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SUBJECT: PRELIMINARY RESULTS FOR STUDY 221: EFFECT OF CHEMIGATION
INJECTION SPEED ON THE EFFICACY AND LEACHING OF THE
PRE-EMERGENCE HERBICIDES SIMAZINE AND DIURON

SUMMARY

Chemigation is the application of pesticides through irrigation systems and has been identified in Title 3, California Code of Regulations (3CCR) section 6487.4b as a method to reduce the potential for pesticides to pollute ground water in runoff vulnerable areas. However, most pesticide labels for atrazine, simazine, bromacil, diuron, and norflurazon, the known ground water contaminants listed in 3CCR section 6800a, prohibit application through irrigation systems. In 2003, the Department of Pesticide Regulation (DPR) sponsored a collaborative study with the Center for Irrigation Technology at California State University, Fresno and the pesticide registrants Syngenta Crop Protection and DuPont Crop Protection to improve our understanding of chemigation efficacy and to support label changes that would facilitate the use of this mitigation measure. The pre-emergence herbicides simazine and diuron were chosen because they are commonly used for winter weed control on citrus in runoff vulnerable Ground Water Protection Areas (GWPA's).

The initial study was successful but raised additional questions. In 2004–2005, DPR undertook this study on two Tulare County commercial citrus groves to compare pesticide efficacy and leaching potential between pesticide applications when the same amount of pesticide was injected quickly or slowly into the irrigation system. Pesticide application and soil core data were collected on the fast and slow pesticide injections as well as on one of the standard practice plots. Efficacy ratings were determined on the fast and slow pesticide injection plots, the standard practice plots, and the control plots, providing an opportunity to compare the efficacy of this mitigation measure to the standard practices.



The results from this study did not allow us to determine if it is best to inject the pesticide quickly or slowly. No pesticide residues were detected in any of the soil samples below 61 cm indicating that none of the application methods caused the pesticides to leach below this depth. There was no significant difference in the mass of pesticide recovered per soil core between the fast and slow treatments. But a lower rate of pesticides were applied to the standard practice plot resulting in a significant difference in the mass of diuron recovered from the standard practice plot when compared to the chemigation applications plots. The efficacy of both the fast and slow pesticide injections were similar to the efficacy in the standard practice plots.

INTRODUCTION

Chemigation is becoming an increasingly prevalent application method as more growers convert from flood irrigation to pressurized irrigation systems. In May 2004, DPR implemented regulations that included mitigation measures, such as chemigation, to prevent further ground water contamination of the known ground water contaminants in vulnerable areas. These vulnerable areas have been designated GWAPs and are divided into two pathways for ground water contamination: leaching and runoff. Leaching areas are characterized by coarse, sandy soils that allow pesticides to percolate into ground water. Runoff areas are vulnerable to pesticide contamination because the hardpan layer impedes percolation and can carry pesticide-laden water to dry wells, ditches, ponds, soils with deep cracks, or coarse soil areas. One of the mitigation measures identified in 3CCR section 6487.4b by DPR for runoff vulnerable GWAPs is to incorporate the pesticide by mechanical methods such as by using a disc, harrow, or rotary tiller or through the use of a low flow irrigation system at a rate that does not cause runoff, including chemigation if allowed on the label. This mitigation measure was developed based on studies conducted on small plots in a Fresno citrus orchard. For these low permeability soils, mechanical incorporation was effective in decreasing offsite movement of pre-emergence herbicide residues (Troiano and Garretson, 1998).

Chemigation of the pesticides known to contaminate ground water is considered an acceptable mitigation measure in runoff GWAPs but most of the pesticide products affected by DPRs ground water regulations are not labeled for application through irrigation systems. DPR undertook a series of studies, including this one, to learn more about the efficacy of this method and how it might affect pesticide movement in the soil under different agronomic practices.

The initial chemigation efficacy study, conducted on three Tulare County citrus orchards in 2003–2004, indicated that the weed control obtained through chemigation compared favorably to broadcast applications of simazine and diuron, a standard practice among growers in this area. The majority of simazine and diuron residues in the study were also retained in the upper 7.6 cm of soil (Basinal et al., 2005). Since the efficacy and residue movement results of the initial study were acceptable to DPR and growers, DPR provided this information to the registrants and the Citrus Mutual Growers Association for their use in support of label amendments that eventually allowed

the application of simazine and diuron through chemigation systems in Tulare and Fresno County citrus orchards.

Despite the promising results of the initial study, questions remained about how the operation of the irrigation system affects the efficacy of the injected pesticides. This study, conducted in 2004–2005, sought to determine if the speed of the pesticide injection affects the efficacy and leaching potential of the pre-emergence herbicides. Opinions of growers and advisors differ about whether it is better to inject the pesticide quickly or over a longer period. In this study, simazine and diuron were applied quickly and slowly through a micro sprinkler irrigation system to two Tulare County citrus orchards in November 2004. Study staff used the efficacy rating from the previous year and collected additional information on the standard practice, including application rates and soil samples.

MATERIALS AND METHODS

Study Sites

The study was located in two Tulare County runoff GWPA. Site 1 was a single 3.6-hectare block of 65-year-old citrus trees. Site 2 was an 8.9-hectare citrus orchard divided into 4 blocks of 10-year-old trees. The canopy surface area varied between the two sites because of the difference in tree age. The orchard floor at Site 1 was exposed to less sun with a canopy surface area of 50% to 60% while at Site 2 the canopy surface area was 20% to 25%.

Site 1's irrigation system used spinning head micro sprinklers that covered an area of 35.29 m² each (Table 1). Fanjet micro sprinklers with fixed spray patterns that covered an area of 14.29 m² each were installed on the irrigation system at Site 2 (Table 1). The micro sprinklers were located in the tree rows with each emitter centered between two trees and covering the area not shaded by the tree canopy.

Simazine and diuron are commonly used by citrus growers in the Central Valley for pre-emergence control of winter weeds. Since the use of micro sprinkler irrigation facilitates weed growth where the irrigation occurs and weeds growing around emitters can adversely affect irrigation distribution, the standard practice is to keep the area around the emitters free of weeds. At both sites, the standard practice consists of broadcasting a three-foot band of pre-emergence or post-emergence herbicides on each side of the tree row from one tree canopy to the other. Contact herbicides are applied if additional control is needed.

Table 1. Pesticide applications

| Site | Treatment | Rate (kg/ha) | | Area per Emitter (m ²) | # Trees per Plot | Net Area (ha) | Amt Product per Plot (L) | | Duration (min) | Date Applied |
|------|-----------|-------------------------|------------------------|------------------------------------|------------------|---------------|--------------------------|----------|----------------|--------------|
| | | Princep 4L [§] | Direx 4L ^{§§} | | | | Princep 4L | Direx 4L | | |
| 1 | Fast | 4.4 | 3.6 | 35.29 | 88 | 0.31 | 2.9 | 2.3 | 34 | 11/08/2004 |
| 1 | Slow | 4.4 | 3.6 | 35.29 | 136 | 0.48 | 4.5 | 3.6 | 118 | 11/08/2004 |
| 1 | Standard | * | * | N/A | N/A | N/A | * | * | N/A | 11/12/2004 |
| 1 | Control | 0 | 0 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 2 | Fast | 4.4 | 3.6 | 14.29 | 108 | 0.15 | 1.4 | 1.2 | 24 | 11/30/2004 |
| 2 | Slow | 4.4 | 3.6 | 14.29 | 108 | 0.15 | 1.4 | 1.2 | 104 | 11/30/2004 |
| 2 | Standard | ** | ** | ** | ** | ** | ** | ** | ** | ** |
| 2 | Control | 0 | 0 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |

N/A = Not Applicable

* The grower applied 2.25 kg/ha of Princep Caliber 90 (2.0 kg/ha AI) and 1.1 kg/ha of Karmex DF 80 (0.9 kg/ha AI) in 284 L water/ha.

** The grower did not use simazine or diuron on the standard practice plot.

§ 4.4 kg/ha product = 4 lbs/A AI

§§ 3.6 kg/ha product = 3.2 lbs/A AI

Study Design

There were four treatment plots at each study site: fast pesticide injection, slow pesticide injection, standard practice, and control (Table 1). Since the micro sprinklers were placed in the tree rows, the management of the middle rows was not investigated by this study. The chemigated plots were irrigated for approximately 90 minutes before the pesticide injection. For the fast and slow injection treatments, the recommended maximum labeled rate of the pre-emergence herbicides simazine and diuron were injected into the irrigation system for approximately 30 and 120 minutes, respectively (Table 1). At Site 1, the post-application irrigation continued for 120 minutes after the application. At Site 2, the post-application irrigation continued for approximately 18 hours due to an unanticipated need for frost protection. The standard practice treatment of the tree rows differed by site. At Site 1, the grower broadcast simazine and diuron by tractor whereas at Site 2 the grower applied glyphosate for post-emergence weed control. Since the grower did not use simazine or diuron on the standard practice treatment at Site 2, no post application soil samples were collected for this treatment. On the control plots, no herbicides were applied and the weeds were allowed to grow undisturbed. Each treatment plot was subdivided into four subplots and soil cores were taken from each of the subplots.

Pesticide Applications

A Cole-Parmer peristaltic metering pump was used for the fast and slow pesticide injection treatments. The intended application rates for simazine (Princep 4L, EPA Reg. No. 100-526) and diuron (Direx 4L, EPA Reg. No. 1812-257) were 4.4 kg/ha and 3.6 kg/ha, respectively (Table 1). The amount of simazine and diuron applied to each plot was calculated by multiplying the area

covered by a single emitter by the number of trees per plot by the intended rate for each treatment (Table 1).

$$\text{Amount of Pesticide Applied} = A_e \times N_t \times R_p$$

where:

A_e = Surface area covered by a single emitter

N_t = Number of trees per plot

R_p = Application rate of pesticide

The calculated amount of pesticide required for each application was measured and injected without dilution into the closest valve to the plot in November 2004 (Table 1). Since simazine and diuron were not labeled for application through irrigation systems at the time of application, these applications were conducted under DPR Pesticide Research Authorization number 410018.

The tree rows of the standard practice plot at Site 1 received a pre-emergence application rate of 2.3 kg/ha of Princep Caliber 90 (simazine) and 1.1 kg/ha of Karmex DF 80 (diuron) in 284 L water/ha as a 3-foot band between the trees in November 2004. The standard practice plot at Site 2 received a post-emergence application of 2% concentration glyphosate to the tree rows in February 2005.

Water Samples

Background: Before the injection of the pre-emergence herbicides, water samples were collected directly into 1 L amber bottles from three randomly selected emitters at each site and analyzed for the presence of simazine and diuron.

Flow Rate: The average flow rate and system pressure were determined at each site. The outputs of five randomly chosen emitters per plot were measured for 30 seconds. The results per site were averaged and converted to the flow rate in ml/min.

Application: After the pesticides were detected at the furthest emitters from the injection point, water samples were collected directly into 1 L amber bottles from six randomly selected emitters at each chemigation treatment plot to determine the concentration of simazine and diuron.

Mass Deposition Sheet Samples

At Site 1, mass deposition sheets (MDS) were used during the pesticide application on the standard practice plot to determine the concentration of simazine and diuron. Since simazine and diuron were not applied on the standard practice treatment at Site 2, no MDS samples were collected at this location. DPR SOP FSOT005.00 for sampling with MDSs was followed (Walters, 2003).

Soil Samples

Where possible, soil cores were obtained to a depth of 152.4 cm with the first two soil segments taken in 7.6-cm increments, the next three segments in 15.2-cm increments, and the next three segments in 30.5-cm increments, unless stated otherwise. The cores were 7.6 cm in diameter and each sample was a composite of two cores. The composite sample for each depth was split into two sub-samples and analyzed for simazine and diuron residues, soil moisture, soil texture and percent organic carbon. DPR SOP FSSO002.00 for soil sampling was followed for each soil sampling event (Garretson, 1999a). The procedure used to measure the percent soil moisture is given in SOP METH001.00 (Garretson, 1999b).

Pre-Application: Two random samples were obtained from each plot before the pesticide applications to determine the background concentrations of the pre-emergence herbicides and the physical properties of the soil.

Post-Application: The first post-application soil samples were randomly sampled from the area wetted by the sprinklers within four days of the pesticide application. Four composite samples were collected to 45.7 cm deep from each of the following plots: fast injection, slow injection, and Site 1 standard practice. The first two soil segments were taken in 7.6-cm increments and the remainder in 15.2-cm increments. To test for subsequent leaching, four composite soil samples from each of the fast and slow injection plots were collected at 34-44 days, 92-98 days, and 126-127 days after the pesticide application. For the last three sampling events, the composite samples were obtained to the 152.4-cm depth when possible. Four composite post-application soil samples were taken at Site 1 from the standard practices plot at 94 and 122 days to the 152.4-cm depth when possible. Since no simazine or diuron was applied on the standard practice treatment at Site 2, post-application soil samples were not taken at this location.

Efficacy

Efficacy was based on a visual rating system that reflected the overall performance of each treatment. The performances of chemigated plots were compared to the control plots and to the standard practice treatments on each evaluation date. Measurements were taken by a team composed of study staff, growers and registrant representatives at 44, 98, 126, and 143 days after

treatment at Site 1 and at 62, 92, and 121 days after treatment at Site 2. Digital photos were taken to illustrate the performance of the treatments. The rating was based on the percent of the area without weeds and ranged from zero percent control to 100% control as listed below:

- 0%: Total lack of control
- 5-30%: Insignificant to poor weed control
- 40-60%: Inadequate weed control
- 70%: Adequate weed control
- 80%: Good weed control
- 90%: Excellent weed control
- 100%: Complete control

Quality Control and Analysis

The quality control procedures for all samples followed SOP QAQC001.00 for Chemistry Laboratory Quality Control (Segawa, 1995).

RESULTS

Water Analysis

Background: All water samples collected before the pesticide injection were negative for both simazine and diuron (Appendix, Table 11).

Flow Rate: The average flow rate for Site 1 was 610 ml/min at 31 psi, and for Site 2 was 720 ml/min at 25 psi (Appendix, Table 12). The raw data for Site 1 was lost after the average had already been calculated.

Application: The mass of pesticide applied per emitter was calculated by multiplying the pesticide injection time by the average flow rate and the pesticide concentration. The mass was then divided by the surface area of the emitter to obtain the application rate in kg/ha (Table 2).

$$\text{Pesticide application rate} = \frac{T_i \times F \times C_e}{A_e}$$

Where:

T_i = Pesticide injection time

F = Average flow rate

C_e = Concentration of pesticide measured from emitter

A_e = Surface area covered by the emitter

Table 2. Descriptive statistics for emitter samples

| Chemical (kg/ha) | Site | Chemigation Treatment | N | Mean (kg/ha) | Standard Error (kg/ha) | Standard Deviation (kg/ha) | Coefficient Of Variation | Median (kg/ha) |
|------------------|------|-----------------------|---|--------------|------------------------|----------------------------|--------------------------|----------------|
| Simazine | 1 | Fast | 6 | 1.8012 | 0.0898 | 0.2199 | 12.21 | 1.7777 |
| Simazine | 2 | Fast | 6 | 2.134 | 0.424 | 1.038 | 48.64 | 2.025 |
| Simazine | 1 | Slow | 6 | 2.726 | 0.231 | 0.567 | 20.79 | 2.075 |
| Simazine | 2 | Slow | 6 | 3.527 | 0.245 | 0.600 | 17.01 | 3.494 |
| Simazine | 1 | Control | 3 | 0 | 0 | 0 | 0 | 0 |
| Simazine | 2 | Control | 3 | 0 | 0 | 0 | 0 | 0 |
| Diuron | 1 | Fast | 6 | 1.078 | 0.125 | 0.305 | 28.35 | 1.072 |
| Diuron | 2 | Fast | 6 | 1.621 | 0.484 | 1.184 | 73.07 | 1.445 |
| Diuron | 1 | Slow | 6 | 0.673 | 0.100 | 0.245 | 36.41 | 0.620 |
| Diuron | 2 | Slow | 6 | 0.3179 | 0.0657 | 0.1609 | 50.62 | 0.2799 |
| Diuron | 1 | Control | 3 | 0 | 0 | 0 | 0 | 0 |
| Diuron | 2 | Control | 3 | 0 | 0 | 0 | 0 | 0 |

Study staff applied simazine and diuron at a rate of 4.4 kg/ha and 3.6 kg/ha, respectively, to the fast and slow injection treatment plots at both study sites (Table 1). Although each treatment plot received the same application rate, emitter samples indicated an unexpectedly high degree of variability in the pesticide rates sampled from the emitters. The mean rate of simazine sampled from the emitters at the slow treatments was significantly greater than the rate sampled at the fast treatments (Figure 1, Kruskal-Wallis $p=0.001$). The opposite was true for diuron. The mean rate of diuron sampled from the emitters at the slow treatments was significantly less than the rate sampled at the fast treatments (Figure 2, Kruskal-Wallis $p=0.002$). There were no significant differences between the sites for simazine or diuron.

The emitter sample results also varied greatly from the actual rate applied. The mean simazine emitter rate was 2.6 kg/ha and the mean diuron emitter rate was 0.9 kg/ha, which were 42% and 75% lower than the theoretical rate, respectively. The coefficient of variations ranged from 12% to 70% for the water samples collected (Table 2).

Since the amount of simazine and diuron injected into the system was specifically calculated to achieve the same rate for each injection treatment and site, there should not have been a difference in the overall application rates between fast and slow treatments measured from the emitter samples. In addition, the measured differences were not consistent between AIs. For example, the simazine concentration was greater for the slow injections whereas the opposite effect was indicated for diuron (Figures 1 and 2).

