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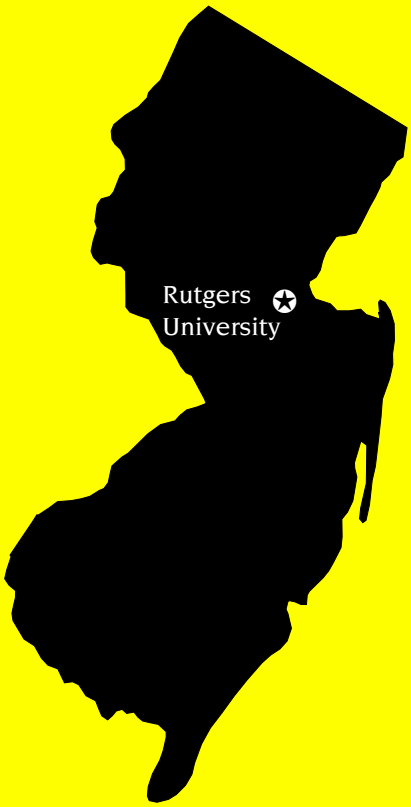

THE NEW JERSEY TURFGRASS ASSOCIATION

In Cooperation With

RUTGERS COOPERATIVE EXTENSION
NEW JERSEY AGRICULTURAL EXPERIMENT STATION
RUTGERS, THE STATE UNIVERSITY OF NEW JERSEY
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The Rutgers Turfgrass Proceedings is published yearly by the Rutgers Center for Turfgrass Science, Rutgers Cooperative Extension, and the New Jersey Agricultural Experiment Station, Cook College, Rutgers University in cooperation with the New Jersey Turfgrass Association. The purpose of this document is to provide a forum for the dissemination of information and the exchange of ideas and knowledge. The proceedings provide turfgrass managers, research scientists, extension specialists, and industry personnel with opportunities to communicate with co-workers. Through this forum, these professionals also reach a more general audience, which includes the public. Articles appearing in these proceedings are divided into two sections.

The first section includes lecture notes of papers presented at the 1998 New Jersey Turfgrass Expo. Publication of the New Jersey Turfgrass Expo Notes provides a readily available source of information covering a wide range of topics. The Expo Notes include technical and popular presentations of importance to the turfgrass industry.

The second section includes research papers containing original research findings and reviews covering selected subjects in turfgrass science. The primary objective of this section is to facilitate the timely dissemination of original turfgrass research for use by the turfgrass industry.

Special thanks are given to those who have submitted papers for this proceedings, to the New Jersey Turfgrass Association for financial assistance, and to those individuals who have provided support to the Rutgers Turf Research Program at Cook College - Rutgers, The State University of New Jersey.

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PERFORMANCE OF PERENNIAL RYEGRASS CULTIVARS AND SELECTIONS IN NEW JERSEY TURF TRIALS

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Perennial ryegrass (*Lolium perenne* L.) is a cool-season grass best adapted to areas with mild winters and cool, moist summers. Perennial ryegrass is popular because under good conditions it can rapidly establish an attractive and vigorous turf stand within a month or two of germination.

The development of improved "turf-type" perennial ryegrasses continues at the New Jersey Agricultural Experiment Station and many other facilities throughout the world. Many of the newer perennial ryegrasses are darker in color, denser, have a lower growth habit, more uniform appearance, and better mowing quality. Plant breeders are expanding the genetic base of perennial ryegrasses used in cultivar development by incorporating collections of new germplasm from old turfs around the world into the breeding program. The presence of an endophyte (*Neotyphodium lolii*) in many perennial ryegrasses has enhanced insect resistance and stress tolerance.

The tables presented in this paper provide current data on trials established at the Plant Science Research Center, Adelphia, NJ and the Turfgrass Research Facility, North Brunswick, NJ. The 1994 North Brunswick test (Table 1) was evaluated in cooperation with the National Turfgrass Evaluation Program (NTEP).

PROCEDURES

Four perennial ryegrass tests were established between 1994 and 1997. One test was seeded at North Brunswick, NJ in September 1994 (Table 1). The other three tests were seeded at Adelphia, NJ: one in August 1995 (Table 2), one in August 1996 (Table 3), and the other in August 1997 (Table 4).

The three Adelphia tests were hand sown with 0.88 oz of seed into 3 X 5 ft plots (3.7 lb seed/1000 ft^2). The North Brunswick test was hand sown with 2.1 oz of seed into 3.5 X 5.5 ft plots (6.8 lb seed/1000 ft^2). A 6 inch unseeded border surrounded each plot. All tests were arranged in a randomized complete block design with three replications. Management procedures included irrigation as needed to avoid severe drought stress, a fall application of the postemergence herbicides 2,4-D and Dicamba for broadleaf weed control, and a spring application of DCPA or bensulide for preemergence control of summer annuals. In addition, an application of Dylox was used on the 1994 North Brunswick test for grub control.

The annual rate of nitrogen (N) and mowing height for each test are presented in Table 5. Single applications of fertilizer did not exceed 1.0 lb N/1000 ft^2. The amount and timing of nitrogen applied to turf varied to encourage disease and other stresses. Tests were mowed regularly with reel mowers to maintain an 1.5 inch height of cut. Rotary mowers were occasionally used to remove stems. Based on soil test results, tests were limed as needed to maintain a pH of 6.0 to 6.5.

