

## **1994 TURF WEED CONTROL AND MANAGEMENT RESEARCH**

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In 1994 research focused on several different areas. Projects were initiated or continued that examined disease resistance in creeping bentgrass, the effects of PGR's on quality and recovery from injury on golf course turf, the establishment of creeping bentgrass on sand-based greens, and the response of mixed fairways of creeping bentgrass/annual bluegrass to Prograss.

This research is conducted by a number of graduate and undergraduate students without whom none of the results presented here would be possible. Graduate students active in research in 1994 were Ron Calhoun, Rafael Carrascosa, Darin Lickfeldt, and Scott Warnke. Undergraduate students who helped support these research projects included Allaire Groestchy and Juan Ugalde.

Scott Warnke is studying disease resistance in creeping bentgrass. Creeping bentgrass is the most important golf course turf in Northeastern North America. Diseases are the single biggest pest problem for creeping bentgrass and fungicide usage represents a large portion of the agrichemical budget on golf courses. Dollar spot, although relatively easy to control, occurs frequently throughout the growing season resulting in several fungicide applications each year. An improvement in natural levels of dollar spot resistance in creeping bentgrass could result in large cost savings for most golf courses. Current levels of natural resistance in creeping bentgrass are quite low. Our research seeks to identify clones of creeping bentgrass with good resistance to dollar spot and using biotechnology, determine the heritability of the resistance seen in these elite clones. An initial screen of available bentgrass germplasm showed that just a few clones had a high level of natural resistance to dollar spot (Table 1). Future research will focus on the genetics of the observed resistance, accomplished by crossing resistant clones with susceptible clones and studying the inheritance patterns in the offspring.

Establishment of bentgrass on new sand-based greens should be a fairly straightforward task; however, many superintendents often have had difficulty in getting good establishment. Starter fertilizer programs have emphasized frequent applications of quick release nitrogen sources to push the bentgrass towards rapid establishment. These high rates of nitrogen fertilizer, typically 1 lb N/ 1000 ft<sup>2</sup>(M)/wk, could lead to very high rates of nitrogen leaching. The purpose of this study was to examine different starter fertilizer programs for their effect on bentgrass establishment and nitrate leaching through an 80/20 (sand/peat) greens mix. Plots were established by removing the sod from a 2 year old Pennlinks creeping bentgrass turf. Prior to seeding, suction lysimeters were installed into selected plots to allow sampling of soil water solutions. The suction lysimeters were installed at the base of the greens mix, just above the choker layer. Additional 80/20 mix was added to the soil to return the site to its original level and the area was smoothed and seeded on July 27 with 1 lb seed/M.

A number of different fertility programs were used (Table 2) that included different N sources or compared tilling the fertilizer into the soil profile versus surface applications of the fertilizer. Some slight differences in initial establishment were observed; however, these were soon masked by the subsequent fertility applications (Figure 1). Thus, the weekly applications of nitrogen were very effective in promoting rapid establishment and outweighed the effect of starter fertilizer programs.

Leaching data is still being compiled, however, some preliminary data is available (Figure 2). These data show the leaching that resulted from the initial starter fertilizer applications; subsequent fertility applications would come in later leaching events. The data are too preliminary to draw conclusions concerning which treatments may lead to greater nitrate leaching. However, it is clear that very high levels of nitrate leaching can occur during establishment. Care should be taken when the turf is establishing to use nitrogen fertilizers wisely.

Table 1. Results of dollar spot screening with 31 different creeping bentgrass populations.

Entry	Species	Origin	Mean Disease Rating	Number of Plants in Class							Number Scored
				* 1	2	3	4	5	6	7	
DF-1	Creeping	Tee-2-Green Corp.	2.6	13	60	3	6	12	4	2	100
A-1	Creeping	Tee-2-Green Corp.	2	27	61	3	4	2	3	0	100
Lopez	Creeping	Finelawn Research, Inc	1.9	24	71	1	3	1	0	0	100
Cobra	Creeping	International Seeds, Inc.	1.7	42	52	2	4	0	0	0	100
Syn 92-1-93	Creeping	Texas A&M University	1.7	52	40	0	6	2	0	0	100
Bar Ws 4210	Creeping	Barenbrug Holland	1.6	48	45	3	3	1	0	0	100
Pennlinks	Creeping	Tee-2-Green Corp.	1.6	58	33	1	7	1	0	0	100
88CBE	Creeping	International Seeds, Inc	1.5	42	32	5	0	0	0	0	79
18th Green	Creeping	Johnson Seeds, Ltd.	1.5	54	46	0	0	0	0	0	100
Southshore	Creeping	Loft's Seed, Inc	1.5	52	46	0	2	0	0	0	100
PI 235541	Creeping	Pullman WA.	1.5	65	20	2	6	1	0	0	94
Providence	Creeping	Seed Research of OR, Inc.	1.5	49	48	0	1	0	0	0	98
G-2	Creeping	Tee-2-Green Corp.	1.5	44	55	0	0	0	0	0	99
G-6	Creeping	Tee-2-Green Corp.	1.5	49	50	0	1	0	0	0	100
Penneagle	Creeping	Tee-2-Green Corp.	1.5	57	40	0	3	0	0	0	100
SR1020	Creeping	Seed Research of OR, Inc.	1.4	61	36	3	0	0	0	0	100
Penncross	Creeping	Tee-2-Green Corp	1.4	63	36	0	1	0	0	0	100
PI 235440	Creeping	Pullman WA.	1.3	70	20	0	2	0	0	0	92
PI 251945	Creeping	Pullman WA.	1.3	72	25	1	2	0	0	0	100
A-4	Creeping	Tee-2-Green Corp.	1.3	78	20	0	1	1	0	0	100
Syn 92-5-93	Creeping	Texas A&M University	1.3	73	23	2	2	0	0	0	100
Syn 92-2-93	Creeping	Texas A&M University	1.3	76	22	0	1	1	0	0	100
Pro/Cup	Creeping	Forbes Seed & Grain, Inc.	1.2	81	19	0	0	0	0	0	100
Emerald	Creeping	International Seeds, Inc.	1.2	81	18	0	1	0	0	0	100
Crenshaw	Creeping	Texas A&M University	1.2	75	25	0	0	0	0	0	100
Cato	Creeping	Texas A&M University	1.2	79	21	0	0	0	0	0	100
Trueline	Creeping	Turf Merchants	1.2	72	20	0	0	0	0	0	92
SR7100	Colonial	Seed Research of OR, Inc.	1.1	90	9	0	0	0	0	0	99
Seaside	Creeping	Standard	1.1	89	11	0	0	0	0	0	100
Tendez	Colonial	Finelawn Research, Inc.	1	94	1	0	0	0	0	0	95
Syn 1-88	Creeping	Texas A&M University	1	86	14	0	0	0	0	0	100
		Total or mean	1.4	1916	1019	26	56	22	7	2	3048
		% of total plants		63	33	0.8	1.8	0.7	0.2	0.1	
		% of plants selected								3.7	
				* Rating from 1-9 1=dead plant 9=no damage							