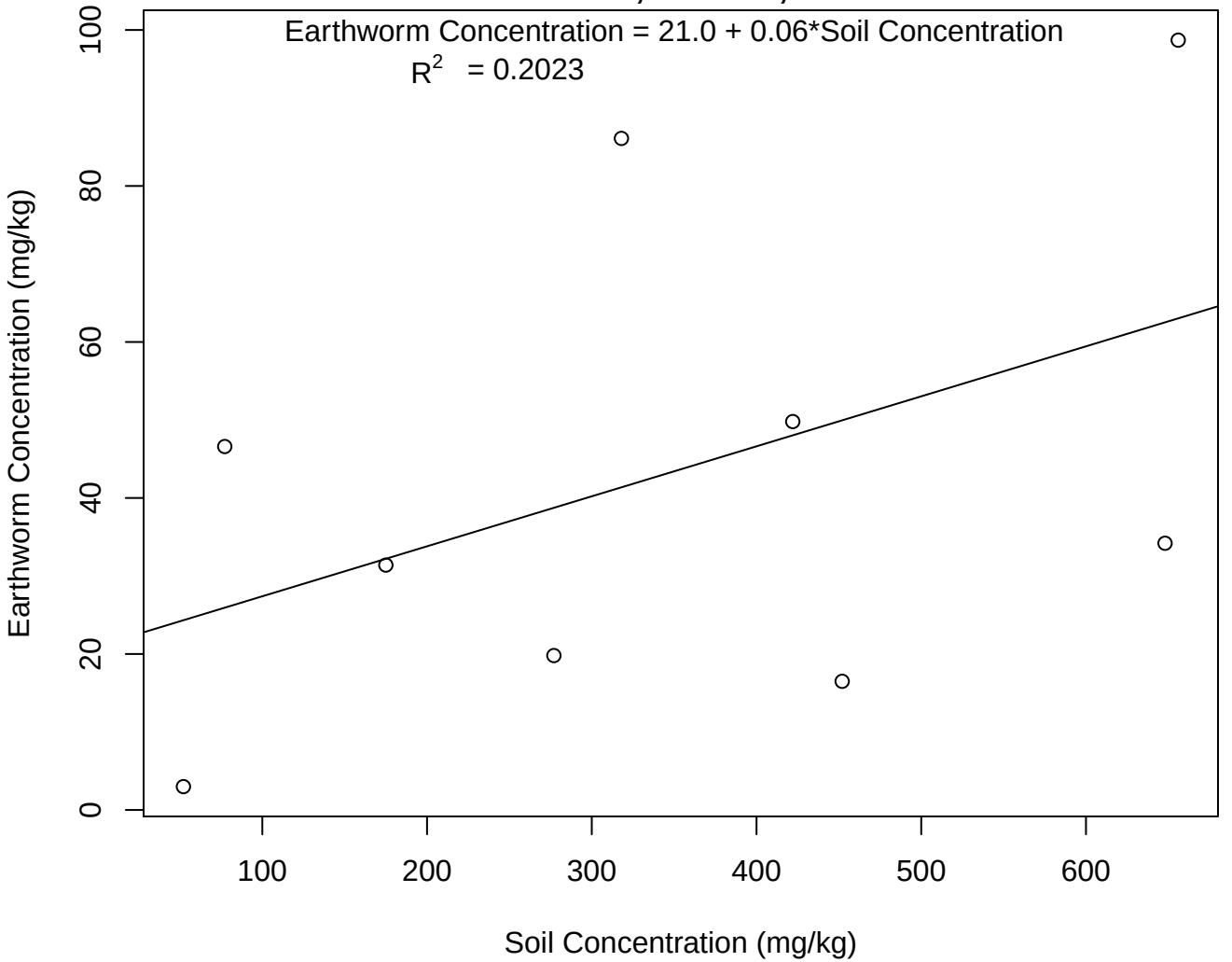


FIGURE 3
ZINC REGRESSION ASSUMPTIONS
SWMU 16 TOXICITY TESTING
NSA CRANE, CRANE, INDIANA

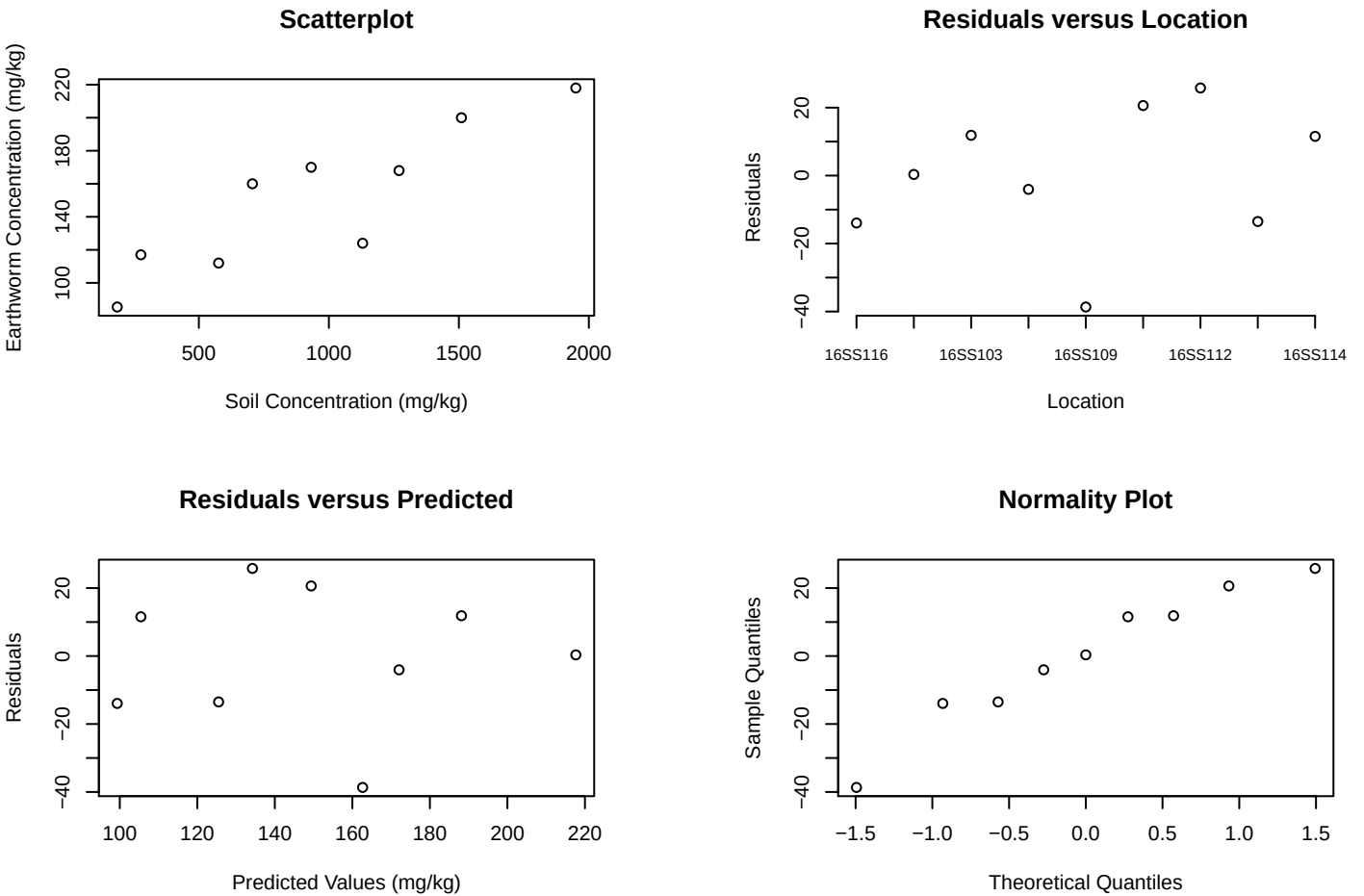
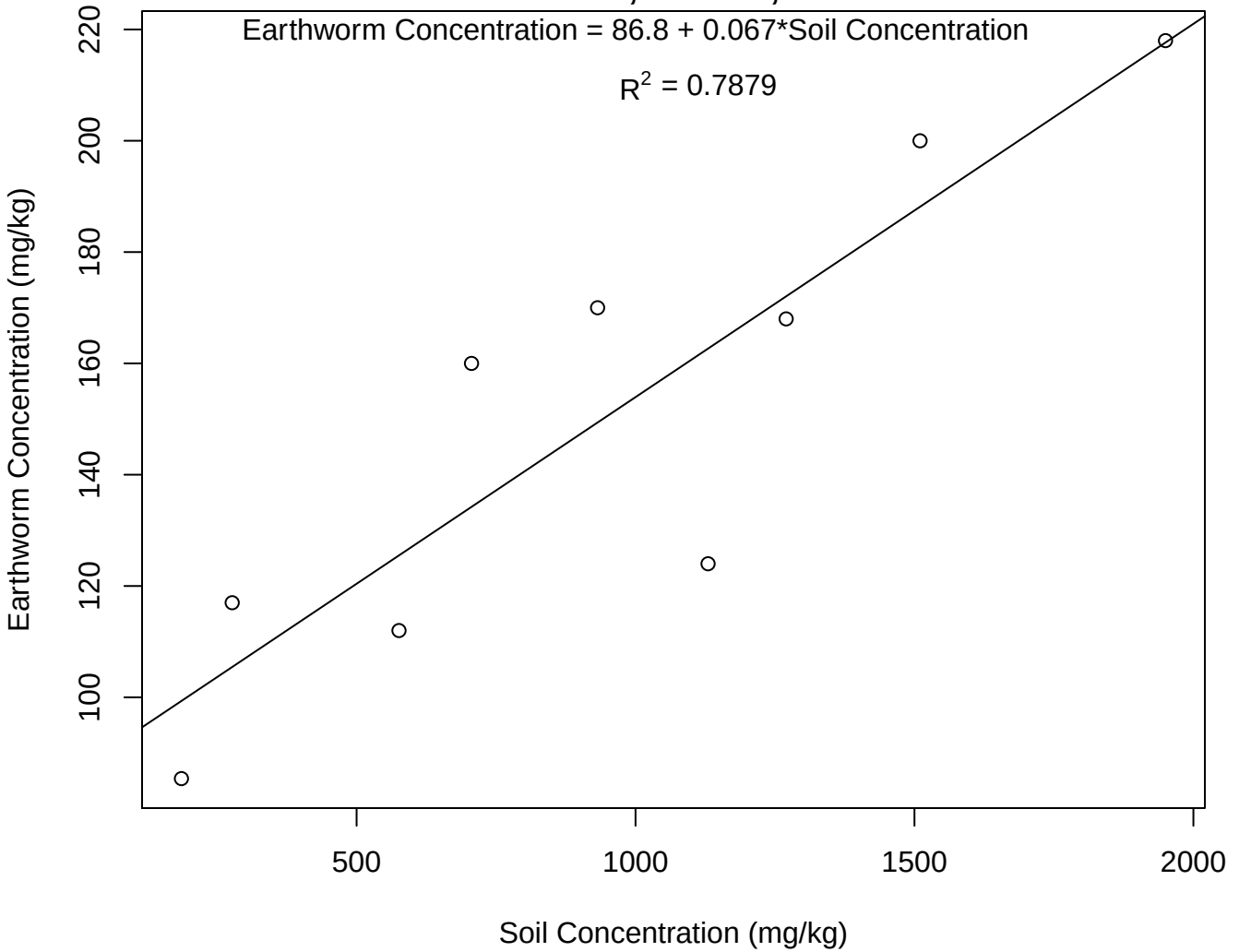
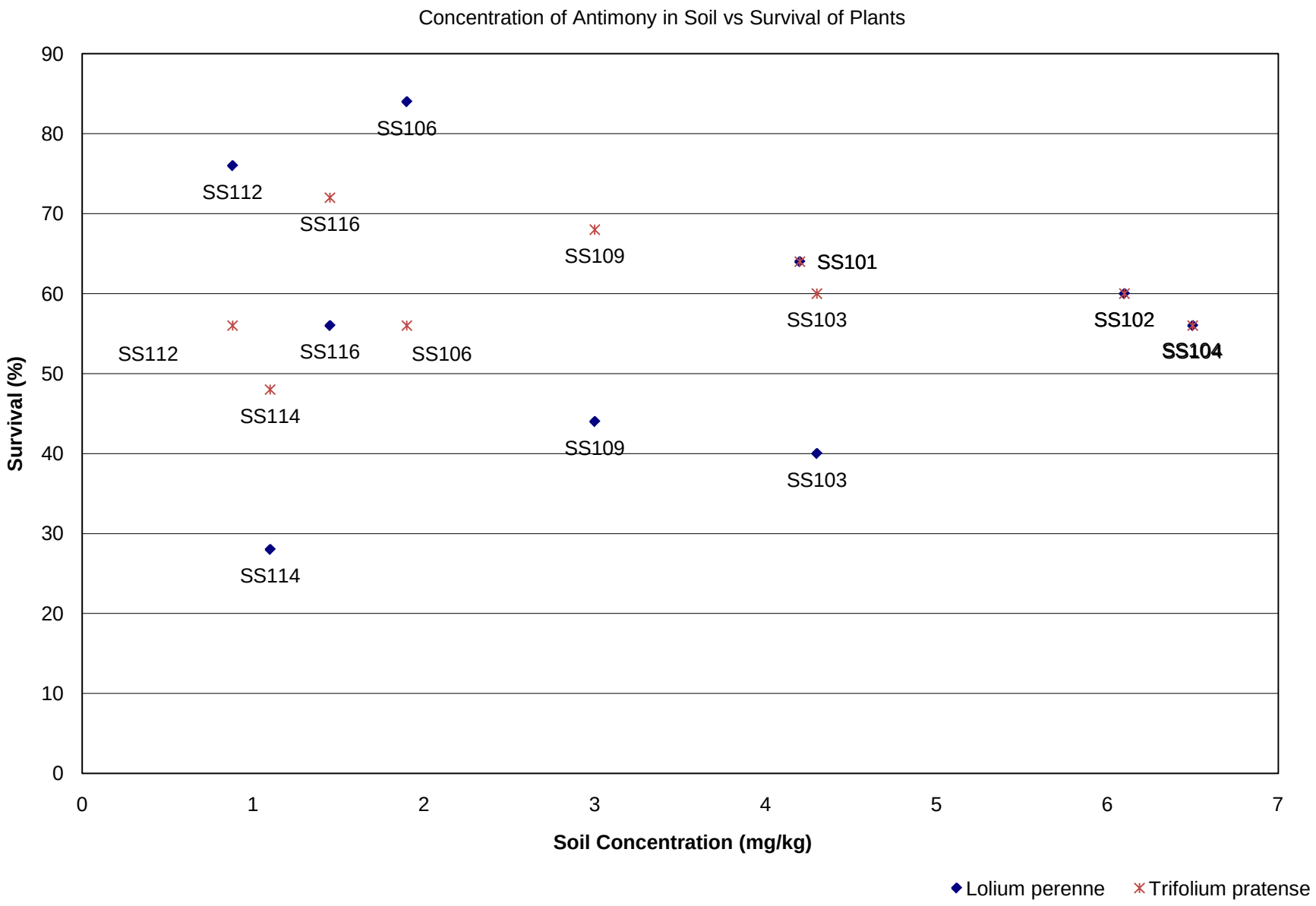


