

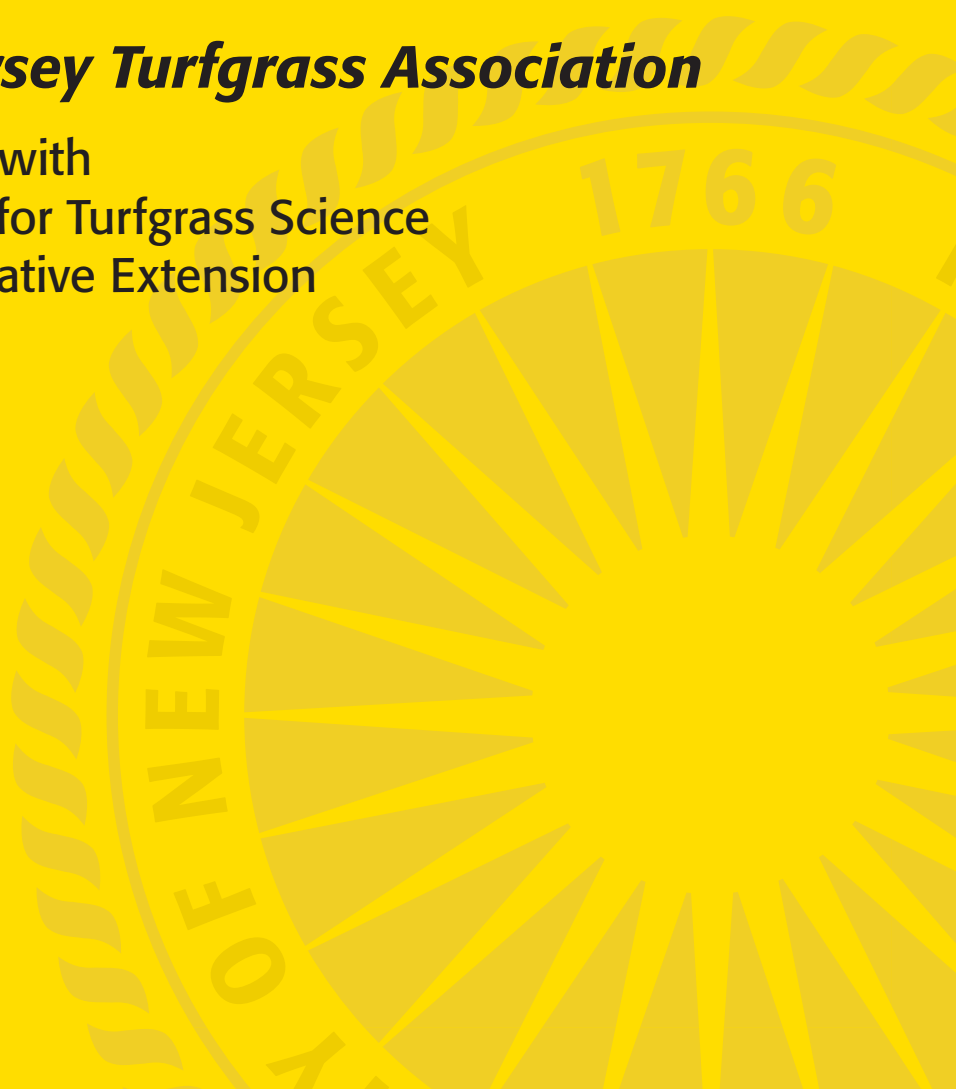
# RUTGERS

New Jersey Agricultural  
Experiment Station

## **2006 Turfgrass Proceedings**

***The New Jersey Turfgrass Association***

In Cooperation with  
Rutgers Center for Turfgrass Science  
Rutgers Cooperative Extension



# **2006 RUTGERS TURFGRASS PROCEEDINGS**

**of the**

## **New Jersey Turfgrass Expo December 5-7, 2006 Trump Taj Mahal Atlantic City, New Jersey**

The Rutgers Turfgrass Proceedings is published yearly by the Rutgers Center for Turfgrass Science, Rutgers Cooperative Extension, and the New Jersey Agricultural Experiment Station, School of Environmental and Biological Sciences, Rutgers, The State University of New Jersey 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.

This publication includes lecture notes of papers presented at the 2006 New Jersey Turfgrass Expo. Publication of these lectures provides a readily avail-

able source of information covering a wide range of topics and includes technical and popular presentations of importance to the turfgrass industry.