All tests were rated throughout the growing season for visual turf quality (i.e., attractive appearance, turf color, uniformity, density, clean

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mowing, reduced rate of vertical growth, leaf texture, spring green-up, and insect and disease damage). The 1994 North Brunswick trial was specifically rated for spring green-up, color, and wear tolerance (Table 1). The 1996 Adelphia test was also evaluated for dollar spot disease (Table 3), and the 1997 test was evaluated for establishment, winter yellowing, steminess, leaf spot disease, and crown rust (Table 4). All ratings were based on a 1 to 9 scale, with 9 representing the best turf characteristic. Plots were evaluated by a number of turfgrass specialists to reduce the impact of personal bias for particular characteristics. All data were summarized and subjected to an analysis of variance. Means were separated using the least significant difference (LSD) multiple comparisons test.

RESULTS AND DISCUSSION

Results for all tests are presented in Tables 1 through 4. Entries in these tables are ranked according to their overall (multi-year) quality average. A high quality average is generally indicative of a darker green color, greater density, finer leaf texture, lower growth habit, better mowing quality, better wear tolerance, and less insect or disease damage. Additional characteristics were evaluated separately on some tests when differences between entries were apparent.

Establishment

Perennial ryegrass is popular in many parts of the world because it rapidly establishes a turf with an attractive, leafy appearance. Seedling vigor can be affected by factors such as genetics, seed quality, the environment, after ripening dormancy, and management procedures. From the September 1997 establishment rating (Table 4), it is evident that most of the entries in this table were well established one month after seeding. EDR, Paragon, and Solitaire were among the best establishing cultivars in the test.

Spring Green-up

The data presented in Table 1 indicated that many of the better quality turf type perennial ryegrasses were later to green-up as compared to the cultivars with moderate turf performance. This is apparent in varieties such as Brightstar II, Prelude III, Palmer III, and Repel III. All of these entries had above average turf quality; they were, however, among the slowest entries to come out of winter dormancy. A color rating (Table 1) in May 1998 indicated that the same varieties were actively growing and possessed some of the darkest green color.

Disease

Evaluations were made on the turf plots when diseases were most active. A dollar spot rating from the 1996 Adelphia test (Table 3) indicates that few cultivars had exceptional resistance to the disease. Experimentals such as BAR Lp 695-1 and BAR Lp 695-2 were moderately resistant to the disease, and cultivars such as Brightstar, Exacta, and Prizm exhibited fair to moderate resistance.

A difference in tolerance to summer leaf spot disease was very evident in Table 4. Solitaire, a newer perennial ryegrass variety, was the only cultivar presented in this table that showed good resistance to summer leaf spot. Cultivars and experimentals such as EDR, Paragon, and Sev II A were moderately susceptible, and varieties such as Accent, Catalina, and Wind Dancer were very susceptible to this disease.

Ascochyta leaf blight is a foliar disease that is common among many of the turfgrasses. This disease can occur throughout the year, especially from late winter to early spring and during mid-summer months when conditions are optimal for the disease. A winter yellowing rating (Table 4) suggests that experimentals and varieties such as Paragon, SJSPR, and Solitaire exhibited good resistance to the disease as compared to varieties such as Caliente, Nui, and Pennfine.

Wear Tolerance

The 1994 North Brunswick test was subjected to artificial wear during the 1998 growing season (Table 1). Plots were worn 69 times throughout the growing season using a walk-behind traffic simulator developed at Rutgers

University (Meyer et al., 1997). Many differences were evident in the wear tolerance level of various cultivars. Varieties such as Brightstar II, Catalina, and Panther showed better wear tolerance as compared to older varieties such as Linn and Pennfine.

SUMMARY

Although perennial ryegrasses have been significantly improved through breeding efforts, genetically stable resistance to gray leaf spot, crown rust, dollar spot, pink patch, red thread, and brown patch are needed. In addition, improved heat and cold hardiness and the ability to survive under ice sheets for extended periods are also necessary to achieve a more attractive, dependable turf stand.

ACKNOWLEDGMENTS

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Meyer, W. A., Murphy, J. A., and Smith, D. A., 1997. Response of cool-season turfgrasses to a novel traffic simulator. Page 125 *in* Agronomy Abstracts, American Society of Agronomy, Madison, Wisconsin.

Table 1. Performance of perennial ryegrass cultivars and selections in a turf trial established in September 1994 at North Brunswick, NJ. (Includes 1994 National Perennial Ryegrass Test-NTEP.)