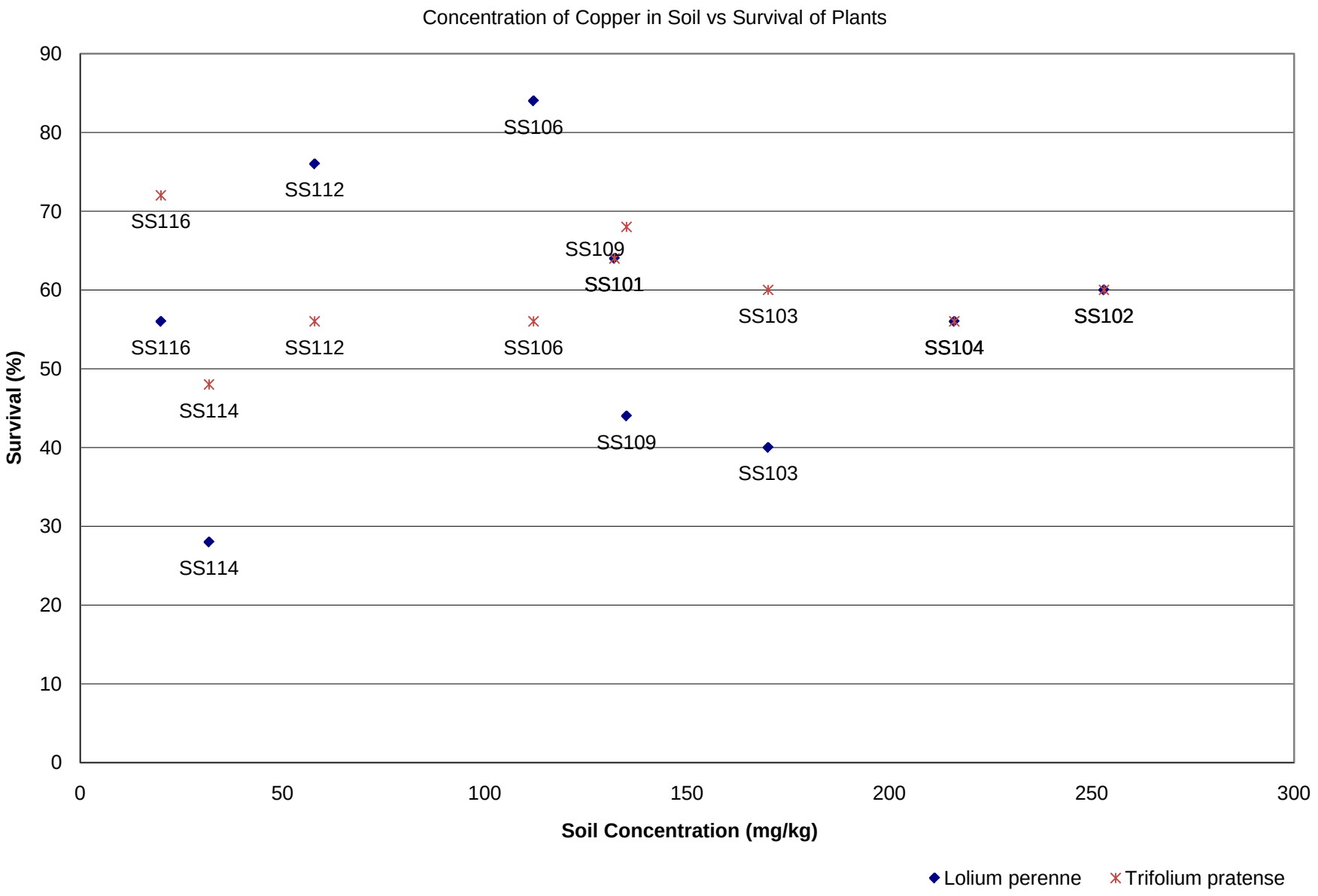
FIGURE 4
ZINC REGRESSION
SWMU 16 TOXICITY TESTING
NSA CRANE, CRANE, INDIANA

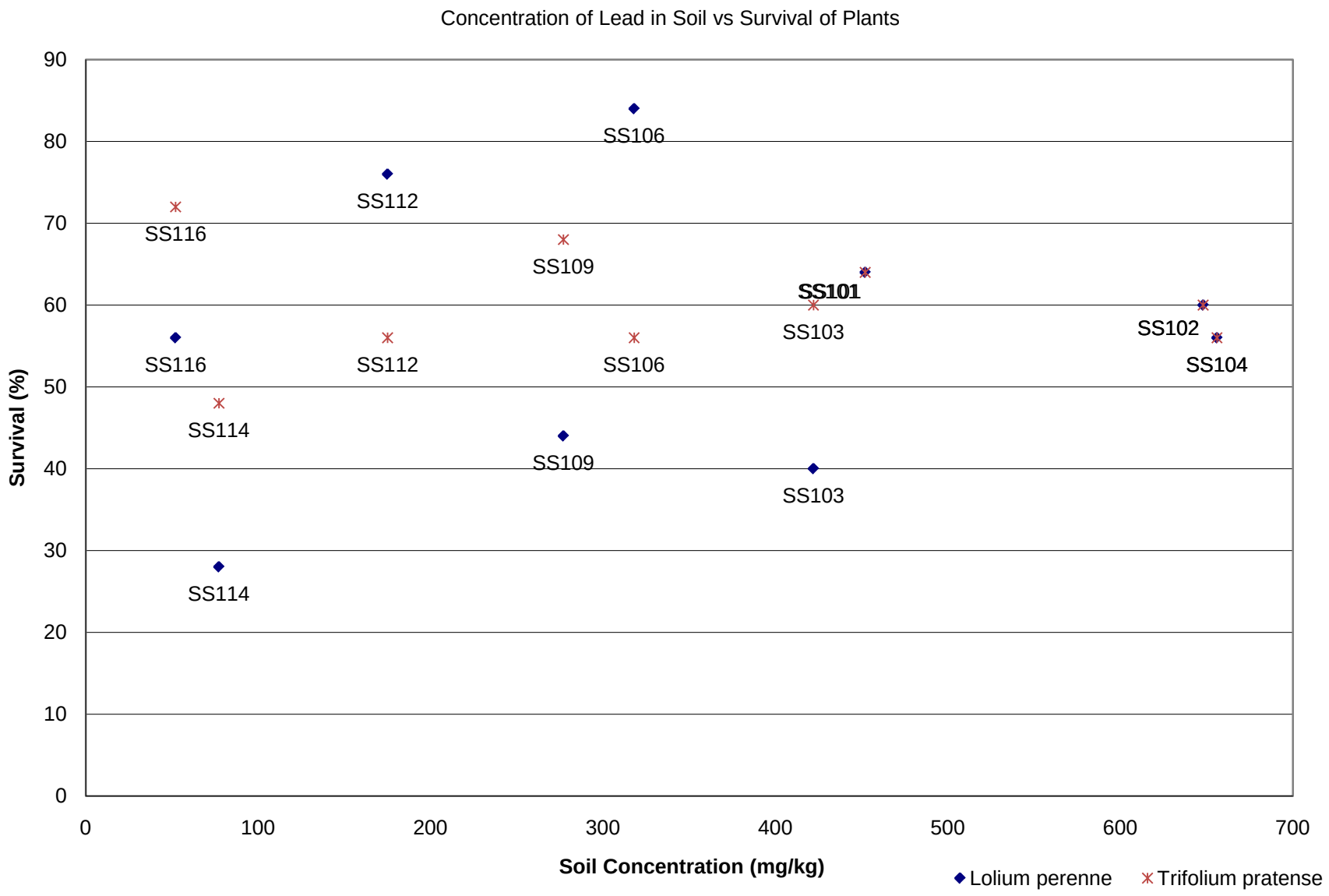


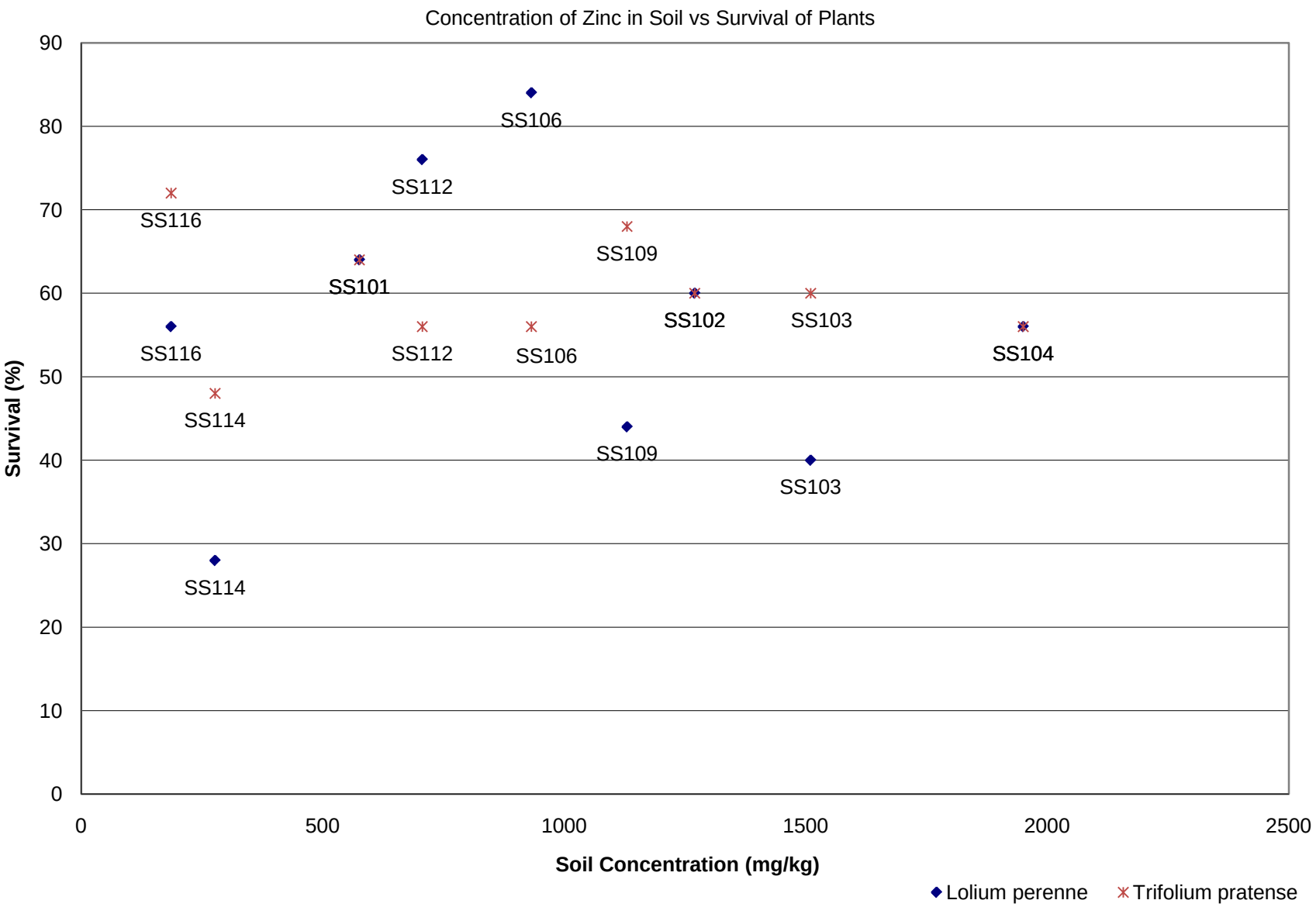
ATTACHMENT 5

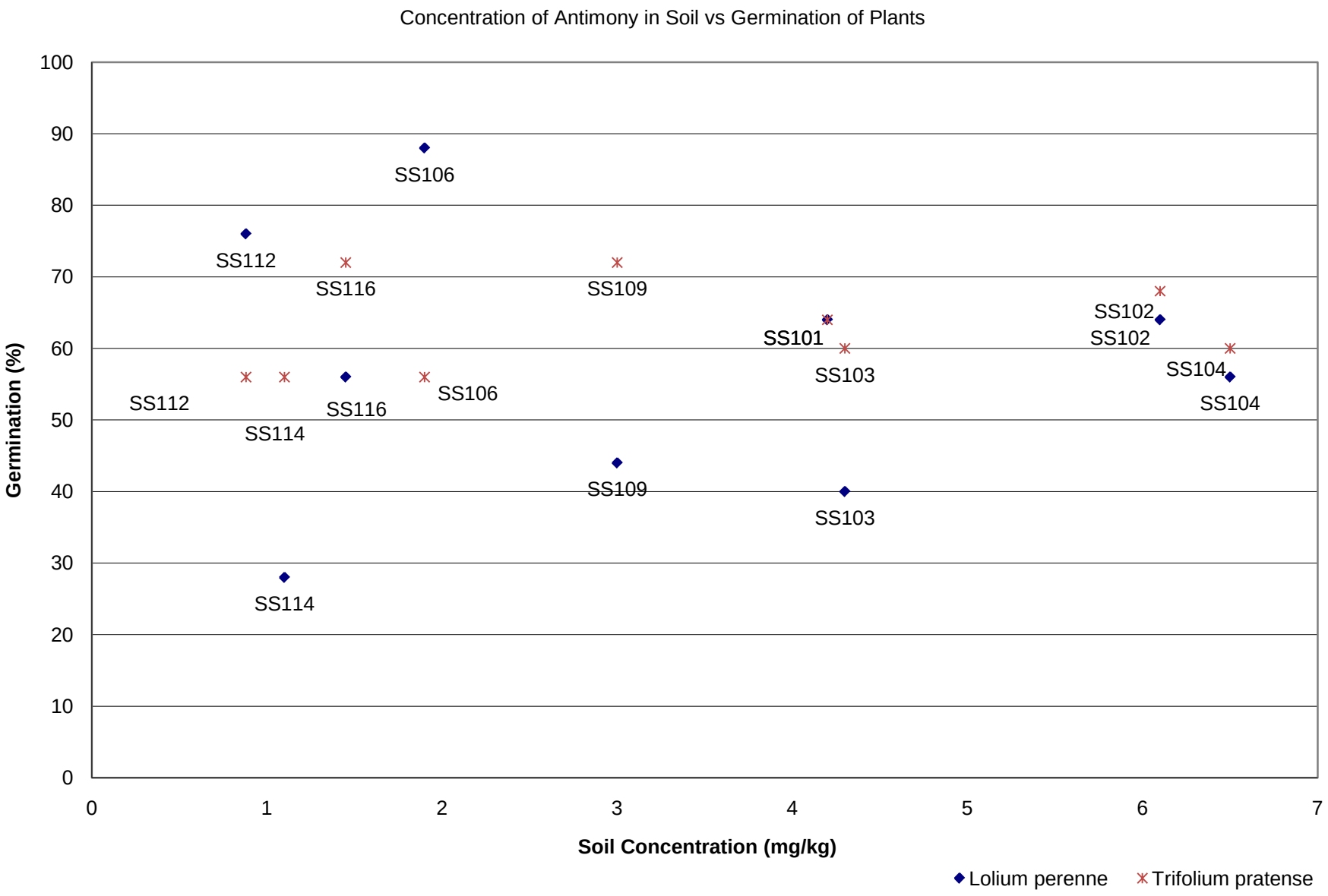
PLANT TOXICITY TEST PLOTS

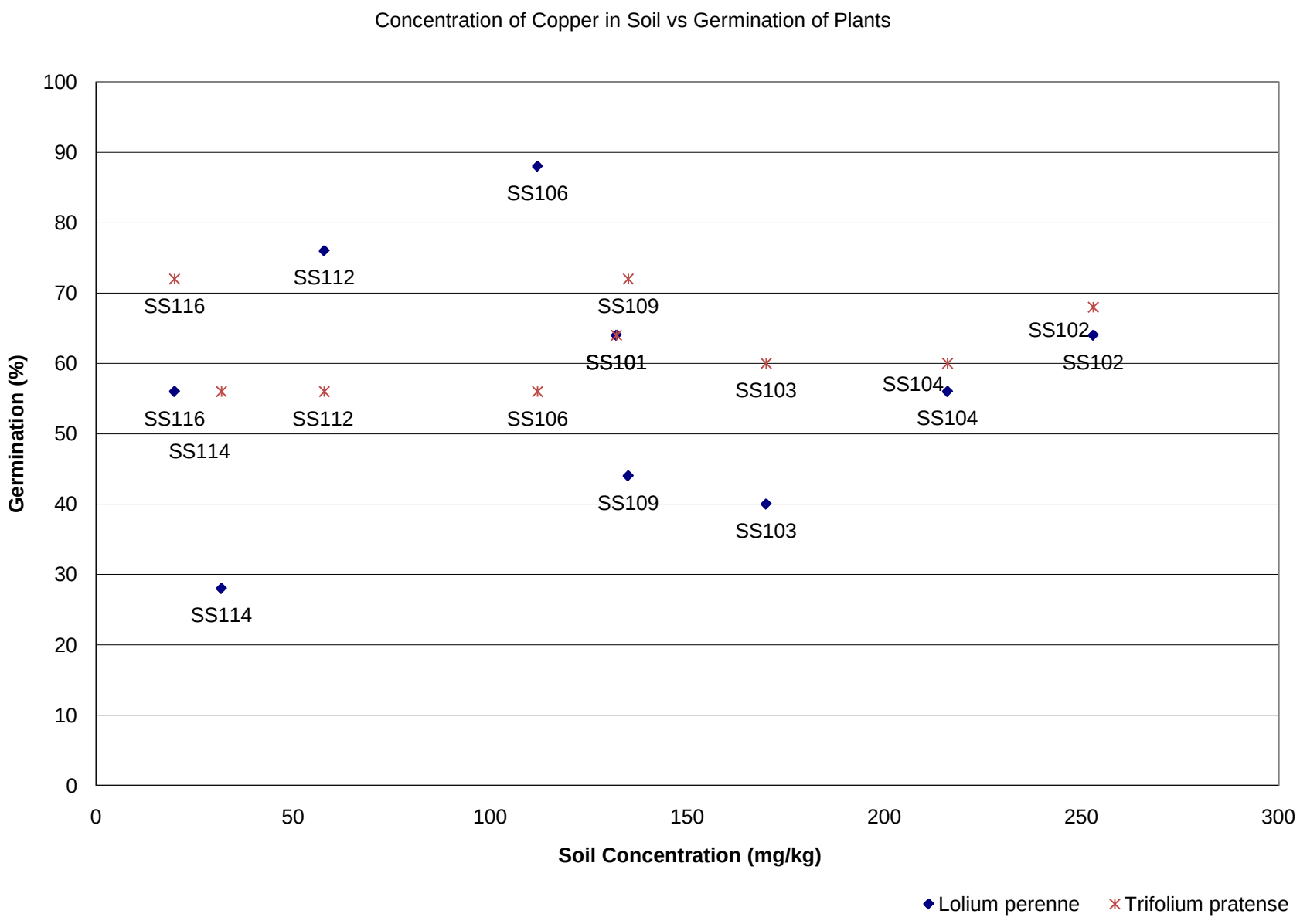

Concentration of Antimony in Soil vs Survival of Plants
Survival (%)
Soil Concentration (mg/kg)
0
10
20
30
40
50
60
70
80
90
0
1
2
3
4
5
6
7
SS106
SS112
SS116
SS109
SS101
SS103
SS102
SS104
SS112
SS116
SS106
SS114
SS109
SS103
SS114
Lolium perenne
Trifolium pratense

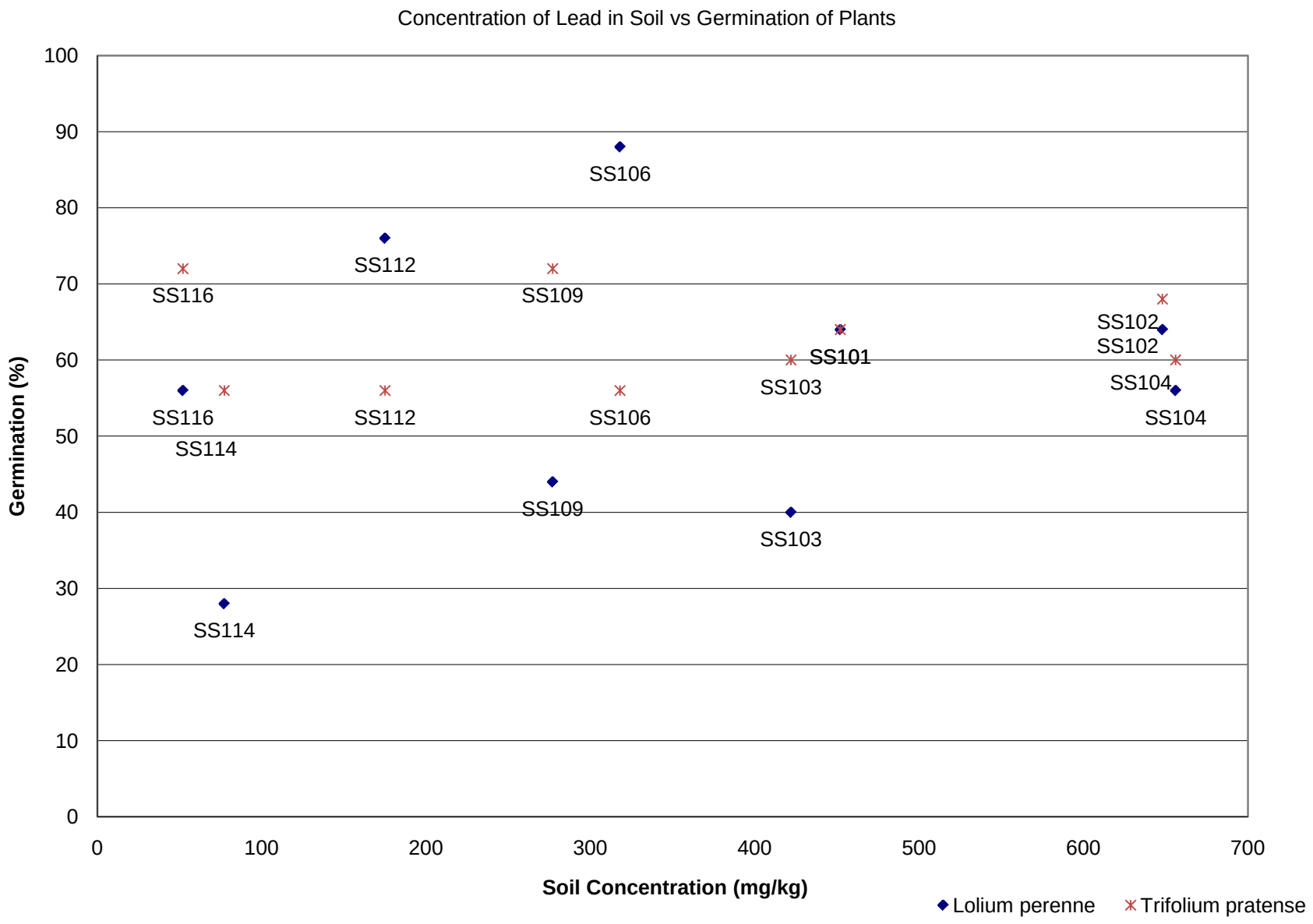

Concentration of Copper in Soil vs Survival of Plants
Survival (%)
Soil Concentration (mg/kg)
0
10
20
30
40
50
60
70
80
90
0
50
100
150
200
250
300
SS106
SS112
SS116
SS109
SS101
SS103
SS102
SS104
SS116
SS112
SS106
SS114
SS109
SS103
SS114
Lolium perenne
Trifolium pratense