This proceedings also includes research papers that contain original research findings and reviews of selected subjects in turfgrass science. These papers are presented primarily 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 Barbara Fitzgerald and Marlene Karasik for administrative and secretarial support.

Dr. Ann Brooks Gould, Editor  
Dr. Bruce B. Clarke, Coordinator

# 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 that has become increasingly popular among homeowners, sports turf managers, and golf course superintendents. Perennial ryegrass is a vigorous, bunch type grass best known for its ability to rapidly establish an attractive turf stand within a short time of seeding. Perennial Ryegrass performs well in a wide variety of soil conditions and while it will tolerate partial shade, prefers to be planted in full sun. It is often found in mixtures with slower germinating grasses such as Kentucky bluegrass and the fine fescues to help prevent soil erosion during lawn establishment. Perennial ryegrass is also often used in the southern United States for overseeding winter dormant lawns. The development of improved perennial ryegrass cultivars continues at the New Jersey Agricultural Experiment Station as well as other research facilities.

Turfgrass breeders and researchers are continuing to research the beneficial role of endophytes in turfgrasses. Endophytes are naturally occurring fungi that live within the leaf, sheath, and stem tissue of certain grasses. The endophytes are transmitted to succeeding generations of plants by seed. The presence of a *Neotyphodium lolii* endophyte has enhanced insect resistance and stress tolerance in many perennial ryegrasses. International collection trips are being made in an effort to acquire new sources of germplasm containing the endophyte.

## PROCEDURES

Four perennial ryegrass trials were established between 2004 and 2005. Three of the tests were seeded at the Rutgers Plant Biology and Pathology Research and Extension Farm in Adelphia, NJ (Tables 1, 3, and 4) and one test was seeded at the

Rutgers Horticultural Research Farm II in North Brunswick, NJ (Table 2). 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<sup>2</sup>). 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<sup>2</sup>). All tests were arranged in a randomized complete block design with three replications, and plots had a six-inch unseeded border to limit contamination.

A spring application of Dimension was used for pre-emergence control of summer annuals on all tests. The North Brunswick test also received a spring application of Super Trimec for post-emergence control of broadleaf weeds. All tests represented in Tables 1 through 4 were treated in June with an application of Merit for grub control. The North Brunswick test also received a July application of Turflon and Lontrel for broadleaf weed control. In the trials represented in Tables 1, 3, and 4, the postemergence herbicides 2, 4-D, Banvel, and MCPP were applied in November for broadleaf weed control.

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

All tests were rated throughout the growing season for visual turf quality (i.e., overall appearance,

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turf color, uniformity, density, mowing quality, reduced rate of vertical growth, leaf texture, and damage due to insects and diseases). Other ratings such as establishment, spring green-up, color, density, leaf texture, and disease damage were rated when significant differences were evident. All ratings were based on a 1 to 9 scale, where 9 represents 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 Fisher's protected least significant difference (LSD) mean separation test.

## RESULTS AND DISCUSSION

Results for all tests are presented in Tables 1 through 4. Entries in Tables 1 to 3 are ranked according to their overall (multi-year) quality average. Entries in Table 4 are ranked by the turf quality average in 2006. A high quality average is generally indicative of better disease resistance, a darker green color, greater density and uniformity, finer leaf texture, lower growth habit, improved mowing quality, and less damage from insects. Tables 1 and 2 include entries of the 2004 National Perennial Ryegrass Test sponsored by the National Turfgrass Evaluation Program (NTEP).

### Turf Quality

Considerable improvements have been made in the overall quality of turf type perennial ryegrasses during the last 40 years. Newer varieties such as All\*Star 3, Exacta II GLSR, and Paragon GLR as well as many promising experimentals are darker green, more uniform in appearance, are denser with a lower growth habit, and exhibit cleaner mowing and better tolerance to diseases and insects (Tables 1 to 4).

### Establishment

Perennial ryegrass is the most widely used grass in home lawns, parks, golf courses, and athletic fields because of its ability to establish an attractive turf stand within 7 to 10 days. Rapid establishment helps to suppress weeds and prevent soil erosion. An early October establishment rating in Table 4 indicates that most cultivars and selections were well established within 2 months of seeding. Seedling establishment and vigor can be affected by factors such as genetics, seed quality and storage, environmental conditions, after ripening dormancy, and management procedures.