		Turf Quality[1]					Spring		Worn Green Cover	Worn	Worn	Worn
	Cultivar or Selection	1995-1998 Avg.	1995 Avg.	1996 Avg.	1997 Avg.	1998 Avg.	Green-up[2] April 1998	Color[3] May 1998	(%) July 1998	Quality[4] July 1998	Quality[4] Sept. 1998	Quality[4] 1998 Avg.
1	Brightstar II	6.6	7.0	6.7	6.3	6.3	2.3	8.0	63.3	5.3	4.3	4.8
2	Panther	6.4	6.5	6.3	6.6	6.1	5.0	6.0	63.3	6.0	4.7	5.3
3	Palmer III	6.4	7.0	6.2	6.1	6.1	4.3	6.7	48.3	5.0	5.0	5.0
4	Calypso II	6.2	6.8	6.3	6.2	5.6	5.0	5.7	41.7	4.3	4.3	4.3
5	Premier II	6.2	6.4	6.4	6.1	5.9	5.0	6.7	36.7	4.7	3.0	3.8
6	Catalina	6.1	6.4	6.2	6.1	5.7	4.0	6.0	61.7	6.3	4.7	5.5
7	Prelude III	6.1	6.4	6.1	6.1	5.7	3.7	8.0	48.3	5.3	4.0	4.7
8	Secretariat	6.1	6.8	5.9	5.8	5.7	4.7	6.0	43.3	4.0	4.0	4.0
9	Monterey	6.0	6.7	5.9	5.9	5.5	5.7	5.7	55.0	5.7	5.0	5.3
10	Repel III	6.0	6.3	5.9	6.1	5.6	3.3	8.0	41.7	4.0	3.3	3.7
11	LRF-94-C8	6.0	6.5	6.0	5.8	5.5	3.0	8.0	46.7	5.3	4.7	5.0
12	Line Drive	5.9	6.4	5.9	6.0	5.4	3.7	7.3	33.3	4.7	2.7	3.7
13	Manhattan 3	5.9	6.3	5.7	6.0	5.7	5.0	6.7	55.0	5.3	5.0	5.2
14	Pennant II	5.9	6.4	5.7	5.7	5.8	4.0	7.0	40.0	4.0	4.3	4.2
15	Chaparral	5.8	6.4	5.7	5.9	5.3	4.7	7.7	37.3	4.0	3.3	3.7
16	Citation III	5.8	6.3	5.9	5.6	5.4	4.3	7.0	40.0	4.0	3.7	3.8
17	Laredo	5.8	6.0	6.1	5.9	5.0	5.0	6.0	26.7	2.7	2.3	2.5
18	Divine	5.8	6.2	6.2	5.2	5.4	4.7	6.3	41.7	4.7	3.7	4.2
19	Sunshine	5.7	6.2	5.6	5.3	5.6	4.0	7.0	45.0	5.0	5.3	5.2
20	Esquire	5.7	5.8	5.7	5.7	5.5	5.7	6.7	63.3	5.0	4.3	4.7

(Continued)

Table 1 (continued).

	Cultivar or Selection	Turf Quality[1] 1995-1998 Avg.	Turf Quality[1] 1995 Avg.	Turf Quality[1] 1996 Avg.	Turf Quality[1] 1997 Avg.	Turf Quality[1] 1998 Avg.	Spring Green-up[2] April 1998	Color[3] May 1998	Worn Green Cover (%) July 1998	Worn Quality[4] July 1998	Worn Quality[4] Sept. 1998	Worn Quality[4] 1998 Avg.
21	Caddieshack	5.7	6.2	5.7	5.6	5.1	4.3	6.3	55.0	4.3	3.7	4.0
22	Majesty	5.6	6.0	5.8	5.6	5.2	4.0	6.3	45.0	6.3	3.3	4.8
23	MB 45	5.6	5.9	5.6	5.3	5.6	3.3	7.3	33.3	4.0	2.7	3.3
24	Prizm	5.6	6.1	5.9	5.0	5.3	5.0	5.0	56.0	5.7	4.3	5.0
25	Winddancer	5.5	5.9	5.4	5.6	5.2	3.0	7.7	35.0	4.3	3.0	3.7
26	WX3-93	5.5	6.2	5.0	5.7	5.1	3.7	7.0	40.0	3.7	3.3	3.5
27	Omega 3	5.5	6.0	5.6	4.8	5.6	5.7	5.3	43.3	4.3	4.0	4.2
28	MB 44	5.5	5.7	5.4	5.3	5.4	2.7	8.7	34.3	4.3	3.0	3.7
29	Accent	5.5	6.1	5.8	5.1	4.8	4.7	6.0	43.3	4.0	3.3	3.7
30	Omni	5.4	5.9	5.2	5.2	5.5	3.7	5.7	48.3	5.7	4.0	4.8
31	Wind Star	5.4	5.9	5.4	5.2	5.2	5.7	5.0	60.0	5.3	5.0	5.2
32	APR 124	5.4	5.6	5.5	5.4	4.9	5.7	5.0	44.3	3.7	3.7	3.7
33	Derby Supreme	5.4	6.2	5.2	5.2	4.7	5.3	5.0	56.7	5.7	4.3	5.0
34	Top Gun	5.3	5.7	5.5	5.1	5.1	5.7	5.0	61.7	5.7	4.0	4.8
35	Imagine	5.3	5.8	4.9	5.2	5.2	2.0	7.7	36.7	4.0	3.7	3.8
36	Top Hat	5.3	5.9	5.7	5.1	4.4	4.3	5.0	45.3	5.0	3.0	4.0
37	Elf	5.3	6.1	5.6	5.0	4.5	5.0	5.7	31.7	3.0	3.0	3.0
38	Mardi Gras	5.3	5.9	5.4	4.7	5.0	4.3	5.7	41.7	4.7	4.0	4.3
39	Sonata	5.2	6.3	4.8	5.1	4.8	4.0	4.7	33.3	3.7	3.0	3.3
40	Brightstar	5.2	6.1	4.9	5.2	4.8	3.3	6.3	35.0	3.3	2.7	3.0

(Continued)

Table 1 (continued).