Figure 1. Simazine water emitter samples separated by treatment

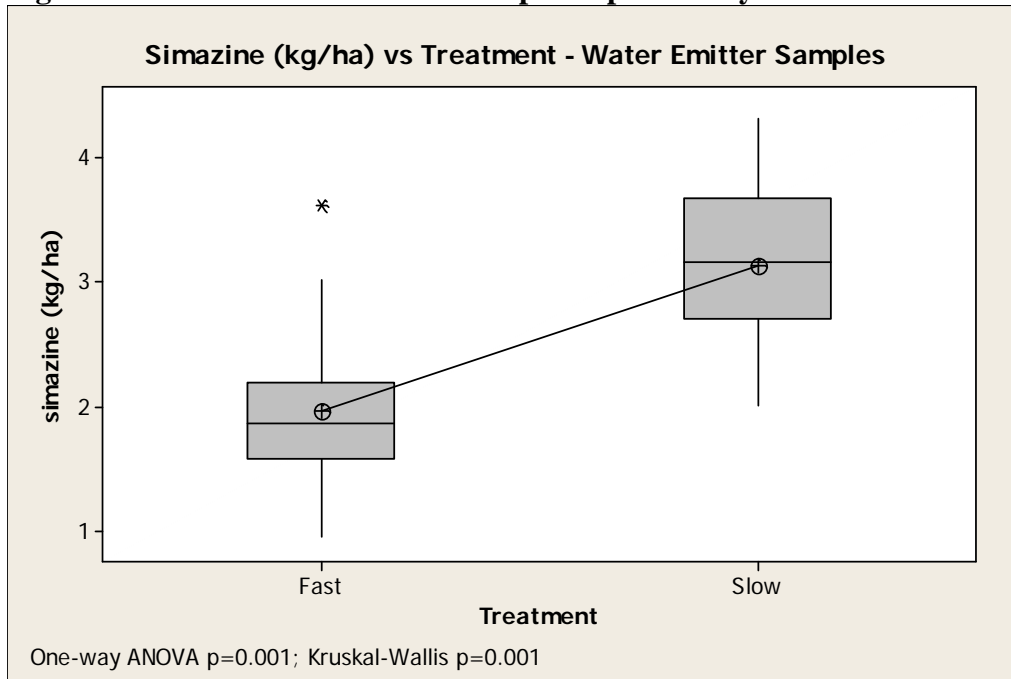
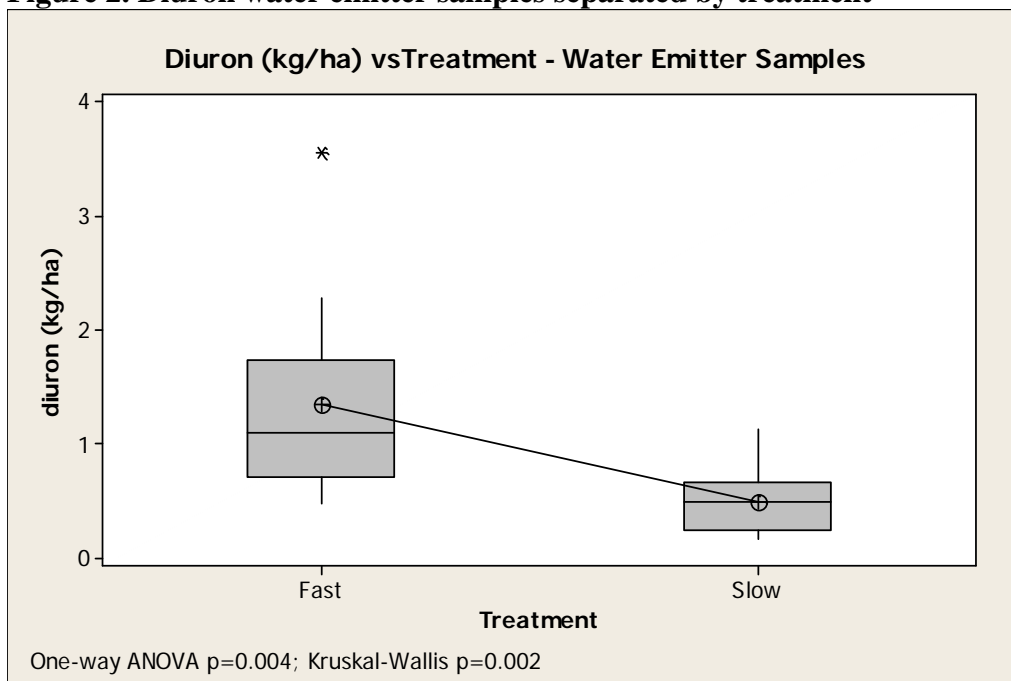


Figure 2. Diuron water emitter samples separated by treatment



Although the exact reason for the unexpected variability is unknown, several factors could have contributed to the variability. The pesticides were injected as part of a research project to better understand the techniques for applying simazine and diuron by chemigation. Since the pesticides were not labeled for use through irrigation systems when these applications occurred, the researchers did not have label instructions for the best method of injecting the pesticides. The injections were made without diluting or agitating the pesticide products, which may have resulted in the products not being thoroughly mixed before being injected into the irrigation system. Also, the injections were made very close to the emitters which also may not have given the pesticide enough time in the irrigation line to become thoroughly mixed and may have contributed to the variation among emitters. Any fluctuations in pressure occurring during the sampling period could also have affected the measurements. Although all of these reasons could have contributed to the variation, they do not explain why the results were consistently detected at a rate lower than the rate applied.

Quality Control: None of the field blanks contained detectable residues of simazine or diuron. Four water samples, one from each injection treatment, were spiked with simazine and diuron. The spiked water samples had a mean recovery rate for simazine of 104% with a standard deviation (SD) of 5.9% and the samples spiked with diuron had a mean recovery rate of 99% with a SD of 11.6% (Table 3).

Table 3. Quality control: percent recovery for spiked water samples

| Date | Simazine (% recovery) | Simazine Control Limits | Diuron (% recovery) | Diuron Control Limits | Reporting Limit (ppb) | Treatment | Site |
|-------------|-----------------------|-------------------------|---------------------|-----------------------|-----------------------|-----------|------|
| 1/3/2005 | 107 | UWL | 116 | UWL | 0.05 | Fast | 1 |
| 1/3/2005 | 111 | UWL | 97 | | 0.05 | Slow | 1 |
| 1/7/2005 | 98.6 | | 94.9 | | 0.05 | Fast | 2 |
| 1/7/2005 | 100 | | 89.4 | | 0.05 | Slow | 2 |
| Mean | 104 | | 99.3 | | | | |
| SD | 5.9 | | 11.6 | | | | |

UWL = Upper warning limit: Simazine = 100.8%, Diuron = 109.4%
 SD = Standard Deviation

Mass Deposition Sheet Analysis

Based on the grower's reported product application rate, the rate of active ingredient applied to the standard practice treatment at Site 1 was calculated to be 2.0 kg/ha of simazine and 0.90 kg/ha of diuron. MDS collection sheets indicated the average simazine rate to be 0.9 kg/ha and the average diuron rate to be 0.57 kg/ha, both approximately half of the growers' reported rate applied (Table 4 and Appendix, Table 13). It is unclear why there was such a large difference between the grower's reported rate and the rate determined by the MDS collection sheets.

Table 4. Descriptive statistics for the mass deposition sheets

| Chemical (kg/ha) | N | Mean (kg/ha) | Standard Error (kg/ha) | Standard Deviation (kg/ha) |
|------------------|---|--------------|------------------------|----------------------------|
| Simazine | 4 | 0.918 | 0.134 | 0.268 |
| Diuron | 4 | 0.5708 | 0.0436 | 0.0873 |

Quality Control: None of the field blanks contained detectable residues of simazine or diuron. Two MDSs were spiked with simazine and diuron. The spiked MDS samples had a mean recovery rate for simazine of 99% with a SD of 3.0% and the samples spiked with diuron had a mean recovery rate of 91% with a SD of 0.6% (Table 5).

Table 5. Quality control: percent recovery for spiked mass deposition sheets

| Date | Simazine (% recovery) | Diuron (% recovery) | Reporting Limit (ug/MDS) | Treatment | Site |
|-------------|-----------------------|---------------------|--------------------------|-----------|------|
| 1/14/2005 | 101 | 91.6 | 0.5 | Standard | 1 |
| 1/14/2005 | 96.8 | 90.8 | 0.5 | Standard | 1 |
| Mean | 98.9 | 91.2 | | | |
| SD | 3.0 | 0.6 | | | |

Soil Analysis

The soil textures in the study area ranged from sandy loam to sandy clay loam at Site 1 and from sandy loam to clay loam at Site 2 (Appendix, Table 14).

Pre-Application: The background soil sampling indicated no detectable residues at Site 1 but there were some simazine and diuron residues in the top 15.2 cm of soil at Site 2 (Table 6). The background residues at Site 2 included three detections of simazine residues that ranged from 0.021 to 0.100 ppm and seven detections of diuron residues that ranged from 0.016 to 0.268 ppm (Appendix, Table 15). The residues were detected in each of the treatment plots at Site 2. The minimum amount of simazine that can cause symptoms in plants is 0.15–0.2 ppm (A. DaSilva, personal communication, 2008). All of the simazine background residues were below this level so it is unlikely that these simazine residues had an effect on the outcome of the study. At this point, the minimum amount of diuron needed to cause symptoms is unknown but diuron residues were detected in each of the plots at Site 2 indicating that if the results were affected they would have been affected evenly at the site.

Table 6. Descriptive statistics for the soil sample concentrations

| Chemical | Site | Days after Application | Treatment | N | Mean (ppm) | Standard Error (ppm) | Standard Deviation (ppm) | Coefficient of Variation | Median (ppm) |
|----------|------|------------------------|------------|---|------------|----------------------|--------------------------|--------------------------|--------------|
| Simazine | 1 | Background | Background | 8 | nd | * | * | * | nd |
| Simazine | 1 | 1 | Fast | 4 | 1.580 | 0.538 | 1.075 | 68.03 | 1.233 |
| Simazine | 1 | 45 | Fast | 4 | 2.52 | 1.03 | 2.05 | 81.44 | 2.13 |
| Simazine | 1 | 90 | Fast | 4 | 0.1376 | 0.0404 | 0.0808 | 58.72 | 0.1405 |
| Simazine | 1 | 120 | Fast | 4 | 0.0391 | 0.0279 | 0.0559 | 142.96 | 0.0189 |
| Simazine | 1 | 1 | Slow | 4 | 1.441 | 0.312 | 0.624 | 43.26 | 1.214 |
| Simazine | 1 | 45 | Slow | 4 | 3.216 | 0.340 | 0.679 | 21.12 | 3.098 |
| Simazine | 1 | 90 | Slow | 4 | 0.393 | 0.158 | 0.316 | 80.56 | 0.311 |
| Simazine | 1 | 120 | Slow | 4 | 0.133 | 0.123 | 0.246 | 185.80 | 0.0144 |
| Simazine | 1 | 1 | Standard | 4 | 0.835 | 0.468 | 0.936 | 112.06 | 0.588 |
| Simazine | 1 | 90 | Standard | 4 | 0.1202 | 0.0270 | 0.0540 | 44.95 | 0.1060 |
| Simazine | 1 | 120 | Standard | 4 | 0.0660 | 0.0383 | 0.0766 | 116.18 | 0.0438 |
| Simazine | 2 | Background | Background | 8 | 0.0161 | 0.0132 | 0.0372 | 231.89 | nd |
| Simazine | 2 | 1 | Fast | 4 | 0.684 | 0.175 | 0.351 | 51.29 | 0.677 |
| Simazine | 2 | 45 | Fast | 4 | 0.9622 | 0.0700 | 0.1400 | 14.55 | 0.9602 |
| Simazine | 2 | 90 | Fast | 4 | 0.328 | 0.126 | 0.253 | 77.09 | 0.232 |
| Simazine | 2 | 120 | Fast | 4 | 0.4142 | 0.0740 | 0.1479 | 35.71 | 0.3902 |
| Simazine | 2 | 1 | Slow | 4 | 1.131 | 0.110 | 0.219 | 19.36 | 1.061 |
| Simazine | 2 | 45 | Slow | 4 | 0.513 | 0.237 | 0.475 | 92.46 | 0.342 |
| Simazine | 2 | 90 | Slow | 4 | 0.387 | 0.104 | 0.208 | 53.78 | 0.450 |
| Simazine | 2 | 120 | Slow | 4 | 0.3130 | 0.0979 | 0.1958 | 62.55 | 0.3392 |
| Diuron | 1 | Background | Background | 8 | nd | * | * | * | nd |
| Diuron | 1 | 1 | Fast | 4 | 1.719 | 0.737 | 1.473 | 85.69 | 1.098 |
| Diuron | 1 | 45 | Fast | 4 | 1.607 | 0.443 | 0.886 | 55.14 | 1.465 |
| Diuron | 1 | 90 | Fast | 4 | 0.3611 | 0.0724 | 0.1449 | 40.12 | 0.3541 |
| Diuron | 1 | 120 | Fast | 4 | 0.309 | 0.122 | 0.243 | 78.62 | 0.261 |
| Diuron | 1 | 1 | Slow | 4 | 1.156 | 0.295 | 0.590 | 51.01 | 0.938 |
| Diuron | 1 | 45 | Slow | 4 | 2.459 | 0.640 | 1.280 | 52.05 | 1.980 |
| Diuron | 1 | 90 | Slow | 4 | 0.3846 | 0.0413 | 0.0826 | 21.46 | 0.3973 |
| Diuron | 1 | 120 | Slow | 4 | 0.329 | 0.110 | 0.219 | 66.54 | 0.332 |
| Diuron | 1 | 1 | Standard | 4 | 0.354 | 0.194 | 0.389 | 109.92 | 0.255 |
| Diuron | 1 | 90 | Standard | 4 | 0.0842 | 0.0278 | 0.0557 | 66.12 | 0.0731 |
| Diuron | 1 | 120 | Standard | 4 | 0.08558 | 0.00661 | 0.01321 | 15.44 | 0.08530 |
| Diuron | 2 | Background | Background | 8 | 0.0798 | 0.0366 | 0.1036 | 129.83 | 0.0414 |
| Diuron | 2 | 1 | Fast | 4 | 1.066 | 0.152 | 0.304 | 28.54 | 1.155 |
| Diuron | 2 | 45 | Fast | 4 | 1.547 | 0.571 | 1.142 | 73.86 | 1.263 |
| Diuron | 2 | 90 | Fast | 4 | 0.655 | 0.110 | 0.220 | 33.64 | 0.712 |
| Diuron | 2 | 120 | Fast | 4 | 0.4230 | 0.0699 | 0.1398 | 33.05 | 0.4540 |
| Diuron | 2 | 1 | Slow | 4 | 1.253 | 0.390 | 0.781 | 62.33 | 1.085 |
| Diuron | 2 | 45 | Slow | 4 | 0.418 | 0.154 | 0.308 | 73.69 | 0.330 |
| Diuron | 2 | 90 | Slow | 4 | 0.473 | 0.159 | 0.318 | 67.25 | 0.431 |
| Diuron | 2 | 120 | Slow | 4 | 0.451 | 0.157 | 0.314 | 69.72 | 0.363 |

nd = not detected

Post-Application: All of the soil samples collected within a day or two after the pesticide application had simazine and diuron residues in the top 7.6 cm of soil. Simazine and diuron residues were measured in several of the deepest soil samples (30.5–45.7 cm depth interval) collected within a day or two after application indicating the possibility that not all of the residues were captured during the sampling event (Figures 3 and 4). At Site 1, one of the soil cores from the standard practice plot and two of the soil cores from the fast chemigation treatment plot had pesticide detections in the deepest soil core segment. At Site 2, one of the soil cores from the fast chemigation treatment plot had pesticide detections in the deepest soil core segment. None of the soil cores in the slow chemigation treatment plots had pesticide detections in the deepest soil core segments (Appendix, Table 15).

For the sampling events at approximately 45, 90, and 120 days after the pesticide application no pesticide residues were detected in the soil samples below 61 cm indicating that the pesticides did not leach below this depth even at Site 2 which received the longer post-application frost protection irrigation (Appendix, Table 15).