### Disease

Many of the newly developed perennial ryegrasses differ significantly in disease resistance and recovery. New Jersey provides excellent environmental conditions for the development of diseases such as gray leaf spot (caused by *Pyricularia grisea*), red thread (caused by *Laetisaria fuciformis*), dollar spot (caused by *Sclerotinia homoeocarpa*), brown patch (caused by *Rhizoctonia solani*), and certain strains of rusts that attack perennial ryegrass as well as many other turf species.

The development of improved resistance to gray leaf spot steadily continues at the New Jersey Agricultural Experiment Station. Gray leaf spot can be a devastating disease on newly established turf stands of perennial ryegrass. The disease is favored when several hours of leaf wetness and/or high humidity as well as temperatures above 68 °F are maintained. Gray leaf spot begins as small, gray to brown leaf lesions that progress into dark gray-brown or light brown oblong lesions. Diseased leaves often appear off-color and wilted, after which irregularly-shaped patches appear. In August 2005, a perennial ryegrass test was established at Adelphia, NJ (Table 4) and maintained to encourage a gray leaf spot epidemic, which occurred on this test. Compared to older cultivars, many experimentals as well as the newer varieties released to the market had excellent resistance to the disease. This test is significant given the damaging impact gray leaf spot can have on turf-type perennial ryegrass.

## SUMMARY

Turf type perennial ryegrass is one of the most versatile grasses available. Its high traffic tolerance, rapid establishment, and deep green color are raising the demand for perennial ryegrass in the turf grass seed industry. Although considerable improvements have been made to perennial ryegrasses, an increase in genetically stable resistance to gray leaf spot, crown rust, dollar spot, pink patch, red thread, and brown patch is still needed. In addition, increased heat and drought tolerance, cold hardiness, and the ability to survive under ice sheets for extended periods are also necessary.

## ACKNOWLEDGMENTS

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New Agricultural Experiment Station, State and Hatch Act funds, Rutgers Center for Turfgrass Science, other grants and gifts from the United States Golf Association. Additional support was received by the New Jersey Turfgrass Association, the New Jersey Turfgrass Foundation and the National Turfgrass Evaluation Program.

Table 1. Performance of perennial ryegrass cultivars and selections in a turf trial established in August 2004 at Adelphia, NJ. (Includes all entries of the 2004 National Perennial Ryegrass Test sponsored by NTEP.)

	Cultivar or Selection	-----Turf Quality <sup>1</sup> -----			Color <sup>2</sup> 2006 Avg.
		2005- 2006 Avg.	2005 Avg.	2006 Avg.	
1	GL4 Comp	6.9	7.3	6.5	6.0
2	All*Star 3	6.9	7.1	6.7	6.3
3	Exacta II GLSR	6.8	7.1	6.5	6.0
4	D04-11T	6.7	7.0	6.5	6.0
5	Derby Xtreme	6.6	6.5	6.8	6.3
6	Fiesta 4	6.6	7.0	6.2	6.7
7	Revenge GLX	6.5	6.6	6.5	6.3
8	Dasher 3	6.5	6.3	6.6	6.0
9	Stellar GL	6.5	6.5	6.4	7.7
10	SR 4600	6.4	6.9	6.0	6.0
11	DP1	6.4	6.7	6.1	6.0
12	LCK	6.4	6.3	6.5	5.7
13	Palmer V	6.4	6.3	6.5	5.7
14	Kokomo II	6.3	6.4	6.2	6.7
15	GL1 Comp	6.3	6.9	5.6	5.0
16	Regal 5	6.3	6.5	6.0	6.3
17	Attribute	6.2	6.7	5.8	6.3
18	Amazing GS	6.2	6.5	5.9	6.7
19	Palace	6.2	6.3	6.1	7.0
20	Homerun	6.1	6.4	5.9	5.3
21	Palmer GLS	6.1	6.2	6.0	5.3
22	GL3 Comp	6.1	6.1	6.0	6.7
23	Protégé GLR	6.1	5.9	6.2	6.3
24	Fusion	6.1	6.0	6.1	6.7
25	Notable	6.1	6.6	5.5	5.3
26	Panther GLS	6.1	6.6	5.5	5.3
27	Palmer IV	6.1	5.9	6.2	6.7
28	Paragon GLR	6.0	6.4	5.6	5.3
29	1G Squared	6.0	6.7	5.2	5.7
30	MMW	5.9	6.4	5.4	5.7
31	Primary	5.9	5.8	5.9	5.7
32	Harrier	5.9	6.1	5.6	5.3
33	Repell GLS	5.9	6.0	5.7	5.0
34	Line Drive GLS	5.8	6.0	5.6	5.3
35	D04-1667	5.8	5.9	5.7	4.7

(Continued)

Table 1 (continued).