	Cultivar or Selection	Turf Quality[1] 1995-1998 Avg.	Turf Quality[1] 1995 Avg.	Turf Quality[1] 1996 Avg.	Turf Quality[1] 1997 Avg.	Turf Quality[1] 1998 Avg.	Spring Green-up[2] April 1998	Color[3] May 1998	Worn Green Cover (%) July 1998	Worn Quality[4] July 1998	Worn Quality[4] Sept. 1998	Worn Quality[4] 1998 Avg.
41	Night Hawk	5.2	5.7	5.5	5.0	4.6	4.7	6.0	38.3	4.0	4.0	4.0
42	Edge	5.2	5.3	5.3	5.3	4.9	5.7	4.7	48.3	5.0	4.7	4.8
43	Yorktown III	5.2	5.5	5.1	5.4	4.8	5.3	4.3	36.7	4.7	3.0	3.8
44	Advantage	5.2	5.7	5.3	5.0	4.8	4.0	6.0	30.0	3.7	2.7	3.2
45	SR 4200	5.2	5.3	5.2	5.1	5.1	5.7	5.0	56.7	5.7	4.7	5.2
46	Palmer II	5.2	5.9	5.0	5.0	4.8	3.7	6.0	33.3	4.7	2.7	3.7
47	Head Start	5.2	5.8	5.1	5.3	4.5	3.7	6.0	35.0	4.0	2.3	3.2
48	Pennant	5.2	5.8	5.4	4.8	4.5	5.0	5.0	42.7	5.0	3.3	4.2
49	Precision	5.1	5.7	5.6	5.0	4.3	6.0	4.0	58.3	4.7	3.7	4.2
50	Legacy II	5.1	5.5	4.7	5.5	4.8	4.0	6.0	26.7	4.0	3.0	3.5
51	Roadrunner	5.1	5.1	4.8	5.3	5.3	4.7	6.3	50.0	5.0	4.0	4.5
52	Wizard	5.1	5.2	5.4	5.1	4.8	4.0	5.0	38.3	4.0	2.7	3.3
53	Riviera II	5.1	5.4	5.2	5.0	4.7	5.7	5.3	51.7	5.7	4.3	5.0
54	Blackhawk	5.1	5.4	5.0	4.9	5.1	6.0	4.0	65.0	6.0	5.3	5.7
55	Stardance	5.1	5.5	5.3	4.7	4.8	4.0	5.0	36.7	4.0	2.7	3.3
56	Koos 93-6	5.1	5.4	4.8	5.0	5.0	6.0	4.0	40.0	4.3	3.7	4.0
57	Blazer III	5.0	5.5	4.8	4.8	5.1	4.3	5.3	34.3	4.0	3.0	3.5
58	Passport	5.0	5.3	4.9	5.0	4.9	4.3	5.3	43.3	5.0	3.0	4.0
59	Saturn II	5.0	5.5	5.2	4.7	4.7	5.0	4.0	50.0	4.3	3.7	4.0
60	MVF-4-1	5.0	5.4	4.8	5.1	4.7	5.7	4.7	46.7	5.3	4.0	4.7

(Continued)

Table 1 (continued).

	Cultivar or Selection	Turf Quality[1] 1995-1998 Avg.	Turf Quality[1] 1995 Avg.	Turf Quality[1] 1996 Avg.	Turf Quality[1] 1997 Avg.	Turf Quality[1] 1998 Avg.	Spring Green-up[2] April 1998	Color[3] May 1998	Worn Green Cover (%) July 1998	Worn Quality[4] July 1998	Worn Quality[4] Sept. 1998	Worn Quality[4] 1998 Avg.
61	Achiever	5.0	5.3	5.2	5.0	4.6	5.3	5.0	45.0	3.7	4.3	4.0
62	Prelude II	5.0	5.4	4.8	5.3	4.5	5.0	4.7	44.3	5.7	3.0	4.3
63	Competitor	5.0	5.6	4.8	5.1	4.6	4.0	5.7	41.7	5.3	3.3	4.3
64	Excel	5.0	5.3	5.4	4.8	4.4	3.7	7.0	35.0	4.7	2.3	3.5
65	Stallion Supreme	5.0	5.6	5.1	5.1	4.1	3.7	4.3	48.3	4.3	4.3	4.3
66	Vivid	5.0	5.5	5.0	4.7	4.7	5.0	6.0	65.0	5.7	4.3	5.0
67	Nine-O-One	4.9	5.3	4.8	5.1	4.6	4.0	5.0	35.0	4.0	2.0	3.0
68	WX3-91	4.9	5.2	4.8	5.2	4.5	5.3	5.0	50.0	4.7	4.3	4.5
69	Cutter	4.9	5.5	4.8	5.1	4.2	5.0	5.0	43.3	3.3	3.3	3.3
70	PST-2CB	4.9	5.7	4.6	4.5	4.8	4.7	5.0	35.0	4.0	3.0	3.5
71	Stallion Select	4.9	5.1	5.3	4.7	4.5	5.3	4.7	51.7	5.3	3.7	4.5
72	Assure	4.9	5.5	4.9	4.8	4.3	5.0	4.3	51.7	5.3	4.0	4.7
73	CAS-LP23	4.9	5.4	4.7	4.7	4.6	2.7	5.7	55.0	5.7	3.7	4.7
74	Spell Bound	4.8	5.3	5.3	4.5	4.2	5.0	5.3	58.3	4.3	3.7	4.0
75	Quickstart	4.8	5.3	5.2	4.4	4.3	5.0	4.3	26.7	4.0	3.0	3.5
76	Morning Star	4.8	4.9	4.9	4.9	4.5	5.7	4.3	45.0	5.0	3.7	4.3
77	SRX 4/JBPR	4.8	5.4	4.7	4.8	4.3	4.0	6.7	48.3	4.7	2.7	3.7
78	PS-D-9	4.8	4.9	4.9	4.7	4.6	5.0	4.3	48.3	5.0	3.3	4.2
79	Advent	4.8	5.4	4.5	4.6	4.6	7.7	3.3	42.7	5.0	4.3	4.7
80	Repell II	4.8	5.4	4.9	4.7	4.0	5.0	5.0	31.7	4.0	2.0	3.0