Figure 3. Concentration of simazine (ug) recovered at each sampling depth over time separated by site

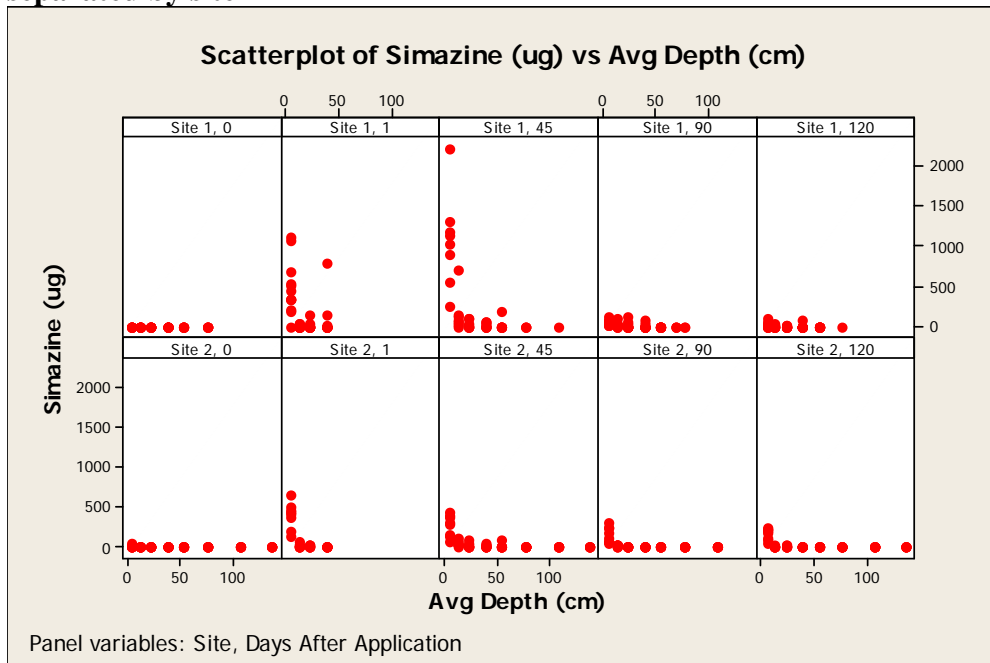
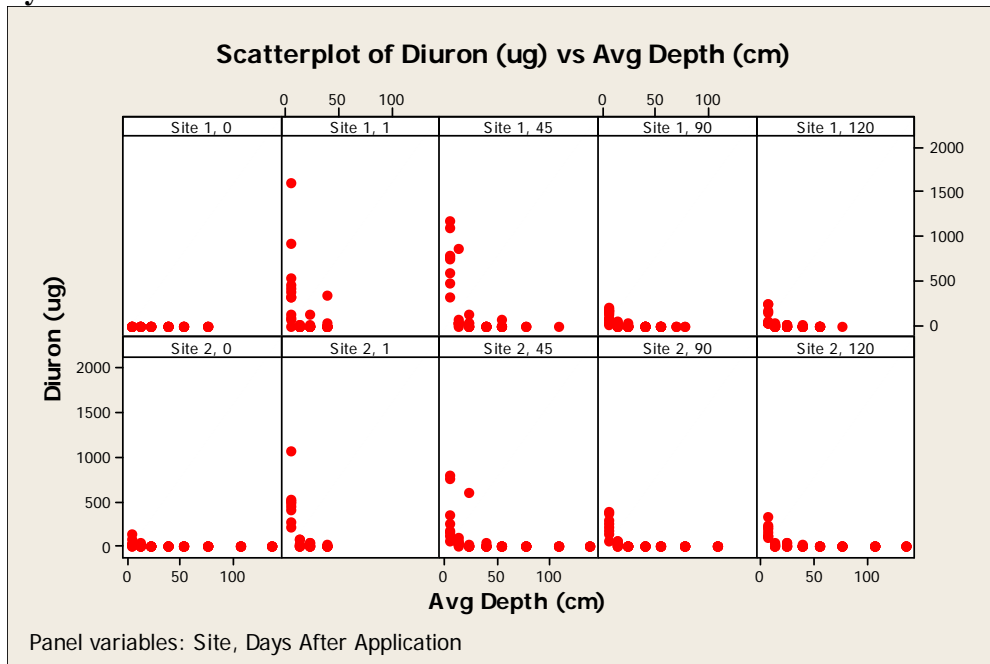


Figure 4. Concentration of diuron (ug) recovered at each sampling depth over time separated by site



The mass of the pesticide recovered per soil core was calculated by multiplying the soil bulk density (Appendix, Table 14) by the core depth and by the concentration of pesticide per core. The mass was then divided by the core surface area to obtain the application rate in kg/ha.

$$Application\ rate = \frac{\rho \times D \times C_s}{A_c}$$

Where:

ρ = Bulk density

D = Core depth

C_s = Pesticide concentration from the soil core

A_c = Core surface area

The mass of simazine and diuron recovered per soil core was not significantly different between the fast and slow treatments at either site (Figures 5-8). At Site 1, the mass of diuron recovered per soil core from the standard practice plot was significantly different ($p=0.011$) from the mass of diuron recovered from the fast and slow treatments (Figure 7). This difference can be explained by the different application rates between treatments (Table 1). There was no significant difference in the mass of simazine recovered from any of the treatments at Site 1 (Figure 5).

Figure 5. Mass of simazine (ug/core) recovered for each treatment at Site 1

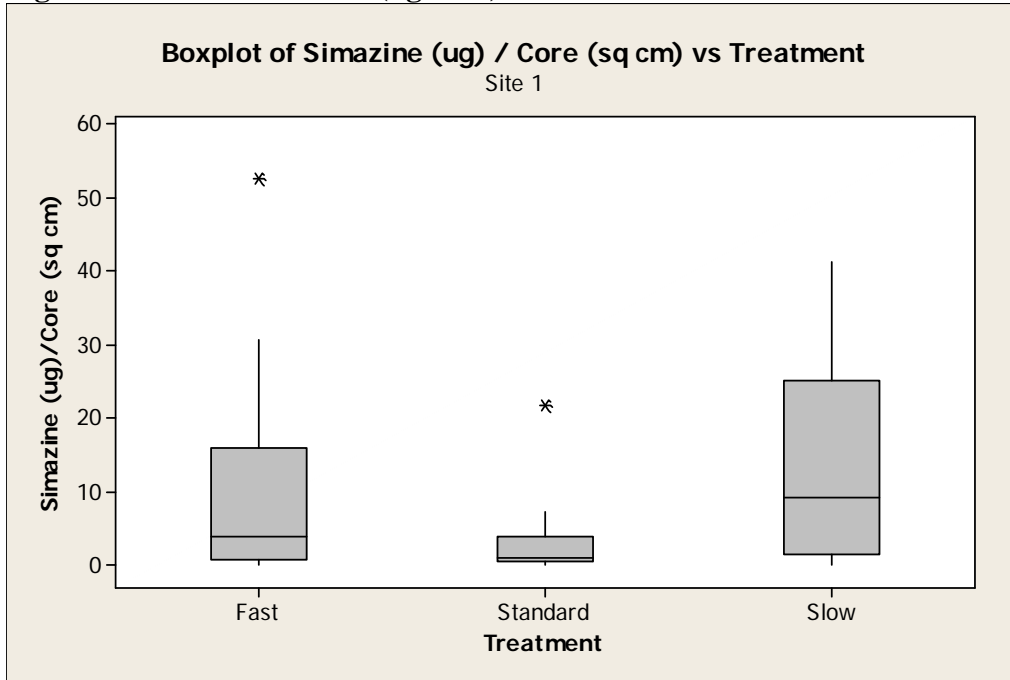


Figure 6. Mass of simazine (ug/core) recovered for each treatment at Site 2

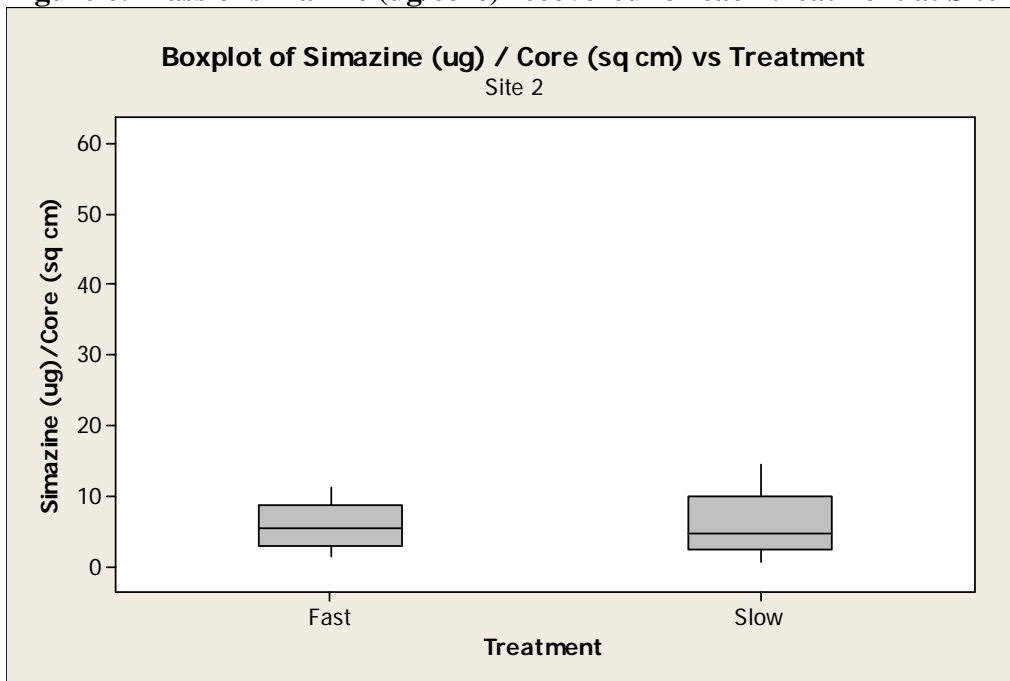


Figure 7. Mass of diuron (ug/core) recovered for each treatment at Site 1

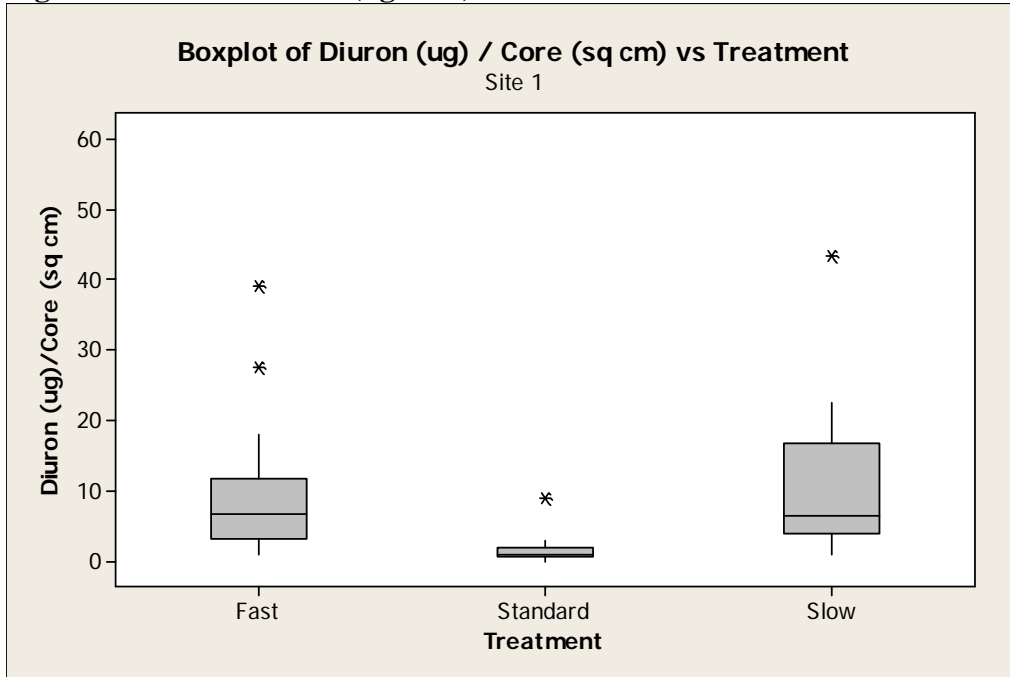
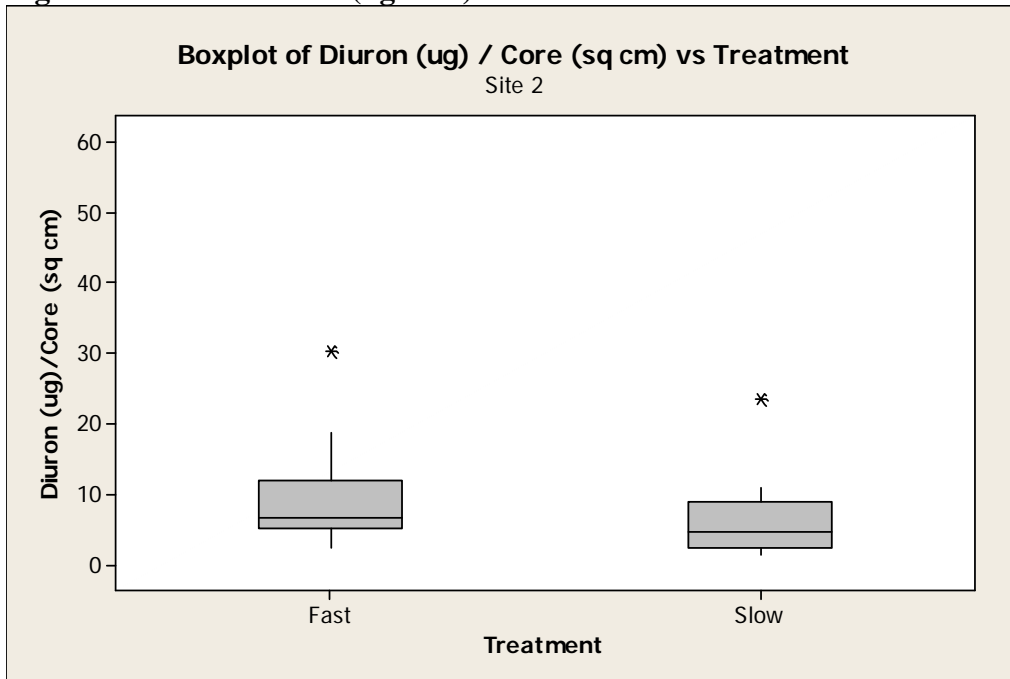


Figure 8. Mass of diuron (ug/core) recovered for each treatment at Site 2



If the pesticide does not leach below the sampling area, it is often possible to use the mass of pesticide recovered at each sampling period to determine a degradation rate of the pesticide in the soil. It was not possible to determine the degradation rate of the pesticides for this study because the mass of simazine and diuron in each core did not follow the normal exponential decay curve. In fact, in several of the sites, the mass of pesticide recovered from the combined segments of each core was greater 45 days after application than on the day after application (Table 7). Since the grower's standard practice plot was not sampled 45 days after application we were unable to determine the reason for the higher mass recovered 45 days after application than on the day after application.

Table 7. Mass of pesticide per soil core

| Site | Treatment | Replicate | Simazine (kg/ha) | | | | Diuron (kg/ha) | | | |
|------|-----------|-----------|------------------|--------|--------|---------|----------------|--------|--------|---------|
| | | | Day 1 | Day 45 | Day 90 | Day 120 | Day 1 | Day 45 | Day 90 | Day 120 |
| 1 | Fast | 1 | 3.075 | 2.838 | 0.223 | 0.038 | 3.915 | 1.802 | 0.539 | 0.615 |
| 1 | Fast | 2 | 0.781 | 1.415 | 0.096 | 0.000 | 1.021 | 1.127 | 0.307 | 0.101 |
| 1 | Fast | 3 | 1.652 | 0.567 | 0.185 | 0.119 | 1.174 | 0.738 | 0.197 | 0.395 |
| 1 | Fast | 4 | 0.813 | 5.258 | 0.047 | 0.000 | 0.767 | 2.761 | 0.401 | 0.127 |
| 1 | Slow | 1 | 2.360 | 4.125 | 0.107 | 0.000 | 2.027 | 4.328 | 0.384 | 0.222 |
| 1 | Slow | 2 | 1.163 | 3.299 | 0.354 | 0.029 | 0.933 | 1.549 | 0.273 | 0.571 |
| 1 | Slow | 3 | 1.265 | 2.896 | 0.842 | 0.502 | 0.943 | 2.239 | 0.471 | 0.442 |
| 1 | Slow | 4 | 0.978 | 2.545 | 0.268 | 0.000 | 0.721 | 1.720 | 0.410 | 0.082 |
| 1 | Standard | 1 | 0.446 | N/A | 0.197 | 0.035 | 0.206 | N/A | 0.030 | 0.095 |
| 1 | Standard | 2 | 0.729 | N/A | 0.072 | 0.176 | 0.304 | N/A | 0.084 | 0.099 |
| 1 | Standard | 3 | 2.164 | N/A | 0.097 | 0.052 | 0.905 | N/A | 0.062 | 0.073 |
| 1 | Standard | 4 | 0.000 | N/A | 0.116 | 0.000 | 0.000 | N/A | 0.161 | 0.075 |
| 2 | Fast | 1 | 1.076 | 0.882 | 0.300 | 0.262 | 1.082 | 0.639 | 0.751 | 0.399 |
| 2 | Fast | 2 | 0.867 | 1.039 | 0.164 | 0.614 | 1.320 | 1.878 | 0.343 | 0.548 |
| 2 | Fast | 3 | 0.487 | 1.117 | 0.693 | 0.418 | 1.228 | 0.648 | 0.852 | 0.236 |
| 2 | Fast | 4 | 0.306 | 0.812 | 0.154 | 0.362 | 0.634 | 3.021 | 0.673 | 0.509 |
| 2 | Slow | 1 | 1.444 | 1.213 | 0.374 | 0.079 | 2.347 | 0.859 | 0.475 | 0.195 |
| 2 | Slow | 2 | 0.958 | 0.316 | 0.527 | 0.452 | 1.068 | 0.288 | 0.386 | 0.485 |
| 2 | Slow | 3 | 1.006 | 0.157 | 0.550 | 0.226 | 0.494 | 0.152 | 0.897 | 0.241 |
| 2 | Slow | 4 | 1.117 | 0.367 | 0.098 | 0.495 | 1.102 | 0.373 | 0.133 | 0.882 |

N/A = Not available. Soil samples were not collected.

Quality Control: None of the field blanks had detectable levels of simazine or diuron. The percent recoveries for the samples are listed in Table 8 and the descriptive statistics are outlined in Table 9. The spiked soil samples had a mean recovery rate for simazine of 91.3% with a SD of 2.3% and the samples spiked with diuron had a mean recovery rate of 92.5% with a SD of 9.2%. Many of the soil samples spiked with diuron were above the upper warning limit, especially on the samples analyzed 45 days after the pesticide application (Table 8). There was a significant difference between the

percent diuron recovered from the soil samples spiked the day after application (median = 86.7%) and the ones spiked 45 days after the application (median = 100%) (Table 9) (Kruskal-Wallis, $p = 0.015$). Even though the soil samples spiked with simazine were within the control limits, the soil cores still showed an increase in simazine and diuron on day 45. This result indicates that the laboratory analysis was not the reason the soil cores had a higher mass of pesticides 45 days after application than 1 day after application.