	Cultivar or Selection	-----Turf Quality <sup>1</sup> -----			Color <sup>2</sup> 2006 Avg.
		2005- 2006 Avg.	2005 Avg.	2006 Avg.	
36	Keystone 2	5.8	6.0	5.5	5.3
37	D04-UP	5.8	5.8	5.7	6.0
38	Phenom	5.7	6.0	5.4	5.0
39	Secretariat II GLSR	5.6	6.0	5.2	4.7
40	Buena Vista	5.4	5.5	5.4	6.0
41	Charismatic II GLSR	5.3	5.7	4.9	5.7
42	PST-2AG4	5.3	5.7	5.0	6.0
43	\$ilver Dollar	5.3	5.5	5.2	6.0
44	APR 1670	5.3	5.6	5.0	5.3
45	PST-2GSM	5.3	5.5	5.1	5.3
46	Apple GL	5.3	5.8	4.8	5.7
47	AC2	5.3	5.1	5.4	6.7
48	Dart	5.2	5.6	4.8	5.3
49	APR 1648	5.2	4.6	5.8	6.7
50	Manhattan 5 GLR	5.1	5.3	4.8	4.7
51	Cabo II	5.0	4.9	5.1	7.3
52	Calypso III	5.0	5.0	5.0	7.0
53	PST-2MNG	5.0	5.0	4.9	5.0
54	Overdrive	4.9	4.8	5.0	5.3
55	Prototype	4.9	4.9	4.9	5.3
56	Pleasure Supreme	4.9	4.9	4.8	6.0
57	ASP6006	4.8	4.8	4.8	7.0
58	ASP6004	4.8	4.7	4.9	7.0
59	VB77	4.8	4.7	4.9	6.0
60	Mach I	4.8	4.7	4.8	5.7
61	Gray Star	4.7	4.8	4.5	5.3
62	SRX 4692	4.6	4.6	4.7	5.7
63	RAD-PR8	4.6	4.7	4.6	5.0
64	Pentium	4.6	4.5	4.7	4.0
65	ES45	4.6	4.5	4.6	6.7
66	Citation Fore	4.6	4.9	4.3	4.7
67	Pinnacle II	4.5	4.6	4.5	5.3
68	VB99	4.5	4.4	4.6	7.3
69	SNR	4.5	4.6	4.4	6.7
70	04-BEN	4.5	4.5	4.5	4.3

(Continued)

Table 1 (continued).

	Cultivar or Selection	-----Turf Quality <sup>1</sup> -----			Color <sup>2</sup> 2006 Avg.
		2005- 2006 Avg.	2005 Avg.	2006 Avg.	
71	PST-2BLK	4.5	4.5	4.5	5.0
72	GPR	4.4	4.4	4.5	6.0
73	Firebolt	4.4	4.4	4.4	6.3
74	E-99	4.4	4.1	4.7	4.7
75	PST-217	4.4	4.0	4.8	5.7
76	SRX 4682	4.4	4.7	4.0	3.3
77	PST-2LAN	4.4	4.6	4.1	4.0
78	PM 102	4.4	4.1	4.6	7.3
79	Delaware XL	4.3	4.3	4.4	6.3
80	DP 17-9499	4.3	4.1	4.5	5.7
81	Top Gun II	4.3	4.1	4.4	5.7
82	04-BRE	4.3	4.5	4.0	5.3
83	Presidio	4.2	4.1	4.3	6.7
84	La Quinta	4.2	4.0	4.4	7.0
85	Cutter II	4.2	4.0	4.5	6.3
86	BAR Lp 4920	4.2	4.0	4.4	5.3
87	Accent II	4.2	4.1	4.3	3.7
88	Quicksilver	4.2	4.2	4.2	6.3
89	TR47	4.1	4.0	4.2	6.7
90	BAR Lp 4420	4.1	4.1	4.2	5.3
91	Pizzazz	4.1	3.9	4.3	6.0
92	Monterey 3	4.1	3.9	4.2	4.7
93	Halo	4.1	4.0	4.2	6.7
94	SP4	4.1	4.0	4.1	7.7
95	Wayfarer	4.0	4.0	4.1	6.3
96	BAR Lp 4317	4.0	3.9	4.1	4.0
97	ASP6003	4.0	3.7	4.2	6.3
98	Brightstar SLT	4.0	3.9	4.0	4.3
99	D04-LP05	3.9	3.7	4.2	6.3
100	PS-2	3.9	3.3	4.5	5.3
101	Pianist	3.9	3.9	3.9	4.3
102	ASP6002	3.9	3.8	4.0	6.7
103	Headstart 2	3.9	3.7	4.1	6.3
104	Wind Dance 2	3.9	3.5	4.3	6.0
105	ASP6005	3.8	3.9	3.7	6.0