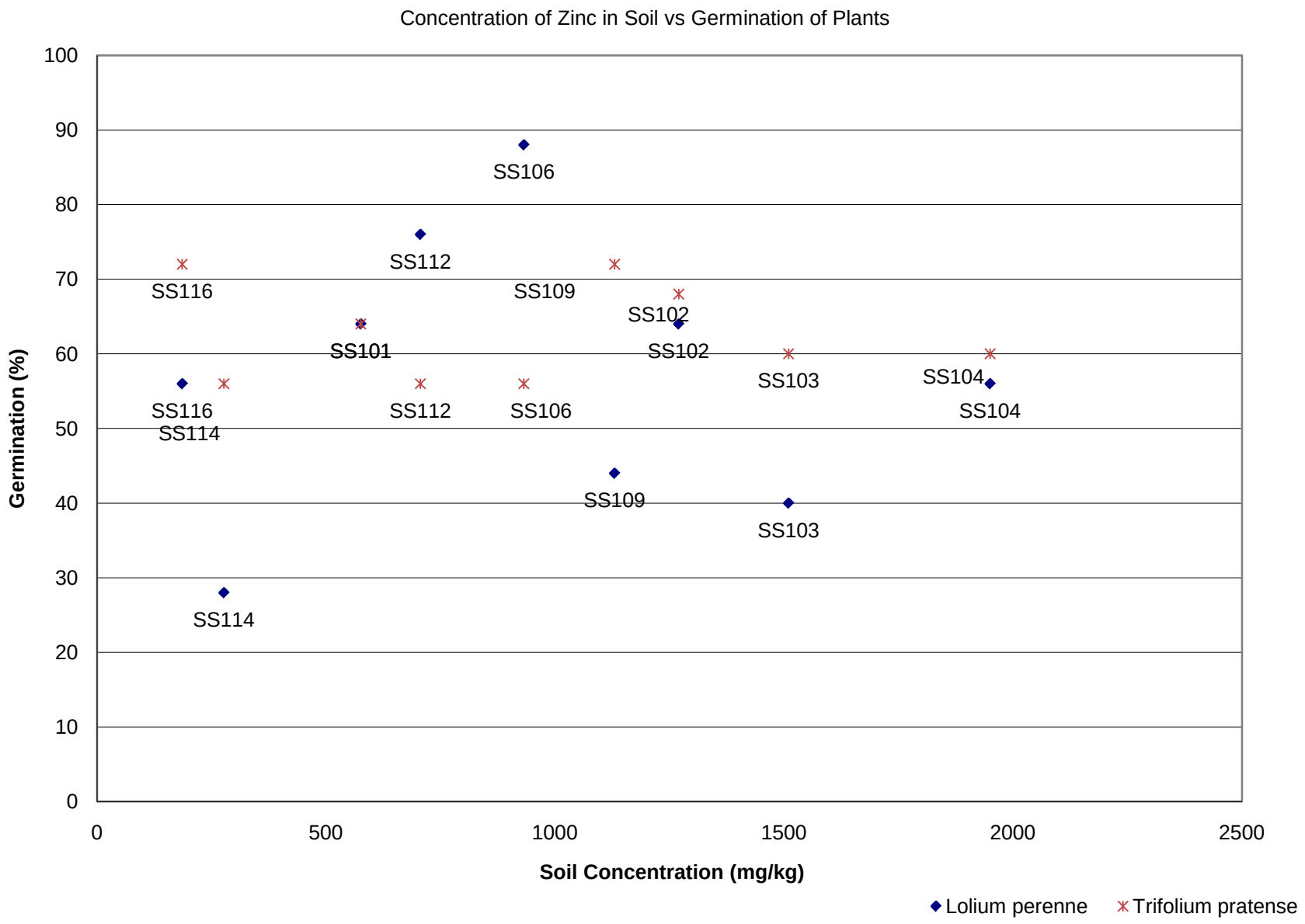

Concentration of Lead in Soil vs Survival of Plants
Survival (%)
Soil Concentration (mg/kg)
0
10
20
30
40
50
60
70
80
90
0
100
200
300
400
500
600
700
SS106
SS112
SS116
SS109
SS101
SS103
SS102
SS104
SS116
SS112
SS106
SS114
SS109
SS103
SS114
Lolium perenne
Trifolium pratense

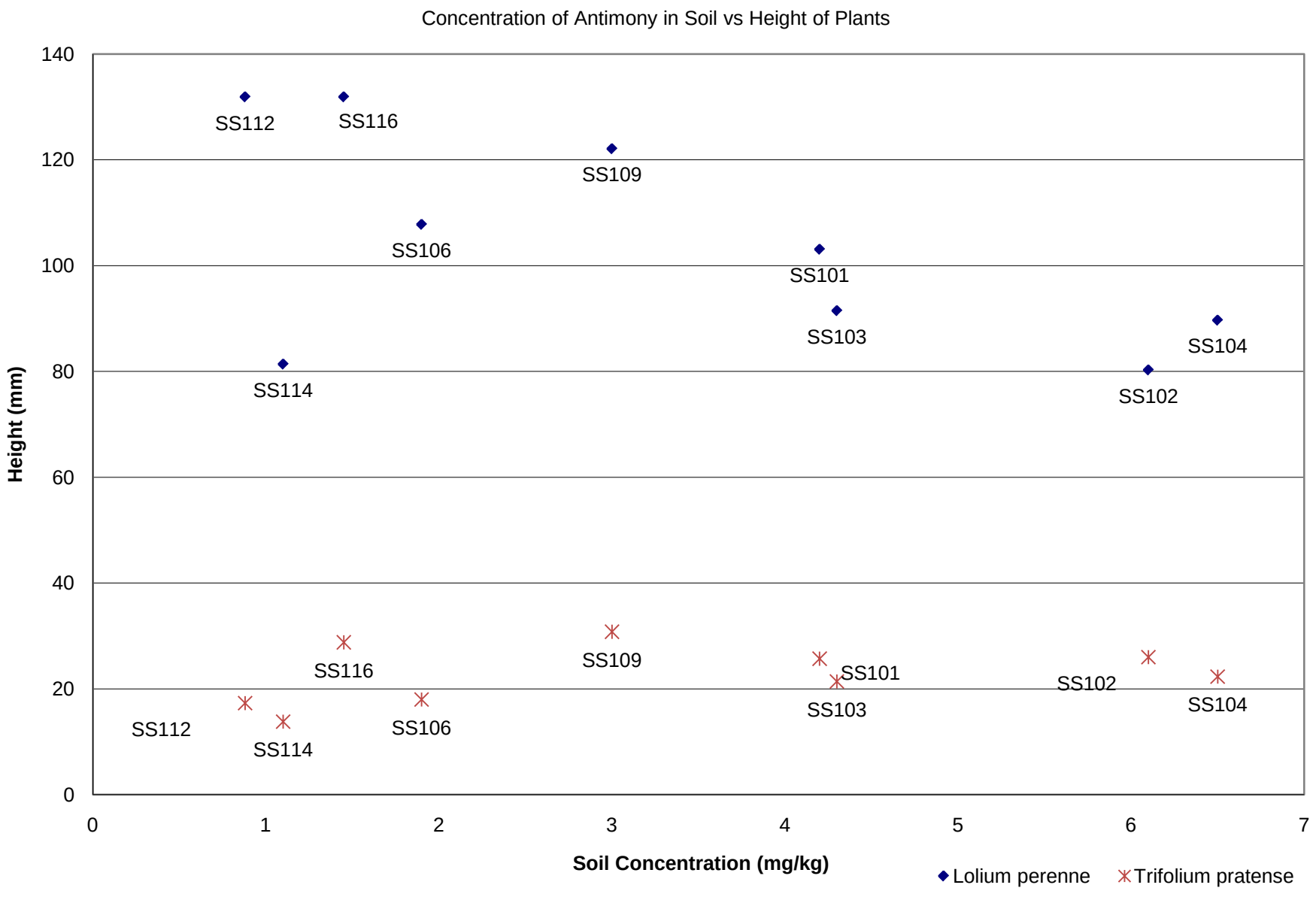

Concentration of Zinc in Soil vs Survival of Plants
Survival (%)
Soil Concentration (mg/kg)
0
10
20
30
40
50
60
70
80
90
0
500
1000
1500
2000
2500
SS106
SS112
SS116
SS109
SS101
SS102
SS103
SS116
SS112
SS106
SS104
SS114
SS109
SS103
SS114
Lolium perenne
Trifolium pratense

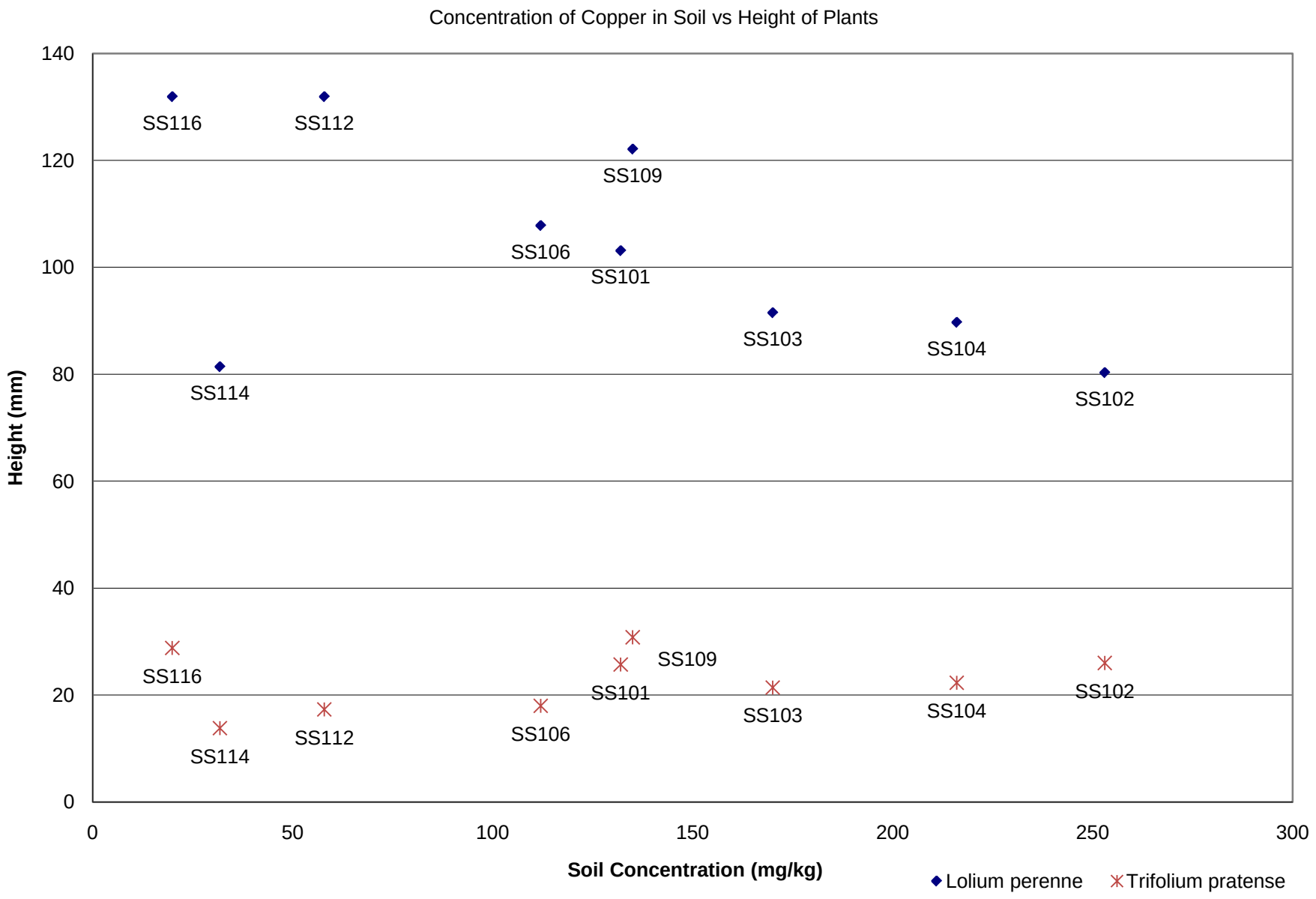

Concentration of Antimony in Soil vs Germination of Plants
Germination (%)
Soil Concentration (mg/kg)
100
90
80
70
60
50
40
30
20
10
0
0
1
2
3
4
5
6
7
SS106
SS112
SS116
SS109
SS101
SS102
SS102
SS103
SS104
SS104
SS112
SS114
SS116
SS106
SS109
SS103
SS114
Lolium perenne
Trifolium pratense

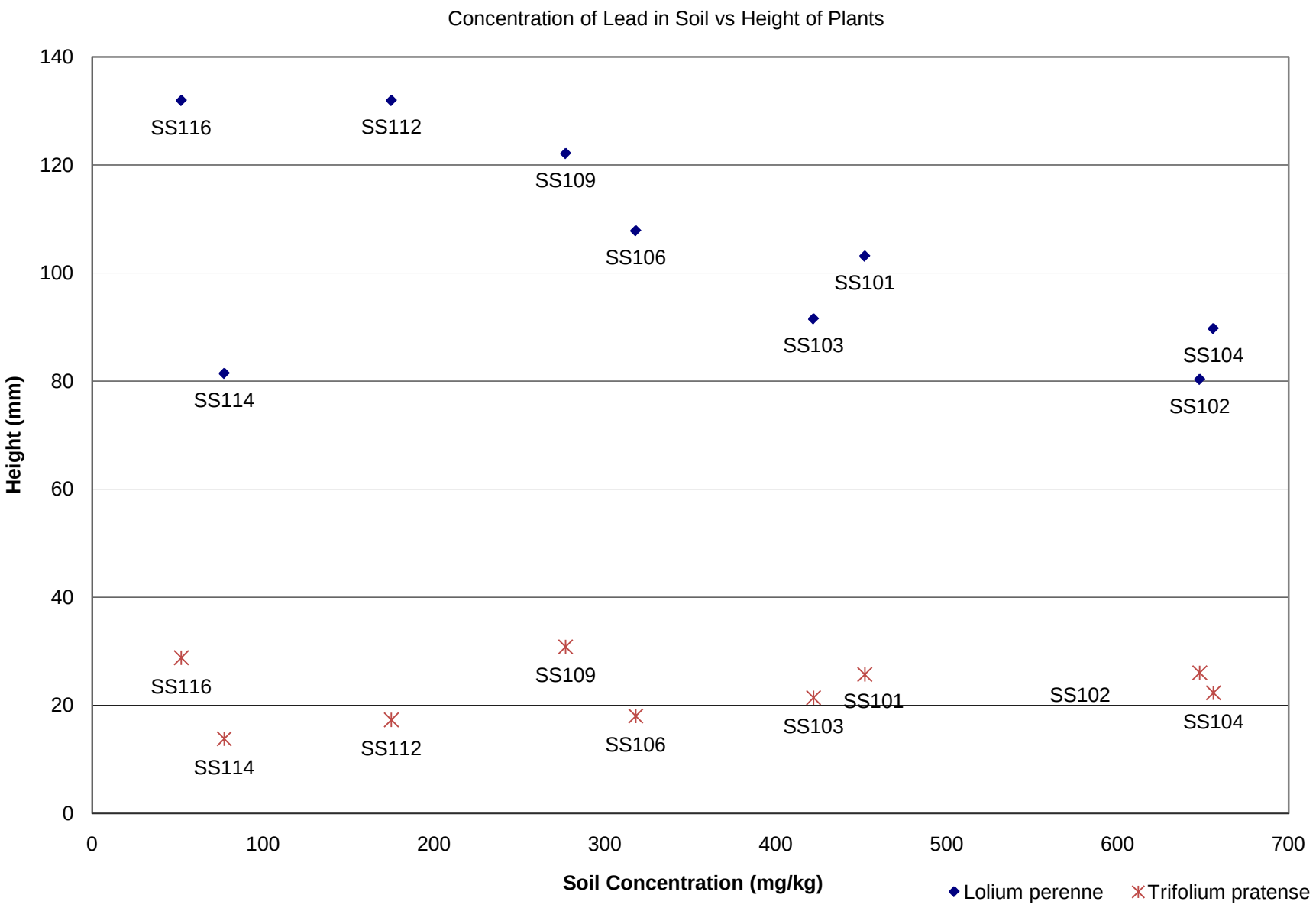

Concentration of Copper in Soil vs Germination of Plants
Germination (%)
Soil Concentration (mg/kg)
100
90
80
70
60
50
40
30
20
10
0
0
50
100
150
200
250
300
SS106
SS112
SS116
SS109
SS101
SS102
SS103
SS104
SS116
SS112
SS106
SS114
SS109
SS103
SS104
SS114
Lolium perenne
Trifolium pratense