Table 8. Quality control: percent recovery for spiked soil samples

| Date | Simazine (% recovery) | Simazine Control Limits | Diuron (% recovery) | Diuron Control Limits | Reporting Limit (ppm) | Days After Application |
|------------|-----------------------|-------------------------|---------------------|-----------------------|-----------------------|------------------------|
| 12/23/2004 | 90 | | 103 | UWL | 0.015 | 0 |
| 12/23/2004 | 93.3 | | 90 | | 0.015 | 0 |
| 12/24/2004 | 86.7 | | 83.3 | | 0.015 | 0 |
| 12/27/2004 | 90 | | 96.7 | | 0.015 | 0 |
| 1/3/2005 | 93.3 | | 96.7 | | 0.015 | 0 |
| 1/3/2005 | 93.3 | | 103 | UWL | 0.015 | 0 |
| 1/3/2005 | 86.7 | | 80 | | 0.015 | 0 |
| 1/3/2005 | 86.7 | | 86.7 | | 0.015 | 1 |
| 1/3/2005 | 83.3 | | 83.3 | | 0.015 | 1 |
| 1/5/2005 | 86.7 | | 80 | | 0.015 | 1 |
| 1/5/2005 | 93.3 | | 100 | UWL | 0.015 | 1 |
| 1/7/2005 | 86.7 | | 93.3 | | 0.015 | 1 |
| 1/18/2005 | 93.3 | | 96.7 | | 0.015 | 1 |
| 1/18/2005 | 83.3 | | 76.7 | | 0.015 | 1 |
| 1/21/2005 | 86.7 | | 100 | UWL | 0.015 | 1 |
| 1/21/2005 | 96.7 | | 80 | | 0.015 | 1 |
| 1/7/2005 | 96.7 | | 100 | UWL | 0.015 | 45 |
| 1/14/2005 | 90 | | 100 | UWL | 0.015 | 45 |
| 1/13/2005 | 93.3 | | 100 | UWL | 0.015 | 45 |
| 1/13/2005 | 83.3 | | 83.3 | | 0.015 | 45 |
| 1/13/2005 | 93.3 | | 100 | UWL | 0.015 | 45 |
| 3/9/2005 | 93.3 | | 96.7 | | 0.015 | 45 |
| 3/9/2005 | 90 | | 107 | UCL | 0.015 | 45 |
| 3/10/2005 | 90 | | 96.7 | | 0.015 | 45 |
| 3/10/2005 | 86.7 | | 100 | UWL | 0.015 | 45 |
| 3/11/2005 | 100 | | 100 | UWL | 0.015 | 45 |
| 3/15/2005 | 80 | | 76.7 | | 0.015 | 90 |
| 3/15/2005 | 100 | | 103 | UWL | 0.015 | 90 |
| 3/23/2005 | 83.3 | | 80 | | 0.015 | 90 |
| 3/23/2005 | 103 | UWL | 96.7 | | 0.015 | 90 |
| 3/23/2005 | 93.3 | | 80 | | 0.015 | 90 |
| 3/23/2005 | 86.7 | | 86.7 | | 0.015 | 90 |

| Date | Simazine (% recovery) | Simazine Control Limits | Diuron (% recovery) | Diuron Control Limits | Reporting Limit (ppm) | Days After Application |
|-------------|-----------------------|-------------------------|---------------------|-----------------------|-----------------------|------------------------|
| 3/23/2005 | 90 | | 83.3 | | 0.015 | 90 |
| 3/23/2005 | 100 | | 103 | UWL | 0.015 | 90 |
| 3/23/2005 | 90 | | 86.7 | | 0.015 | 90 |
| 3/23/2005 | 103 | UWL | 103 | UWL | 0.015 | 90 |
| 5/5/2005 | 86.7 | | 96.7 | | 0.015 | 120 |
| 5/5/2005 | 90 | | 80 | | 0.015 | 120 |
| 5/5/2005 | 96.7 | | 96.7 | | 0.015 | 120 |
| 5/5/2005 | 86.7 | | 100 | UWL | 0.015 | 120 |
| 5/5/2005 | 100 | | 96.7 | | 0.015 | 120 |
| 5/5/2005 | 86.7 | | 76.7 | | 0.015 | 120 |
| 5/5/2005 | 90 | | 93.3 | | 0.015 | 120 |
| 5/5/2005 | 96.7 | | 96.7 | | 0.015 | 120 |
| 5/5/2005 | 93.3 | | 96.7 | | 0.015 | 120 |
| 5/5/2005 | 96.7 | | 90 | | 0.015 | 120 |
| Mean | 91.3 | | 92.5 | | | |
| SD | 2.3 | | 9.2 | | | |

UWL = Upper warning limit
 UCL = Upper control limit

Table 9. Descriptive statistics for soil quality control percent recovery

| Chemical | Days After Application | N | Mean (%) | SE Mean (%) | St Dev (%) | Median (%) |
|----------|------------------------|----|----------|-------------|------------|------------|
| Simazine | 0 | 7 | 90.47 | 1.12 | 2.97 | 90.00 |
| Simazine | 1 | 9 | 88.52 | 1.58 | 4.75 | 86.70 |
| Simazine | 45 | 10 | 91.66 | 1.51 | 4.78 | 91.65 |
| Simazine | 90 | 10 | 92.93 | 2.62 | 8.29 | 91.65 |
| Simazine | 120 | 10 | 92.35 | 1.57 | 4.98 | 91.65 |
| Diuron | 0 | 7 | 93.24 | 3.45 | 9.12 | 96.70 |
| Diuron | 1 | 9 | 88.52 | 3.05 | 9.14 | 86.70 |
| Diuron | 45 | 10 | 98.37 | 1.89 | 5.99 | 100.00 |
| Diuron | 90 | 10 | 89.91 | 3.33 | 10.52 | 86.70 |
| Diuron | 120 | 10 | 92.35 | 2.49 | 7.87 | 96.70 |

Efficacy

Observations of the efficacy of the pesticide applications are given in Table 10. Figures 9–14 are photos of the control and chemigation treatment areas. The grower at Site 1 was especially satisfied with the results of the slow injection treatment where efficacy was rated at 95% at 143 days after application. At this site, the slow injection treatment outperformed the other treatments by as much as 10% while there was little difference in efficacy between the fast injection treatment and the standard practice. The application rate for the standard practice was much less than the application rate for the chemigation treatments. The similar efficacy observed on the standard practice plot and

the fast injection treatment occurred with a considerably lower rate of active ingredient applied on the standard practice plot. At Site 2 the fast injection treatment and the standard practice using glyphosate controlled a similar percent of weeds whereas the slow injection treatment controlled fewer weeds.

Table 10. Efficacy

| # Days After Treatment | Site | % of Weeds Controlled by Treatment | | | |
|------------------------|------|------------------------------------|------|------|----------|
| | | Control | Fast | Slow | Standard |
| 44 | 1 | 0 | 100 | 100 | 100 |
| 98 | 1 | 0 | 85 | 95 | 85 |
| 126 | 1 | 0 | 80 | 95 | 85 |
| 143 | 1 | 0 | 85 | 95 | 85 |
| 62 | 2 | 0 | 90 | 80 | 90 |
| 92 | 2 | 0 | 90 | 80 | 90 |
| 121 | 2 | 0 | 90 | 80 | 85 |

Figure 9. Site 1 Control



Figure 10. Site 2 Control



Figure 11. Site 1 Fast Treatment



Figure 12. Site 2 Fast Treatment



Figure 13. Site 1 Slow Treatment



Figure 14. Site 2 Slow Treatment



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APPENDIX

Table 11. Pesticide application water emitter sample results

| Date Collected | Simazine (ppb) | Diuron (ppb) | MDL (ppb) | Site | Treatment | Simazine (kg/ha) | Diuron (kg/ha) |
|----------------|----------------|--------------|-----------|------|-----------|------------------|----------------|
| 11/30/04 | nd | nd | 0.05 | 2 | Control | N/A | N/A |
| 11/30/04 | nd | nd | 0.05 | 2 | Control | N/A | N/A |
| 11/30/04 | nd | nd | 0.05 | 2 | Control | N/A | N/A |
| 11/8/04 | nd | nd | 0.05 | 1 | Control | N/A | N/A |
| 11/8/04 | nd | nd | 0.05 | 1 | Control | N/A | N/A |
| 11/8/04 | nd | nd | 0.05 | 1 | Control | N/A | N/A |
| 11/30/04 | 249000 | 149000 | 0.05 | 2 | Fast | 3.010 | 1.801 |
| 11/30/04 | 299000 | 294000 | 0.05 | 2 | Fast | 3.615 | 3.554 |
| 11/30/04 | 185000 | 189000 | 0.05 | 2 | Fast | 2.237 | 2.285 |
| 11/30/04 | 150000 | 39400 | 0.05 | 2 | Fast | 1.813 | 0.476 |
| 11/30/04 | 97200 | 43100 | 0.05 | 2 | Fast | 1.175 | 0.521 |
| 11/30/04 | 78900 | 90000 | 0.05 | 2 | Fast | 0.954 | 1.088 |
| 11/8/04 | 324000 | 70900 | 0.05 | 1 | Fast | 1.904 | 0.857 |
| 11/8/04 | 352000 | 106000 | 0.05 | 1 | Fast | 2.069 | 1.281 |
| 11/8/04 | 265000 | 85900 | 0.05 | 1 | Fast | 1.557 | 1.038 |
| 11/8/04 | 281000 | 91500 | 0.05 | 1 | Fast | 1.651 | 1.106 |
| 11/8/04 | 275000 | 54500 | 0.05 | 1 | Fast | 1.616 | 0.659 |
| 11/8/04 | 342000 | 126000 | 0.05 | 1 | Fast | 2.010 | 1.523 |
| 11/30/04 | 52300 | 13100 | 0.05 | 2 | Slow | 2.740 | 0.158 |
| 11/30/04 | 60900 | 29700 | 0.05 | 2 | Slow | 3.190 | 0.359 |
| 11/30/04 | 59700 | 16600 | 0.05 | 2 | Slow | 3.128 | 0.201 |
| 11/30/04 | 82200 | 36200 | 0.05 | 2 | Slow | 4.306 | 0.438 |
| 11/30/04 | 76400 | 15900 | 0.05 | 2 | Slow | 4.002 | 0.192 |
| 11/30/04 | 72500 | 46300 | 0.05 | 2 | Slow | 3.798 | 0.560 |
| 11/8/04 | 98000 | 35400 | 0.05 | 1 | Slow | 1.999 | 0.428 |
| 11/8/04 | 148000 | 57300 | 0.05 | 1 | Slow | 3.018 | 0.693 |
| 11/8/04 | 103000 | 45200 | 0.05 | 1 | Slow | 2.101 | 0.546 |
| 11/8/04 | 132000 | 44600 | 0.05 | 1 | Slow | 2.692 | 0.539 |
| 11/8/04 | 161000 | 58400 | 0.05 | 1 | Slow | 3.284 | 0.706 |
| 11/8/04 | 160000 | 93100 | 0.05 | 1 | Slow | 3.263 | 1.126 |

nd = not detected
 N/A = not available

Table 12. Flow rate results

| Site | Treatment | Flow Rate (ml / 30 sec) |
|------|-----------|----------------------------|
| 1 | Fast | N/A |
| 1 | Fast | N/A |
| 1 | Fast | N/A |
| 1 | Fast | N/A |
| 1 | Fast | N/A |
| 1 | Slow | N/A |
| 1 | Slow | N/A |
| 1 | Slow | N/A |
| 1 | Slow | N/A |
| 1 | Slow | N/A |
| 2 | Fast | 360 |
| 2 | Fast | 360 |
| 2 | Fast | 355 |
| 2 | Fast | 365 |
| 2 | Fast | 355 |
| 2 | Slow | 370 |
| 2 | Slow | 375 |
| 2 | Slow | 370 |
| 2 | Slow | 370 |
| 2 | Slow | 365 |

N/A = not available

Table 13. Results from mass deposition sheets from the standard practice plot at Site 1

| Date Collected | Simazine (ug/MDS) | Diuron (ug/MDS) | MDL (ug/MDS) | Site | Simazine (kg/ha) | Diuron (kg/ha) |
|----------------|----------------------|--------------------|-----------------|------|---------------------|-------------------|
| 11/12/04 | 7770 | 5670 | 0.5 | 1 | 0.835275 | 0.609525 |
| 11/12/04 | 12200 | 6150 | 0.5 | 1 | 1.3115 | 0.661125 |
| 11/12/04 | 6590 | 4250 | 0.5 | 1 | 0.708425 | 0.456875 |
| 11/12/04 | 7600 | 5170 | 0.5 | 1 | 0.817 | 0.555775 |

Table 14. Soil physical properties

| Site | % of Sample >2mm | Texture of portion of Sample <2mm | | | Depth (cm) | Texture | Calculated Bulk Density | % Organic Carbon |
|------|------------------|-----------------------------------|--------|--------|---------------|-----------------|-------------------------|------------------|
| | | % Sand | % Silt | % Clay | | | | |
| 1 | 4.9 | 49.0 | 32.0 | 19.0 | 0 – 7.6 | Loam | 1.43 | 1.3 |
| 1 | 3.2 | 46.0 | 30.0 | 24.0 | 7.6 – 15.2 | Loam | 1.39 | 0.3 |
| 1 | 3.0 | 46.0 | 31.0 | 23.0 | 15.2 – 30.5 | Loam | 1.40 | 0.3 |
| 1 | 13.9 | 46.0 | 32.0 | 22.0 | 30.5 – 45.7 | Loam | 1.40 | 0.2 |
| 1 | 3.7 | 49.0 | 31.0 | 20.0 | 45.7 - 61 | Loam | 1.42 | 0.1 |
| 1 | 9.1 | 53.0 | 30.0 | 17.0 | 61 – 91.4 | Sandy loam | 1.46 | 0.1 |
| 1 | 8.7 | 51.0 | 31.0 | 18.0 | 0 – 7.6 | Loam | 1.44 | 2.3 |
| 1 | 9.5 | 51.0 | 30.0 | 19.0 | 7.6 – 15.2 | Loam | 1.44 | 0.3 |
| 1 | 11.1 | 55.0 | 24.0 | 21.0 | 15.2 – 30.5 | Sandy clay loam | 1.43 | 0.3 |
| 1 | 9.2 | 51.0 | 30.0 | 19.0 | 30.5 – 45.7 | Loam | 1.44 | 0.2 |
| 1 | 9.3 | 52.0 | 32.0 | 16.0 | 0 – 7.6 | Loam | 1.46 | 1.6 |
| 1 | 6.5 | 51.0 | 30.0 | 19.0 | 7.6 – 15.2 | Loam | 1.44 | 0.5 |
| 1 | 10.8 | 51.0 | 32.0 | 17.0 | 15.2 – 30.5 | Loam | 1.45 | 0.4 |
| 1 | 2.4 | 51.0 | 33.0 | 16.0 | 30.5 – 45.7 | Loam | 1.46 | 0.2 |
| 1 | 2.7 | 49.0 | 32.0 | 19.0 | 45.7 - 61 | Loam | 1.43 | 0.1 |
| 1 | 7.5 | 53.0 | 30.0 | 17.0 | 61 – 91.4 | Sandy loam | 1.46 | 0.2 |
| 1 | 12.0 | 65.0 | 24.0 | 11.0 | 0 – 7.6 | Sandy loam | 1.54 | 1.1 |
| 1 | 3.9 | 54.0 | 29.0 | 17.0 | 7.6 – 15.2 | Sandy loam | 1.46 | 0.5 |
| 1 | 7.8 | 51.0 | 33.0 | 16.0 | 15.2 – 30.5 | Loam | 1.46 | 0.4 |
| 1 | 2.4 | 49.0 | 35.0 | 16.0 | 30.5 – 45.7 | Loam | 1.46 | 0.2 |
| 1 | 3.7 | 53.0 | 34.0 | 13.0 | 45.7 - 61 | Sandy loam | 1.50 | 0.2 |
| 1 | 1.3 | 53.0 | 26.0 | 21.0 | 61 – 91.4 | Sandy clay loam | 1.42 | 0.2 |
| 1 | 3.9 | 56.0 | 32.0 | 12.0 | 0 – 7.6 | Sandy loam | 1.55 | 2.0 |
| 1 | 11.9 | 56.0 | 28.0 | 16.0 | 7.6 – 15.2 | Sandy loam | 1.47 | 0.4 |
| 1 | 3.7 | 55.0 | 28.0 | 17.0 | 15.2 – 30.5 | Sandy loam | 1.46 | 0.4 |
| 1 | 11.2 | 57.0 | 28.0 | 15.0 | 30.5 – 45.7 | Sandy loam | 1.48 | 0.2 |
| 1 | 18.0 | 52.0 | 29.0 | 19.0 | 45.7 - 61 | Loam | 1.44 | 0.2 |
| 1 | 12.1 | 56.0 | 31.0 | 13.0 | 0 – 7.6 | Sandy loam | 1.50 | 0.3 |
| 1 | 24.2 | 57.0 | 28.0 | 15.0 | 7.6 – 15.2 | Sandy loam | 1.48 | 0.6 |
| 1 | 17.5 | 54.0 | 29.0 | 17.0 | 15.2 – 30.5 | Sandy loam | 1.48 | 0.4 |
| 1 | 9.0 | 57.0 | 26.0 | 17.0 | 30.5 – 45.7 | Sandy loam | 1.46 | 0.3 |
| 1 | 15.7 | 55.0 | 25.0 | 20.0 | 45.7 - 61 | Sandy clay loam | 1.44 | 0.4 |
| 1 | 3.4 | 53.0 | 30.0 | 17.0 | 61 – 76.2 | Sandy loam | 1.46 | 1.2 |
| 1 | 6.0 | 50.0 | 32.0 | 18.0 | 91.4 – 106.7 | Loam | 1.44 | 0.7 |
| 1 | 1.6 | 49.0 | 29.0 | 22.0 | 106.7 – 121.9 | Loam | 1.41 | 0.4 |
| 1 | 5.7 | 48.0 | 29.0 | 23.0 | 121.9 – 137.2 | Loam | 1.40 | N/A |
| 1 | 3.4 | 50.0 | 29.0 | 21.0 | 137.2 – 152.4 | Loam | 1.42 | N/A |
| 1 | 12.1 | 56.0 | 31.0 | 13.0 | 0 – 7.6 | Sandy loam | 1.50 | 2.5 |
| 1 | 8.6 | 54.0 | 31.0 | 15.0 | 7.6 – 15.2 | Sandy loam | 1.48 | 0.6 |
| 1 | 7.8 | 55.0 | 30.0 | 15.0 | 15.2 – 30.5 | Sandy loam | 1.48 | 0.3 |
| 1 | 7.3 | 51.0 | 30.0 | 19.0 | 30.5 – 45.7 | Loam | 1.44 | 0.3 |