(Continued)



Table 1 (continued).

	Cultivar or Selection	-----Turf Quality <sup>1</sup> -----			Color <sup>2</sup> 2006 Avg.
		2005- 2006 Avg.	2005 Avg.	2006 Avg.	
106	Sunshine 2	3.8	3.7	3.9	6.0
107	Galatti	3.8	4.0	3.5	4.7
108	Goalkeeper II	3.7	3.5	3.9	5.3
109	Pick 02-R	3.7	3.7	3.6	7.0
110	Inspire	3.7	3.4	3.9	4.7
111	Caddieshack II	3.6	3.2	3.9	4.7
112	ASP6001	3.6	3.3	3.8	5.7
113	Premier II	3.6	3.7	3.5	4.3
114	Palmer III	3.4	3.4	3.4	3.3
115	DP 17-9788	3.3	3.4	3.2	3.3
116	Barlennium	3.2	3.1	3.3	4.0
117	Panther	3.2	3.0	3.3	2.0
118	Affinity	3.1	3.2	3.0	2.3
119	Premier	2.8	2.9	2.7	1.7
120	LPR 02203	2.6	2.5	2.8	2.3
121	Pinnacle	2.3	2.1	2.4	1.3
122	Manhattan II	1.9	1.8	2.0	3.7
123	Linn	1.0	1.0	1.0	1.3
	LSD at 5% =	0.6	0.7	0.7	1.1

<sup>1</sup>9 = best turf quality<sup>2</sup>9 = darkest green color

Table 2. Performance of perennial ryegrass cultivars and selections in a turf trial established in August 2004 at North Brunswick, NJ. (Includes all entries of the 2004 National Perennial Ryegrass Test sponsored by NTEP.)

	Cultivar or Selection	-----Turf Quality <sup>1</sup> -----			Color <sup>2</sup> 2006 Avg.
		2005- 2006 Avg.	2005 Avg.	2006 Avg.	
1	All*Star 3	7.3	7.4	7.2	6.7
2	D04-11T	7.3	7.7	6.9	6.0
3	Dasher 3	6.9	7.2	6.6	6.7
4	Fiesta 4	6.9	7.0	6.8	5.7
5	Amazing GS	6.9	6.8	7.0	6.7
6	Regal 5	6.9	7.1	6.6	7.0
7	Palmer V	6.8	7.1	6.5	5.3
8	SR 4600	6.8	7.4	6.2	6.3
9	Attribute	6.7	6.9	6.6	6.0
10	Derby Xtreme	6.7	6.8	6.6	6.3
11	Panther GLS	6.7	6.7	6.7	5.7
12	MMW	6.7	7.1	6.3	6.0
13	Homerun	6.6	6.6	6.5	6.3
14	Primary	6.5	6.7	6.4	6.0
15	DP1	6.5	7.2	5.8	6.0
16	D04-1667	6.5	6.9	6.2	5.0
17	LCK	6.5	6.4	6.6	5.7
18	Kokomo II	6.5	6.7	6.3	6.3
19	Harrier	6.5	7.1	5.9	5.3
20	\$ilver Dollar	6.5	6.1	6.8	6.3
21	Notable	6.4	6.6	6.2	5.7
22	Exacta II GLSR	6.4	6.8	6.0	6.3
23	Palace	6.4	6.6	6.2	6.7
24	Palmer GLS	6.3	6.6	6.0	5.7
25	SRX 4692	6.3	6.4	6.2	5.7
26	1G Squared	6.3	6.7	5.8	5.0
27	PST-2GSM	6.3	6.1	6.5	5.0
28	Dart	6.3	6.7	5.9	5.7
29	Paragon GLR	6.3	6.9	5.7	6.0
30	Revenge GLX	6.3	6.7	5.8	6.3
31	Charismatic II GLSR	6.3	6.6	5.9	5.3
32	Line Drive GLS	6.3	6.6	5.9	4.7
33	Palmer IV	6.2	6.6	5.9	7.0
34	D04-UP	6.2	6.7	5.8	5.7
35	Protégé GLR	6.2	6.4	6.1	6.0

(Continued)

Table 2 (continued).

