

**2003 PROGRESSIVE TURF/SIMPLOT PROJECT**

**DANIELS FERTILIZER EFFICACY STUDY**

**FINAL REPORT**

**May 8, 2003**

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**OBJECTIVE:** To determine the efficacy of several liquid fertilizers by alternating products weekly on greens height bermudagrass.

**TREATMENTS:**

Treatment 1:

|        |        |                             |
|--------|--------|-----------------------------|
| Week 1 | 5-0-7  | 0.1 lbN/1000ft <sup>2</sup> |
| Week 2 | 10-3-5 | 0.2                         |
| Week 3 | 5-0-7  | 0.1                         |
| Week 4 | 10-3-5 | 0.2                         |
| Week 5 | 5-0-7  | 0.05                        |
| Week 6 | 10-3-5 | 0.1                         |
| Week 7 | 5-0-7  | 0.05                        |
| Week 8 | 10-3-5 | 0.1                         |

Treatment 2:

|        |        |      |
|--------|--------|------|
| Week 1 | 5-0-7  | 0.05 |
| Week 2 | 10-3-5 | 0.1  |
| Week 3 | 5-0-7  | 0.05 |
| Week 4 | 10-3-5 | 0.1  |
| Week 5 | 5-0-7  | 0.05 |
| Week 6 | 10-3-5 | 0.1  |
| Week 7 | 5-0-7  | 0.05 |
| Week 8 | 10-3-5 | 0.1  |

Treatment 3:

|        |         |      |
|--------|---------|------|
| Week 1 | 5-0-7   | 0.05 |
| Week 2 | 10-3-5  | 0.1  |
| Week 3 | 28-8-18 | 0.2  |
| Week 4 | 5-0-7   | 0.05 |
| Week 5 | 10-3-5  | 0.1  |
| Week 6 | 28-8-18 | 0.2  |
| Week 7 | 10-3-5  | 0.1  |
| Week 8 | 28-8-18 | 0.2  |

Treatment 4:

|           |             |     |
|-----------|-------------|-----|
| Weeks 2-8 | 18-3-4 + Fe | 0.1 |
|-----------|-------------|-----|

4 TRTS X 3 REPS X 2 GRASSES [Tifeagle & Tifdwarf] = 24 PLOTS

## **MATERIALS AND METHODS:**

The above treatments were initiated on February 21, 2003 on Tifeagle and Tifdwarf bermudagrass using a CO<sub>2</sub> backpack type boom sprayer set at 20psi to deliver a volume of 1.0 gallon/1000ft<sup>2</sup>. Plot size was 1m x 1m and there were 3 replications per treatment. Weekly treatments were applied 21February, 27 February, 7 March, 12 March, 18 March, 26 March, 4 April, and 11 April. Plots were rated for quality/color (scale of 1-10 with 10=dark green turf, 1=dead/brown turf, and 6=minimally acceptable turf) for the duration of the experiment and on selected dates density (scale of 1-10 with 10=most dense, 1=least dense) and algae ratings (scale of 1-10 with 10=most algae and 1=least algae) were also taken. At the end of the study soil cores were removed from each plot to determine root ash weight differences. At this writing only root dry weights are presented—ash weights have not yet been determined. All data was subject to statistical analysis and significant means were identified.

## **RESULTS AND DISCUSSION:**

This short-term experiment was conducted to evaluate the effect of supplemental fertilizer and organic input programs on Tifeagle and Tifdwarf bermudagrass. For the Tifeagle portion of the experiment, Treatment 1 generally had the highest turf quality ratings, greater turf density ratings (visual), and lowest algae ratings during the two-month period (Tables 1 and 2). On most dates there were significant differences among the treatments for the parameters tested (Tables 1 and 2).

On Tifdwarf the turf quality results were more variable (Table 3). There were fewer dates when treatments were significantly different and the differences, when significant, were at a lower level of probability and Treatment 1 was not consistently highest rated (Table 3). On 3/13, Treatment 1 had the lowest quality rating that was perhaps affected by a mowing event (just prior to ratings). Turf density was significantly greater for Treatments 2-4 on the first two observation dates (Table 4). Thereafter, no treatment differences were noted (Table 4).

There were no significant root dry weight differences for either grass (Table 5). However, in the Tifeagle plots, Treatment 1 had numerically greater root mass than other treatments. Perhaps significant differences between treatments will be observed when the roots are ashed and the organic and sand components of the samples can be better separated.

Based upon the differential responses of the two grasses to the supplemental application, it appears that different treatment protocols should be used based on grass type. For example, Tifeagle benefited most from Treatment 1 while Treatment 3 might be a better choice for Tifdwarf. However, more testing should be done before a recommendation is made. Because this was a brief, preliminary test done for two months at one location, further and longer term testing is highly suggested.

