Preemergency and Postemergency Activity of Cutless® and Rubigan® on the Germination and Development of Annual Bluegrass and Creeping Bentgrass

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INTRODUCTION

Annual bluegrass (**Poa annua**) is often the major component of golf course turf. It competes well with creeping bentgrass (**Agrostis palustris**) when irrigation is frequent, nitrogen levels are high and mowing heights are low. Even when mowing heights are 0.25 inches or less, annual bluegrass is able to produce large amounts of seed. Annual bluegrass is often considered an undesirable golf turf. It is susceptible to winter damage and is difficult to maintain as a quality turf during stressful summer months. The purpose of this study is to evaluate the effects of Cutless® (El-500) and Rubigan® on the growth rate of annual bluegrass and creeping bentgrass before and soon after seedling emergence.

MATERIALS AND METHODS

Seeds of both species, **Poa annua** and **Agrostis palustris** cv. 'Penneagle' were sown in dry sterilized unmodified Kirkland silt loam soil. **P. annua** was seeded at 2 lb/1000 sq ft (.178 gram/6 inch standard pot). **A. palustris** cv. Penneagle was sown at 1 lb/1000 sq ft (.089 grams/6 inch standard pot). Germination of **P. annua** was at least 88% and germination of **A. palustris** cv. Penneagle was at least 72%. Seed was applied by hand to the soil surface and lightly "raked" into the soil. Seed was planted no deeper than .25 inch.

Preemergency and postemergence treatments consist of Cutless® at 0.5, 0.75, 1.0 and 2.0 lb ai/A and Rubigan® at 2.5 lb ai/A. An untreated control was also included as a treatment. Preemergency treatments were applied December 5, 1984 to seeded, dry soil. After application, pots were placed on a mist bench. By December 10, both species had started to germinate. Postemergency control treatments were applied December 21, 1984. All turf at least 1 inch in height at the time of application. After treatment, the pots were returned to the mist bench until December 24, 1984. At this time they were removed from the mist and watered as needed.

All herbicides were applied in a pesticide spray chamber using a spray volume of 25 gpa at ½ the treatment rate in each of two applications. This gave a total spray volume of 50 gpa for each desired rate. The nozzle tip used was a Teejet 8002E with a 30 inch swath. Pots were aligned in the chamber so that they were treated with only the center 6 inches of the spray pattern. The nozzle traveled at the speed of 1.0 mph. The pressure at the nozzle tip was 20 psi. This gives a rate of 0.12 gpm (233 ml/30 sec.).

RESULTS AND DISCUSSION

Evaluations were made 6 weeks following treatment (Table 1 through Table 4). Measurements were made on January 16, 1985 for the preemergency applications and February 1, 1985 for the postemergence applications.

Phytotoxicity (or crop injury) was a visual rating made on a 1 through 9 scale where 9 represents no visible injury and 1 represents complete necrosis. Most injury to both species oc-

(cont'd. page 11)

(Activity of Cutless® & Rubigan® cont'd.)

curred with the postemergency application of all materials, especially with Rubigan® and the highest rate of Cutless®. Turf injury was also apparent in both species with a preemergency application of Rubigan®. Injury with Rubigan® was most visible as a wilting and spotting. Postemergency injury with Cutless® was visible as tip dieback.

Percent cover was evaluated as the percent (visual estimation) of each pot covered with turf. Cutless® treatments at 2.0 lb ai/A and Rubigan® treatments significantly reduced turf cover for both species. All treatments significantly reduced turf cover when the treatments were applied prior to seed germination. Percent cover was least effected by lower rates of Cutless® when applied as a postemergent treatment.

Height measurements represent the average height in centimeters of the turf canopy. All treatments resulted in reduced growth to both species. The exception to this was Rubigan® applied as a postemergent to annual bluegrass. With this treatment height measurements were not significantly lower than the control.

Clipping weights represent the dried weight in grams/m_2 of the turf plants harvested at soil level six weeks following treatment. All treatment weights were significantly lower than the controls for both species and application times. The consistently measured reduction in growth of both species with any applications of Cutless® or Rubigan® indicates significant activity of the materials on young seedlings of both species regardless of application techniques.