	Cultivar or Selection	-----Turf Quality <sup>1</sup> -----			Color <sup>2</sup> 2006 Avg.
		2005- 2006 Avg.	2005 Avg.	2006 Avg.	
36	Secretariat II GLSR	6.2	6.6	5.8	4.7
37	Keystone 2	6.2	6.2	6.2	5.7
38	Apple GL	6.2	6.8	5.6	6.3
39	PST-2AG4	6.2	5.9	6.5	5.3
40	APR 1670	6.1	6.5	5.7	5.0
41	Stellar GL	6.1	6.5	5.6	6.3
42	PST-2MNG	6.0	5.8	6.1	5.3
43	Phenom	6.0	6.6	5.3	5.0
44	Prototype	5.9	5.8	6.0	5.0
45	Fusion	5.9	6.0	5.8	6.7
46	Cabo II	5.9	6.4	5.3	8.0
47	Manhattan 5 GLR	5.6	6.3	5.0	4.7
48	Repell GLS	5.5	6.0	5.1	5.3
49	Buena Vista	5.5	5.9	5.1	5.7
50	SRX 4682	5.3	5.8	4.9	4.7
51	Calypso III	5.3	5.3	5.2	6.3
52	Pleasure Supreme	5.3	5.1	5.4	7.0
53	ASP6004	5.2	4.6	5.8	6.7
54	E-99	5.2	4.9	5.5	6.0
55	ES45	5.2	5.0	5.4	7.3
56	Overdrive	5.2	4.9	5.5	5.0
57	RAD-PR8	5.2	5.4	4.9	5.0
58	ASP6005	5.2	5.1	5.2	7.7
59	04-BRE	5.2	5.3	5.0	5.7
60	Delaware XL	5.1	4.5	5.8	7.0
61	Gray Star	5.1	4.9	5.4	6.0
62	AC2	5.1	5.1	5.1	5.7
63	ASP6002	5.0	4.8	5.3	7.7
64	PST-2LAN	5.0	5.0	5.1	4.3
65	PST-2BLK	5.0	4.6	5.4	4.7
66	GPR	5.0	4.5	5.4	7.3
67	SNR	5.0	4.7	5.2	7.7
68	Citation Fore	5.0	5.0	4.9	4.3
69	ASP6006	4.9	4.7	5.1	7.3
70	04-BEN	4.9	5.3	4.5	4.7

(Continued)

Table 2 (continued).

	Cultivar or Selection	-----Turf Quality <sup>1</sup> -----			Color <sup>2</sup> 2006 Avg.
		2005- 2006 Avg.	2005 Avg.	2006 Avg.	
71	Wind Dance 2	4.9	4.8	4.9	6.7
72	VB77	4.8	4.7	4.9	6.0
73	Pinnacle II	4.8	4.4	5.1	6.7
74	Pentium	4.8	4.0	5.5	4.7
75	Pizzazz	4.8	4.3	5.2	5.7
76	PST-217	4.8	4.5	5.0	5.7
77	TR47	4.7	4.5	5.0	8.0
78	Presidio	4.7	4.4	5.0	5.7
79	Wayfarer	4.5	4.3	4.8	8.0
80	VB99	4.5	4.4	4.6	7.0
81	Galatti	4.5	4.1	4.9	5.3
82	APR 1648	4.5	3.5	5.5	6.7
83	DP 17-9499	4.5	4.0	4.9	6.0
84	SP4	4.4	4.0	4.8	8.0
85	ASP6003	4.4	3.9	4.9	7.3
86	Halo	4.4	4.0	4.7	8.0
87	ASP6001	4.3	3.8	4.8	6.7
88	Accent II	4.3	3.8	4.7	5.0
89	Mach I	4.2	3.8	4.7	6.0
90	Quicksilver	4.2	3.7	4.8	7.0
91	Cutter II	4.2	3.7	4.7	6.7
92	Top Gun II	4.1	3.4	4.7	6.3
93	BAR Lp 4420	4.0	4.1	3.9	6.0
94	Inspire	4.0	3.3	4.6	5.0
95	DP 17-9788	4.0	3.8	4.1	3.3
96	Monterey 3	3.9	3.3	4.6	4.7
97	PM 102	3.9	3.6	4.2	7.0
98	Brightstar SLT	3.9	3.6	4.2	4.7
99	BAR Lp 4317	3.9	3.8	3.9	4.0
100	PS-2	3.9	3.2	4.5	6.0
101	La Quinta	3.8	3.6	4.1	7.3
102	Pianist	3.8	3.3	4.3	5.7
103	D04-LP05	3.8	3.4	4.2	6.0
104	BAR Lp 4920	3.8	3.5	4.0	4.7
105	Firebolt	3.8	3.8	3.7	7.0