Table 1. Quality/color ratings for Progressive Turf Fertilizer Study initiated on February 21, 2003 on Tifeagle ultradwarf bermudagrass (Site 1).

| Source       | 2/21 | 2/28 | 3/13 | 3/31 | 4/4   | 4/15 |
|--------------|------|------|------|------|-------|------|
| TRT 1        | 6.8  | 8.2a | 8.7a | 8.8a | 8.7a  | 8.7a |
| TRT 2        | 6.7  | 7.2b | 7.2c | 8.2a | 7.7ab | 8.2a |
| TRT 3        | 6.8  | 7.3b | 7.8b | 8.0a | 7.7ab | 8.2a |
| TRT 4        | 6.8  | 6.5c | 7.3c | 6.8b | 6.8b  | 7.2b |
| Significance | ns   | **   | *    | **   | *     | **   |

ns, \*\*, and \* = P>0.10, P<0.01, and P<0.05

Means with the same letter within a column are not significantly different according to Duncan's Multiple Range Test.

Quality/color ratings based on a 1-10 scale with 10=dark green turf, 1=dead/brown turf and 6=minimally acceptable turf.

Table 2. Density and algae ratings for Progressive Turf Fertilizer Study initiated on February 21, 2003 on Tifeagle ultradwarf bermudagrass (Site 1).

| Source       | 3/13 | 3/31 | 4/4  | 4/15 | 3/13(algae) |
|--------------|------|------|------|------|-------------|
| TRT 1        | 8.3a | 8.8a | 8.2a | 8.6a | 1.3b        |
| TRT 2        | 6.2b | 7.7b | 7.3a | 7.7b | 5.0a        |
| TRT 3        | 6.5b | 7.3b | 7.7a | 7.7b | 4.5a        |
| TRT 4        | 6.0b | 6.2c | 5.8b | 6.7c | 5.0a        |
| Significance | **   | **   | *    | **   | **          |

\*\* and \* = P<0.01 and P<0.05

Means with the same letter within a column are not significantly different according to Duncan's Multiple Range Test.

Density ratings based on a scale of 1-10 with 10=most dense, 1=least dense.

Algae ratings based on a scale of 1-10 with 10=most algae and 1=least algae.

Table 3. Quality/color ratings for Progressive Turf Fertilizer Study initiated on February 21, 2003 on Tifdwarf bermudagrass (Site 2).

| Source       | 2/21 | 2/28 | 3/13  | 3/31 | 4/4   | 4/15 |
|--------------|------|------|-------|------|-------|------|
| TRT 1        | 8.0  | 8.0a | 6.3b  | 7.8  | 8.2ab | 8.5  |
| TRT 2        | 7.8  | 8.0a | 7.5ab | 7.8  | 7.7b  | 8.0  |
| TRT 3        | 7.8  | 8.0a | 8.0a  | 8.5  | 8.7a  | 8.2  |
| TRT 4        | 7.7  | 7.7b | 8.0a  | 8.0  | 8.0ab | 7.8  |
| Significance | ns   | +    | +     | ns   | +     | ns   |

ns and + = P>0.10 and P<0.10

Means with the same letter within a column are not significantly different according to Duncan's Multiple Range Test.

Quality/color ratings based on a 1-10 scale with 10=dark green turf, 1=dead/brown turf and 6=minimally acceptable turf.

Table 4. Density ratings for Progressive Turf Fertilizer Study initiated on February 21, 2003 on Tifdwarf bermudagrass (Site 2).

| Source       | 3/13  | 3/31  | 4/4 | 4/15 |
|--------------|-------|-------|-----|------|
| TRT 1        | 5.8b  | 5.8b  | 7.0 | 8.3  |
| TRT 2        | 7.0ab | 7.0ab | 6.8 | 7.7  |
| TRT 3        | 7.2a  | 7.2a  | 7.8 | 7.8  |
| TRT 4        | 7.5a  | 7.5a  | 7.3 | 7.3  |
| Significance | +     | +     | ns  | ns   |

+ and ns =  $P < 0.10$  and  $P > 0.10$

Means with the same letter within a column are not significantly different according to Duncan's Multiple Range Test.

Density ratings based on a scale of 1-10 with 10=most dense.

Table 5. Root dry weights (grams) taken from each plot for Progressive Fertilizer Study initiated on February 21, 2003 on Tifeagle (Site 1) and Tifdwarf (Site 2) bermudagrasses.

| Source       | Tifeagle (Site 1) | Tifdwarf (Site 2) |
|--------------|-------------------|-------------------|
| TRT 1        | 1.10 grams        | 0.13              |
| TRT 2        | 0.63              | 0.33              |
| TRT 3        | 0.50              | 0.23              |
| TRT 4        | 0.40              | 0.10              |
| Significance | ns                | ns                |

ns =  $P > 0.10$