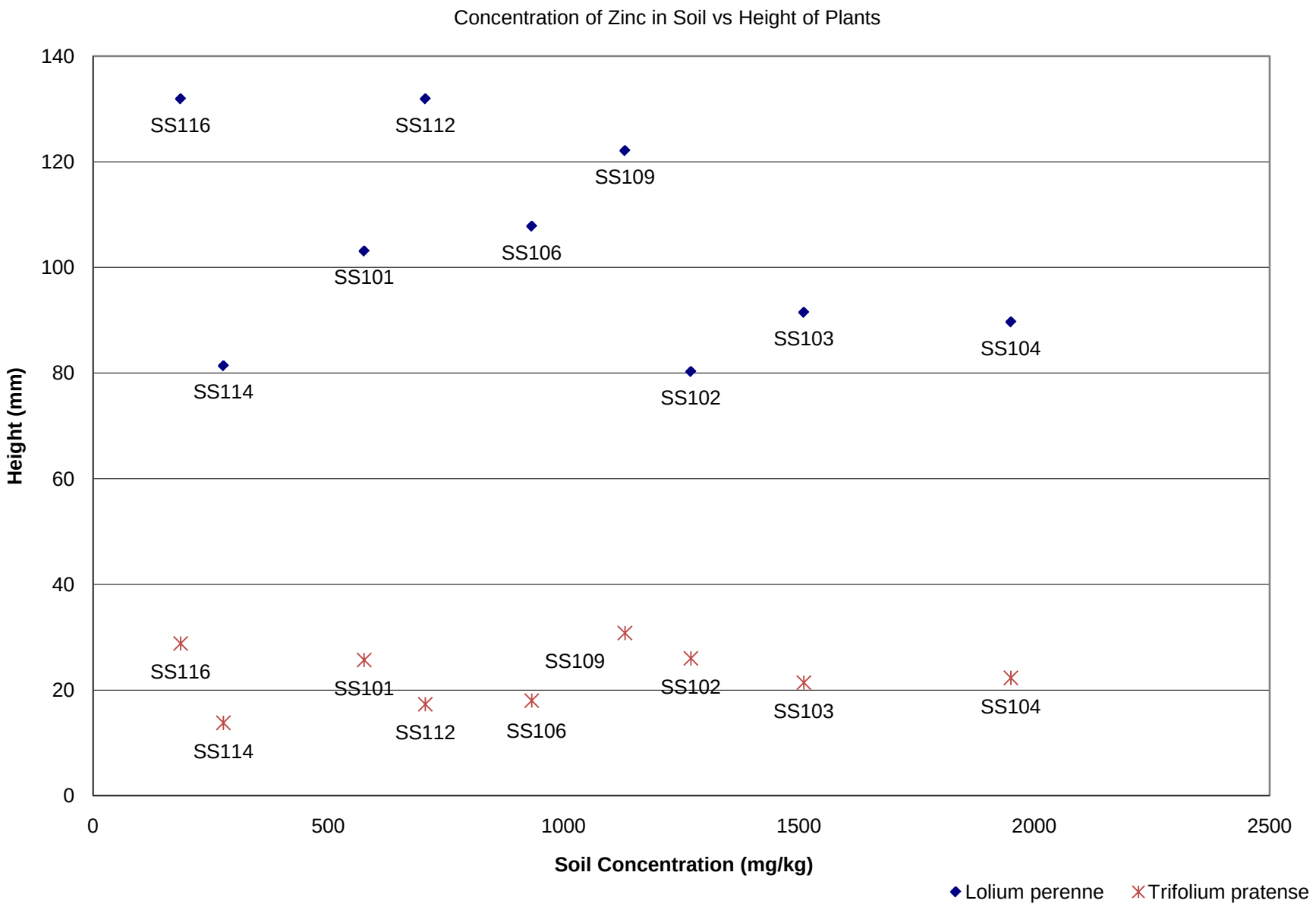

Concentration of Lead in Soil vs Germination of Plants
Germination (%)
Soil Concentration (mg/kg)
0
10
20
30
40
50
60
70
80
90
100
0
100
200
300
400
500
600
700
SS106
SS112
SS116
SS109
SS102
SS102
SS101
SS103
SS104
SS116
SS112
SS106
SS104
SS114
SS109
SS103
SS114
Lolium perenne
Trifolium pratense

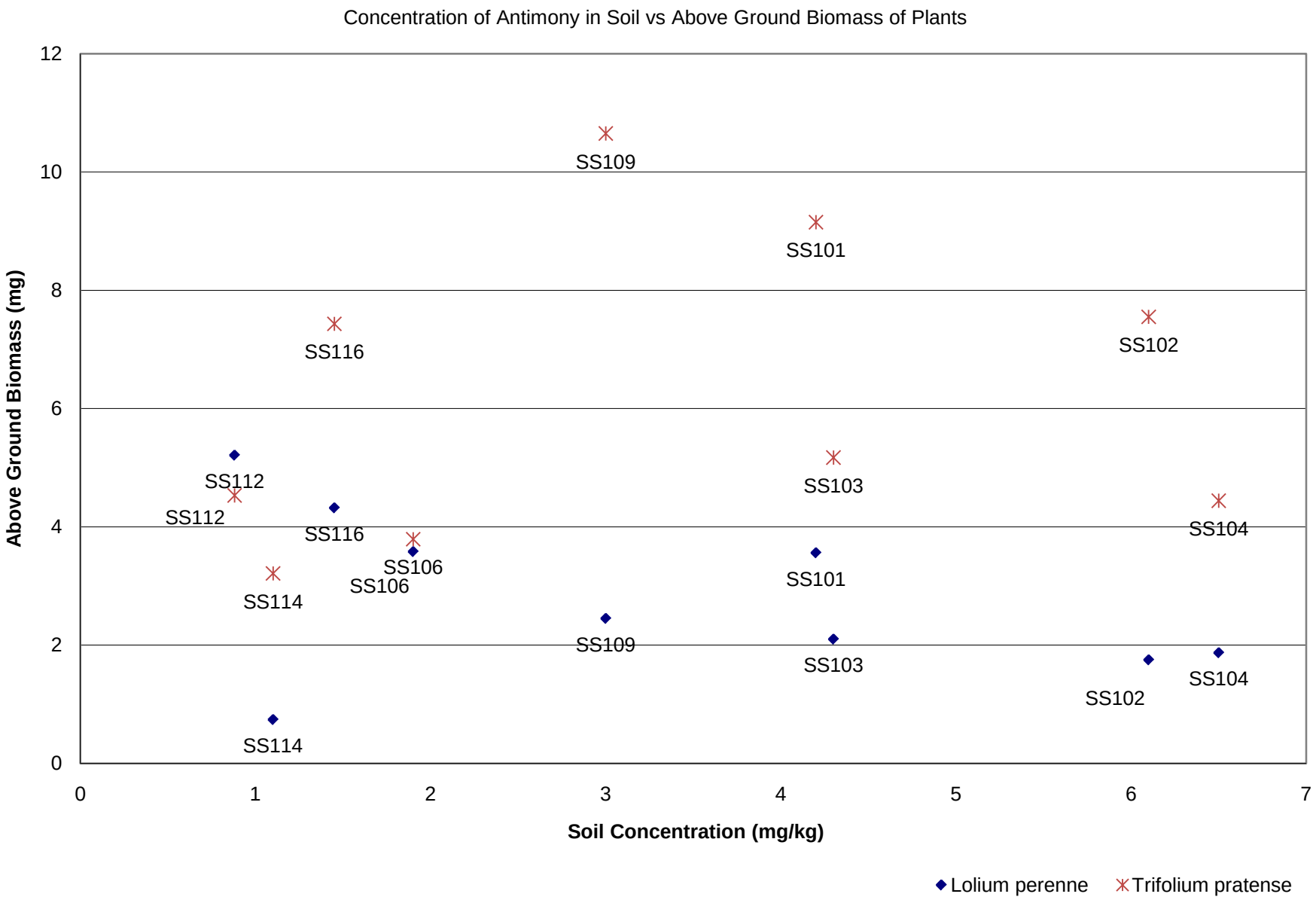

Concentration of Zinc in Soil vs Germination of Plants
Germination (%)
Soil Concentration (mg/kg)
100
90
80
70
60
50
40
30
20
10
0
0
500
1000
1500
2000
2500
SS106
SS112
SS116
SS109
SS102
SS101
SS102
SS103
SS104
SS116
SS112
SS106
SS104
SS114
SS109
SS103
SS114
Lolium perenne
Trifolium pratense

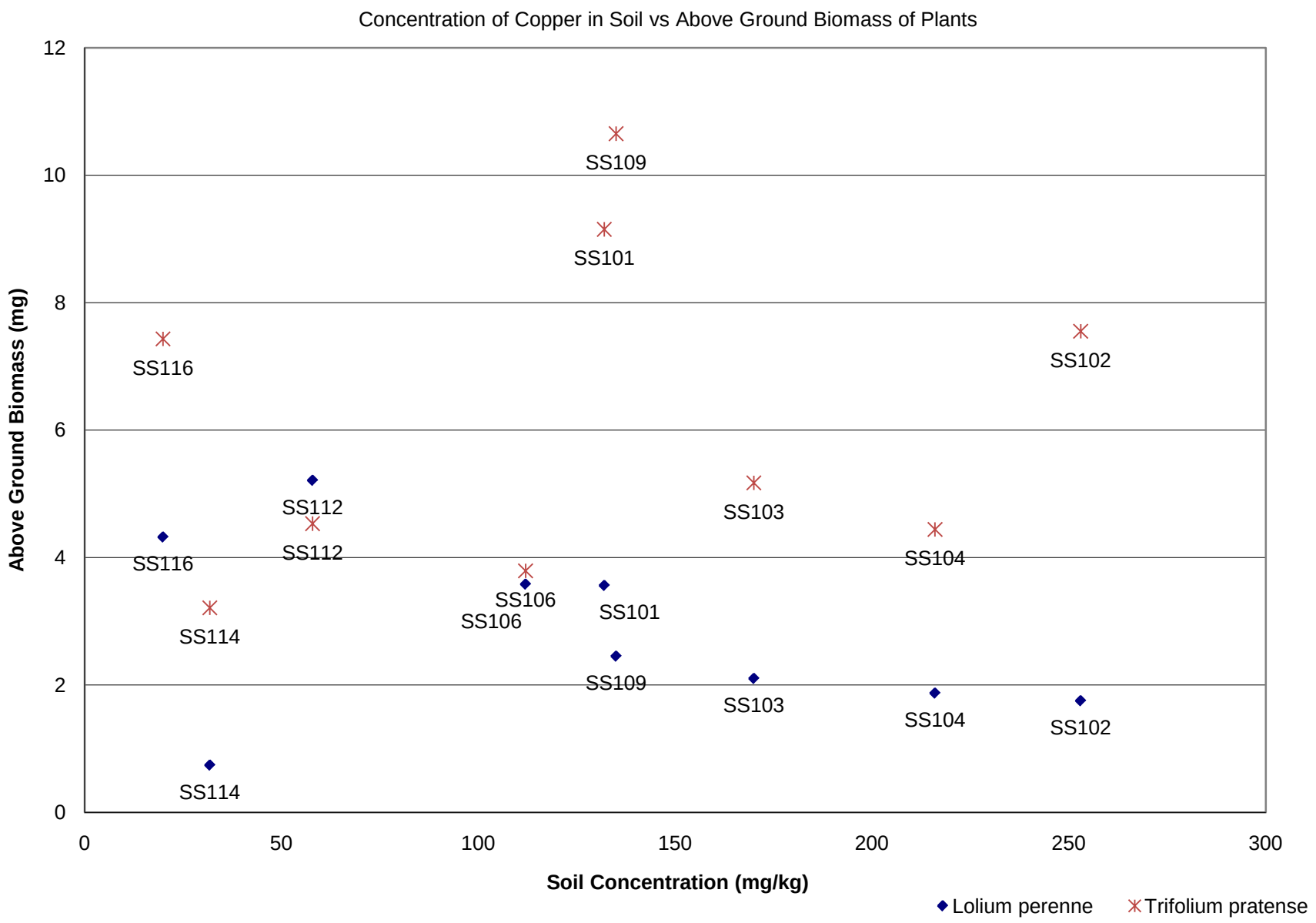

Concentration of Antimony in Soil vs Height of Plants
Height (mm)
Soil Concentration (mg/kg)
0
20
40
60
80
100
120
140
0
1
2
3
4
5
6
7
SS112
SS116
SS109
SS106
SS101
SS103
SS104
SS114
SS102
SS116
SS109
SS101
SS102
SS103
SS104
SS112
SS114
SS106
Lolium perenne
Trifolium pratense

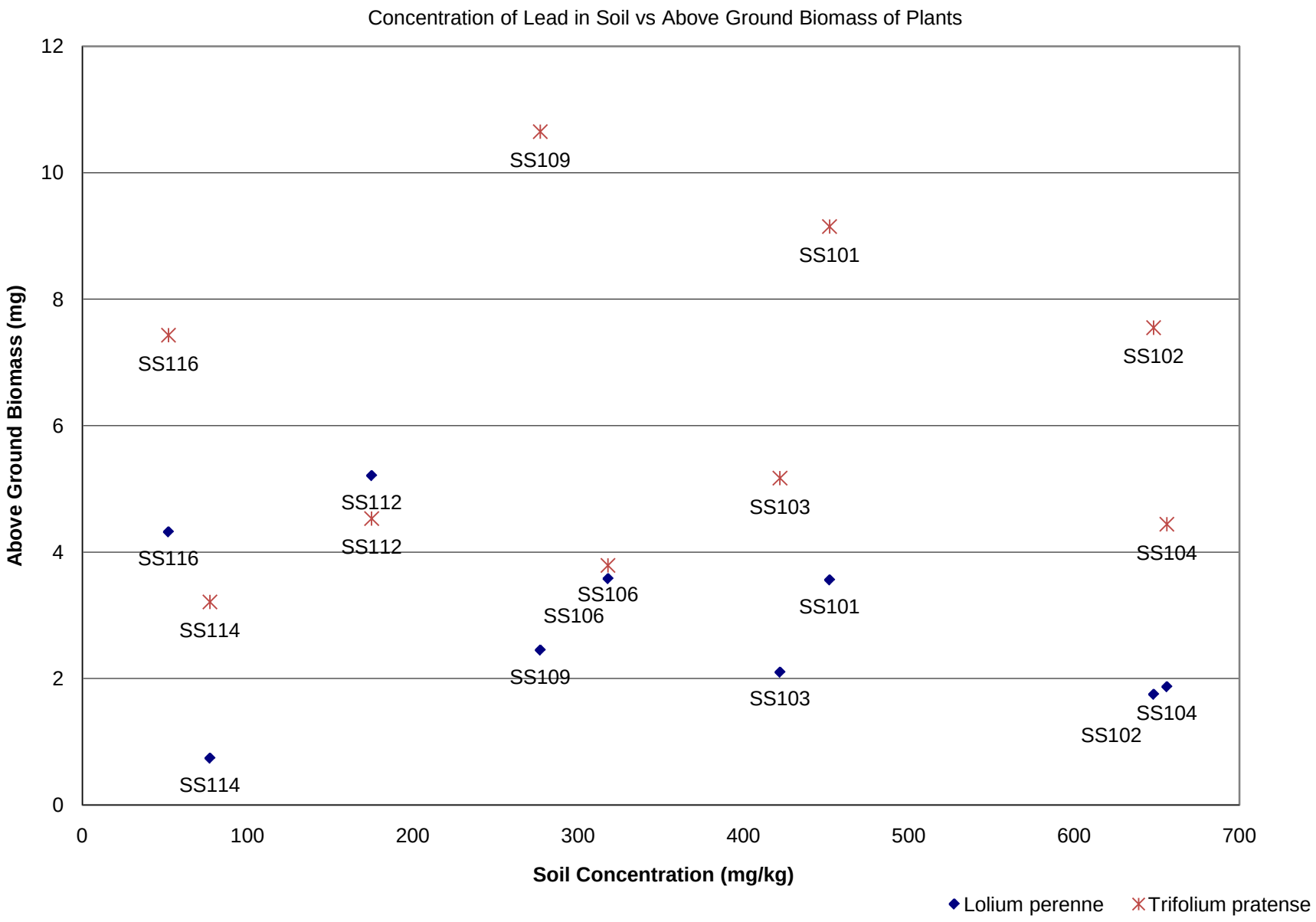

Concentration of Copper in Soil vs Height of Plants
Height (mm)
Soil Concentration (mg/kg)
0
20
40
60
80
100
120
140
0
50
100
150
200
250
300
SS116
SS112
SS109
SS106
SS101
SS103
SS104
SS114
SS102
SS116
SS109
SS101
SS102
SS103
SS104
SS112
SS106
SS114
Lolium perenne
Trifolium pratense

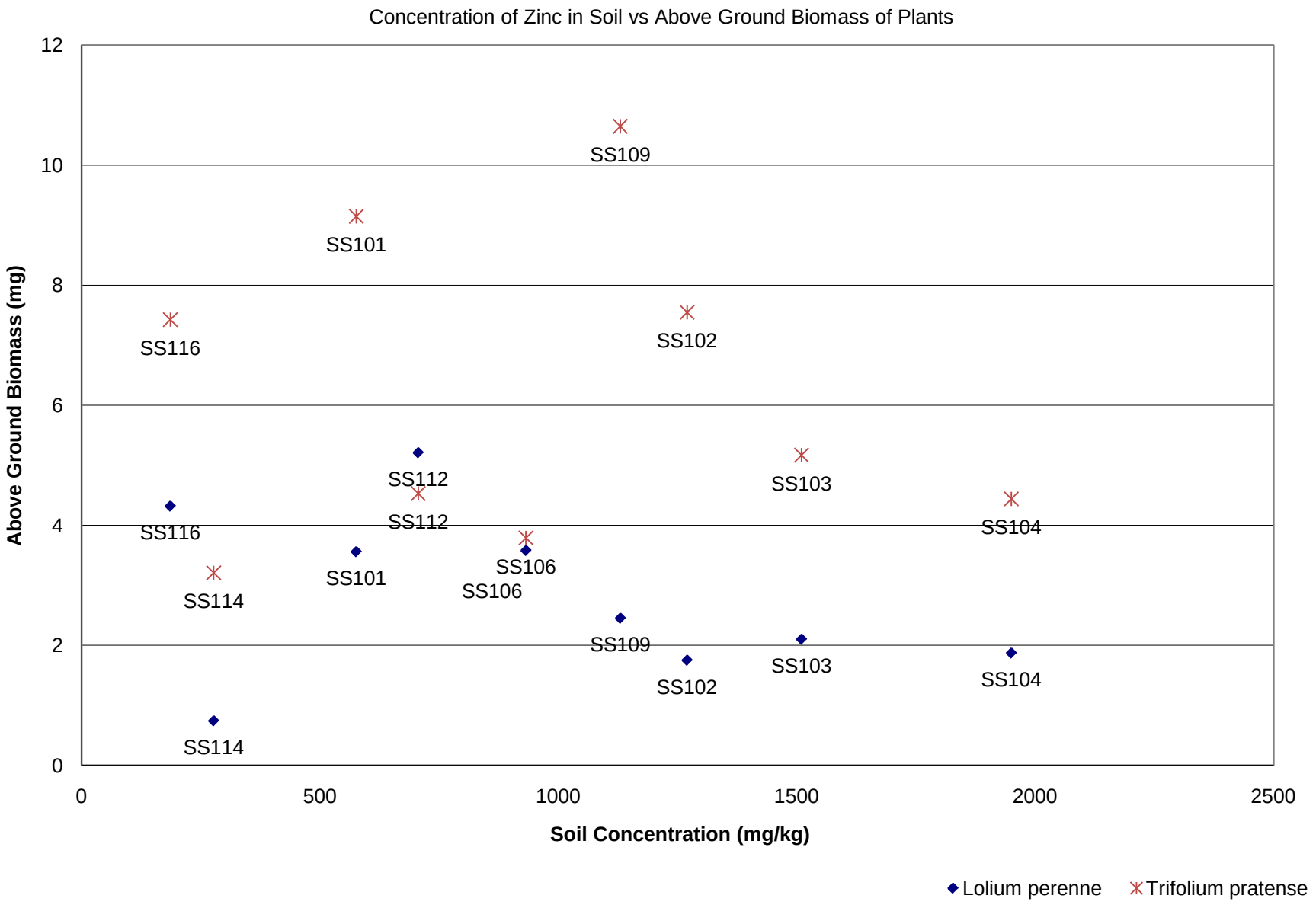

Concentration of Lead in Soil vs Height of Plants
Height (mm)
Soil Concentration (mg/kg)
0
20
40
60
80
100
120
140
0
100
200
300
400
500
600
700
SS116
SS112
SS109
SS106
SS101
SS103
SS104
SS114
SS102
SS116
SS109
SS101
SS102
SS103
SS104
SS114
SS112
SS106
Lolium perenne
Trifolium pratense