(Continued)

Table 1 (continued).

	Cultivar or Selection	Turf Quality[1] 1995-1998 Avg.	Turf Quality[1] 1995 Avg.	Turf Quality[1] 1996 Avg.	Turf Quality[1] 1997 Avg.	Turf Quality[1] 1998 Avg.	Spring Green-up[2] April 1998	Color[3] May 1998	Worn Green Cover (%) July 1998	Worn Quality[4] July 1998	Worn Quality[4] Sept. 1998	Worn Quality[4] 1998 Avg.
81	R2	4.7	4.9	4.8	4.7	4.5	6.0	4.7	53.3	5.7	4.3	5.0
82	Protocol	4.7	5.0	4.9	4.6	4.3	5.7	4.7	40.0	5.0	3.7	4.3
83	SR 4010	4.7	5.2	4.8	4.4	4.3	5.7	4.0	41.7	4.3	4.3	4.3
84	Navajo	4.7	5.4	4.6	4.6	4.1	3.7	4.0	60.0	5.3	3.7	4.5
85	SRX 4/DMSO	4.6	5.3	4.6	4.4	4.3	5.0	3.0	48.3	6.7	4.7	5.7
86	Academy	4.6	5.2	4.7	4.4	4.2	4.7	4.3	40.0	4.7	4.3	4.5
87	SRX 4/CCR	4.6	5.1	4.8	4.0	4.4	4.7	4.3	48.3	5.3	3.3	4.3
88	SR 4400	4.6	5.4	4.2	4.2	4.4	5.3	4.0	36.7	5.0	3.7	4.3
89	ASP400	4.5	4.8	4.9	4.3	4.1	4.7	4.7	41.0	3.7	3.7	3.7
90	BAR Er 5813	4.5	5.2	4.6	3.8	4.4	5.3	4.7	35.0	3.0	3.0	3.0
91	Nobility	4.4	4.9	4.2	4.3	4.2	6.0	4.0	49.3	5.7	4.0	4.8
92	SRX 4320	4.4	4.9	4.3	4.4	4.2	6.0	4.0	45.0	4.7	3.0	3.8
93	WVPB-PR-C-2	4.4	5.1	4.4	4.2	3.9	4.7	4.3	42.7	4.3	3.7	4.0
94	Express	4.4	4.7	4.8	4.1	4.0	6.7	4.0	35.0	3.0	3.3	3.2
95	Pegasus	4.4	4.5	4.8	4.2	4.0	4.7	5.0	60.0	5.7	3.0	4.3
96	APR 131	4.3	5.0	4.6	3.9	3.8	5.0	4.3	40.0	4.7	3.3	4.0
97	Buccaneer II	4.3	4.6	4.1	4.4	4.1	5.7	3.0	55.0	6.3	3.7	5.0
98	Dancer	4.3	5.1	4.6	4.0	3.4	4.7	5.0	45.0	4.3	2.3	3.3
99	Saturn	4.2	4.5	4.4	4.1	3.8	5.7	3.7	51.7	5.3	3.0	4.2
100	Prelude	4.0	4.3	4.3	3.9	3.6	6.7	3.3	41.7	5.3	3.3	4.3

(Continued)

Table 1 (continued).