| Site | % of Sample >2mm | Texture of portion of Sample <2mm | | | Depth (cm) | Texture | Calculated Bulk Density | % Organic Carbon |
|------|------------------|-----------------------------------|--------|--------|---------------|-----------------|-------------------------|------------------|
| | | % Sand | % Silt | % Clay | | | | |
| 1 | 8.7 | 51.0 | 34.0 | 15.0 | 45.7 - 61 | Loam | 1.41 | 0.3 |
| 1 | 4.7 | 49.0 | 31.0 | 20.0 | 61 -91.4 | Loam | 1.42 | 0.2 |
| 2 | 1.7 | 56.0 | 26.0 | 18.0 | 0 - 7.6 | Sandy loam | 1.45 | 1.1 |
| 2 | 1.5 | 55.0 | 25.0 | 20.0 | 7.6 - 15.2 | Sandy clay loam | 1.44 | 0.7 |
| 2 | 1.7 | 56.0 | 24.0 | 20.0 | 15.2 - 30.5 | Sandy clay loam | 1.44 | 0.5 |
| 2 | 1.2 | 54.0 | 28.0 | 18.0 | 30.5 - 45.7 | Sandy loam | 1.45 | 0.5 |
| 2 | 1.3 | 58.0 | 24.0 | 18.0 | 45.7 - 61 | Sandy loam | 1.46 | 0.3 |
| 2 | 1.3 | 60.0 | 25.0 | 15.0 | 61 -91.4 | Sandy loam | 1.49 | 0.1 |
| 2 | 0.9 | 65.0 | 23.0 | 12.0 | 91.4 - 121.9 | Sandy loam | 1.53 | 0.1 |
| 2 | 0.8 | 66.0 | 14.0 | 20.0 | 121.9 - 152.4 | Sandy clay loam | 1.46 | 0.1 |
| 2 | 0.6 | 42.0 | 32.0 | 26.0 | 0 - 7.6 | Loam | 1.37 | 1.0 |
| 2 | 0.7 | 48.0 | 26.0 | 26.0 | 7.6 - 15.2 | Sandy clay loam | 1.38 | 0.3 |
| 2 | 0.3 | 47.0 | 29.0 | 24.0 | 15.2 - 30.5 | Loam | 1.39 | 0.5 |
| 2 | 0.2 | 44.0 | 34.0 | 22.0 | 30.5 - 45.7 | Loam | 1.40 | 0.2 |
| 2 | 0.2 | 36.0 | 32.0 | 32.0 | 45.7 - 61 | Clay loam | 1.33 | 0.1 |
| 2 | 0.5 | 28.0 | 30.0 | 42.0 | 61 -91.4 | Clay | N/A | 0.1 |
| 2 | 1.6 | 32.0 | 31.0 | 37.0 | 91.4 - 121.9 | Clay loam | 1.30 | 0.1 |
| 2 | 4.7 | 40.0 | 36.0 | 24.0 | 121.9 - 152.4 | Loam | 1.38 | 0.1 |
| 2 | 1.0 | 43.0 | 29.0 | 28.0 | 0 - 7.6 | Clay loam | 1.36 | 1.1 |
| 2 | 0.5 | 44.0 | 27.0 | 29.0 | 7.6 - 15.2 | Clay loam | 1.36 | 0.9 |
| 2 | 0.3 | 45.0 | 28.0 | 27.0 | 15.2 - 30.5 | Clay loam | 1.37 | 0.4 |
| 2 | 0.2 | 46.0 | 28.0 | 26.0 | 30.5 - 45.7 | Loam | 1.38 | 0.4 |
| 2 | 0.1 | 48.0 | 28.0 | 24.0 | 45.7 - 61 | Loam | 1.40 | 0.2 |
| 2 | 0.4 | 41.0 | 30.0 | 29.0 | 61 -91.4 | Clay loam | 1.35 | 0.2 |
| 2 | 0.1 | 38.0 | 32.0 | 30.0 | 91.4 - 121.9 | Clay loam | 1.34 | 0.2 |
| 2 | 0.1 | 41.0 | 43.0 | 16.0 | 121.9 - 152.4 | Loam | 1.44 | 0.0 |

N/A = not available

Table 15. Soil core results

| Date Collected | Simazine (ppm) | Diuron (ppm) | % Moisture | Treatment | Depth (cm) | Site | Days After Application | Replicate |
|----------------|----------------|--------------|------------|------------|-------------|------|------------------------|-----------|
| 11/2/04 | nd | nd | 16.3 | Background | 0 – 7.6 | 1 | Background | 1 |
| 11/2/04 | nd | nd | 12.2 | Background | 7.6 – 15.2 | 1 | Background | 1 |
| 11/2/04 | nd | nd | 14.1 | Background | 15.2 – 30.5 | 1 | Background | 1 |
| 11/2/04 | nd | nd | 13.7 | Background | 30.5 – 45.7 | 1 | Background | 1 |
| 11/2/04 | nd | nd | 15 | Background | 45.7 - 61 | 1 | Background | 1 |
| 11/2/04 | nd | nd | 12.9 | Background | 61 –91.4 | 1 | Background | 1 |
| 11/2/04 | nd | nd | 17.6 | Background | 0 – 7.6 | 1 | Background | 2 |
| 11/2/04 | nd | nd | 12.3 | Background | 7.6 – 15.2 | 1 | Background | 2 |
| 11/2/04 | nd | nd | 11.9 | Background | 15.2 – 30.5 | 1 | Background | 2 |
| 11/2/04 | nd | nd | 12.3 | Background | 30.5 – 45.7 | 1 | Background | 2 |
| 11/2/04 | nd | nd | 13.8 | Background | 0 – 7.6 | 1 | Background | 3 |
| 11/2/04 | nd | nd | 12.5 | Background | 7.6 – 15.2 | 1 | Background | 3 |
| 11/2/04 | nd | nd | 13.3 | Background | 15.2 – 30.5 | 1 | Background | 3 |
| 11/2/04 | nd | nd | 12.8 | Background | 30.5 – 45.7 | 1 | Background | 3 |
| 11/2/04 | nd | nd | 12.1 | Background | 45.7 - 61 | 1 | Background | 3 |
| 11/2/04 | nd | nd | 14.3 | Background | 61 –91.4 | 1 | Background | 3 |
| 11/2/04 | nd | nd | 15 | Background | 0 – 7.6 | 1 | Background | 4 |
| 11/2/04 | nd | nd | 12 | Background | 7.6 – 15.2 | 1 | Background | 4 |
| 11/2/04 | nd | nd | 10.1 | Background | 15.2 – 30.5 | 1 | Background | 4 |
| 11/2/04 | nd | nd | 7.68 | Background | 30.5 – 45.7 | 1 | Background | 4 |
| 11/2/04 | nd | nd | 7.3 | Background | 45.7 - 61 | 1 | Background | 4 |
| 11/2/04 | nd | nd | 11.5 | Background | 61 –91.4 | 1 | Background | 4 |
| 11/2/04 | nd | nd | 18.9 | Background | 0 – 7.6 | 1 | Background | 5 |
| 11/2/04 | nd | nd | 11.1 | Background | 7.6 – 15.2 | 1 | Background | 5 |
| 11/2/04 | nd | nd | 10.3 | Background | 15.2 – 30.5 | 1 | Background | 5 |
| 11/2/04 | nd | nd | 7.23 | Background | 30.5 – 45.7 | 1 | Background | 5 |
| 11/2/04 | nd | nd | 8.4 | Background | 45.7 - 61 | 1 | Background | 5 |
| 11/2/04 | nd | nd | 17.7 | Background | 0 – 7.6 | 1 | Background | 6 |
| 11/2/04 | nd | nd | 11.8 | Background | 7.6 – 15.2 | 1 | Background | 6 |
| 11/2/04 | nd | nd | 10.2 | Background | 15.2 – 30.5 | 1 | Background | 6 |
| 11/2/04 | nd | nd | 9.76 | Background | 30.5 – 45.7 | 1 | Background | 6 |
| 11/2/04 | nd | nd | 7.91 | Background | 45.7 - 61 | 1 | Background | 6 |
| 11/2/04 | nd | nd | 9.46 | Background | 61 –91.4 | 1 | Background | 6 |
| 11/2/04 | nd | nd | 14.7 | Background | 0 – 7.6 | 1 | Background | 7 |
| 11/2/04 | nd | nd | 11.2 | Background | 7.6 – 15.2 | 1 | Background | 7 |
| 11/2/04 | nd | nd | 16.9 | Background | 15.2 – 30.5 | 1 | Background | 7 |
| 11/2/04 | nd | nd | 9.37 | Background | 30.5 – 45.7 | 1 | Background | 7 |
| 11/2/04 | nd | nd | 18.7 | Background | 0 – 7.6 | 1 | Background | 8 |
| 11/2/04 | nd | nd | 11.8 | Background | 7.6 – 15.2 | 1 | Background | 8 |
| 11/2/04 | nd | nd | 9.41 | Background | 15.2 – 30.5 | 1 | Background | 8 |
| 11/2/04 | nd | nd | 11.6 | Background | 30.5 – 45.7 | 1 | Background | 8 |
| 11/2/04 | nd | nd | 11.6 | Background | 45.7 - 61 | 1 | Background | 8 |
| 11/2/04 | nd | nd | 10.2 | Background | 61 –91.4 | 1 | Background | 8 |

| Date Collected | Simazine (ppm) | Diuron (ppm) | % Moisture | Treatment | Depth (cm) | Site | Days After Application | Replicate |
|----------------|----------------|--------------|------------|------------|---------------|------|------------------------|-----------|
| 11/5/04 | nd | 0.016 | 20.5 | Background | 0 – 7.6 | 2 | Background | 1 |
| 11/5/04 | nd | nd | 17.7 | Background | 7.6 – 15.2 | 2 | Background | 1 |
| 11/5/04 | nd | nd | 15.0 | Background | 15.2 – 30.5 | 2 | Background | 1 |
| 11/5/04 | nd | nd | 12.2 | Background | 30.5 – 45.7 | 2 | Background | 1 |
| 11/5/04 | nd | nd | 10.3 | Background | 45.7 - 61 | 2 | Background | 1 |
| 11/5/04 | nd | nd | 9.58 | Background | 61 –91.4 | 2 | Background | 1 |
| 11/5/04 | nd | nd | 10.4 | Background | 91.4 - 121.9 | 2 | Background | 1 |
| 11/5/04 | nd | nd | 11.1 | Background | 121.9 – 152.4 | 2 | Background | 1 |
| 11/5/04 | nd | nd | 18.7 | Background | 0 – 7.6 | 2 | Background | 2 |
| 11/5/04 | nd | nd | 18 | Background | 7.6 – 15.2 | 2 | Background | 2 |
| 11/5/04 | nd | nd | 14.3 | Background | 15.2 – 30.5 | 2 | Background | 2 |
| 11/5/04 | nd | nd | 12.5 | Background | 30.5 – 45.7 | 2 | Background | 2 |
| 11/5/04 | nd | nd | 10.3 | Background | 45.7 - 61 | 2 | Background | 2 |
| 11/5/04 | nd | nd | 8.52 | Background | 61 –91.4 | 2 | Background | 2 |
| 11/5/04 | nd | nd | 9.6 | Background | 91.4 - 121.9 | 2 | Background | 2 |
| 11/5/04 | nd | nd | 9.12 | Background | 121.9 – 152.4 | 2 | Background | 2 |
| 11/5/04 | nd | nd | 17.5 | Background | 0 – 7.6 | 2 | Background | 3 |
| 11/5/04 | nd | 0.059 | 15.6 | Background | 7.6 – 15.2 | 2 | Background | 3 |
| 11/5/04 | nd | nd | 13.5 | Background | 15.2 – 30.5 | 2 | Background | 3 |
| 11/5/04 | nd | nd | 11 | Background | 30.5 – 45.7 | 2 | Background | 3 |
| 11/5/04 | nd | nd | 8.93 | Background | 45.7 - 61 | 2 | Background | 3 |
| 11/5/04 | nd | nd | 7.18 | Background | 61 –91.4 | 2 | Background | 3 |
| 11/5/04 | nd | nd | 4.75 | Background | 91.4 - 121.9 | 2 | Background | 3 |
| 11/5/04 | 0.021 | 0.137 | 14.3 | Background | 0 – 7.6 | 2 | Background | 4 |
| 11/5/04 | nd | nd | 14.5 | Background | 7.6 – 15.2 | 2 | Background | 4 |
| 11/5/04 | nd | nd | 13.6 | Background | 15.2 – 30.5 | 2 | Background | 4 |
| 11/5/04 | nd | nd | 13.7 | Background | 30.5 – 45.7 | 2 | Background | 4 |
| 11/5/04 | nd | nd | 12.8 | Background | 45.7 - 61 | 2 | Background | 4 |
| 11/5/04 | nd | nd | 15 | Background | 61 –91.4 | 2 | Background | 4 |
| 11/5/04 | nd | nd | 14.1 | Background | 91.4 - 121.9 | 2 | Background | 4 |
| 11/5/04 | nd | nd | 12 | Background | 121.9 – 152.4 | 2 | Background | 4 |
| 11/5/04 | nd | 0.036 | 13.3 | Background | 0 – 7.6 | 2 | Background | 5 |
| 11/5/04 | nd | nd | 10.1 | Background | 7.6 – 15.2 | 2 | Background | 5 |
| 11/5/04 | nd | nd | 11.5 | Background | 15.2 – 30.5 | 2 | Background | 5 |
| 11/5/04 | nd | nd | 13.3 | Background | 30.5 – 45.7 | 2 | Background | 5 |
| 11/5/04 | nd | nd | 11.8 | Background | 45.7 - 61 | 2 | Background | 5 |
| 11/5/04 | nd | 0.018 | 12.8 | Background | 0 – 7.6 | 2 | Background | 6 |
| 11/5/04 | nd | nd | 9.74 | Background | 7.6 – 15.2 | 2 | Background | 6 |
| 11/5/04 | nd | nd | 7.04 | Background | 15.2 – 30.5 | 2 | Background | 6 |
| 11/5/04 | nd | nd | 8.22 | Background | 30.5 – 45.7 | 2 | Background | 6 |
| 11/5/04 | nd | nd | 8.43 | Background | 45.7 - 61 | 2 | Background | 6 |
| 11/5/04 | nd | nd | 8.27 | Background | 61 –91.4 | 2 | Background | 6 |
| 11/5/04 | nd | nd | 6.38 | Background | 91.4 - 121.9 | 2 | Background | 6 |
| 11/5/04 | nd | nd | 6.54 | Background | 121.9 – 152.4 | 2 | Background | 6 |

| Date Collected | Simazine (ppm) | Diuron (ppm) | % Moisture | Treatment | Depth (cm) | Site | Days After Application | Replicate |
|----------------|----------------|--------------|------------|------------|---------------|------|------------------------|-----------|
| 11/5/04 | nd | 0.042 | 17.2 | Background | 0 – 7.6 | 2 | Background | 7 |
| 11/5/04 | nd | nd | 15.7 | Background | 7.6 – 15.2 | 2 | Background | 7 |
| 11/5/04 | nd | nd | 15.1 | Background | 15.2 – 30.5 | 2 | Background | 7 |
| 11/5/04 | nd | nd | 13.4 | Background | 30.5 – 45.7 | 2 | Background | 7 |
| 11/5/04 | nd | nd | 16.1 | Background | 45.7 - 61 | 2 | Background | 7 |
| 11/5/04 | nd | nd | 18.1 | Background | 61 –91.4 | 2 | Background | 7 |
| 11/5/04 | nd | nd | 18.3 | Background | 91.4 - 121.9 | 2 | Background | 7 |
| 11/5/04 | nd | nd | 16.9 | Background | 121.9 – 152.4 | 2 | Background | 7 |
| 11/5/04 | 0.100 | 0.268 | 15.5 | Background | 0 – 7.6 | 2 | Background | 8 |
| 11/5/04 | nd | 0.025 | 13.7 | Background | 7.6 – 15.2 | 2 | Background | 8 |
| 11/5/04 | nd | nd | 12.3 | Background | 15.2 – 30.5 | 2 | Background | 8 |
| 11/5/04 | nd | nd | 11.3 | Background | 30.5 – 45.7 | 2 | Background | 8 |
| 11/5/04 | nd | nd | 10.3 | Background | 45.7 - 61 | 2 | Background | 8 |
| 11/5/04 | nd | nd | 10.6 | Background | 61 –91.4 | 2 | Background | 8 |
| 11/5/04 | nd | nd | 13.5 | Background | 91.4 - 121.9 | 2 | Background | 8 |
| 11/5/04 | nd | nd | 11.4 | Background | 121.9 – 152.4 | 2 | Background | 8 |
| 11/16/04 | 0.403 | 0.186 | 16.7 | Standard | 0 – 7.6 | 1 | 1-Day | 1 |
| 11/16/04 | nd | nd | 11.6 | Standard | 7.6 – 15.2 | 1 | 1-Day | 1 |
| 11/16/04 | nd | nd | 11 | Standard | 15.2 – 30.5 | 1 | 1-Day | 1 |
| 11/16/04 | nd | nd | 9.55 | Standard | 30.5 – 45.7 | 1 | 1-Day | 1 |
| 11/16/04 | 0.658 | 0.274 | 24.9 | Standard | 0 – 7.6 | 1 | 1-Day | 2 |
| 11/16/04 | nd | nd | 9.22 | Standard | 7.6 – 15.2 | 1 | 1-Day | 2 |
| 11/16/04 | nd | nd | 11.5 | Standard | 15.2 – 30.5 | 1 | 1-Day | 2 |
| 11/16/04 | nd | nd | 8.86 | Standard | 30.5 – 45.7 | 1 | 1-Day | 2 |
| 11/16/04 | 0.362 | 0.136 | 21.5 | Standard | 0 – 7.6 | 1 | 1-Day | 3 |
| 11/16/04 | nd | nd | 12.4 | Standard | 7.6 – 15.2 | 1 | 1-Day | 3 |
| 11/16/04 | nd | nd | 12.4 | Standard | 15.2 – 30.5 | 1 | 1-Day | 3 |
| 11/16/04 | 0.804 | 0.344 | 11.8 | Standard | 30.5 – 45.7 | 1 | 1-Day | 3 |
| 11/16/04 | nd | nd | 16.9 | Standard | 0 – 7.6 | 1 | 1-Day | 4 |
| 11/16/04 | nd | nd | 12.2 | Standard | 7.6 – 15.2 | 1 | 1-Day | 4 |
| 11/16/04 | nd | nd | 12.3 | Standard | 15.2 – 30.5 | 1 | 1-Day | 4 |
| 11/16/04 | nd | nd | 11.2 | Standard | 30.5 – 45.7 | 1 | 1-Day | 4 |
| 11/10/04 | 2.220 | 3.18 | 18.7 | Fast | 0 – 7.6 | 1 | 1-Day | 1 |
| 11/10/04 | nd | nd | 13.3 | Fast | 7.6 – 15.2 | 1 | 1-Day | 1 |
| 11/10/04 | 0.138 | 0.135 | 13.2 | Fast | 15.2 – 30.5 | 1 | 1-Day | 1 |
| 11/10/04 | 0.142 | 0.043 | 15.3 | Fast | 30.5 – 45.7 | 1 | 1-Day | 1 |
| 11/10/04 | 0.689 | 0.922 | 14.8 | Fast | 0 – 7.6 | 1 | 1-Day | 2 |
| 11/10/04 | 0.016 | nd | 13.7 | Fast | 7.6 – 15.2 | 1 | 1-Day | 2 |
| 11/10/04 | nd | nd | 12.5 | Fast | 15.2 – 30.5 | 1 | 1-Day | 2 |
| 11/10/04 | nd | nd | 13.5 | Fast | 30.5 – 45.7 | 1 | 1-Day | 2 |
| 11/10/04 | 1.350 | 1.06 | 21.2 | Fast | 0 – 7.6 | 1 | 1-Day | 3 |
| 11/10/04 | 0.026 | nd | 13.2 | Fast | 7.6 – 15.2 | 1 | 1-Day | 3 |
| 11/10/04 | 0.039 | nd | 11 | Fast | 15.2 – 30.5 | 1 | 1-Day | 3 |
| 11/10/04 | 0.019 | nd | 16.2 | Fast | 30.5 – 45.7 | 1 | 1-Day | 3 |