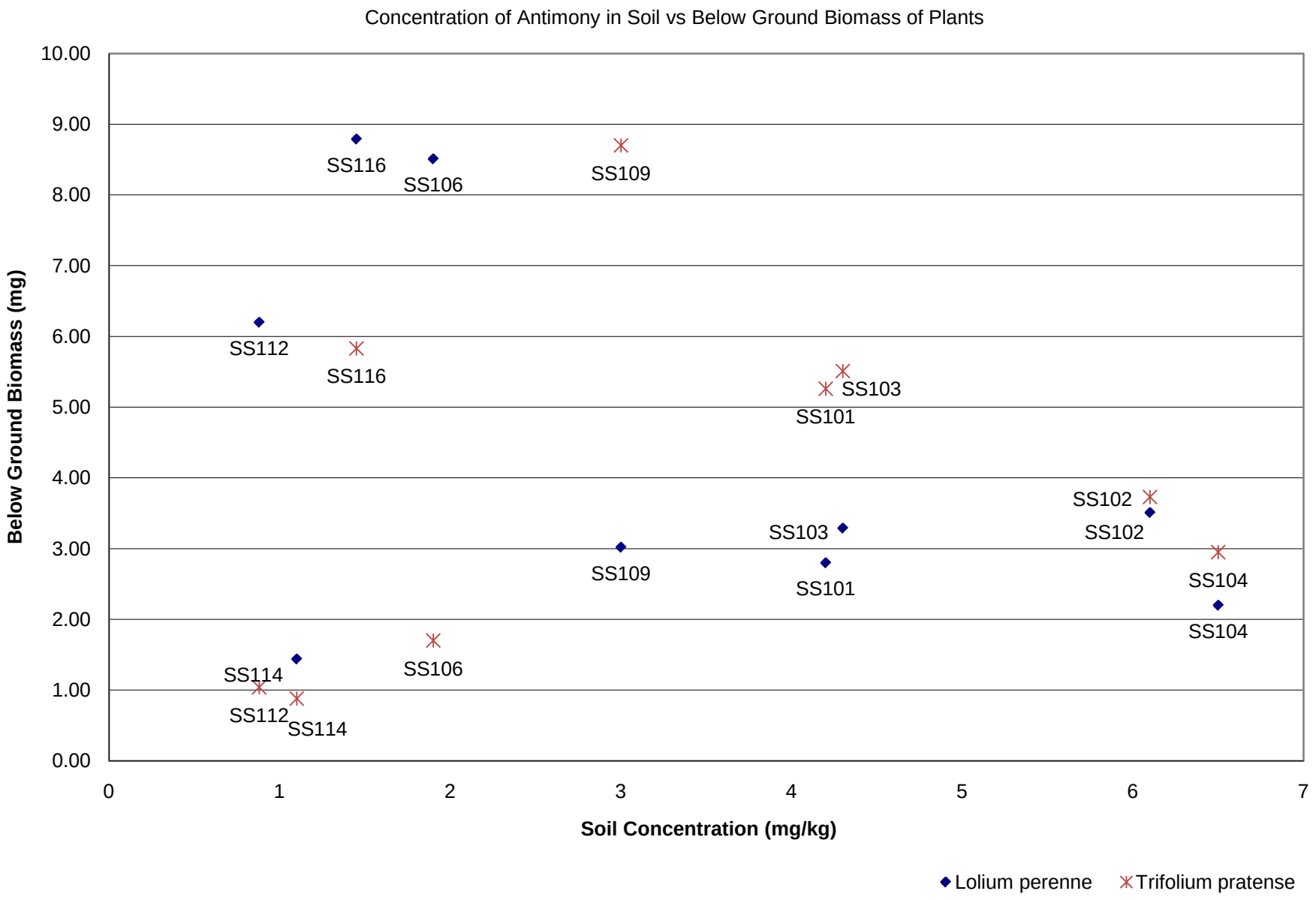

Concentration of Zinc in Soil vs Height of Plants
Height (mm)
Soil Concentration (mg/kg)
0
20
40
60
80
100
120
140
0
500
1000
1500
2000
2500
SS116
SS112
SS109
SS106
SS101
SS103
SS104
SS114
SS102
SS116
SS101
SS109
SS102
SS103
SS104
SS112
SS106
SS114
Lolium perenne
Trifolium pratense

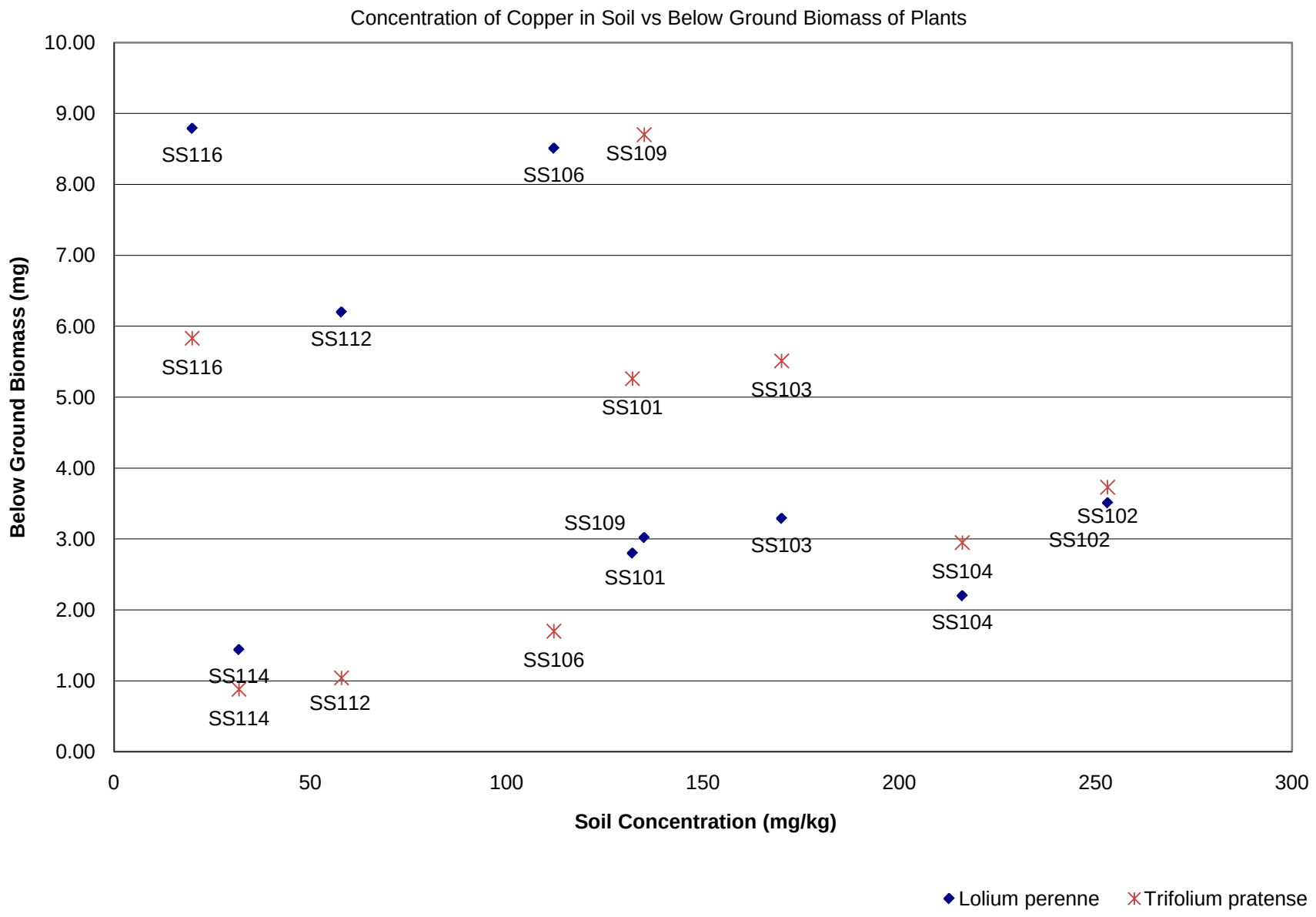

Concentration of Antimony in Soil vs Above Ground Biomass of Plants
Above Ground Biomass (mg)
Soil Concentration (mg/kg)
0
2
4
6
8
10
12
0
1
2
3
4
5
6
7
SS109
SS101
SS116
SS102
SS112
SS103
SS112
SS104
SS116
SS106
SS106
SS101
SS114
SS109
SS103
SS104
SS102
SS114
Lolium perenne
Trifolium pratense

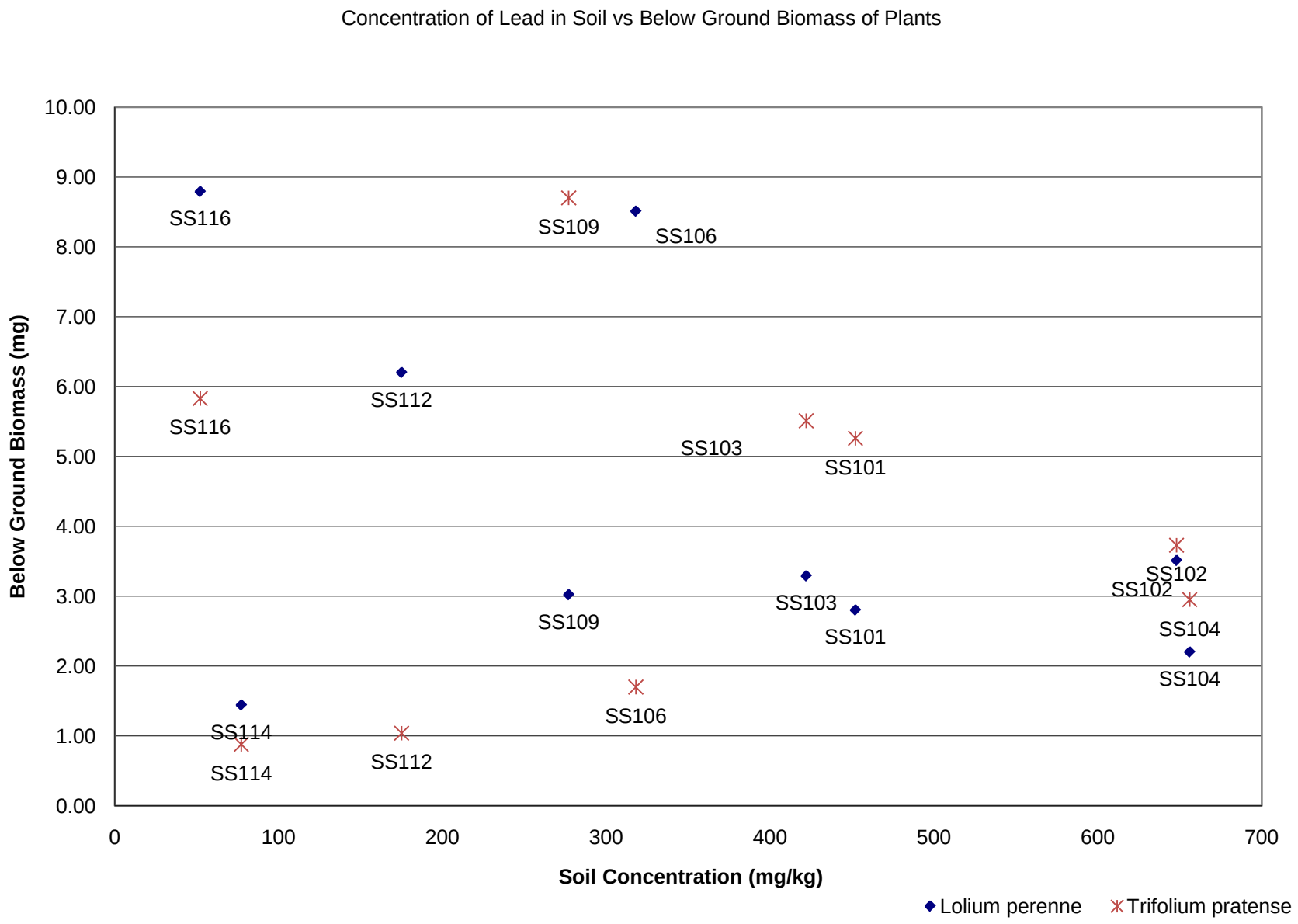

Concentration of Copper in Soil vs Above Ground Biomass of Plants
Above Ground Biomass (mg)
Soil Concentration (mg/kg)
0
2
4
6
8
10
12
0
50
100
150
200
250
300
SS109
SS101
SS116
SS102
SS112
SS103
SS112
SS104
SS116
SS106
SS106
SS101
SS114
SS109
SS103
SS104
SS102
SS114
Lolium perenne
Trifolium pratense

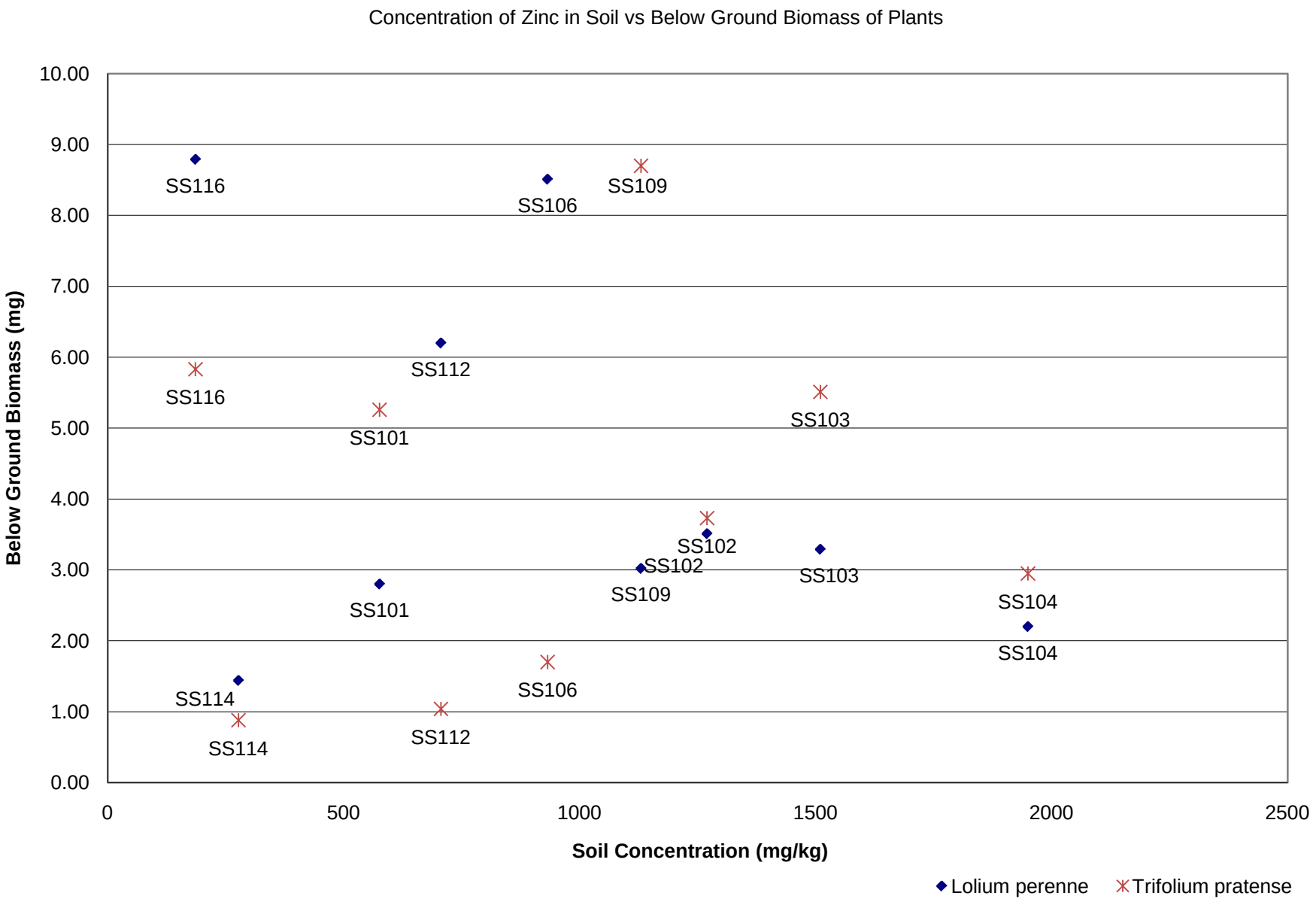

Concentration of Lead in Soil vs Above Ground Biomass of Plants
Above Ground Biomass (mg)
Soil Concentration (mg/kg)
0
2
4
6
8
10
12
0
100
200
300
400
500
600
700
SS109
SS101
SS116
SS102
SS112
SS103
SS112
SS104
SS116
SS106
SS106
SS101
SS114
SS109
SS103
SS104
SS102
SS114
Lolium perenne
Trifolium pratense


Concentration of Zinc in Soil vs Above Ground Biomass of Plants
Above Ground Biomass (mg)
Soil Concentration (mg/kg)
0
2
4
6
8
10
12
0
500
1000
1500
2000
2500
SS109
SS101
SS116
SS102
SS112
SS103
SS104
SS106
SS114
Lolium perenne
Trifolium pratense


Concentration of Antimony in Soil vs Below Ground Biomass of Plants
Below Ground Biomass (mg)
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
0
1
2
3
4
5
6
7
Soil Concentration (mg/kg)
SS116
SS106
SS109
SS112
SS116
SS103
SS101
SS102
SS102
SS103
SS109
SS101
SS104
SS104
SS114
SS106
SS112
SS114
Lolium perenne
Trifolium pratense

