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Evaluation of SeedBoost* Microbial Soil Inoculant for Establishment of Ryegrass During Overseeding

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Abstract

Applications of SeedBoost, microbial soil inoculant, did not affect ryegrass stand establishment with respect to number of plants counted, plant height, clipping weight, visual density, or quality ratings at any rating date. Interactions between ryegrass seeding rates and treatment with or without SeedBoost did not occur in this experiment. Significant differences were observed among seeding rates such that 800 lb PLS/A was better than 600 lb PLS/A and 400 lb PLS/A had the least stand establishment plant counts, clipping weights, and visual quality ratings.

Introduction

The overseeding process in the low desert region of Arizona occurs during the fall season when climatic conditions are generally not conducive for planting and growing cool-season turfgrasses. During September and early October, temperatures are typically still above 100°F and extremely stressful conditions with winds and poor quality irrigation water contribute to the difficulties of germinating and establishing a winter turfgrass. Typically, golf courses close down for a period of time to allow the newly planted grass to get established before golfers are allowed to play and to drive carts off of designated paths. Golf course superintendents and professional turf managers are continuously seeking ways to optimize winter turfgrass germination and establishment under harsh conditions. SeedBoost, a microbial soil inoculant, is evaluated in this experiment to determine its efficacy to improve winter turfgrass establishment.

Materials and Methods

A small plot experiment was conducted at the Arizona State University Polytechnic Campus in Mesa, AZ. The driving range tee area had hybrid bermudagrass cv. Tifway 419 that was mowed to a very short height of 0.25 to 0.5 inch in preparation for overseeding on 10 October 2005. A perennial ryegrass blend composed of cv. Covet, Whitney, and Edison was used for overseeding. The experiment was established as a split-plot design to compare the use of SeedBoost microbial soil inoculant versus untreated plots that were overseeded with different seeding rates of 400, 600, and 800 lb PLS/A. Each individual plot measured 3 ft by 5 ft and treatments were replicated three times. Seeding of individual plots was done by shaking a 3# coffee can with holes drilled on the bottom to allow the grass seed to pass through. Seed was contained within the individual plots by being walled with a four-sided wooden frame. The SeedBoost treatment at 1.0 oz product per 1000 ft^2 was applied with a backpack CO2 sprayer equipped with a hand-held boom. The three-nozzle boom consisted of 8002 flat fan tips spaced 20-inches apart and pressurized to 30 psi and delivered in 2 gallon water per 1000 ft^2. Two SeedBoost applications were made on 19 and 26 October 2005.

Ryegrass emergence and establishment occurred following continuous regular irrigation for one week after seeding. Stand counts were initiated on 19 October when the first spray was applied. Counts were taken from five sub-

samples of each treatment plot using a 3.8 cm diameter metal ring and counting all emerging plants within it. Plant height was measured on 24 October and fresh clipping weights were collected at first mowing on 26 October. Visual turfgrass density and quality ratings were evaluated during the winter and early spring.

Results and Discussion

Stand counts of ryegrass being established showed that significant differences occurred among seeding rates of 400, 600, and 800 lb/A. The initial stand count at on 19-Oct-2005 at 9 days after seeding (DAS) or the day of the first application of Seed Boost showed a rate response for number of plants with 800>600>400 lb/A (Table). The same differences among seeding rates occurred at all five evaluation dates through 21 DAS. At 16 DAS, at the first mowing, the fresh clipping weight of ryegrass was significantly lower for the 400 lb/A seeding rate compared to 600 and 800 lb/A seeding rates. Visual observations in November, January, and March showed that turfgrass density and quality improved significantly when seeding rates increased.

The applications of SeedBoost at 9 and 16 DAS did not affect ryegrass stand establishment with respect to number of plants counted, plant height, clipping weight, visual density, or quality ratings at any rating date. Interactions between ryegrass seeding rates and treatment with or without SeedBoost did not occur in this experiment.

The overseeding process during the time from seeding through establishing the stand during October was not impacted by severe or extreme weather conditions. High temperatures did not exceed 95°F and the average high temperature was 87°F from planting date on 10 October to the first SeedBoost application on 19 October. It was anticipated that extreme conditions such as high temperatures could be offset by the applications of SeedBoost. Also, SeedBoost may have enhanced the germination and establishment rates of variable seeding rates but no differences were observed between treated and untreated.

Future investigations under more rigorous and stressful climatic conditions may provide information to substantiate advantages that SeedBoost or similar products may provide during overseeding in the desert.

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Table. Effect of SeedBoost* on ryegrass stand establishment, plant height, clipping weight and turf quality.

Treatment	Stand count					Plant ht	Clipping wt	Quality[1]		
	No. plants / 11.4 sq cm					cm	gram			
	19-Oct	21-Oct	24-Oct	26-Oct	31-Oct	24-Oct	26-Oct	8-Nov	20-Jan	9-Mar
400 lb seed	24.9	31.4	23.9	26.6	18.2	4.8	20.8	5.8	4.8	2.8
600 lb seed	32.1	42.8	31.5	30.9	21.3	4.8	40.1	7.3	6.0	3.4
800 lb seed	39.4	53.7	37.0	34.2	25.9	5.2	45.7	7.9	6.8	4.0
LSD (p=0.05)	5.10	9.90	6.00	4.70	3.80	0.59	8.24	0.60	0.40	0.40
untreated	30.6	40.9	30.8	31.1	21.7	4.9	33.4	6.8	5.8	3.4
SeedBoost	33.7	44.4	30.8	30	21.9	5	37.7	7.2	5.8	3.3
LSD (p=0.05)	4.10	8.10	4.90	3.80	3.10	0.48	6.73	0.50	0.30	0.40

[1]Quality rating where 1 is worst and 9 is best
Seeding date – 10-Oct-2005