| Date Collected | Simazine (ppm) | Diuron (ppm) | % Moisture | Treatment | Depth (cm) | Site | Days After Application | Replicate |
|----------------|----------------|--------------|------------|-----------|-------------|------|------------------------|-----------|
| 11/10/04 | 0.663 | 0.661 | 13.7 | Fast | 0 – 7.6 | 1 | 1-Day | 4 |
| 11/10/04 | 0.070 | 0.031 | 11.5 | Fast | 7.6 – 15.2 | 1 | 1-Day | 4 |
| 11/10/04 | nd | nd | 8.01 | Fast | 15.2 – 30.5 | 1 | 1-Day | 4 |
| 11/10/04 | nd | nd | 7.53 | Fast | 30.5 – 45.7 | 1 | 1-Day | 4 |
| 11/10/04 | 2.130 | 1.83 | 18.3 | Slow | 0 – 7.6 | 1 | 1-Day | 1 |
| 11/10/04 | nd | nd | 12.5 | Slow | 7.6 – 15.2 | 1 | 1-Day | 1 |
| 11/10/04 | nd | nd | 10.9 | Slow | 15.2 – 30.5 | 1 | 1-Day | 1 |
| 11/10/04 | nd | nd | 10.9 | Slow | 30.5 – 45.7 | 1 | 1-Day | 1 |
| 11/10/04 | 1.050 | 0.842 | 21.7 | Slow | 0 – 7.6 | 1 | 1-Day | 2 |
| 11/10/04 | nd | nd | 15.1 | Slow | 7.6 – 15.2 | 1 | 1-Day | 2 |
| 11/10/04 | nd | nd | 12.6 | Slow | 15.2 – 30.5 | 1 | 1-Day | 2 |
| 11/10/04 | nd | nd | 7.7 | Slow | 30.5 – 45.7 | 1 | 1-Day | 2 |
| 11/10/04 | 1.030 | 0.775 | 21.4 | Slow | 0 – 7.6 | 1 | 1-Day | 3 |
| 11/10/04 | 0.067 | 0.044 | 11.1 | Slow | 7.6 – 15.2 | 1 | 1-Day | 3 |
| 11/10/04 | 0.022 | 0.016 | 11.3 | Slow | 15.2 – 30.5 | 1 | 1-Day | 3 |
| 11/10/04 | nd | nd | 8.04 | Slow | 30.5 – 45.7 | 1 | 1-Day | 3 |
| 11/10/04 | 0.883 | 0.651 | 22 | Slow | 0 – 7.6 | 1 | 1-Day | 4 |
| 11/10/04 | nd | nd | 11 | Slow | 7.6 – 15.2 | 1 | 1-Day | 4 |
| 11/10/04 | nd | nd | 12 | Slow | 15.2 – 30.5 | 1 | 1-Day | 4 |
| 11/10/04 | nd | nd | 11.5 | Slow | 30.5 – 45.7 | 1 | 1-Day | 4 |
| 12/1/04 | 0.875 | 0.843 | 20.8 | Fast | 0 – 7.6 | 2 | 1- Day | 1 |
| 12/1/04 | 0.138 | 0.176 | 19.0 | Fast | 7.6 – 15.2 | 2 | 1- Day | 1 |
| 12/1/04 | nd | nd | 16.3 | Fast | 15.2 – 30.5 | 2 | 1- Day | 1 |
| 12/1/04 | nd | nd | 13.5 | Fast | 30.5 – 45.7 | 2 | 1- Day | 1 |
| 12/1/04 | 0.757 | 1.08 | 20.1 | Fast | 0 – 7.6 | 2 | 1- Day | 2 |
| 12/1/04 | 0.060 | 0.163 | 19.1 | Fast | 7.6 – 15.2 | 2 | 1- Day | 2 |
| 12/1/04 | nd | nd | 15.3 | Fast | 15.2 – 30.5 | 2 | 1- Day | 2 |
| 12/1/04 | nd | nd | 12.5 | Fast | 30.5 – 45.7 | 2 | 1- Day | 2 |
| 12/1/04 | 0.394 | 1.04 | 24.1 | Fast | 0 – 7.6 | 2 | 1- Day | 3 |
| 12/1/04 | 0.020 | nd | 21.5 | Fast | 7.6 – 15.2 | 2 | 1- Day | 3 |
| 12/1/04 | 0.022 | 0.039 | 15.6 | Fast | 15.2 – 30.5 | 2 | 1- Day | 3 |
| 12/1/04 | nd | 0.019 | 14.6 | Fast | 30.5 – 45.7 | 2 | 1- Day | 3 |
| 12/1/04 | 0.272 | 0.577 | 21.4 | Fast | 0 – 7.6 | 2 | 1- Day | 4 |
| 12/1/04 | 0.016 | 0.02 | 20.3 | Fast | 7.6 – 15.2 | 2 | 1- Day | 4 |
| 12/1/04 | nd | nd | 14.5 | Fast | 15.2 – 30.5 | 2 | 1- Day | 4 |
| 12/1/04 | nd | nd | 13.2 | Fast | 30.5 – 45.7 | 2 | 1- Day | 4 |
| 12/1/04 | 1.36 | 2.21 | 23.3 | Slow | 0 – 7.6 | 2 | 1- Day | 1 |
| 12/1/04 | nd | nd | 13.5 | Slow | 7.6 – 15.2 | 2 | 1- Day | 1 |
| 12/1/04 | nd | nd | 10.2 | Slow | 15.2 – 30.5 | 2 | 1- Day | 1 |
| 12/1/04 | nd | nd | 11 | Slow | 30.5 – 45.7 | 2 | 1- Day | 1 |
| 12/1/04 | 0.864 | 0.946 | 19.5 | Slow | 0 – 7.6 | 2 | 1- Day | 2 |
| 12/1/04 | nd | nd | 15.6 | Slow | 7.6 – 15.2 | 2 | 1- Day | 2 |
| 12/1/04 | 0.019 | 0.03 | 11.3 | Slow | 15.2 – 30.5 | 2 | 1- Day | 2 |
| 12/1/04 | nd | nd | 13.9 | Slow | 30.5 – 45.7 | 2 | 1- Day | 2 |

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| Date Collected | Simazine (ppm) | Diuron (ppm) | % Moisture | Treatment | Depth (cm) | Site | Days After Application | Replicate |
|----------------|----------------|--------------|------------|-----------|-------------|------|------------------------|-----------|
| 12/1/04 | 0.93 | 0.444 | 20.6 | Slow | 0 – 7.6 | 2 | 1- Day | 3 |
| 12/1/04 | 0.017 | 0.021 | 16.1 | Slow | 7.6 – 15.2 | 2 | 1- Day | 3 |
| 12/1/04 | nd | nd | 15.2 | Slow | 15.2 – 30.5 | 2 | 1- Day | 3 |
| 12/1/04 | nd | nd | 10.9 | Slow | 30.5 – 45.7 | 2 | 1- Day | 3 |
| 12/1/04 | 1.02 | 0.998 | 21.2 | Slow | 0 – 7.6 | 2 | 1- Day | 4 |
| 12/1/04 | nd | nd | 16.8 | Slow | 7.6 – 15.2 | 2 | 1- Day | 4 |
| 12/1/04 | 0.016 | 0.020 | 13.4 | Slow | 15.2 – 30.5 | 2 | 1- Day | 4 |
| 12/1/04 | nd | nd | 10.9 | Slow | 30.5 – 45.7 | 2 | 1- Day | 4 |
| 12/22/04 | 2.250 | 1.56 | 24.2 | Fast | 0 – 7.6 | 1 | 45-Day | 1 |
| 12/22/04 | 0.266 | 0.066 | 16.7 | Fast | 7.6 – 15.2 | 1 | 45-Day | 1 |
| 12/22/04 | nd | nd | 13.1 | Fast | 15.2 – 30.5 | 1 | 45-Day | 1 |
| 12/22/04 | 0.022 | nd | 12.5 | Fast | 30.5 – 45.7 | 1 | 45-Day | 1 |
| 12/22/04 | nd | nd | 13.3 | Fast | 45.7 - 61 | 1 | 45-Day | 1 |
| 12/22/04 | 1.120 | 0.95 | 17.8 | Fast | 0 – 7.6 | 1 | 45-Day | 2 |
| 12/22/04 | 0.156 | 0.067 | 10.2 | Fast | 7.6 – 15.2 | 1 | 45-Day | 2 |
| 12/22/04 | nd | nd | 13.7 | Fast | 15.2 – 30.5 | 1 | 45-Day | 2 |
| 12/22/04 | nd | nd | 12.7 | Fast | 30.5 – 45.7 | 1 | 45-Day | 2 |
| 12/22/04 | nd | nd | 13.4 | Fast | 45.7 - 61 | 1 | 45-Day | 2 |
| 12/22/04 | 0.512 | 0.666 | 18.1 | Fast | 0 – 7.6 | 1 | 45-Day | 3 |
| 12/22/04 | nd | nd | 13.8 | Fast | 7.6 – 15.2 | 1 | 45-Day | 3 |
| 12/22/04 | nd | nd | 13.2 | Fast | 15.2 – 30.5 | 1 | 45-Day | 3 |
| 12/22/04 | nd | nd | 11.8 | Fast | 30.5 – 45.7 | 1 | 45-Day | 3 |
| 12/22/04 | nd | nd | 12.6 | Fast | 45.7 - 61 | 1 | 45-Day | 3 |
| 12/22/04 | nd | nd | 13.3 | Fast | 61 –91.4 | 1 | 45-Day | 3 |
| 12/22/04 | 4.410 | 2.35 | 17 | Fast | 0 – 7.6 | 1 | 45-Day | 4 |
| 12/22/04 | 0.274 | 0.064 | 13.9 | Fast | 7.6 – 15.2 | 1 | 45-Day | 4 |
| 12/22/04 | 0.030 | 0.039 | 13.8 | Fast | 15.2 – 30.5 | 1 | 45-Day | 4 |
| 12/22/04 | nd | nd | 12.8 | Fast | 30.5 – 45.7 | 1 | 45-Day | 4 |
| 12/22/04 | nd | nd | 15 | Fast | 45.7 - 61 | 1 | 45-Day | 4 |
| 12/22/04 | 2.330 | 2.17 | 18.6 | Slow | 0 – 7.6 | 1 | 45-Day | 1 |
| 12/22/04 | 1.380 | 1.72 | 10.1 | Slow | 7.6 – 15.2 | 1 | 45-Day | 1 |
| 12/22/04 | nd | nd | 12 | Slow | 15.2 – 30.5 | 1 | 45-Day | 1 |
| 12/22/04 | nd | nd | 11.3 | Slow | 30.5 – 45.7 | 1 | 45-Day | 1 |
| 12/22/04 | nd | nd | 10.6 | Slow | 45.7 - 61 | 1 | 45-Day | 1 |
| 12/22/04 | nd | nd | 10.5 | Slow | 61 –91.4 | 1 | 45-Day | 1 |
| 12/22/04 | 2.620 | 1.18 | 21.3 | Slow | 0 – 7.6 | 1 | 45-Day | 2 |
| 12/22/04 | 0.034 | 0.151 | 13.4 | Slow | 7.6 – 15.2 | 1 | 45-Day | 2 |
| 12/22/04 | 0.100 | 0.033 | 10.6 | Slow | 15.2 – 30.5 | 1 | 45-Day | 2 |
| 12/22/04 | 0.063 | nd | 11.6 | Slow | 30.5 – 45.7 | 1 | 45-Day | 2 |
| 12/22/04 | nd | nd | 11.9 | Slow | 45.7 - 61 | 1 | 45-Day | 2 |
| 12/22/04 | 1.810 | 1.55 | 19.5 | Slow | 0 – 7.6 | 1 | 45-Day | 3 |
| 12/22/04 | 0.096 | 0.033 | 12.7 | Slow | 7.6 – 15.2 | 1 | 45-Day | 3 |
| 12/22/04 | 0.109 | 0.138 | 11.3 | Slow | 15.2 – 30.5 | 1 | 45-Day | 3 |
| 12/22/04 | 0.057 | nd | 13.1 | Slow | 30.5 – 45.7 | 1 | 45-Day | 3 |

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| Date Collected | Simazine (ppm) | Diuron (ppm) | % Moisture | Treatment | Depth (cm) | Site | Days After Application | Replicate |
|----------------|----------------|--------------|------------|-----------|---------------|------|------------------------|-----------|
| 12/22/04 | 0.190 | 0.082 | 10.9 | Slow | 45.7 - 61 | 1 | 45-Day | 3 |
| 12/22/04 | 2.030 | 1.49 | 23 | Slow | 0 - 7.6 | 1 | 45-Day | 4 |
| 12/22/04 | 0.139 | 0.062 | 14.3 | Slow | 7.6 - 15.2 | 1 | 45-Day | 4 |
| 12/22/04 | 0.027 | nd | 11.1 | Slow | 15.2 - 30.5 | 1 | 45-Day | 4 |
| 12/22/04 | 0.037 | nd | 11.4 | Slow | 30.5 - 45.7 | 1 | 45-Day | 4 |
| 12/22/04 | nd | nd | 12.5 | Slow | 45.7 - 61 | 1 | 45-Day | 4 |
| 12/22/04 | nd | nd | 10.6 | Slow | 61 -91.4 | 1 | 45-Day | 4 |
| 12/22/04 | nd | nd | 12.1 | Slow | 91.4 - 121.9 | 1 | 45-Day | 4 |
| 1/31/05 | 0.743 | 0.528 | 22.3 | Fast | 0 - 7.6 | 2 | 45-Day | 1 |
| 1/31/05 | 0.047 | 0.074 | 18.8 | Fast | 7.6 - 15.2 | 2 | 45-Day | 1 |
| 1/31/05 | nd | nd | 17.1 | Fast | 15.2 - 30.5 | 2 | 45-Day | 1 |
| 1/31/05 | 0.020 | nd | 16.7 | Fast | 30.5 - 45.7 | 2 | 45-Day | 1 |
| 1/31/05 | nd | nd | 15.8 | Fast | 45.7 - 61 | 2 | 45-Day | 1 |
| 1/31/05 | nd | nd | 15.4 | Fast | 61 -91.4 | 2 | 45-Day | 1 |
| 1/31/05 | nd | nd | 11.6 | Fast | 91.4 - 121.9 | 2 | 45-Day | 1 |
| 1/31/05 | nd | nd | 11.6 | Fast | 121.9 - 152.4 | 2 | 45-Day | 1 |
| 1/31/05 | 0.826 | 1.647 | 20.7 | Fast | 0 - 7.6 | 2 | 45-Day | 2 |
| 1/31/05 | 0.118 | 0.122 | 19.1 | Fast | 7.6 - 15.2 | 2 | 45-Day | 2 |
| 1/31/05 | 0.017 | nd | 18.2 | Fast | 15.2 - 30.5 | 2 | 45-Day | 2 |
| 1/31/05 | nd | nd | 18.8 | Fast | 30.5 - 45.7 | 2 | 45-Day | 2 |
| 1/31/05 | nd | nd | 14 | Fast | 45.7 - 61 | 2 | 45-Day | 2 |
| 1/31/05 | nd | nd | 15.6 | Fast | 61 -91.4 | 2 | 45-Day | 2 |
| 1/31/05 | 0.579 | 0.372 | 20.3 | Fast | 0 - 7.6 | 2 | 45-Day | 3 |
| 1/31/05 | 0.233 | 0.194 | 18.9 | Fast | 7.6 - 15.2 | 2 | 45-Day | 3 |
| 1/31/05 | 0.083 | 0.022 | 15.8 | Fast | 15.2 - 30.5 | 2 | 45-Day | 3 |
| 1/31/05 | 0.036 | nd | 17.8 | Fast | 30.5 - 45.7 | 2 | 45-Day | 3 |
| 1/31/05 | nd | nd | 17.1 | Fast | 45.7 - 61 | 2 | 45-Day | 3 |
| 1/31/05 | nd | nd | 14.4 | Fast | 61 -91.4 | 2 | 45-Day | 3 |
| 1/31/05 | nd | nd | 12.7 | Fast | 91.4 - 121.9 | 2 | 45-Day | 3 |
| 1/31/05 | 0.638 | 1.575 | 19.4 | Fast | 0 - 7.6 | 2 | 45-Day | 4 |
| 1/31/05 | 0.034 | 0.016 | 21.2 | Fast | 7.6 - 15.2 | 2 | 45-Day | 4 |
| 1/31/05 | 0.046 | 0.624 | 17.1 | Fast | 15.2 - 30.5 | 2 | 45-Day | 4 |
| 1/31/05 | nd | nd | 12.4 | Fast | 30.5 - 45.7 | 2 | 45-Day | 4 |
| 1/31/05 | nd | nd | 20.7 | Fast | 45.7 - 61 | 2 | 45-Day | 4 |
| 1/31/05 | nd | nd | 19.9 | Fast | 61 -91.4 | 2 | 45-Day | 4 |
| 1/31/05 | 0.881 | 0.714 | 12.3 | Slow | 0 - 7.6 | 2 | 45-Day | 1 |
| 1/31/05 | 0.042 | nd | 18.1 | Slow | 7.6 - 15.2 | 2 | 45-Day | 1 |
| 1/31/05 | nd | nd | 17.4 | Slow | 15.2 - 30.5 | 2 | 45-Day | 1 |
| 1/31/05 | 0.028 | 0.047 | 17.5 | Slow | 30.5 - 45.7 | 2 | 45-Day | 1 |
| 1/31/05 | 0.081 | nd | 18.6 | Slow | 45.7 - 61 | 2 | 45-Day | 1 |
| 1/31/05 | nd | nd | 22.4 | Slow | 61 -91.4 | 2 | 45-Day | 1 |
| 1/31/05 | nd | nd | 9.6 | Slow | 91.4 - 121.9 | 2 | 45-Day | 1 |
| 1/31/05 | nd | nd | 12.9 | Slow | 121.9 - 152.4 | 2 | 45-Day | 1 |
| 1/31/05 | 0.274 | 0.254 | 24 | Slow | 0 - 7.6 | 2 | 45-Day | 2 |