	Cultivar or Selection	Turf Quality[1] 1995-1998 Avg.	Turf Quality[1] 1995 Avg.	Turf Quality[1] 1996 Avg.	Turf Quality[1] 1997 Avg.	Turf Quality[1] 1998 Avg.	Spring Green-up[2] April 1998	Color[3] May 1998	Worn Green Cover (%) July 1998	Worn Quality[4] July 1998	Worn Quality[4] Sept. 1998	Worn Quality[4] 1998 Avg.
101	SRX 4/CLPVP	4.0	4.4	3.9	3.8	3.8	4.7	4.0	44.3	4.7	3.0	3.8
102	Williamsburg	4.0	4.5	4.2	3.6	3.5	5.7	3.3	38.3	4.7	4.0	4.3
103	Repell	3.9	4.4	4.0	3.7	3.4	5.7	3.0	41.7	5.3	3.0	4.2
104	Manhattan II	3.8	3.9	3.8	3.9	3.8	6.7	3.7	38.3	4.7	3.7	4.2
105	Blazer II	3.8	4.1	4.0	3.6	3.6	5.0	3.7	48.3	4.7	2.3	3.5
106	APR 066	3.8	4.5	3.5	3.5	3.8	5.0	3.3	36.7	3.7	3.0	3.3
107	Fiesta II	3.7	4.1	4.1	3.5	3.1	6.0	3.0	28.3	3.3	2.3	2.8
108	DLP 1305	3.7	4.0	3.6	3.8	3.3	6.3	3.3	38.3	4.0	2.3	3.2
109	Dasher II	3.7	4.2	3.5	3.5	3.3	6.3	3.0	40.0	4.7	2.7	3.7
110	Mulligan	3.4	3.7	3.5	3.4	3.1	6.0	2.7	26.7	4.0	3.0	3.5
111	Figaro	2.9	3.4	2.7	3.1	2.5	6.7	3.0	36.0	4.7	2.0	3.3
112	Pennfine	2.9	3.2	2.6	3.1	2.9	7.7	3.0	53.3	6.3	2.7	4.5
113	DSV NA 9401	2.9	3.4	3.1	2.6	2.4	4.7	3.0	46.0	4.7	2.3	3.5
114	DSV NA 9402	2.9	3.3	3.0	2.8	2.6	6.7	2.7	35.7	4.3	2.7	3.5
115	Linn	1.5	1.7	1.5	1.5	1.2	7.7	2.0	12.7	1.0	1.7	1.3
	LSD at 5% =	0.5	0.7	0.9	0.7	0.8	1.5	1.0	19.5	1.9	1.6	1.5

[1]9 = best turf quality
[2]9 = earliest spring green-up
[3]9 = darkest green color
[4]9 = best turf quality of worn plots

Table 2. Performance of perennial ryegrass cultivars and selections in a turf trial seeded August 1995 at Adelphia, NJ.

		Turf Quality[1]			
	Cultivar or Selection	1996-1998 Avg.	1996 Avg.	1997 Avg.	1998 Avg.
1	Affirmed	6.6	7.0	6.7	6.0
2	Secretariat	6.4	6.6	6.3	6.5
3	Palmer III	5.9	6.9	5.2	5.7
4	C-10	5.6	6.1	5.7	4.9
5	Calypso II	5.6	6.0	5.4	5.5
6	Gator II	5.5	5.8	5.3	5.4
7	Archer	5.4	6.1	5.0	5.1
8	ISI 95 APRX-P	5.3	5.6	5.1	5.1
9	Legacy II	5.2	5.8	5.0	4.9
10	ISI 95 APRX	5.1	5.6	4.8	4.9
11	J-1704	5.1	5.0	5.0	5.4
12	Prizm	5.0	4.7	5.3	5.1
13	Brightstar	5.0	5.2	5.0	4.8
14	Elf	5.0	5.3	4.8	5.0
15	ISI R2B.1xDG	4.9	5.5	4.8	4.4
16	Advantage	4.9	5.3	4.5	4.9
17	Wx4-134	4.8	4.5	4.7	5.1
18	Repell II	4.8	4.9	5.0	4.6
19	LP22	4.7	5.4	4.0	4.6
20	SR 4200	4.7	4.7	4.6	4.9
21	Assure	4.6	4.4	4.6	5.0
22	Pearl	4.6	4.9	4.2	4.7
23	Prelude II	4.6	4.4	4.7	4.7
24	Edge	4.6	4.2	4.7	4.8
25	Advent	4.5	4.0	4.7	4.7
26	Cutter	4.5	4.3	4.6	4.6
27	ER-95	4.4	4.3	4.5	4.5
28	CAS-LP23	4.4	5.2	3.9	4.2
29	Top Hat	4.3	3.5	4.6	4.8
30	Seville	4.3	3.9	4.4	4.7

(Continued)

Table 2 (continued).

	Cultivar or Selection	Turf Quality[1] 1996-1998 Avg.	1996 Avg.	1997 Avg.	1998 Avg.
31	Chatham	4.3	3.7	4.6	4.4
32	MP26	4.1	4.0	3.9	4.3
33	Blazer II	4.1	4.1	4.0	4.3
34	Fiesta II	4.0	4.0	3.9	4.1
35	Yorktown III	4.0	3.8	4.0	4.3
36	Dasher II	4.0	3.5	4.3	4.4
37	Lowgrow	3.9	3.5	4.2	4.0
38	JD PR-7	3.8	3.4	4.0	4.1
39	Gettysburg	3.7	3.1	3.9	4.2
40	Edge	3.7	3.5	3.7	4.0
41	Pennfine	3.0	2.2	3.3	3.5
42	Duet	2.8	2.3	2.8	3.4
43	Linn	1.3	1.2	1.5	1.2
	LSD at 5% =	0.5	0.7	0.7	0.7

[1]9=best turf quality

Table 3. Performance of perennial ryegrass cultivars and selections in a turf trial seeded August 1996 at Adelphia, NJ.