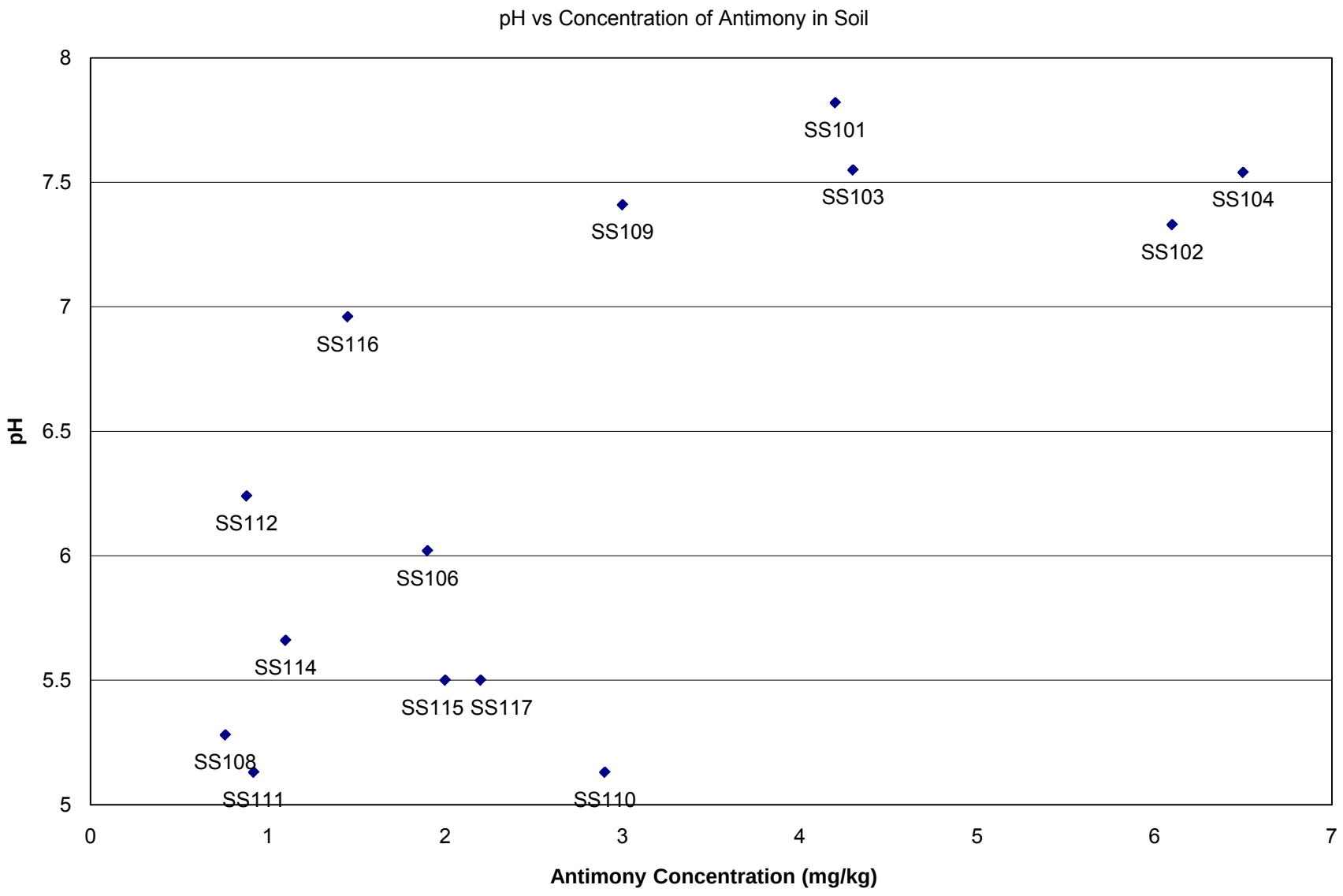

Concentration of Copper in Soil vs Below Ground Biomass of Plants
Below Ground Biomass (mg)
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
0
50
100
150
200
250
300
Soil Concentration (mg/kg)
SS116
SS106
SS109
SS112
SS116
SS101
SS103
SS102
SS109
SS103
SS102
SS101
SS104
SS104
SS106
SS114
SS112
SS114
Lolium perenne
Trifolium pratense

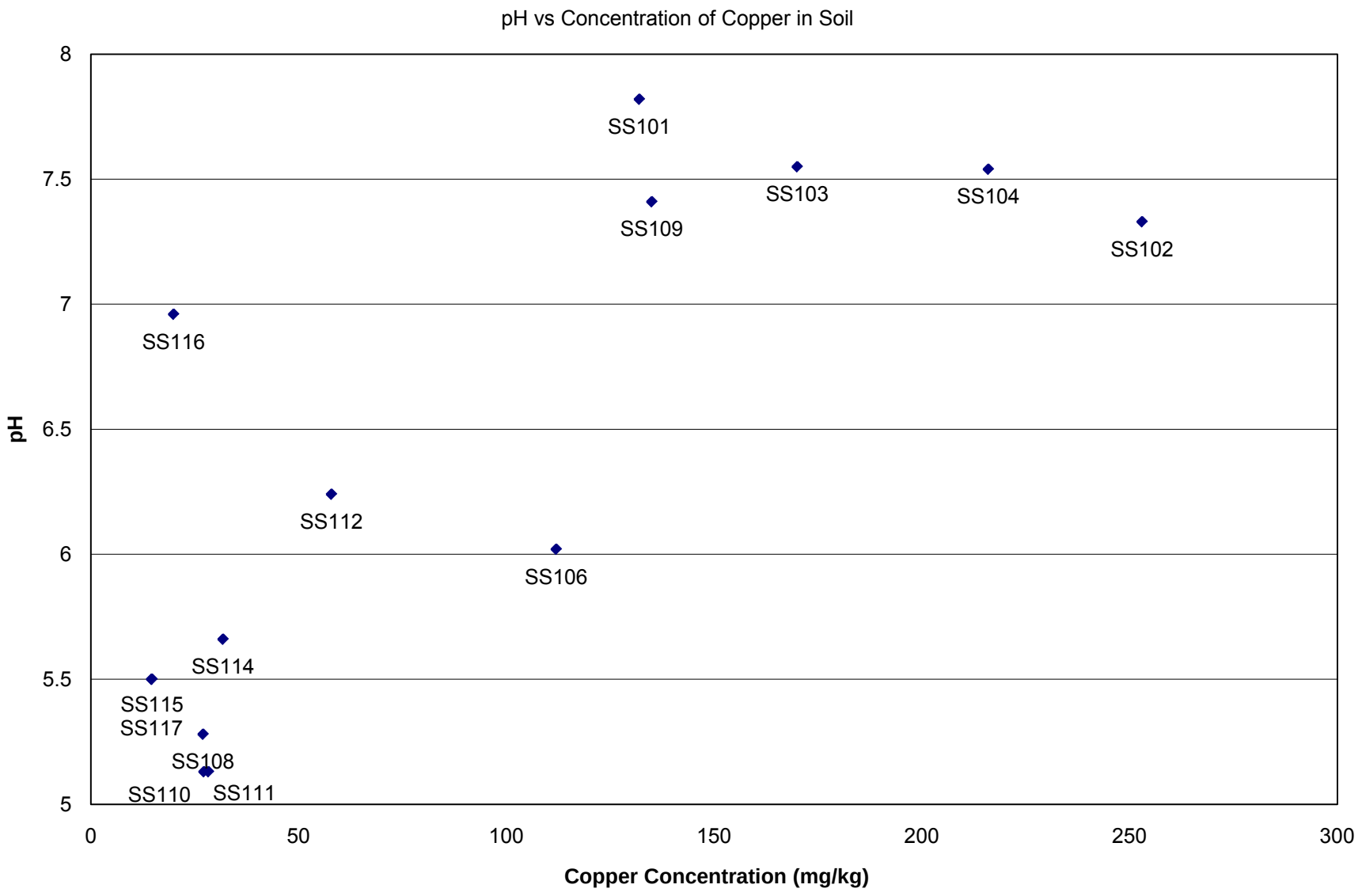

Concentration of Lead in Soil vs Below Ground Biomass of Plants
Below Ground Biomass (mg)
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
0
100
200
300
400
500
600
700
Soil Concentration (mg/kg)
SS116
SS109
SS106
SS112
SS116
SS103
SS101
SS102
SS102
SS103
SS109
SS101
SS104
SS104
SS106
SS114
SS114
SS112
Lolium perenne
Trifolium pratense

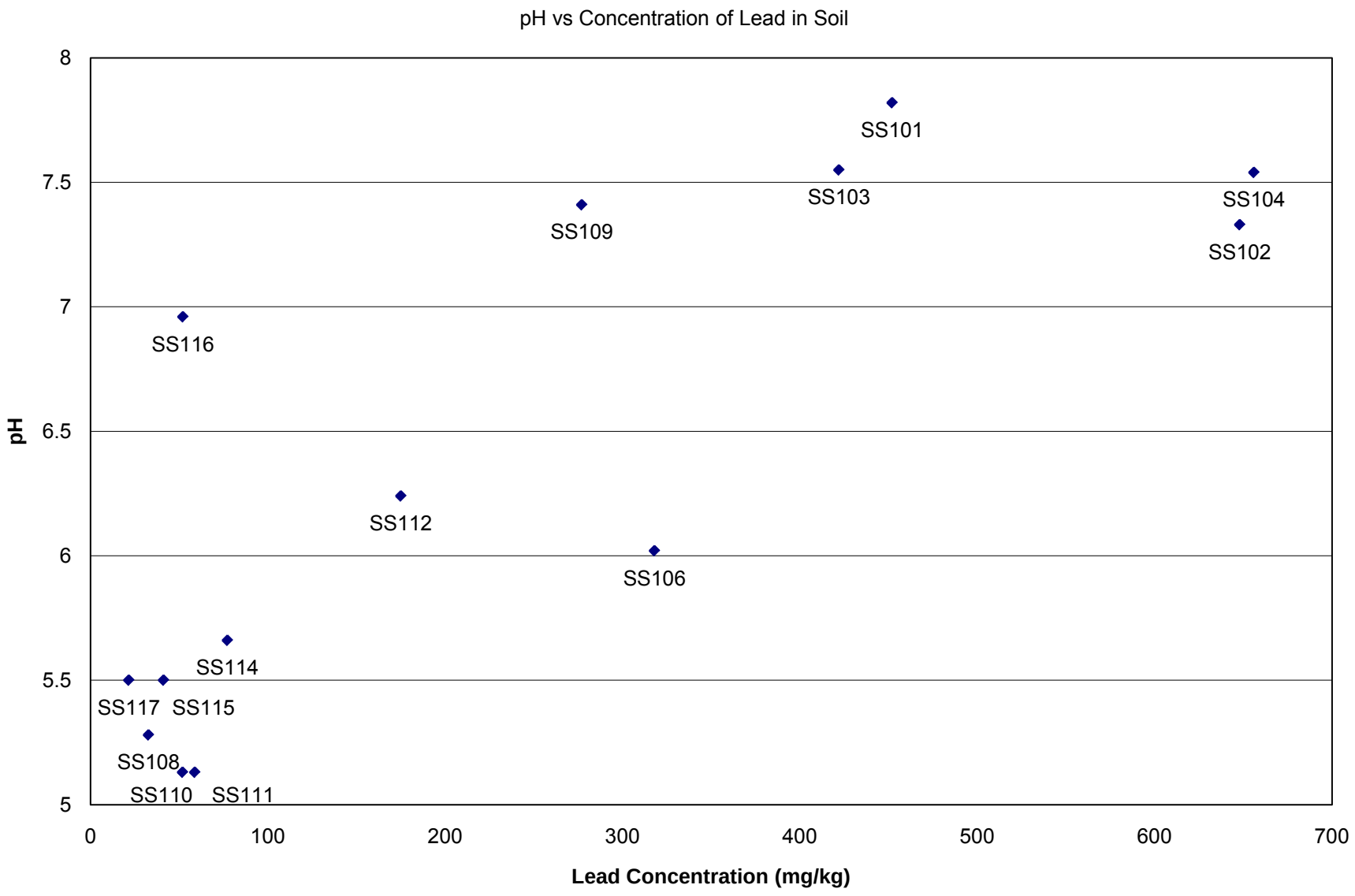

Concentration of Zinc in Soil vs Below Ground Biomass of Plants
Below Ground Biomass (mg)
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
0
500
1000
1500
2000
2500
Soil Concentration (mg/kg)
SS116
SS106
SS109
SS112
SS116
SS101
SS103
SS102
SS102
SS109
SS103
SS101
SS104
SS104
SS106
SS114
SS112
SS114
Lolium perenne
Trifolium pratense