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| Date Collected | Simazine (ppm) | Diuron (ppm) | % Moisture | Treatment | Depth (cm) | Site | Days After Application | Replicate |
|----------------|----------------|--------------|------------|-----------|---------------|------|------------------------|-----------|
| 1/31/05 | 0.024 | 0.017 | 16.9 | Slow | 7.6 – 15.2 | 2 | 45-Day | 2 |
| 1/31/05 | nd | nd | 16.2 | Slow | 15.2 – 30.5 | 2 | 45-Day | 2 |
| 1/31/05 | nd | nd | 19.6 | Slow | 30.5 – 45.7 | 2 | 45-Day | 2 |
| 1/31/05 | nd | nd | 21.4 | Slow | 45.7 - 61 | 2 | 45-Day | 2 |
| 1/31/05 | nd | nd | 11.4 | Slow | 61 –91.4 | 2 | 45-Day | 2 |
| 1/31/05 | nd | nd | 12.9 | Slow | 91.4 - 121.9 | 2 | 45-Day | 2 |
| 1/31/05 | nd | nd | 9.1 | Slow | 121.9 – 152.4 | 2 | 45-Day | 2 |
| 1/31/05 | 0.131 | 0.099 | 14.7 | Slow | 0 – 7.6 | 2 | 45-Day | 3 |
| 1/31/05 | 0.017 | 0.044 | 13.6 | Slow | 7.6 – 15.2 | 2 | 45-Day | 3 |
| 1/31/05 | nd | nd | 13.8 | Slow | 15.2 – 30.5 | 2 | 45-Day | 3 |
| 1/31/05 | nd | nd | 20.5 | Slow | 30.5 – 45.7 | 2 | 45-Day | 3 |
| 1/31/05 | nd | nd | 16.6 | Slow | 45.7 - 61 | 2 | 45-Day | 3 |
| 1/31/05 | nd | nd | 17.3 | Slow | 61 –91.4 | 2 | 45-Day | 3 |
| 1/31/05 | nd | nd | 18.3 | Slow | 91.4 - 121.9 | 2 | 45-Day | 3 |
| 1/31/05 | nd | nd | 16.7 | Slow | 121.9 – 152.4 | 2 | 45-Day | 3 |
| 1/31/05 | 0.317 | 0.321 | 23.5 | Slow | 0 – 7.6 | 2 | 45-Day | 4 |
| 1/31/05 | 0.029 | 0.03 | 17 | Slow | 7.6 – 15.2 | 2 | 45-Day | 4 |
| 1/31/05 | nd | nd | 18 | Slow | 15.2 – 30.5 | 2 | 45-Day | 4 |
| 1/31/05 | nd | nd | 18.5 | Slow | 30.5 – 45.7 | 2 | 45-Day | 4 |
| 1/31/05 | nd | nd | 19.7 | Slow | 45.7 - 61 | 2 | 45-Day | 4 |
| 1/31/05 | nd | nd | 18.5 | Slow | 61 –91.4 | 2 | 45-Day | 4 |
| 1/31/05 | nd | nd | 17.7 | Slow | 91.4 - 121.9 | 2 | 45-Day | 4 |
| 1/31/05 | nd | nd | 16.8 | Slow | 121.9 – 152.4 | 2 | 45-Day | 4 |
| 2/14/05 | 0.116 | 0.027 | 19.1 | Standard | 0 – 7.6 | 1 | 90-Day | 1 |
| 2/14/05 | 0.061 | nd | 14 | Standard | 7.6 – 15.2 | 1 | 90-Day | 1 |
| 2/14/05 | nd | nd | 11.3 | Standard | 15.2 – 30.5 | 1 | 90-Day | 1 |
| 2/14/05 | nd | nd | 12.6 | Standard | 30.5 – 45.7 | 1 | 90-Day | 1 |
| 2/14/05 | nd | nd | 13.1 | Standard | 45.7 - 61 | 1 | 90-Day | 1 |
| 2/14/05 | 0.065 | 0.076 | 19.2 | Standard | 0 – 7.6 | 1 | 90-Day | 2 |
| 2/14/05 | nd | nd | 12.7 | Standard | 7.6 – 15.2 | 1 | 90-Day | 2 |
| 2/14/05 | nd | nd | 11.1 | Standard | 15.2 – 30.5 | 1 | 90-Day | 2 |
| 2/14/05 | nd | nd | 11.6 | Standard | 30.5 – 45.7 | 1 | 90-Day | 2 |
| 2/14/05 | nd | nd | 11.7 | Standard | 45.7 - 61 | 1 | 90-Day | 2 |
| 2/14/05 | 0.072 | 0.056 | 16.1 | Standard | 0 – 7.6 | 1 | 90-Day | 3 |
| 2/14/05 | 0.015 | nd | 11.6 | Standard | 7.6 – 15.2 | 1 | 90-Day | 3 |
| 2/14/05 | nd | nd | 10.4 | Standard | 15.2 – 30.5 | 1 | 90-Day | 3 |
| 2/14/05 | nd | nd | 11.1 | Standard | 30.5 – 45.7 | 1 | 90-Day | 3 |
| 2/14/05 | nd | nd | 11.5 | Standard | 45.7 - 61 | 1 | 90-Day | 3 |
| 2/14/05 | nd | nd | 12.1 | Standard | 61 –91.4 | 1 | 90-Day | 3 |
| 2/14/05 | 0.072 | 0.13 | 17.7 | Standard | 0 – 7.6 | 1 | 90-Day | 4 |
| 2/14/05 | 0.032 | 0.015 | 11.8 | Standard | 7.6 – 15.2 | 1 | 90-Day | 4 |
| 2/14/05 | nd | nd | 12 | Standard | 15.2 – 30.5 | 1 | 90-Day | 4 |
| 2/14/05 | nd | nd | 11.2 | Standard | 30.5 – 45.7 | 1 | 90-Day | 4 |
| 2/14/05 | nd | nd | 10.8 | Standard | 45.7 - 61 | 1 | 90-Day | 4 |

| Date Collected | Simazine (ppm) | Diuron (ppm) | % Moisture | Treatment | Depth (cm) | Site | Days After Application | Replicate |
|----------------|----------------|--------------|------------|-----------|-------------|------|------------------------|-----------|
| 2/14/05 | 0.175 | 0.434 | 18.2 | Fast | 0 – 7.6 | 1 | 90-Day | 1 |
| 2/14/05 | 0.026 | 0.052 | 11.6 | Fast | 7.6 – 15.2 | 1 | 90-Day | 1 |
| 2/14/05 | nd | nd | 12.3 | Fast | 15.2 – 30.5 | 1 | 90-Day | 1 |
| 2/14/05 | nd | nd | 11.8 | Fast | 30.5 – 45.7 | 1 | 90-Day | 1 |
| 2/14/05 | nd | nd | 12.5 | Fast | 45.7 - 61 | 1 | 90-Day | 1 |
| 2/14/05 | 0.037 | 0.257 | 13.9 | Fast | 0 – 7.6 | 1 | 90-Day | 2 |
| 2/14/05 | 0.049 | 0.02 | 11.1 | Fast | 7.6 – 15.2 | 1 | 90-Day | 2 |
| 2/14/05 | nd | nd | 12.2 | Fast | 15.2 – 30.5 | 1 | 90-Day | 2 |
| 2/14/05 | nd | nd | 12.8 | Fast | 30.5 – 45.7 | 1 | 90-Day | 2 |
| 2/14/05 | nd | nd | 12.6 | Fast | 45.7 - 61 | 1 | 90-Day | 2 |
| 2/14/05 | 0.063 | 0.162 | 12 | Fast | 0 – 7.6 | 1 | 90-Day | 3 |
| 2/14/05 | 0.040 | 0.016 | 11.3 | Fast | 7.6 – 15.2 | 1 | 90-Day | 3 |
| 2/14/05 | 0.032 | nd | 13 | Fast | 15.2 – 30.5 | 1 | 90-Day | 3 |
| 2/14/05 | nd | nd | 12 | Fast | 30.5 – 45.7 | 1 | 90-Day | 3 |
| 2/14/05 | nd | nd | 11.6 | Fast | 45.7 - 61 | 1 | 90-Day | 3 |
| 2/14/05 | nd | nd | 12.7 | Fast | 61 –76.2 | 1 | 90-Day | 3 |
| 2/14/05 | 0.042 | 0.362 | 22 | Fast | 0 – 7.6 | 1 | 90-Day | 4 |
| 2/14/05 | nd | nd | 13.2 | Fast | 7.6 – 15.2 | 1 | 90-Day | 4 |
| 2/14/05 | nd | nd | 12.7 | Fast | 15.2 – 30.5 | 1 | 90-Day | 4 |
| 2/14/05 | nd | nd | 12.3 | Fast | 30.5 – 45.7 | 1 | 90-Day | 4 |
| 2/14/05 | nd | nd | 13.1 | Fast | 45.7 - 61 | 1 | 90-Day | 4 |
| 2/14/05 | nd | nd | 12.5 | Fast | 61 –76.2 | 1 | 90-Day | 4 |
| 2/14/05 | 0.044 | 0.347 | 25.3 | Slow | 0 – 7.6 | 1 | 90-Day | 1 |
| 2/14/05 | 0.017 | nd | 12.9 | Slow | 7.6 – 15.2 | 1 | 90-Day | 1 |
| 2/14/05 | 0.018 | nd | 11.8 | Slow | 15.2 – 30.5 | 1 | 90-Day | 1 |
| 2/14/05 | nd | nd | 11.6 | Slow | 30.5 – 45.7 | 1 | 90-Day | 1 |
| 2/14/05 | nd | nd | 11 | Slow | 45.7 - 61 | 1 | 90-Day | 1 |
| 2/14/05 | nd | nd | 13.3 | Slow | 61 –76.2 | 1 | 90-Day | 1 |
| 2/14/05 | 0.121 | 0.181 | 15.5 | Slow | 0 – 7.6 | 1 | 90-Day | 2 |
| 2/14/05 | 0.035 | nd | 10.8 | Slow | 7.6 – 15.2 | 1 | 90-Day | 2 |
| 2/14/05 | 0.051 | 0.033 | 11.4 | Slow | 15.2 – 30.5 | 1 | 90-Day | 2 |
| 2/14/05 | 0.031 | nd | 11.6 | Slow | 30.5 – 45.7 | 1 | 90-Day | 2 |
| 2/14/05 | nd | nd | 10.9 | Slow | 45.7 - 61 | 1 | 90-Day | 2 |
| 2/14/05 | nd | nd | 12 | Slow | 61 –91.4 | 1 | 90-Day | 2 |
| 2/14/05 | 0.179 | 0.286 | 16.4 | Slow | 0 – 7.6 | 1 | 90-Day | 3 |
| 2/14/05 | 0.194 | 0.106 | 10.4 | Slow | 7.6 – 15.2 | 1 | 90-Day | 3 |
| 2/14/05 | 0.119 | 0.016 | 10 | Slow | 15.2 – 30.5 | 1 | 90-Day | 3 |
| 2/14/05 | 0.075 | nd | 10.8 | Slow | 30.5 – 45.7 | 1 | 90-Day | 3 |
| 2/14/05 | nd | nd | 11.3 | Slow | 45.7 - 61 | 1 | 90-Day | 3 |
| 2/14/05 | 0.242 | 0.35 | 20.5 | Slow | 0 – 7.6 | 1 | 90-Day | 4 |
| 2/14/05 | nd | 0.02 | 12.5 | Slow | 7.6 – 15.2 | 1 | 90-Day | 4 |
| 2/14/05 | nd | nd | 11.5 | Slow | 15.2 – 30.5 | 1 | 90-Day | 4 |
| 2/14/05 | nd | nd | 11.3 | Slow | 30.5 – 45.7 | 1 | 90-Day | 4 |
| 2/14/05 | nd | nd | 12.6 | Slow | 45.7 - 61 | 1 | 90-Day | 4 |

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| Date Collected | Simazine (ppm) | Diuron (ppm) | % Moisture | Treatment | Depth (cm) | Site | Days After Application | Replicate |
|----------------|----------------|--------------|------------|-----------|--------------|------|------------------------|-----------|
| 3/2/05 | 0.242 | 0.588 | 19.4 | Fast | 0 – 7.6 | 2 | 90-Day | 1 |
| 3/2/05 | 0.041 | 0.119 | 17.5 | Fast | 7.6 – 15.2 | 2 | 90-Day | 1 |
| 3/2/05 | nd | nd | 15.2 | Fast | 15.2 – 30.5 | 2 | 90-Day | 1 |
| 3/2/05 | nd | nd | 18.1 | Fast | 30.5 – 45.7 | 2 | 90-Day | 1 |
| 3/2/05 | nd | nd | 17.9 | Fast | 45.7 - 61 | 2 | 90-Day | 1 |
| 3/2/05 | nd | nd | 15.3 | Fast | 61 –91.4 | 2 | 90-Day | 1 |
| 3/2/05 | nd | nd | 19.9 | Fast | 91.4 - 121.9 | 2 | 90-Day | 1 |
| 3/2/05 | 0.123 | 0.296 | 19.2 | Fast | 0 – 7.6 | 2 | 90-Day | 2 |
| 3/2/05 | 0.031 | 0.027 | 16.9 | Fast | 7.6 – 15.2 | 2 | 90-Day | 2 |
| 3/2/05 | nd | nd | 17.7 | Fast | 15.2 – 30.5 | 2 | 90-Day | 2 |
| 3/2/05 | nd | nd | 17.3 | Fast | 30.5 – 45.7 | 2 | 90-Day | 2 |
| 3/2/05 | nd | nd | 17.6 | Fast | 45.7 - 61 | 2 | 90-Day | 2 |
| 3/2/05 | nd | nd | 16.9 | Fast | 61 –91.4 | 2 | 90-Day | 2 |
| 3/2/05 | nd | nd | 17 | Fast | 91.4 - 121.9 | 2 | 90-Day | 2 |
| 3/2/05 | 0.629 | 0.763 | 19.4 | Fast | 0 – 7.6 | 2 | 90-Day | 3 |
| 3/2/05 | 0.024 | 0.039 | 16.3 | Fast | 7.6 – 15.2 | 2 | 90-Day | 3 |
| 3/2/05 | nd | nd | 16.8 | Fast | 15.2 – 30.5 | 2 | 90-Day | 3 |
| 3/2/05 | nd | nd | 15.1 | Fast | 30.5 – 45.7 | 2 | 90-Day | 3 |
| 3/2/05 | nd | nd | 14.4 | Fast | 45.7 - 61 | 2 | 90-Day | 3 |
| 3/2/05 | nd | nd | 11.9 | Fast | 61 –91.4 | 2 | 90-Day | 3 |
| 3/2/05 | nd | nd | 10.8 | Fast | 91.4 - 121.9 | 2 | 90-Day | 3 |
| 3/2/05 | 0.126 | 0.517 | 15.7 | Fast | 0 – 7.6 | 2 | 90-Day | 4 |
| 3/2/05 | 0.019 | 0.117 | 16.8 | Fast | 7.6 – 15.2 | 2 | 90-Day | 4 |
| 3/2/05 | nd | nd | 18 | Fast | 15.2 – 30.5 | 2 | 90-Day | 4 |
| 3/2/05 | nd | nd | 18.2 | Fast | 30.5 – 45.7 | 2 | 90-Day | 4 |
| 3/2/05 | nd | nd | 17.5 | Fast | 45.7 - 61 | 2 | 90-Day | 4 |
| 3/2/05 | nd | nd | 16.2 | Fast | 61 –91.4 | 2 | 90-Day | 4 |
| 3/2/05 | nd | nd | 21.2 | Fast | 91.4 - 121.9 | 2 | 90-Day | 4 |
| 3/2/05 | 0.352 | 0.447 | 17.1 | Slow | 0 – 7.6 | 2 | 90-Day | 1 |
| 3/2/05 | nd | nd | 16.1 | Slow | 7.6 – 15.2 | 2 | 90-Day | 1 |
| 3/2/05 | nd | nd | 17.2 | Slow | 15.2 – 30.5 | 2 | 90-Day | 1 |
| 3/2/05 | nd | nd | 20 | Slow | 30.5 – 45.7 | 2 | 90-Day | 1 |
| 3/2/05 | nd | nd | 18.4 | Slow | 45.7 - 61 | 2 | 90-Day | 1 |
| 3/2/05 | nd | nd | 21.4 | Slow | 61 –91.4 | 2 | 90-Day | 1 |
| 3/2/05 | nd | nd | 18.7 | Slow | 91.4 - 121.9 | 2 | 90-Day | 1 |
| 3/2/05 | 0.496 | 0.349 | 14.7 | Slow | 0 – 7.6 | 2 | 90-Day | 2 |
| 3/2/05 | nd | 0.015 | 13.3 | Slow | 7.6 – 15.2 | 2 | 90-Day | 2 |
| 3/2/05 | nd | nd | 14.7 | Slow | 15.2 – 30.5 | 2 | 90-Day | 2 |
| 3/2/05 | nd | nd | 16.4 | Slow | 30.5 – 45.7 | 2 | 90-Day | 2 |
| 3/2/05 | nd | nd | 17.6 | Slow | 45.7 - 61 | 2 | 90-Day | 2 |
| 3/2/05 | nd | nd | 19.7 | Slow | 61 –91.4 | 2 | 90-Day | 2 |
| 3/2/05 | nd | nd | 20.2 | Slow | 91.4 - 121.9 | 2 | 90-Day | 2 |
| 3/2/05 | 0.492 | 0.801 | 18 | Slow | 0 – 7.6 | 2 | 90-Day | 3 |
| 3/2/05 | 0.026 | 0.044 | 16.6 | Slow | 7.6 – 15.2 | 2 | 90-Day | 3 |