Table 1. The evaluation of Cutless® and Rubigan® applied to annual bluegrass prior to seed germination.[1]

Material	Rate lb ai/A	Phytotoxicity[2]	Percent Cover[3]	Height[4] (cm)	Clipping Weights[5]
Cutless®	0.5	9.0a	76.7b	4.4b	39.7b
Cutless®	0.75	9.0a	40.8c	1.6c	19.6c
Cutless®	1.0	9.0a	33.3c	1.6c	16.3cd
Cutless®	2.0	8.8a	12.8d	1.1c	9.3d
Rubigan®	2.5	4.2b	5.3d	3.6b	10.3d
Control	---	9.0a	100.0a	9.6a	81.6a
$LSD_{0.05}$		0.6	14.1	0.8	8.7

Table 2. The evaluation of Cutless® and Rubigan® applied to annual bluegrass when seedlings are 1 inch in height.[1]

Material	Rate lb ai/A	Phytotoxicity[2]	Percent Cover[3]	Height[4] (cm)	Clipping Weights[5]
Cutless®	0.5	7.7b	93.3ab	3.1b	51.7b
Cutless®	0.75	7.5bc	89.2b	2.9b	47.9b
Cutless®	1.0	6.7c	76.7c	2.7b	44.6bc
Cutless®	2.0	5.0d	58.3d	2.4b	34.3c
Rubigan®	2.5	3.8e	69.2c	8.6a	41.3bc
Control	---	8.7a	100.0a	9.6a	97.9a
$LSD_{0.05}$		1.0	9.3	4.1	11.4

[1] All values represent the mean of 6 replications. Means in the same column with the same letter are not significantly different at the 0.05 level as determined by Fisher's Least Significant Difference test.

[2] Phytotoxicity evaluations are made on a 1 to 9 scale, where 9 = no visible damage to the turf and 1 = complete necrosis.

[3] Percent cover indicates the percent of the pot area covered by turfgrass plants.

[4] Height measurements represent the average height in cm of the turf canopy.

[5] Clipping weights represent the dried weight in grams/m^2 of the turf plants harvested at soil level.

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(Activity of Cutless® & Rubigan® cont'd.)

CLIPPING WEIGHTS OF TURF TREATED WITH CUTLESS-POSTEMERGENCE

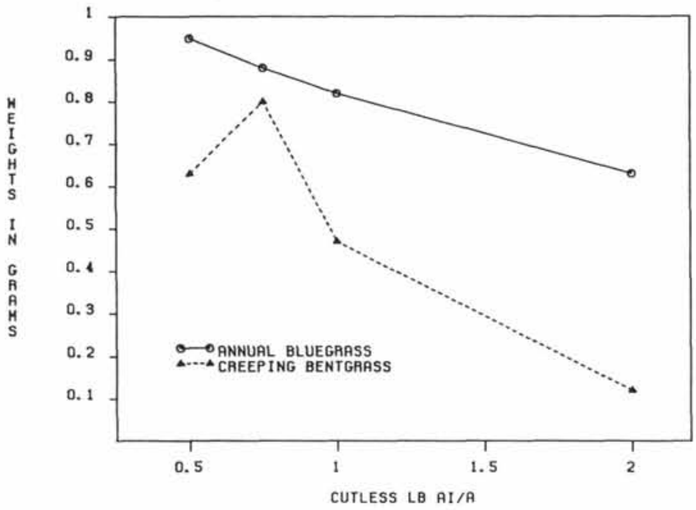


Table 3. The evaluation of Cutless®, and Rubigan® applied to creeping bentgrass prior to seed germination.[1]

Material	Rate lb ai/A	Phytotoxicity[2]	Percent Cover[3]	Height[4] (cm)	Clipping Weights[5]
Cutless®	0.5	9.0a	42.5b	1.6c	12.0b
Cutless®	0.75	9.0a	17.5c	1.1c	5.4cd
Cutless®	1.0	9.0a	11.7cd	1.0c	9.2bc
Cutless®	2.0	9.0a	4.0d	0.8c	2.2d
Rubigan®	2.5	2.8b	1.7d	3.7b	3.3d
Control	---	9.0a	100.0a	9.4a	40.8a
$LSD_{0.05}$		0.5	13.3	0.9	5.4

Table 4. The evaluation of Cutless® and Rubigan® applied to creeping bentgrass when seedlings are 1 inch in height.[1]

Material	Rate lb ai/A	Phytotoxicity[2]	Percent Cover[3]	Height[4] (cm)	Clipping Weights[5]
Cutless®	0.5	8.8a	93.3a	2.2c	34.3bc
Cutless®	0.75	8.3a	90.8a	1.8cd	44.1b
Cutless®	1.0	7.2b	51.7b	1.5cd	25.0c
Cutless®	2.0	1.8d	7.3c	0.8d	6.5d
Rubigan®	2.5	3.3c	39.2b	7.4b	35.4bc
Control	---	8.7a	100.0a	10.4a	58.2a
$LSD_{0.05}$		0.6	13.3	1.1	13.1

[1] All values represent the mean of 6 replications. Means in the same column with the same letter are not significantly different at the 0.05 level as determined by Fisher's Least Significant Difference test.