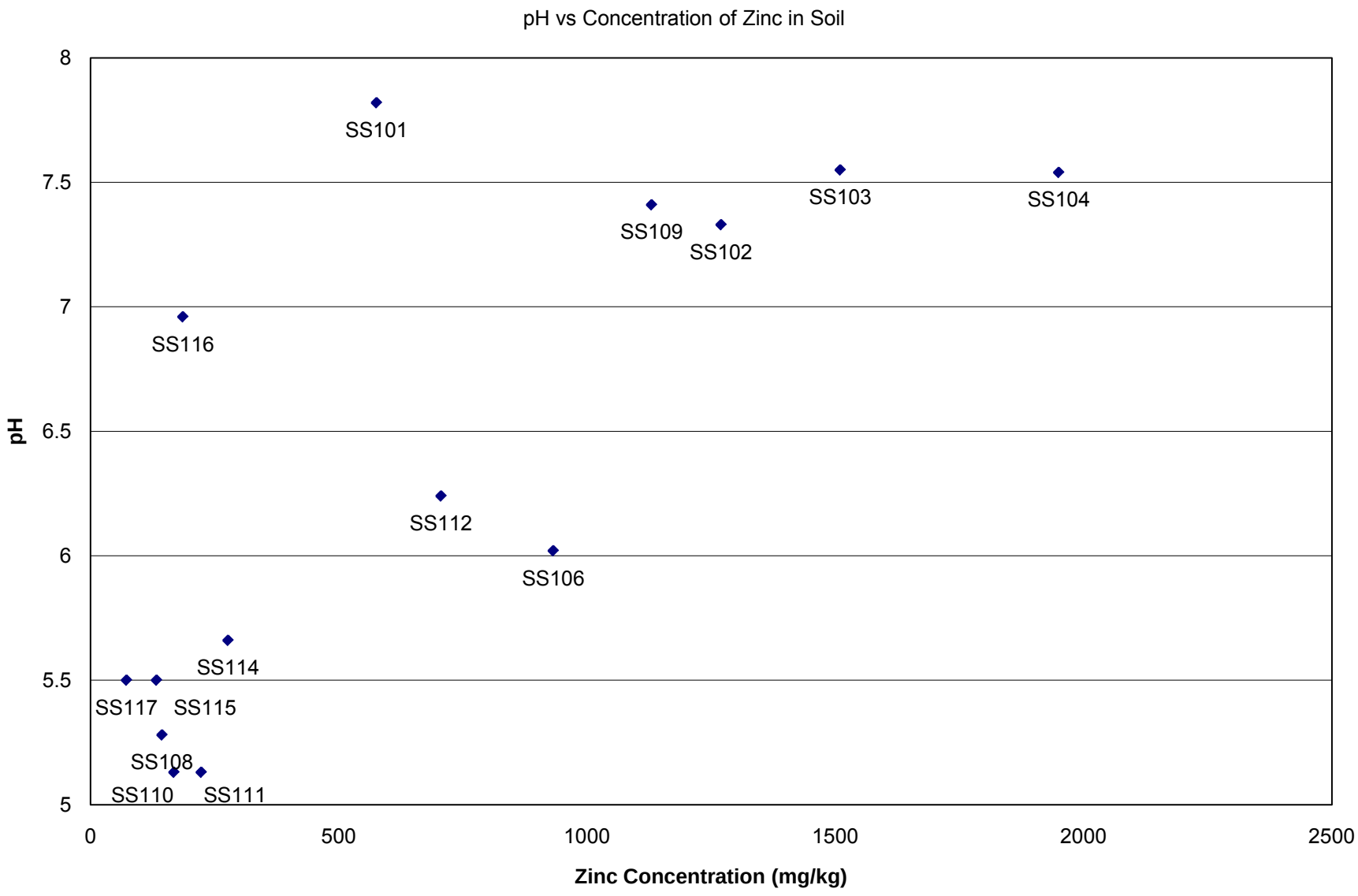
ATTACHMENT 6

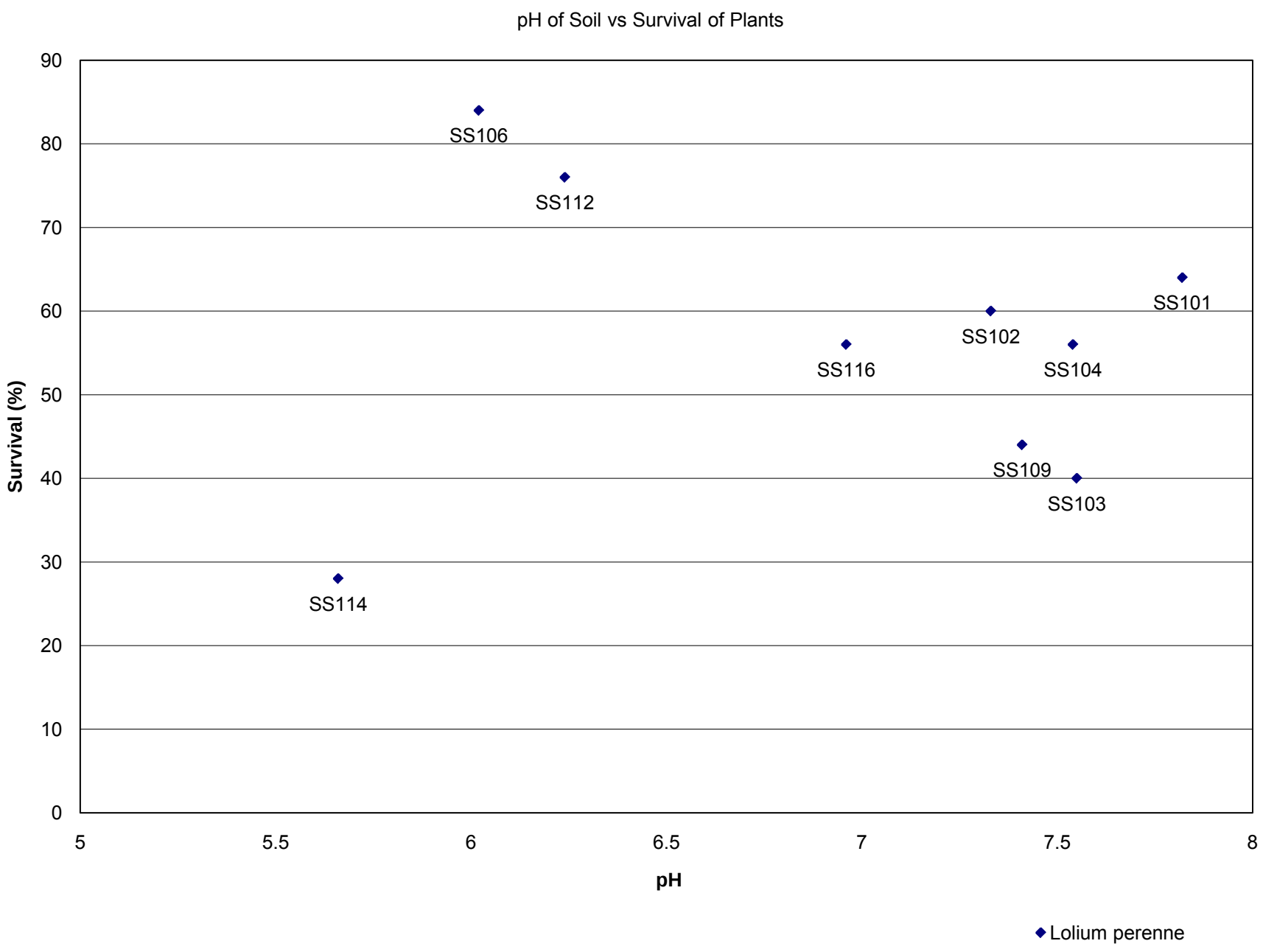
pH PLOTS

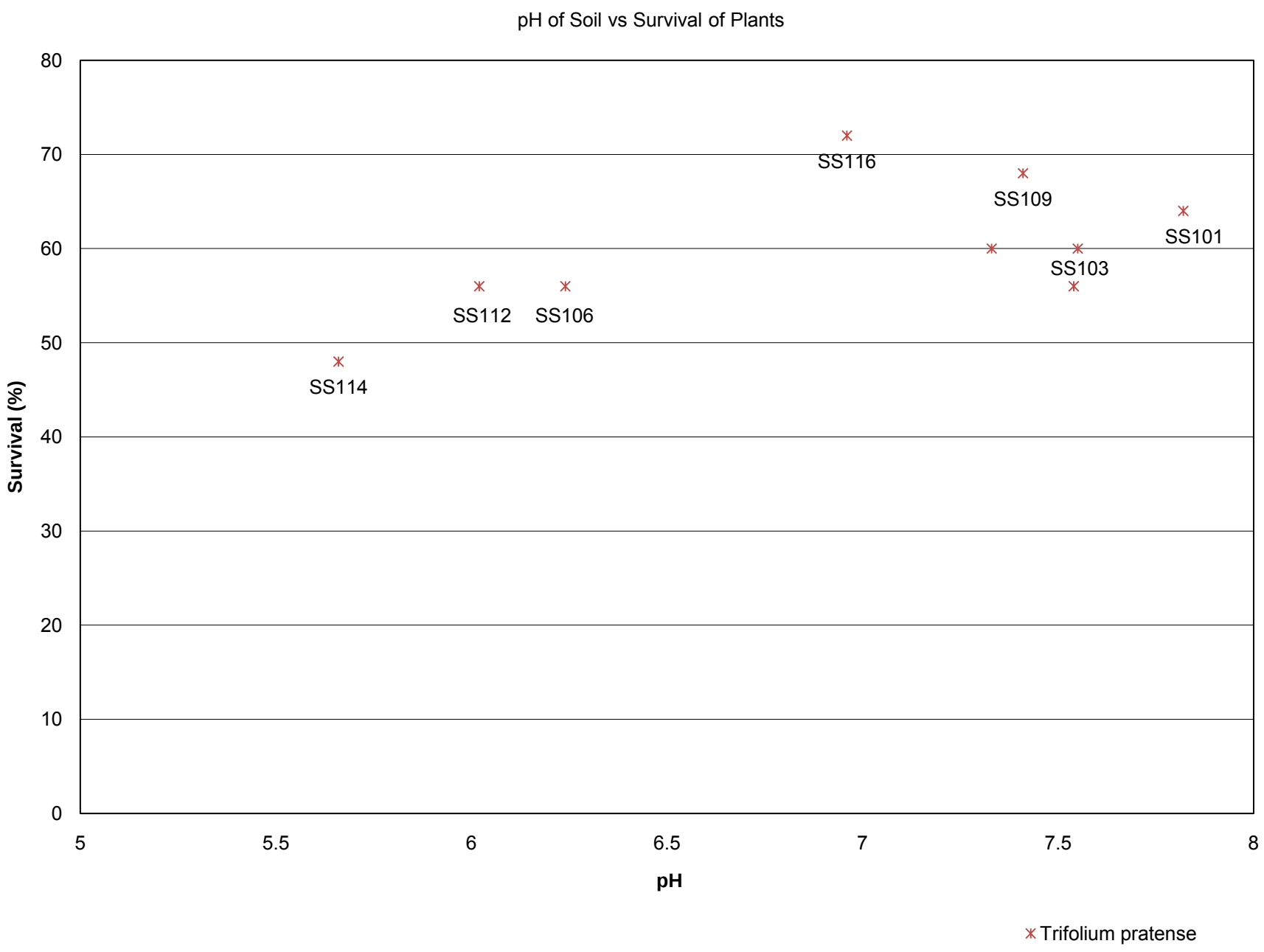

pH vs Concentration of Antimony in Soil
pH
Antimony Concentration (mg/kg)
8
7.5
7
6.5
6
5.5
5
0
1
2
3
4
5
6
7
SS101
SS103
SS104
SS109
SS102
SS116
SS112
SS106
SS114
SS115
SS117
SS108
SS111
SS110

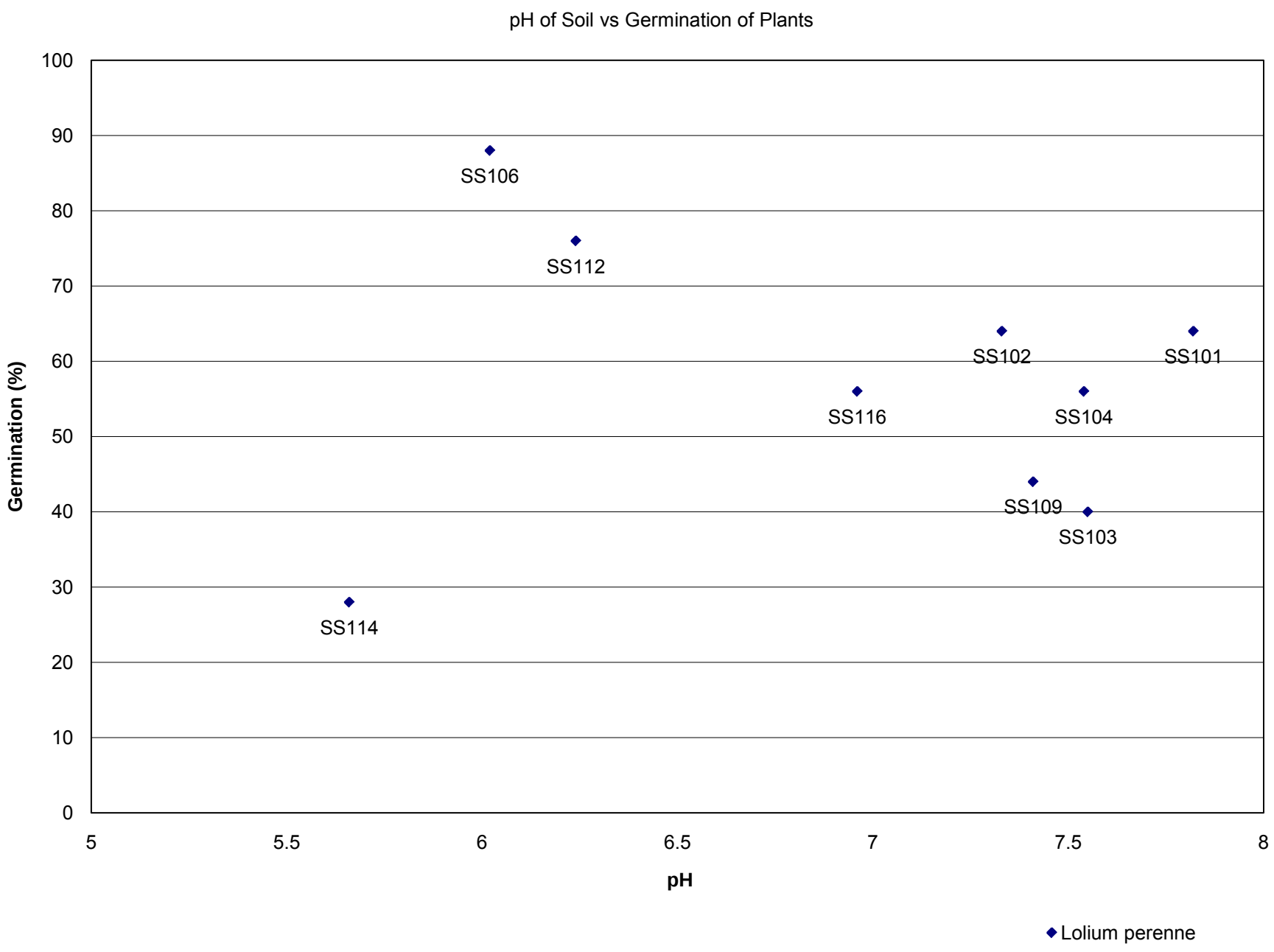

pH vs Concentration of Copper in Soil
pH
Copper Concentration (mg/kg)
8
7.5
7
6.5
6
5.5
5
0
50
100
150
200
250
300
SS101
SS103
SS104
SS109
SS102
SS116
SS112
SS106
SS114
SS115
SS117
SS108
SS110
SS111

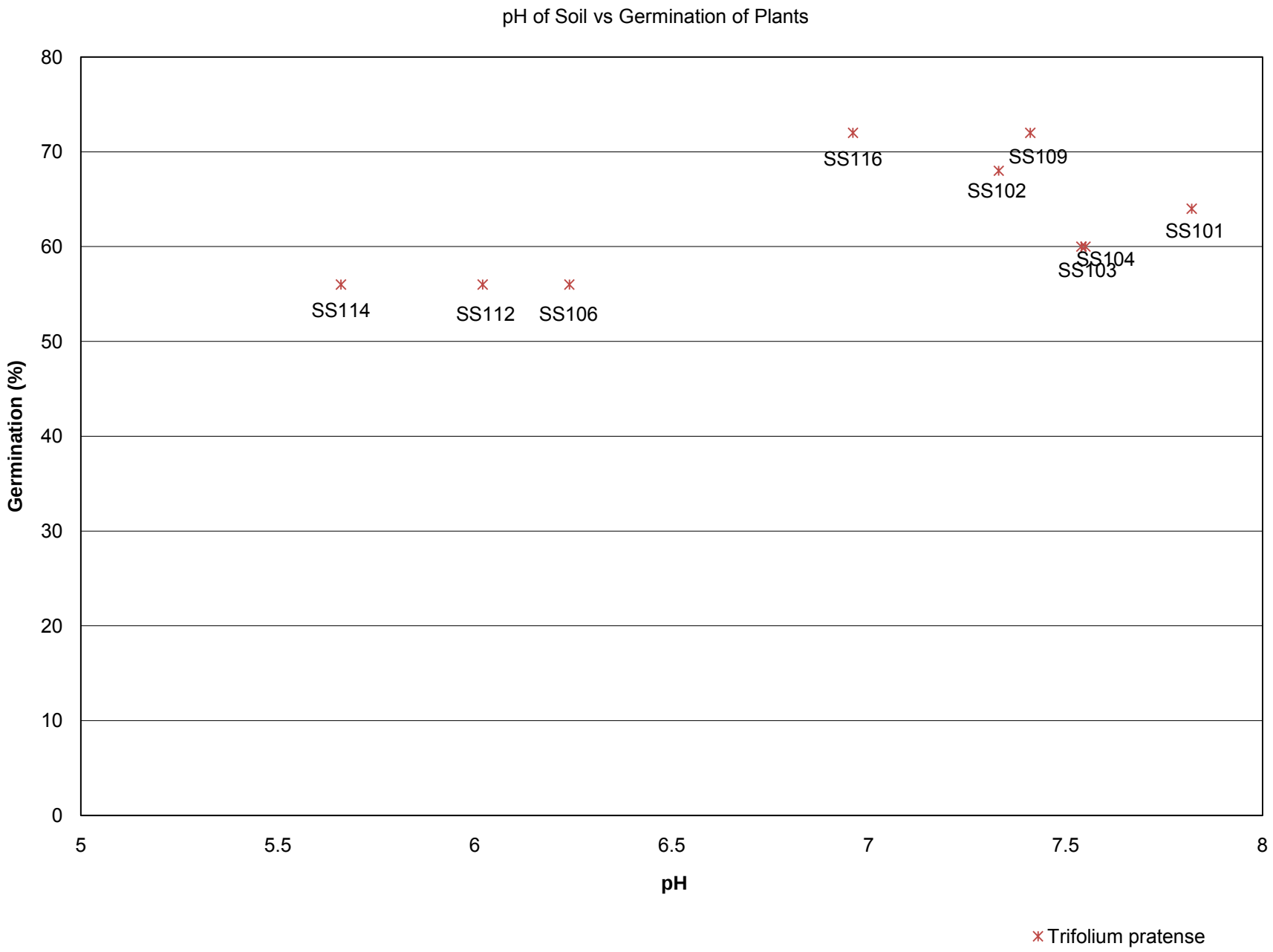

pH vs Concentration of Lead in Soil
pH
Lead Concentration (mg/kg)
8
7.5
7
6.5
6
5.5
5
0
100
200
300
400
500
600
700
SS101
SS103
SS104
SS109
SS102
SS116
SS112
SS106
SS114
SS117
SS115
SS108
SS110
SS111

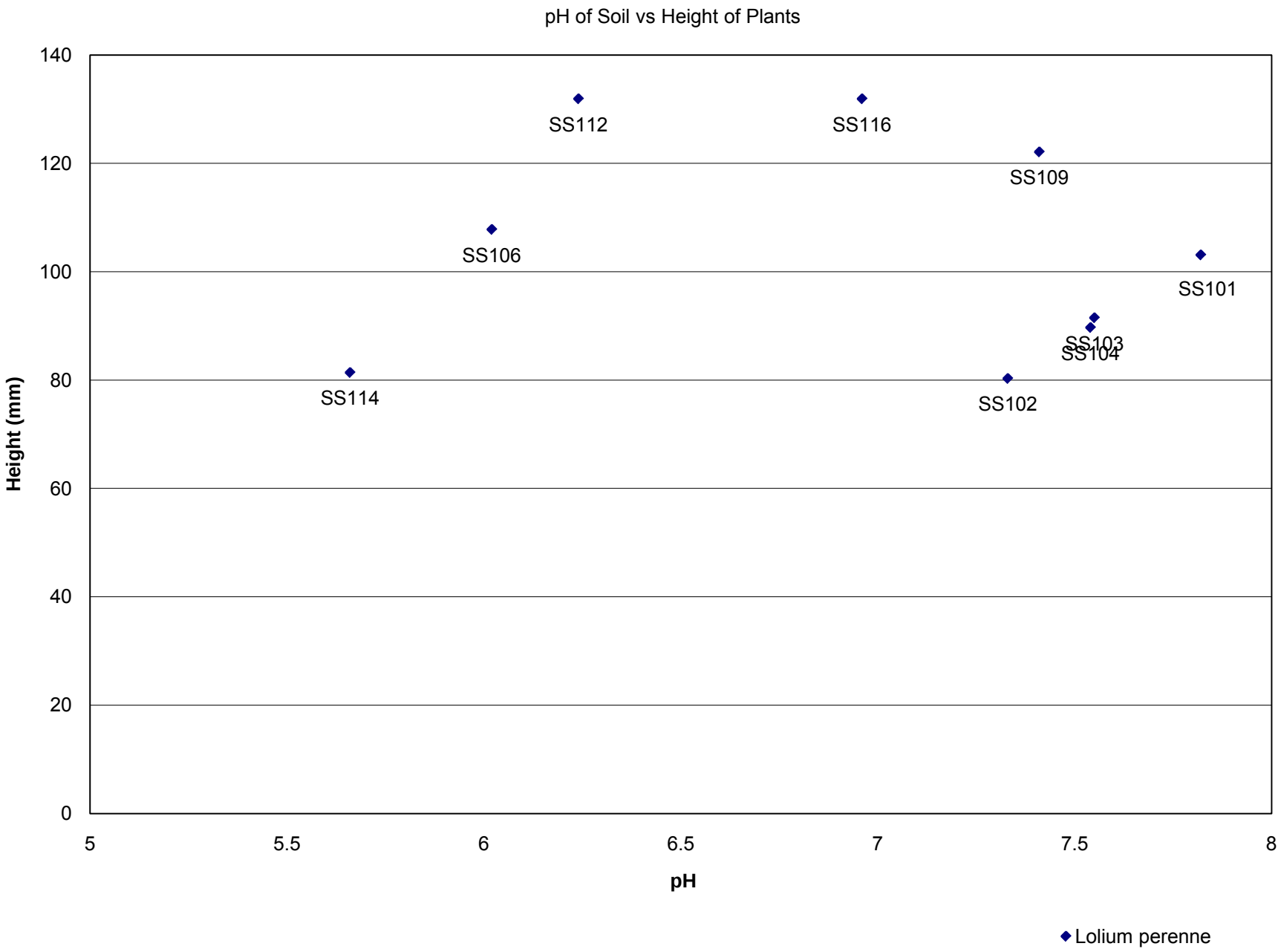

pH vs Concentration of Zinc in Soil
8
7.5
7
6.5
6
5.5
5
pH
0
500
1000
1500
2000
2500
Zinc Concentration (mg/kg)
SS101
SS103
SS104
SS109
SS102
SS116
SS112
SS106
SS114
SS117
SS115
SS108
SS110
SS111

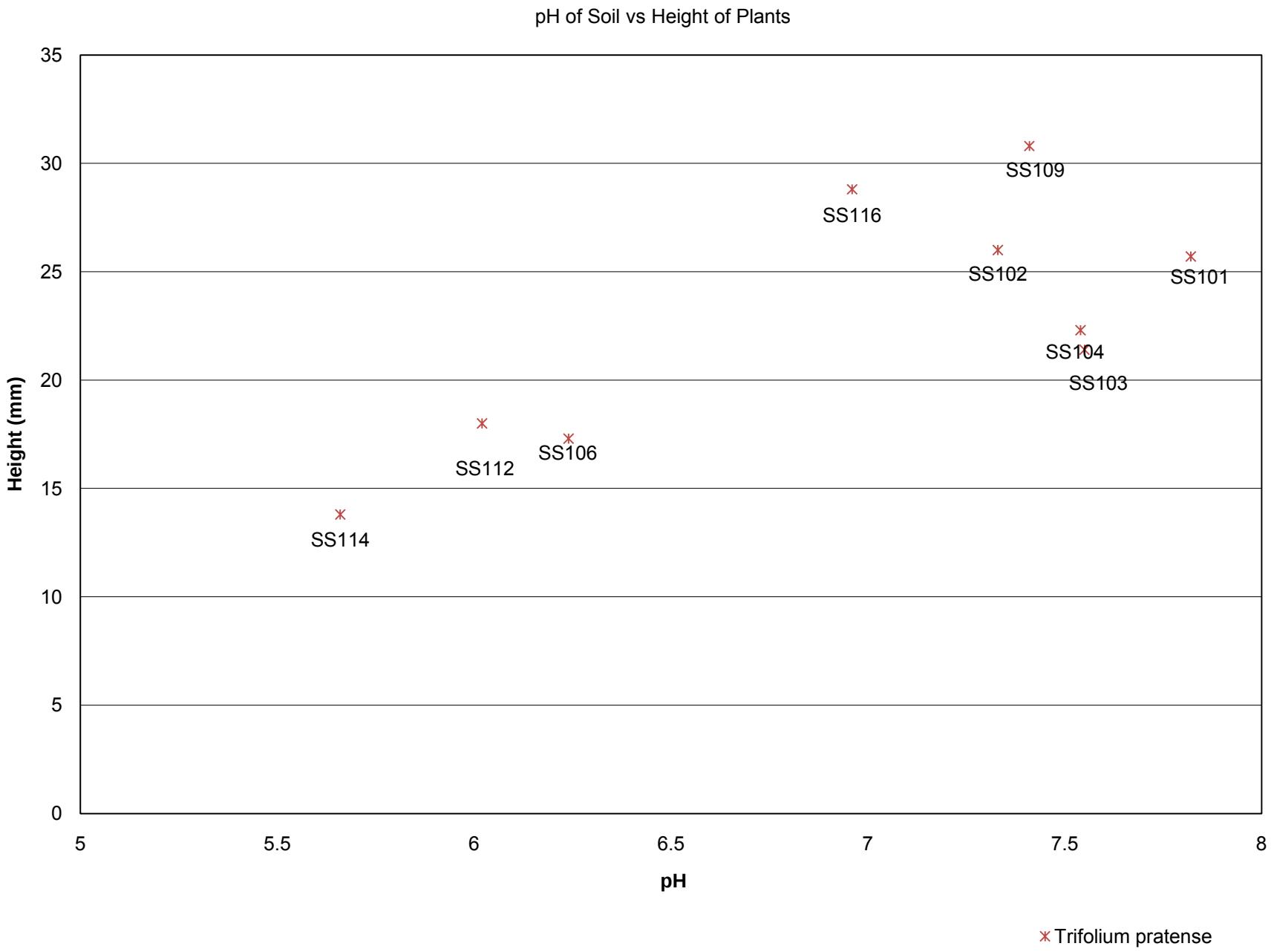

pH of Soil vs Survival of Plants
Survival (%)
pH
90
80
70
60
50
40
30
20
10
0
5
5.5
6
6.5
7
7.5
8
SS106
SS112
SS101
SS102
SS116
SS104
SS109
SS103
SS114
Lolium perenne

