

Toro Bentgrass Establishment Trial 1996-1997

Michael B. Faust and Nick E. Christians

1996

This bentgrass establishment trial was initiated in September, 1996 at the Iowa State University Horticulture Research Station. It is sponsored by the Toro Company. The project was designed to study the effects of Toro products on the establishment of creeping bentgrass on a new sand-based golf green.

The study is being conducted on a 100% sand green which was seeded in September, 1996 with 'Crenshaw' creeping bentgrass. This trial uses a total surface area of 900 ft², with individual treatment plots having an area of 50 ft². Six treatments with three replications are being used.

Five of the treatments used in the study are a combination of products supplied by the Toro Company (Table 1). The final treatment is the control which contains elemental N, P, and K. Application of the treatments followed a 4-week cycle in the fall of 1996. Week one was a 1:1:1 (N,P,K) application with 0.5 lb N, P, and K being applied to the turf. Weeks 2-4 used a 2:0:1 (N,P,K) application with 0.5 lb N, zero P, and 0.25 lb K.

Treatments 1-5 were applied to the turf using a hand-spray boom sprayer. Treatment 6, a granular, was applied using a hand-held shaker. The first 1:1:1 application was made September 25, with the 2:0:1 applications following for the next three weeks. Treatments were irrigated after application. A single 4-week cycle was completed in 1996.

One set of visual quality data was taken October 15, 1996 (See below). This data rated the percentage of ground cover during the fall 1996 grow-in period. Initially, the plots receiving the granular treatments were slightly behind the other liquid treatments. This was demonstrated in turf color and percent cover shown by the emergence of the new bentgrass seedlings.

Percent Cover Data 1996

Treatment #	1	2	3	4	5	6
Rating (Mean)	5	4	4	5	4	3

*Ratings are 9 = Best and 1 = Worst

1997

The treatments were resumed in the spring of 1997 with the following changes. The plots were split into two 25 ft² sections, doubling the number of individual plots in the trial. The first application was a 1:1:1 starter fertilizer containing 0.5 lb N, 0.5 lb P, and 0.5 lb K. This application was made to both sections of the plot on May 1. Application frequency and product quantity changes were initiated two weeks following the 1:1:1 application. At that time, a switch was made to a 2:0:1 material (Table 1). These applications will be used for the remainder of the season. Half of the experimental plots will receive one 0.5 lb N/1000 ft² application every two weeks; (2 applications per month). The other half of the plots will receive two 0.125 lb N/1000 ft² applications per week; (eight applications per month). A total of 1 lb. N/1000 ft² and 0.5 lb K/1000 ft² will be applied to each plot in a one-month period.

Visual quality data will be taken weekly throughout the spring, summer, and fall months. Sampling of clippings are scheduled every two weeks once the grass on the plots has matured. Rooting will be measured in July and September. Clipping tissue samples will be analyzed every two weeks with the IRIS--AP--DUO, Inductively Coupled Argon Plasma Analyzer (ICAP). The analysis by (ICAP) will occur on all plots for a total of eight sampling dates.

Table 1. Toro Bentgrass Establishment Trial 1996 and 1997

- Objective

- Compare the effects of five different combinations of Toro products and control on the establishment of bentgrass on USGA spec. soil mix maintained under putting green conditions.
- Post Germination Treatments (1996)
 - Weekly applications at a rate of 0.5 lb N/1000 ft²
 - Week 1- 1:1:1 N, P, & K
 - Weeks 2, 3, and 4 - 2:0:1 N, P, & K
 - Repeat on a four (4) week cycle through establishment period
- Post Germination Treatments (1997)
 - Initial 1:1:1 treatment application with 0.5 lb N, 0.5 lb P, and 0.5 lb K/1000 ft²
 - 2:0:1 treatment applications to be used for the remainder of the season
 - Half of the plots will receive one 0.5 lb N/1000 ft² application every two weeks (2 applications/month)
 - The other half of the experimental plots will receive two 0.125 lb N/1000 ft² applications per week (8 applications/month)
 - All experimental plots will receive 1.0 lb N/1000 ft² and 0.25 lb K/1000 ft² per month
- 1:1:1 Treatments
 1. 7-24-0 w/5% *humic acid* as P source; KNO₃ as K source; remaining N from NH₃NO₄
 2. 8-16-4 w/*compost-derived organic acids* as P source; KNO₃ as K source; and remaining N from NH₄NO₃
 3. 15% *humic acid* ; H₃PO₄ as primary P source; KNO₃ as primary K source; and remaining N from NH₄NO₃
 4. 5-3-2 w/*molasses* ; H₃PO₄ as primary P source; KNO₃ as primary K source; remaining N from NH₄NO₃
 5. (Control) H₃PO₄ as P source; KNO₃ as K source; remaining N from NH₄NO₃.
 6. 12-16-8 *granular* & 12-3-9 *granular* at 0.5 lb N/1000 ft²
- 2:0:1 Treatments
 1. 22% *humic acid* ; KNO₃ as K source; remaining N from NH₄NO₃
 2. 6-0-0 w/*compost derived organic acids* ; KNO₃ as K source; remaining N from NH₄NO₃
 3. 15% *humic acid* ; KNO₃ as K source; remaining N from NH₄NO₃
 4. 5-3-2 w/*molasses* ; KNO₃ as primary K source; remaining N from NH₄NO₃
 5. (Control) KNO₃ as K source; remaining N from NH₄NO₃
 6. 12-3-9 *granular* at 0.5 lb and 0.125 lb N/1000 ft²
- Response Measurements
 1. Clipping dry weight on a g/m²/day basis
 2. Root mass
 3. Quality