

MANAGEMENT OF MIXED ANNUAL BLUEGRASS / CREEPING BENTGRASS FAIRWAYS

M. G. HENDRICKS AND B. E. BRANHAM
MICHIGAN STATE UNIVERSITY E. LANSING, MI

The loss of turf this year because of environmental stress and disease has resulted in increased interest in methods of shifting from annual bluegrass to creeping bentgrass fairways. Historically, most attempts to shift species composition have failed.

Three overseeding studies were conducted at the Hancock Turfgrass Research Center to examine the effects of cultivation, seeding rate, and chemical treatment on the success of overseeding creeping bentgrass into annual bluegrass. Each study area was treated with Fusilade 2000 (fluazifop-butyl) on June 18, 1987, at a rate of 0.25 lb ai/a, to eliminate the wild type creeping bentgrass. In each study following cultivation, starter fertilizer (19-19-19) was applied at 1 lb N/M. All plots were overseeded at the various seeding rates by hand with Penncross creeping bentgrass seed. Following overseeding, each area was dragged with a mat to incorporate the seed, rolled to ensure good seed to soil contact, and irrigated to keep moist. Liquid formulations were applied using a backpack CO₂ sprayer equipped with 8002 nozzles. The sprayer was calibrated to deliver 50.5 gpa at 30 psi. Granular materials were applied using a drop-type spreader. The grid method was employed to determine the percent creeping bentgrass in each study.

The overseeding studies conducted this year result from information gained from the 1986 overseeding study. The 1986 study was a large factorial study which examined the effects of cultivation, seeding rate, and chemical treatment on creeping bentgrass establishment.

The results of the 1986 study indicated that the method of cultivation did not significantly increase bentgrass establishment; and that 2 or 4 lbs. of creeping bentgrass seed resulted in significantly more creeping bentgrass establishment than the 1 lb seeding rate, with no significant difference between the 2 and 4 lb seeding rate. The results also indicated that chemical treatment resulted in greater creeping bentgrass establishment.

When examining the results of the chemical treatments (Table 1) the fall 1986 data indicate that the Round-up and Round-up + Prograss treatment had 20% and 11% bentgrass cover which was significantly more than the Embark, Embark + Prograss, and no chemical treatments. However, when percent

bentgrass cover was determined the following year (summer 1987) the Round-up + Prograss treatment had 81%, the Round-up treatment 50%, and the Embark + Prograss treatment 42% creeping bentgrass cover. The extremely wet fall of 1986 resulted in decreased bentgrass germination and establishment. Prograss treatment initially decreased bentgrass establishment but, this was reversed the following spring with less than 10 and 25 % annual bluegrass in the Round -up + Prograss and the Embark + Prograss treated plots respectively. There was also an increase in the amount of Kentucky bluegrass in the Prograss treated plots.

The first overseeding study conducted this year (Study 1) was designed to examine which herbicide, plant growth regulator (PGR), or combination of herbicide and PGR would result in the greatest establishment of overseeded creeping bentgrass. The treatments, rates, and application dates are listed in Table 2. Prior to starter fertilizer application and seeding, the study area was vertical mowed in two directions at a depth of 0.3 cm (1/8 inch). The area was overseeded with 2 lb/M Penncross creeping bentgrass seed on August 13, 1987. The chemical treatments were applied as noted (Table 2), with the Cutless treatments being applied two weeks, Round-up 12 days, and Embark two days prior to seeding.

The results of this experiment are summarized in table 2. The analysis of variance of percent creeping bentgrass cover indicated that chemical treatment significantly influenced the establishment of overseeded creeping bentgrass. The Round-up (62%) and Round-up + Prograss (50%) treated plots had significantly more creeping bentgrass than the control (5%). Except for the Prograss treatment applied five weeks after emergence and the Cutless + Prograss treatment, all other treatments which contained Prograss resulted in greater establishment of creeping bentgrass. The Embark (0.38 lb ai/a) + Prograss (0.75 + 0.75 lb ai/a six weeks after emergence) treatment resulted in 33.7% creeping bentgrass establishment which was the greatest bentgrass establishment of all the Embark treatments. However, the other plots treated with Embark did contain more creeping bentgrass than the no chemical treatment. When Cutless or Cutless + Prograss was applied it resulted in 8.3 and 2.3% creeping bentgrass respectively, indicating that these treatments were not successful in establishing overseeded creeping bentgrass.

The second overseeding study (Study 2) was designed to reexamine the effect of cultivation and seeding rate. The seeding rates used in this study were 1, 2, and 4 lb/M Penncross creeping bentgrass. The cultivation treatments were vertical mowing, core cultivation, and no cultivation. The core cultivation treatment consisted of one pass with a Ryan Greensaire aerifier with 3/8 inch tines. The cores

TABLE 1 CREEPING BENTGRASS COVER 1986 OVERSEEDING STUDY

TREATMENT	PERCENT COVER	
	FALL 1986	SUMMER 1987
ROUND-UP	20	50
ROUND-UP +PROGRASS	11	81
EMBARK	3	16
EMBARK + PROGRASS	2	42
NO CHEMICAL	5	19

TABLE 2 TREATMENT, RATE OF APPLICATION, DATE OF APPLICATION, AND PERCENT CREEPING BENTGRASS COVER

TREATMENT	RATE (lb/a)	DATE APPLIED	% COVER
ROUND-UP	1.0	7/30	62.3
ROUND-UP+PROGRASS(6W)*	1.0 + (.75+.75 ai)	7/30 +(9/29 +10/27)	50.0
EMBARK	.25	8/10	12.7
EMBARK	0.38 ai	8/10	25.7
EMBARK	.50	8/10	18.3
PROGRASS(4W)	(.38+.75 ai)	(9/15 + 10/15)	33.7
PROGRASS(5W)	(.38+.75 ai)	(9/21 + 10/19)	4.3
PROGRASS(6W)	(.75+.75 ai)	(9/29 + 10/27)	29.3
EMBARK+PROGRASS(3W)	.38ai + (.25+1.0 ai)	8/10 +(9/9 + 10/6)	23.0
EMBARK+PROGRASS(3W)	.38ai +(.38+.75 ai)	8/10 +(9/9 + 10/6)	22.3
EMBARK+PROGRASS(6W)	.38ai + (.75+.75 ai)	8/10 +(9/29 +10/27)	33.7
CUTLESS	1.0	7/28	8.3
CUTLESS+PROGRASS(6W)	1.0ai + (.75+.75 ai)	7/28 +(9/29 +10/27)	2.3
NO CHEMICAL	-----	-----	5.3
PROGRASS(DORMANT)	(.75 + .75 ai)	(9/15 + 10/15)	----
PROGRASS(DORMANT)	(1.5 + 1.5 ai)	(9/15 + 10/15)	----
LSD (0.05)			28.6

* 3W, 4W,5W, AND 6W INDICATES FIRST PROGRASS APPLICATION AND IS 3,4,5, OR 6 WEEKS AFTER EMERGENCE