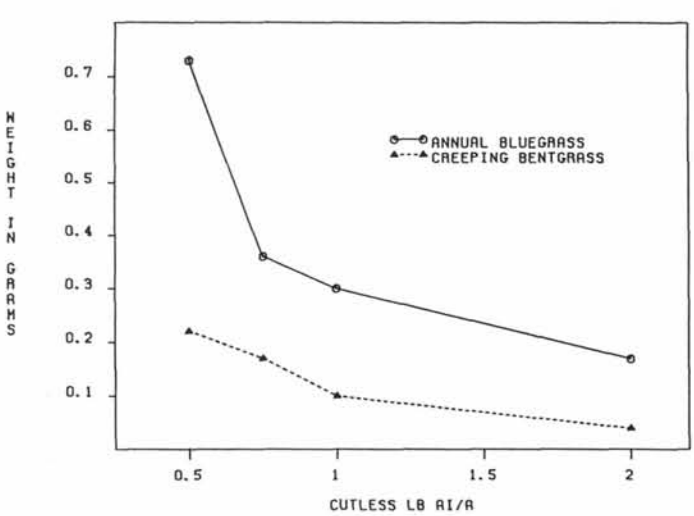
[2] Phytotoxicity evaluations are made on a 1 to 9 scale, where 9 = no visible damage to the turf and 1 = complete necrosis.

[3] Percent cover indicates the percent of the pot area covered by turfgrass plants.

[4] Height measurements represent the average height in cm of the turf canopy.

[5] Clipping weights represent the dried weight in grams/m^2 of the turf plants harvested at soil level.

CLIPPING WEIGHTS OF TURF TREATED WITH CUTLESS (PREEMERGENCE)



ASGCA President Cites Reasons Behind Demand for Golf Courses

Why is the demand for municipal golf courses so strong?

Ken Killian, president of the American Society of Golf Course Architects, pinpointed several reasons why more communities are building new golf courses and predicted that this boom will continue for the next decade.

He noted that there is a pentup demand for golf facilities generally, since high interest rates choked development for several years and that "we now are playing catchup during this period of lower interest and bond rates."

Even more importantly, is the fact that about one-third of the nation's golfers are now women, according to the National Golf Foundation. "We certainly haven't lost the men, but with the influx of women, existing facilities are hard-pressed to accommodate the demand. In areas without a municipal course, municipalities are finding that new facilities are an immediate profit generator that can be used to fund a second course or other recreational programs," Killian stated.

The ASGCA president also feels that the general trend toward better conditioning and more exercise has helped contribute to the demand for more high-quality golfing facilities. "Also", Killian added, "there are more people in retirement than ever before, and many of them are avid golfers."

As communities compete for new industry, they often find that the amenities of the area may well be the deciding factor in a company's decision to relocate. "Studies show," Killian pointed out, "that a good golf course is very important to executives who must relocate a substantial number of managers into a new area."

The ASGCA president said that golf courses can serve as a catalyst for community improvement in addition to providing an aesthetically-pleasing green belt.

- A residential developer donating land for a park site adjacent to another parcel owned by the community could provide enough additional land for a golf course. Or, a developer might be granted a variation for higher-than-normal density housing in return for donating land for a community golf course.
- A landfill, rather than being used for a non-revenue park, can be transformed into a profitable municipal golf course, as has been done in many communities across the country.
- In a similar vein, if a golf course is located adjacent to the water treatment plant, it not only will put that land to profitable use, but serve as an outlet for effluent that does not require expensive treatment.
- Some developers are planning to incorporate a municipal golf course into a combination office park and residential community.

Killian noted that communities considering a municipal golf course may obtain a free planning brochure by writing the American Society of Golf Course Architects, 221 N. LaSalle St., Chicago, IL, 60601.

He added that municipal golf courses no longer are "second class citizens in the world of golf. Some of the best new courses being designed are municipal layouts and that trend will continue as city and recreation department personnel recognize that courses are appreciated by the general public and generate substantial income."

(cont'd. page 18)