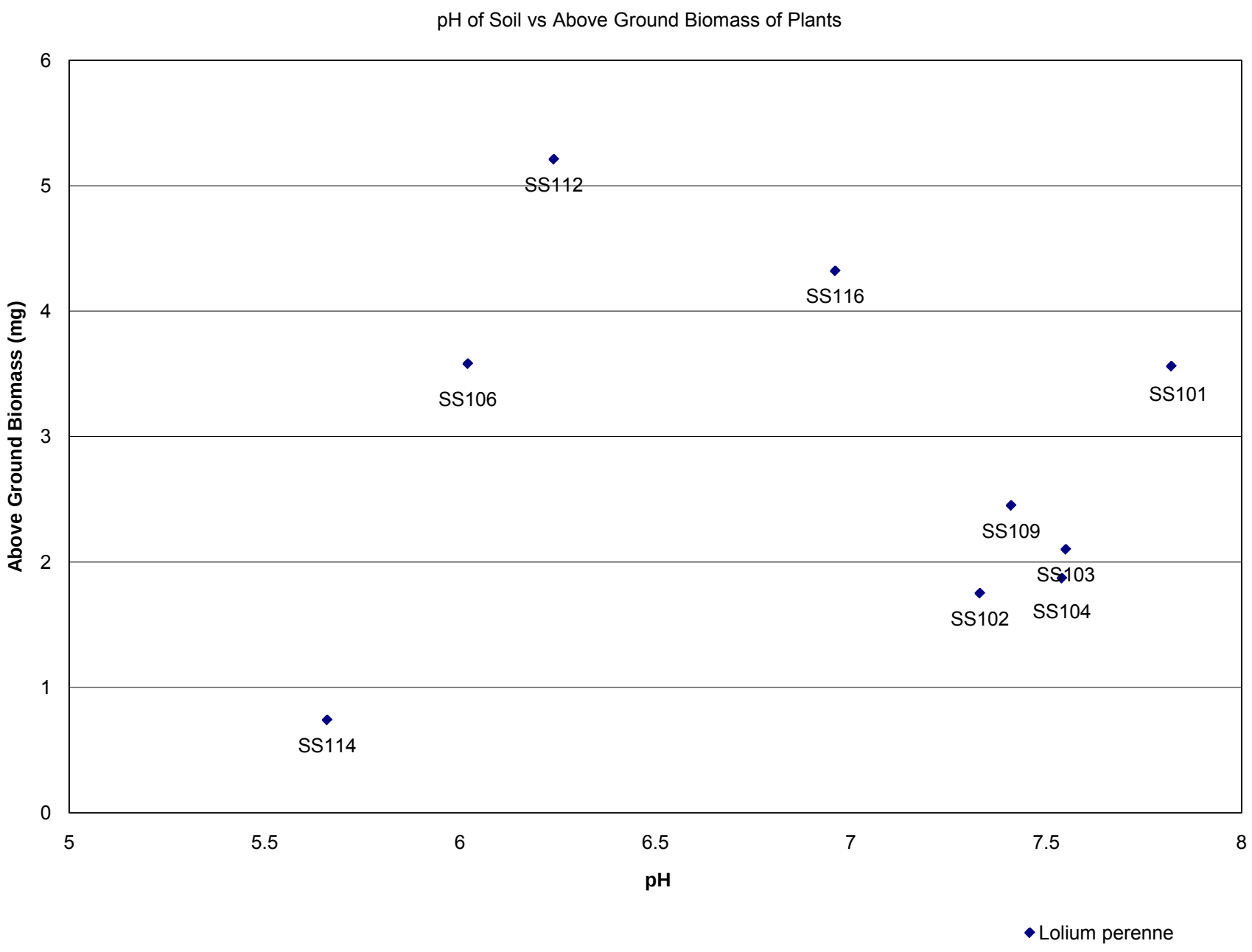

pH of Soil vs Survival of Plants
Survival (%)
80
70
60
50
40
30
20
10
0
5
5.5
6
6.5
7
7.5
8
pH
SS116
SS109
SS101
SS103
SS112
SS106
SS114
Trifolium pratense

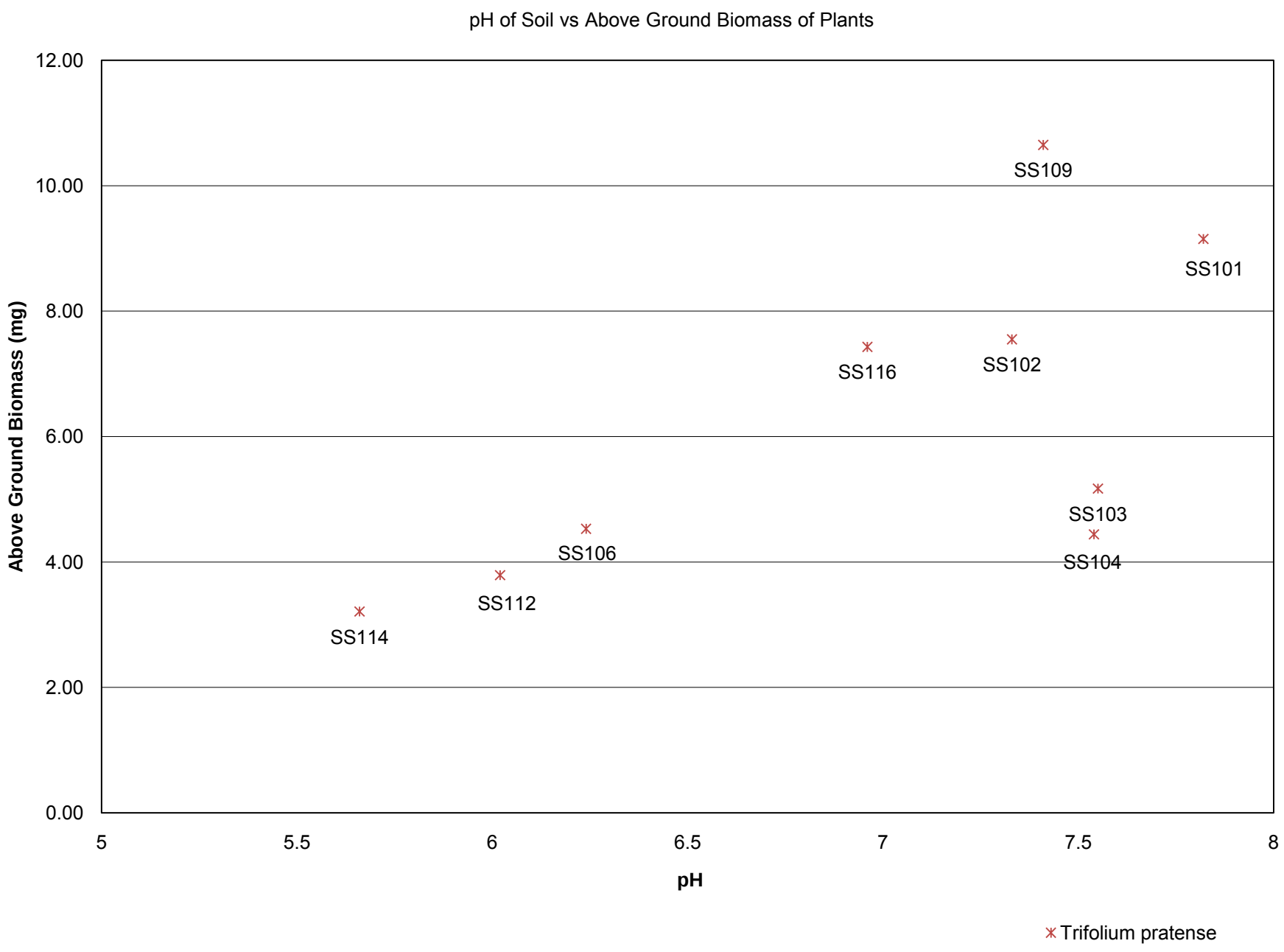

pH of Soil vs Germination of Plants
Germination (%)
100
90
80
70
60
50
40
30
20
10
0
5
5.5
6
6.5
7
7.5
8
pH
SS106
SS112
SS102
SS101
SS116
SS104
SS109
SS103
SS114
Lolium perenne

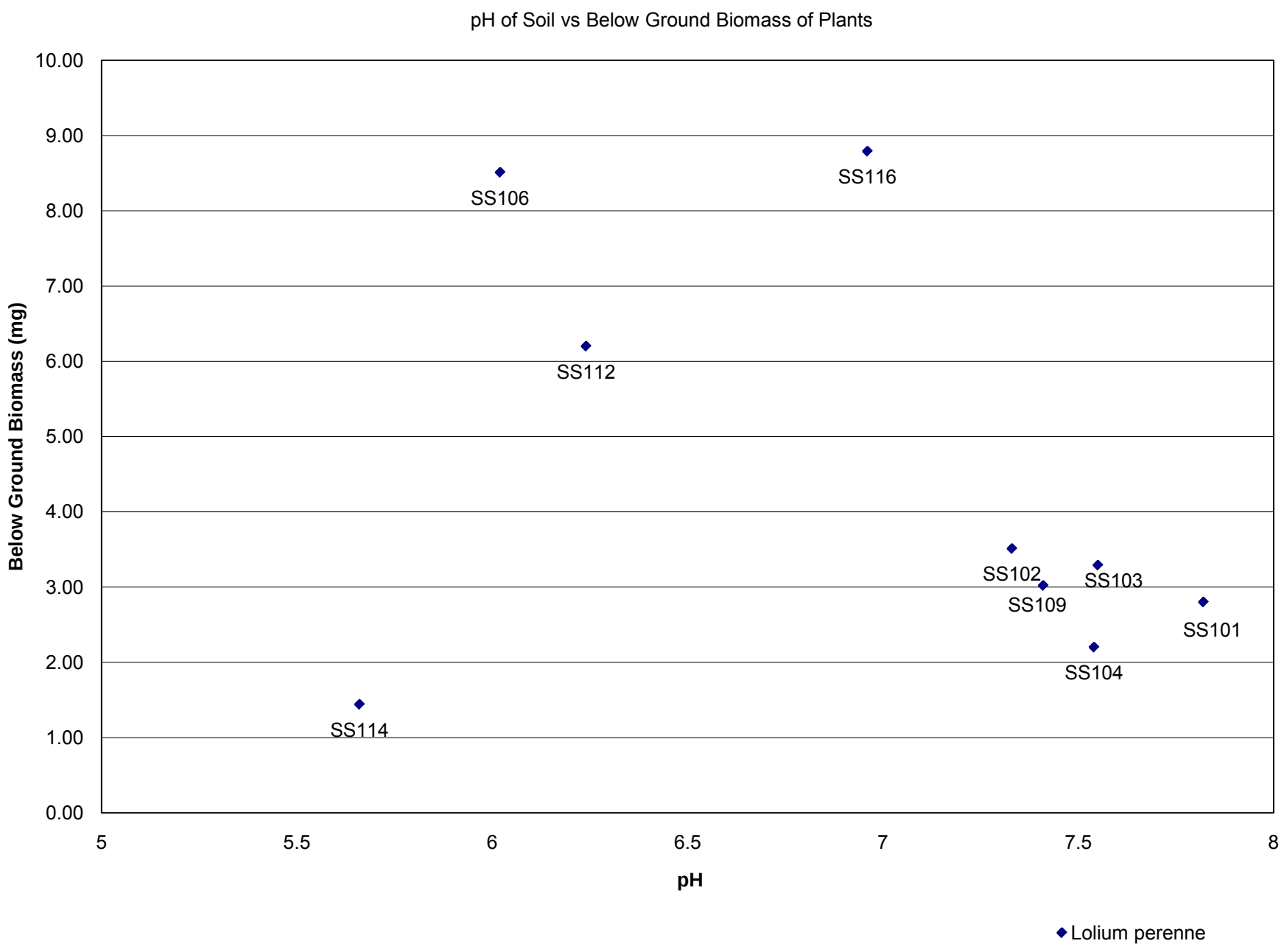

pH of Soil vs Germination of Plants
Germination (%)
80
70
60
50
40
30
20
10
0
5
5.5
6
6.5
7
7.5
8
pH
SS116
SS109
SS102
SS101
SS104
SS103
SS114
SS112
SS106
Trifolium pratense

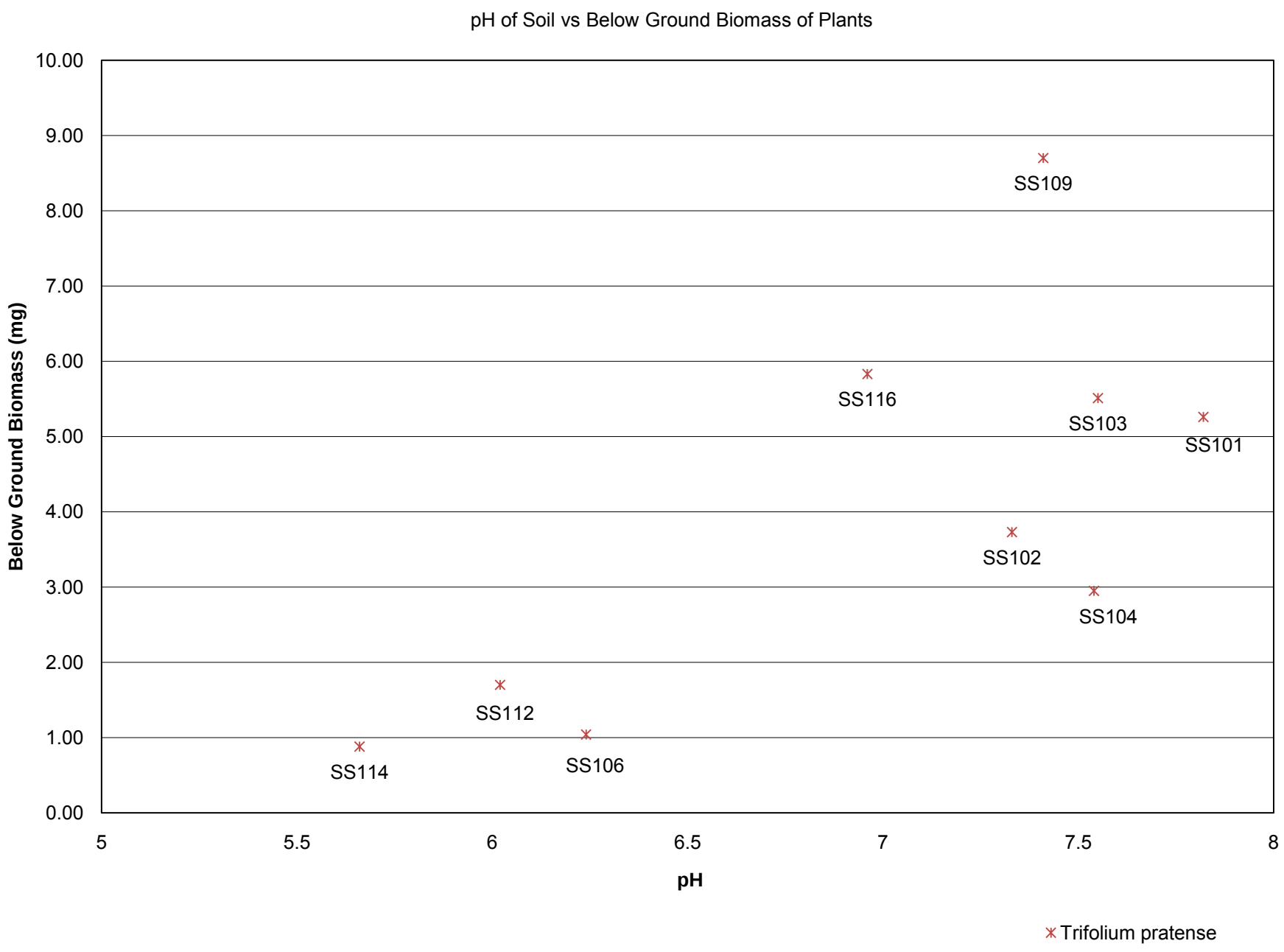

pH of Soil vs Height of Plants
Height (mm)
140
120
100
80
60
40
20
0
5
5.5
6
6.5
7
7.5
8
pH
SS112
SS116
SS109
SS106
SS101
SS103
SS104
SS114
SS102
Lolium perenne


pH of Soil vs Height of Plants
Height (mm)
35
30
25
20
15
10
5
0
5
5.5
6
6.5
7
7.5
8
pH
SS109
SS116
SS102
SS101
SS104
SS103
SS112
SS106
SS114
Trifolium pratense


pH of Soil vs Above Ground Biomass of Plants
Above Ground Biomass (mg)
pH
0
1
2
3
4
5
6
5
5.5
6
6.5
7
7.5
8
SS112
SS116
SS106
SS101
SS109
SS103
SS102
SS104
SS114
Lolium perenne


pH of Soil vs Above Ground Biomass of Plants
Above Ground Biomass (mg)
12.00
10.00
8.00
6.00
4.00
2.00
0.00
5
5.5
6
6.5
7
7.5
8
pH
SS109
SS101
SS116
SS102
SS103
SS104
SS106
SS112
SS114
Trifolium pratense


pH of Soil vs Below Ground Biomass of Plants
Below Ground Biomass (mg)
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
5
5.5
6
6.5
7
7.5
8
pH
SS106
SS116
SS112
SS102
SS103
SS109
SS101
SS104
SS114
Lolium perenne


pH of Soil vs Below Ground Biomass of Plants
Below Ground Biomass (mg)
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
5
5.5
6
6.5
7
7.5
8
pH
SS109
SS116
SS103
SS101
SS102
SS104
SS112
SS106
SS114
Trifolium pratense