| Date Collected | Simazine (ppm) | Diuron (ppm) | % Moisture | Treatment | Depth (cm) | Site | Days After Application | Replicate |
|----------------|----------------|--------------|------------|-----------|--------------|------|------------------------|-----------|
| 3/2/05 | nd | nd | 16.4 | Slow | 15.2 – 30.5 | 2 | 90-Day | 3 |
| 3/2/05 | nd | nd | 17.3 | Slow | 30.5 – 45.7 | 2 | 90-Day | 3 |
| 3/2/05 | nd | nd | 18.7 | Slow | 45.7 - 61 | 2 | 90-Day | 3 |
| 3/2/05 | nd | nd | 13.7 | Slow | 61 –91.4 | 2 | 90-Day | 3 |
| 3/2/05 | nd | nd | 13.8 | Slow | 91.4 - 121.9 | 2 | 90-Day | 3 |
| 3/2/05 | 0.092 | 0.125 | 18.8 | Slow | 0 – 7.6 | 2 | 90-Day | 4 |
| 3/2/05 | nd | nd | 16.9 | Slow | 7.6 – 15.2 | 2 | 90-Day | 4 |
| 3/2/05 | nd | nd | 15.1 | Slow | 15.2 – 30.5 | 2 | 90-Day | 4 |
| 3/2/05 | nd | nd | 15.3 | Slow | 30.5 – 45.7 | 2 | 90-Day | 4 |
| 3/2/05 | nd | nd | 14.8 | Slow | 45.7 - 61 | 2 | 90-Day | 4 |
| 3/2/05 | nd | nd | 18 | Slow | 61 –91.4 | 2 | 90-Day | 4 |
| 3/14/05 | 0.032 | 0.086 | 16.7 | Standard | 0 – 7.6 | 1 | 120-Day | 1 |
| 3/14/05 | nd | nd | N/A | Standard | 7.6 – 15.2 | 1 | 120-Day | 1 |
| 3/14/05 | nd | nd | N/A | Standard | 15.2 – 30.5 | 1 | 120-Day | 1 |
| 3/14/05 | nd | nd | N/A | Standard | 30.5 – 45.7 | 1 | 120-Day | 1 |
| 3/14/05 | 0.077 | 0.089 | 16.1 | Standard | 0 – 7.6 | 1 | 120-Day | 2 |
| 3/14/05 | 0.028 | nd | 11.7 | Standard | 7.6 – 15.2 | 1 | 120-Day | 2 |
| 3/14/05 | 0.027 | nd | 11.9 | Standard | 15.2 – 30.5 | 1 | 120-Day | 2 |
| 3/14/05 | nd | nd | N/A | Standard | 30.5 – 45.7 | 1 | 120-Day | 2 |
| 3/14/05 | nd | nd | N/A | Standard | 45.7 - 61 | 1 | 120-Day | 2 |
| 3/14/05 | 0.032 | 0.066 | 24.2 | Standard | 0 – 7.6 | 1 | 120-Day | 3 |
| 3/14/05 | 0.015 | nd | 13.5 | Standard | 7.6 – 15.2 | 1 | 120-Day | 3 |
| 3/14/05 | nd | nd | N/A | Standard | 15.2 – 30.5 | 1 | 120-Day | 3 |
| 3/14/05 | nd | nd | N/A | Standard | 30.5 – 45.7 | 1 | 120-Day | 3 |
| 3/14/05 | nd | nd | N/A | Standard | 45.7 - 61 | 1 | 120-Day | 3 |
| 3/14/05 | nd | 0.068 | 22.7 | Standard | 0 – 7.6 | 1 | 120-Day | 4 |
| 3/14/05 | nd | nd | N/A | Standard | 7.6 – 15.2 | 1 | 120-Day | 4 |
| 3/14/05 | nd | nd | N/A | Standard | 15.2 – 30.5 | 1 | 120-Day | 4 |
| 3/14/05 | nd | nd | N/A | Standard | 30.5 – 45.7 | 1 | 120-Day | 4 |
| 3/14/05 | nd | nd | N/A | Standard | 45.7 - 61 | 1 | 120-Day | 4 |
| 3/14/05 | 0.018 | 0.504 | 26.5 | Fast | 0 – 7.6 | 1 | 120-Day | 1 |
| 3/14/05 | 0.016 | 0.017 | 13.3 | Fast | 7.6 – 15.2 | 1 | 120-Day | 1 |
| 3/14/05 | nd | 0.017 | 13.5 | Fast | 15.2 – 30.5 | 1 | 120-Day | 1 |
| 3/14/05 | nd | nd | N/A | Fast | 30.5 – 45.7 | 1 | 120-Day | 1 |
| 3/14/05 | nd | nd | N/A | Fast | 45.7 - 61 | 1 | 120-Day | 1 |
| 3/14/05 | nd | 0.068 | 13.5 | Fast | 0 – 7.6 | 1 | 120-Day | 2 |
| 3/14/05 | nd | 0.023 | 10.8 | Fast | 7.6 – 15.2 | 1 | 120-Day | 2 |
| 3/14/05 | nd | nd | N/A | Fast | 15.2 – 30.5 | 1 | 120-Day | 2 |
| 3/14/05 | nd | nd | N/A | Fast | 30.5 – 45.7 | 1 | 120-Day | 2 |
| 3/14/05 | nd | nd | N/A | Fast | 45.7 - 61 | 1 | 120-Day | 2 |
| 3/14/05 | 0.107 | 0.324 | 17.7 | Fast | 0 – 7.6 | 1 | 120-Day | 3 |
| 3/14/05 | nd | 0.032 | 10.1 | Fast | 7.6 – 15.2 | 1 | 120-Day | 3 |
| 3/14/05 | nd | nd | N/A | Fast | 15.2 – 30.5 | 1 | 120-Day | 3 |
| 3/14/05 | nd | nd | N/A | Fast | 30.5 – 45.7 | 1 | 120-Day | 3 |

| Date Collected | Simazine (ppm) | Diuron (ppm) | % Moisture | Treatment | Depth (cm) | Site | Days After Application | Replicate |
|----------------|----------------|--------------|------------|-----------|---------------|------|------------------------|-----------|
| 3/14/05 | nd | nd | N/A | Fast | 45.7 - 61 | 1 | 120-Day | 3 |
| 3/14/05 | nd | 0.082 | 12.7 | Fast | 0 - 7.6 | 1 | 120-Day | 4 |
| 3/14/05 | nd | 0.032 | 11.3 | Fast | 7.6 - 15.2 | 1 | 120-Day | 4 |
| 3/14/05 | nd | nd | N/A | Fast | 15.2 - 30.5 | 1 | 120-Day | 4 |
| 3/14/05 | nd | nd | N/A | Fast | 30.5 - 45.7 | 1 | 120-Day | 4 |
| 3/14/05 | nd | nd | N/A | Fast | 45.7 - 61 | 1 | 120-Day | 4 |
| 3/14/05 | nd | 0.124 | 22 | Slow | 0 - 7.6 | 1 | 120-Day | 1 |
| 3/14/05 | nd | 0.032 | 13.1 | Slow | 7.6 - 15.2 | 1 | 120-Day | 1 |
| 3/14/05 | nd | 0.022 | 12.3 | Slow | 15.2 - 30.5 | 1 | 120-Day | 1 |
| 3/14/05 | nd | nd | N/A | Slow | 30.5 - 45.7 | 1 | 120-Day | 1 |
| 3/14/05 | nd | nd | N/A | Slow | 45.7 - 61 | 1 | 120-Day | 1 |
| 3/14/05 | 0.026 | 0.48 | 22.4 | Slow | 0 - 7.6 | 1 | 120-Day | 2 |
| 3/14/05 | nd | nd | N/A | Slow | 7.6 - 15.2 | 1 | 120-Day | 2 |
| 3/14/05 | nd | nd | N/A | Slow | 15.2 - 30.5 | 1 | 120-Day | 2 |
| 3/14/05 | nd | 0.018 | 11.8 | Slow | 30.5 - 45.7 | 1 | 120-Day | 2 |
| 3/14/05 | nd | nd | N/A | Slow | 45.7 - 61 | 1 | 120-Day | 2 |
| 3/14/05 | 0.199 | 0.31 | 26 | Slow | 0 - 7.6 | 1 | 120-Day | 3 |
| 3/14/05 | 0.057 | 0.051 | 13.5 | Slow | 7.6 - 15.2 | 1 | 120-Day | 3 |
| 3/14/05 | 0.019 | 0.019 | 11.4 | Slow | 15.2 - 30.5 | 1 | 120-Day | 3 |
| 3/14/05 | 0.08 | nd | 11.5 | Slow | 30.5 - 45.7 | 1 | 120-Day | 3 |
| 3/14/05 | nd | nd | N/A | Slow | 45.7 - 61 | 1 | 120-Day | 3 |
| 3/14/05 | nd | nd | N/A | Slow | 61 - 91.4 | 1 | 120-Day | 3 |
| 3/14/05 | nd | 0.074 | 16.1 | Slow | 0 - 7.6 | 1 | 120-Day | 4 |
| 3/14/05 | nd | nd | N/A | Slow | 7.6 - 15.2 | 1 | 120-Day | 4 |
| 3/14/05 | nd | nd | N/A | Slow | 15.2 - 30.5 | 1 | 120-Day | 4 |
| 3/14/05 | nd | nd | N/A | Slow | 30.5 - 45.7 | 1 | 120-Day | 4 |
| 3/14/05 | nd | nd | N/A | Slow | 45.7 - 61 | 1 | 120-Day | 4 |
| 4/6/2005 | 0.19 | 0.303 | 18.8 | Fast | 0 - 7.6 | 2 | 120-Day | 1 |
| 4/6/2005 | 0.017 | 0.041 | 15.9 | Fast | 7.6 - 15.2 | 2 | 120-Day | 1 |
| 4/6/2005 | 0.02 | 0.016 | 15.4 | Fast | 15.2 - 30.5 | 2 | 120-Day | 1 |
| 4/6/2005 | nd | nd | N/A | Fast | 30.5 - 45.7 | 2 | 120-Day | 1 |
| 4/6/2005 | nd | nd | N/A | Fast | 45.7 - 61 | 2 | 120-Day | 1 |
| 4/6/2005 | nd | nd | N/A | Fast | 61 - 91.4 | 2 | 120-Day | 1 |
| 4/6/2005 | nd | nd | N/A | Fast | 91.4 - 121.9 | 2 | 120-Day | 1 |
| 4/6/2005 | 0.501 | 0.391 | 19.6 | Fast | 0 - 7.6 | 2 | 120-Day | 2 |
| 4/6/2005 | 0.045 | 0.067 | 17.2 | Fast | 7.6 - 15.2 | 2 | 120-Day | 2 |
| 4/6/2005 | 0.016 | 0.029 | 16.8 | Fast | 15.2 - 30.5 | 2 | 120-Day | 2 |
| 4/6/2005 | nd | nd | N/A | Fast | 30.5 - 45.7 | 2 | 120-Day | 2 |
| 4/6/2005 | nd | nd | N/A | Fast | 45.7 - 61 | 2 | 120-Day | 2 |
| 4/6/2005 | nd | nd | N/A | Fast | 61 - 91.4 | 2 | 120-Day | 2 |
| 4/6/2005 | nd | nd | N/A | Fast | 91.4 - 121.9 | 2 | 120-Day | 2 |
| 4/6/2005 | nd | nd | N/A | Fast | 121.9 - 152.4 | 2 | 120-Day | 2 |
| 4/6/2005 | 0.394 | 0.222 | 18.3 | Fast | 0 - 7.6 | 2 | 120-Day | 3 |
| 4/6/2005 | nd | nd | N/A | Fast | 7.6 - 15.2 | 2 | 120-Day | 3 |

| Date Collected | Simazine (ppm) | Diuron (ppm) | % Moisture | Treatment | Depth (cm) | Site | Days After Application | Replicate |
|----------------|----------------|--------------|------------|-----------|---------------|------|------------------------|-----------|
| 4/6/2005 | nd | nd | N/A | Fast | 15.2 – 30.5 | 2 | 120-Day | 3 |
| 4/6/2005 | nd | nd | N/A | Fast | 30.5 – 45.7 | 2 | 120-Day | 3 |
| 4/6/2005 | nd | nd | N/A | Fast | 45.7 - 61 | 2 | 120-Day | 3 |
| 4/6/2005 | nd | nd | N/A | Fast | 61 –91.4 | 2 | 120-Day | 3 |
| 4/6/2005 | nd | nd | N/A | Fast | 91.4 - 121.9 | 2 | 120-Day | 3 |
| 4/6/2005 | 0.341 | 0.479 | 18 | Fast | 0 – 7.6 | 2 | 120-Day | 4 |
| 4/6/2005 | nd | nd | N/A | Fast | 7.6 – 15.2 | 2 | 120-Day | 4 |
| 4/6/2005 | nd | nd | N/A | Fast | 15.2 – 30.5 | 2 | 120-Day | 4 |
| 4/6/2005 | nd | nd | N/A | Fast | 30.5 – 45.7 | 2 | 120-Day | 4 |
| 4/6/2005 | nd | nd | N/A | Fast | 45.7 - 61 | 2 | 120-Day | 4 |
| 4/6/2005 | nd | nd | N/A | Fast | 61 –91.4 | 2 | 120-Day | 4 |
| 4/6/2005 | nd | nd | N/A | Fast | 91.4 - 121.9 | 2 | 120-Day | 4 |
| 4/6/2005 | nd | nd | N/A | Fast | 121.9 – 152.4 | 2 | 120-Day | 4 |
| 4/6/2005 | 0.074 | 0.184 | 18.4 | Slow | 0 – 7.6 | 2 | 120-Day | 1 |
| 4/6/2005 | nd | nd | N/A | Slow | 7.6 – 15.2 | 2 | 120-Day | 1 |
| 4/6/2005 | nd | nd | N/A | Slow | 15.2 – 30.5 | 2 | 120-Day | 1 |
| 4/6/2005 | nd | nd | N/A | Slow | 30.5 – 45.7 | 2 | 120-Day | 1 |
| 4/6/2005 | nd | nd | N/A | Slow | 45.7 - 61 | 2 | 120-Day | 1 |
| 4/6/2005 | nd | nd | N/A | Slow | 61 –91.4 | 2 | 120-Day | 1 |
| 4/6/2005 | nd | nd | N/A | Slow | 91.4 - 121.9 | 2 | 120-Day | 1 |
| 4/6/2005 | nd | nd | N/A | Slow | 121.9 – 152.4 | 2 | 120-Day | 1 |
| 4/6/2005 | 0.426 | 0.428 | 15.1 | Slow | 0 – 7.6 | 2 | 120-Day | 2 |
| 4/6/2005 | nd | 0.029 | 14.8 | Slow | 7.6 – 15.2 | 2 | 120-Day | 2 |
| 4/6/2005 | nd | nd | N/A | Slow | 15.2 – 30.5 | 2 | 120-Day | 2 |
| 4/6/2005 | nd | nd | N/A | Slow | 30.5 – 45.7 | 2 | 120-Day | 2 |
| 4/6/2005 | nd | nd | N/A | Slow | 45.7 - 61 | 2 | 120-Day | 2 |
| 4/6/2005 | nd | nd | N/A | Slow | 61 –91.4 | 2 | 120-Day | 2 |
| 4/6/2005 | nd | nd | N/A | Slow | 91.4 - 121.9 | 2 | 120-Day | 2 |
| 4/6/2005 | nd | nd | N/A | Slow | 121.9 – 152.4 | 2 | 120-Day | 2 |
| 4/6/2005 | 0.213 | 0.227 | 18.3 | Slow | 0 – 7.6 | 2 | 120-Day | 3 |
| 4/6/2005 | nd | nd | N/A | Slow | 7.6 – 15.2 | 2 | 120-Day | 3 |
| 4/6/2005 | nd | nd | N/A | Slow | 15.2 – 30.5 | 2 | 120-Day | 3 |
| 4/6/2005 | nd | nd | N/A | Slow | 30.5 – 45.7 | 2 | 120-Day | 3 |
| 4/6/2005 | nd | nd | N/A | Slow | 45.7 - 61 | 2 | 120-Day | 3 |
| 4/6/2005 | 0.451 | 0.691 | 18.6 | Slow | 0 – 7.6 | 2 | 120-Day | 4 |
| 4/6/2005 | 0.015 | 0.029 | 19.5 | Slow | 7.6 – 15.2 | 2 | 120-Day | 4 |
| 4/6/2005 | nd | 0.031 | 20.7 | Slow | 15.2 – 30.5 | 2 | 120-Day | 4 |
| 4/6/2005 | nd | 0.024 | 21.6 | Slow | 30.5 – 45.7 | 2 | 120-Day | 4 |
| 4/6/2005 | nd | nd | N/A | Slow | 45.7 - 61 | 2 | 120-Day | 4 |
| 4/6/2005 | nd | nd | N/A | Slow | 61 –91.4 | 2 | 120-Day | 4 |
| 4/6/2005 | nd | nd | N/A | Slow | 91.4 - 121.9 | 2 | 120-Day | 4 |
| 4/6/2005 | nd | nd | N/A | Slow | 121.9 – 152.4 | 2 | 120-Day | 4 |

nd = not detected
 N/A = not available