	Cultivar or Selection	Turf Quality[1] 1997-1998 Avg.	Turf Quality[1] 1997 Avg.	Turf Quality[1] 1998 Avg.	Dollar Spot[2] 1998 Avg.
1	Paragon	6.3	6.5	6.1	5.3
2	Churchill	6.1	6.3	5.9	5.8
3	BAR Lp 695-1	6.0	6.3	5.6	6.3
4	BAR Lp 94-1	5.7	6.2	5.2	5.7
5	Exacta	5.7	5.9	5.5	4.8
6	Palmer III	5.4	5.8	5.0	5.7
7	Gator II	5.4	5.5	5.3	5.3
8	Calypso II	4.9	5.4	4.3	5.5
9	ISI PR-37	4.9	5.1	4.8	5.2
10	Manhattan 3	4.8	4.7	4.8	5.7
11	Secretariat	4.7	5.0	4.4	5.0
12	BAR Lp 695-2	4.7	4.8	4.6	6.2
13	Catalina	4.7	5.1	4.2	4.3
14	Palmer II	4.5	4.5	4.5	5.3
15	Brightstar	4.5	4.4	4.7	4.0
16	Advantage	4.4	4.5	4.2	5.0
17	Prizm	4.3	4.2	4.4	4.7
18	Saturn II	4.3	4.4	4.2	5.0
19	Citation III	4.3	4.6	4.0	5.2
20	APM	4.2	4.2	4.1	5.5
21	ISI PR-38	4.2	4.2	4.2	5.7
22	Seville	4.0	3.9	4.1	5.3
23	Elf	4.0	4.2	3.8	4.5
24	Windstar	4.0	4.1	3.9	5.0
25	Advent	3.9	3.8	4.0	4.3
26	Prelude II	3.9	4.0	3.7	4.8
27	Equal	3.9	4.2	3.6	4.2
28	SR 4200	3.9	3.9	3.9	4.3
29	Quickstart	3.9	4.0	3.7	5.2
30	Mark V	3.8	4.2	3.4	3.0

(Continued)

Table 3 (continued).

	Cultivar or Selection	Turf Quality[1] 1997-1998 Avg.	Turf Quality[1] 1997 Avg.	Turf Quality[1] 1998 Avg.	Dollar Spot[2] 1998 Avg.
31	Express	3.5	3.5	3.5	5.3
32	Dandy	3.5	3.7	3.3	4.8
33	Manhattan II	3.5	3.5	3.5	5.0
34	Blazer II	3.4	3.3	3.4	5.5
35	Fiesta II	3.1	3.2	2.9	4.2
36	Pennfine	2.4	2.4	2.3	5.0
37	Linn	1.1	1.1	1.1	6.8
	LSD at 5% =	0.5	0.7	0.6	1.5

[1]9=best turf quality
[2]9=least disease

Table 4. Performance of perennial ryegrass cultivars and selections in a turf trial seeded August 1997 at Adelphia, NJ.

	Cultivar or Selection	Turf Quality[1] 1998 Avg.	Establishment[2] Sept. 1997	Winter Yellow[3] Feb. 1998	Steminess[4] June 1998	Summer Leaf Spot[5] Aug. 1998	Crown Rust[5] Oct. 1998
1	SJSPR	6.7	7.3	7.3	4.7	4.7	7.7
2	Solataire	6.5	7.7	7.0	5.0	7.0	7.7
3	Sev II A	6.4	6.3	6.3	5.3	5.7	7.0
4	Paragon	6.3	7.7	7.7	5.3	5.0	6.0
5	2LA-97	6.1	6.7	4.7	5.7	5.0	7.0
6	A96 E-	6.1	7.3	6.3	5.0	5.3	5.7
7	2L96 Bulk	6.1	6.7	4.7	7.3	5.3	6.7
8	Brightstar II	6.1	6.0	7.0	5.3	4.0	6.7
9	Sev II B	6.1	6.7	5.7	4.7	5.7	7.7
10	Sev II C	6.1	7.0	6.0	5.0	5.7	7.3
11	A96 E+	6.0	7.3	6.3	4.7	4.7	5.7
12	EDR	6.0	8.3	7.0	4.3	5.7	6.3
13	MB-48	5.4	6.7	5.7	6.3	3.3	3.7
14	Affirmed	5.4	6.7	5.7	5.0	4.7	5.0
15	EL-2	5.2	4.3	5.0	4.0	4.7	4.7
16	Wind Dancer	5.0	6.7	5.7	6.0	3.3	3.7
17	Catalina	4.8	7.0	4.0	5.7	3.0	5.7
18	Syn 2LTS	4.8	6.3	4.3	5.3	4.0	4.0
19	Syn 2NA-97	4.7	6.3	4.3	4.7	4.7	3.7
20	2PS-97	4.7	6.3	2.7	4.7	5.3	5.0
21	2KS	4.6	7.0	3.0	1.7	5.0	4.7
22	Roadrunner	4.6	6.0	3.3	1.7	4.7	4.0
23	2LC Bulk	4.6	6.0	2.3	4.7	4.7	5.3
24	Laredo	4.4	7.3	2.7	5.3	4.3	4.3
25	Monterey	4.4	7.0	3.3	5.7	5.0	4.7
26	A+ 96	4.4	6.7	2.7	5.7	3.0	3.7
27	Brightstar	4.3	6.3	4.0	6.7	5.0	3.0
28	Saturn II	4.3	5.7	2.7	3.7	5.0	5.3
29	Omega 3	4.3	7.0	2.7	5.7	5.3	5.3
30	Charger II	4.3	5.7	3.0	3.3	4.7	5.7

(Continued)

Table 4 (continued).

	Cultivar or Selection	Turf Quality[1] 1998 Avg.	Establish-ment[2] Sept. 1997	Winter Yellow[3] Feb. 1998	Steminess[4] June 1998	Summer Leaf Spot[5] Aug. 1998	Crown Rust[5] Oct. 1998
31	2PS	4.3	7.0	2.0	5.0	4.7	5.0
32	Caddieshack	4.2	7.7	2.7	5.3	5.3	3.3
33	Manhattan 3	4.1	7.0	2.7	5.0	5.0	4.0
34	Legacy II	4.1	6.7	4.7	5.3	3.7	2.3
35	Chaparral	4.0	6.0	3.3	6.3	3.7	3.3
36	Windstar	4.0	7.3	2.3	5.3	5.0	4.3
37	Penguin	4.0	7.3	4.0	5.3	4.3	2.3
38	Top Gun	4.0	7.0	3.0	5.3	5.0	3.3
39	Esquire	4.0	7.0	2.7	6.0	4.7	2.7
40	Goal Keeper	3.9	6.3	2.7	5.7	4.3	4.0
41	Target	3.8	6.7	2.0	5.0	3.7	3.7
42	Affinity	3.7	7.2	1.9	4.7	4.9	4.5
43	Citation III	3.7	6.0	4.3	3.7	3.7	2.7
44	APM	3.7	7.3	2.7	5.0	5.0	4.0
45	Windstar	3.6	6.3	2.7	4.3	4.0	3.7
46	Stardance	3.6	6.7	2.7	4.0	3.0	3.3
47	Cutter	3.6	6.7	1.3	3.7	4.0	4.3
48	Blackhawk	3.6	7.3	2.0	4.7	5.0	3.3
49	Omni	3.6	8.0	1.7	5.3	5.0	2.7
50	Advent	3.6	7.0	2.0	4.3	4.0	3.0
51	Assure	3.6	7.0	2.3	5.0	3.7	3.0
52	Cathedral	3.6	6.3	1.7	4.0	4.3	4.0
53	Morning Star	3.5	6.7	3.7	4.0	3.7	2.7
54	Seville	3.5	6.7	2.0	4.7	4.0	2.7
55	Cathedral II	3.5	6.3	1.7	5.3	4.0	3.0
56	Fiesta II	3.4	7.3	2.0	3.7	4.0	3.0
57	Evening Shade	3.4	6.7	2.7	4.0	4.0	3.7
58	Dandy	3.4	6.0	3.0	4.0	4.7	2.7
59	Shining Star	3.3	6.7	3.0	4.0	3.7	4.0
60	Line Drive	3.3	7.0	1.3	4.0	4.0	3.7

(Continued)

Table 4 (continued).

	Cultivar or Selection	Turf Quality[1] 1998 Avg.	Establish-ment[2] Sept. 1997	Winter Yellow[3] Feb. 1998	Steminess[4] June 1998	Summer Leaf Spot[5] Aug. 1998	Crown Rust[5] Oct. 1998
61	Accent	3.1	6.3	1.3	4.0	3.3	3.0
62	Express	3.0	7.0	2.0	3.3	4.3	3.0
63	Mulligan	2.7	6.7	2.0	3.7	4.0	2.0
64	Caliente	2.5	6.3	1.0	3.3	3.7	1.3
65	Pennfine	2.3	5.7	1.7	3.3	3.7	2.0
66	Nui	1.1	5.7	1.3	2.3	3.0	8.0
	LSD at 5% =	0.6	0.9	1.3	1.1	1.5	1.6

[1]9 = best turf quality
[2]9 = best turf establishment
[3]9 = least yellowing
[4]9 = least amount of stems
[5]9 = least disease

Table 5. Yearly nitrogen (N) applied and mowing height (Ht) on perennial ryegrass tests established at North Brunswick and Adelphia, NJ.

	1995		1996		1997		1998	
	N[1]	Ht[2]	N	Ht	N	Ht	N	Ht
Table 1 (1994 North Brunswick)	5.9	1.5	4.3	1.5	3.6	1.5	3.8	1.5
Table 2 (1995 Adelphia)			5.0	1.5	3.8	1.5	3.6	1.5
Table 3 (1996 Adelphia)					4.3	1.5	4.1	1.5
Table 4 (1997 Adelphia)							4.6	1.5

[1]Annual N applied (lbs/1000 ft^2).
[2]Mowing height in inches.