(Continued)

Table 2 (continued).

	Cultivar or Selection	-----Turf Quality <sup>1</sup> -----			Color <sup>2</sup> 2006 Avg.
		2005- 2006 Avg.	2005 Avg.	2006 Avg.	
106	Barlennium	3.7	3.4	4.0	4.3
107	Palmer III	3.7	3.4	3.9	4.7
108	Headstart 2	3.7	3.2	4.1	7.3
109	Affinity	3.6	3.5	3.7	2.7
110	Premier	3.6	3.4	3.8	2.7
111	Caddieshack II	3.4	2.9	4.0	5.7
112	GoalKeeper II	3.3	3.1	3.6	4.7
113	Pick 02-R	3.3	3.2	3.4	7.3
114	Sunshine 2	3.3	3.2	3.3	6.0
115	Premier II	3.3	3.0	3.6	4.7
116	Panther	3.0	2.4	3.6	3.7
117	Pinnacle	2.9	2.6	3.1	2.7
118	LPR 02203	2.4	2.0	2.7	3.0
119	Manhattan II	2.2	1.8	2.5	3.0
120	Linn	1.0	1.1	1.0	1.0
	LSD at 5%=	0.7	0.7	0.9	1.2

<sup>1</sup>9 = best turf quality<sup>2</sup>9 = darkest green color

Table 3. Performance of perennial ryegrass cultivars and selections in a turf trial established in August 2004 at Adelphia, NJ.

	Cultivar or Selection	-----Turf Quality <sup>1</sup> -----		
		2005-2006 Avg.	2005 Avg.	2006 Avg.
1	04-10 LP	7.3	7.7	6.8
2	Paragon GLR	6.7	6.7	6.8
3	PST-SYN-2MAG	6.6	6.9	6.3
4	04-8 LP	6.6	6.7	6.5
5	Applaud C-2	6.5	7.2	5.7
6	Palmer IV	6.5	6.5	6.4
7	1G Squared	6.4	6.6	6.1
8	Prelude GLS	6.4	6.5	6.3
9	IS PR-266	6.3	6.5	6.0
10	Repell GLS	6.2	6.4	6.0
11	Phenom	6.2	6.7	5.6
12	SG-04	6.1	6.3	5.9
13	Applaud II (APR 1665)	6.1	6.4	5.8
14	IS PR 239	6.1	6.3	5.8
15	PR5	6.0	6.4	5.7
16	APR 1668	6.0	6.4	5.7
17	APR 1667	6.0	6.5	5.6
18	APR 1675	5.9	6.2	5.6
19	IS PR-230	5.8	6.2	5.4
20	IS PR 267	5.8	6.0	5.6
21	Panther GLS	5.8	6.1	5.5
22	Palmer GLS	5.8	6.2	5.3
23	Integra II (APR 1659)	5.8	5.9	5.6
24	Dart	5.8	6.3	5.2
25	PSW# 5-04	5.7	5.8	5.7
26	APR 1666	5.7	6.0	5.5
27	SR 4550	5.5	5.5	5.6
28	APR 1670	5.5	5.9	5.1
29	PSW# 24-03	5.5	5.4	5.5
30	PST-2J15	5.4	5.0	5.9
31	RAD-PR23	5.4	5.6	5.2
32	RAD-PR6	5.4	5.4	5.3
33	PST-SYN-2RL2	5.3	5.8	4.9
34	PST-2MGG-04	5.2	5.4	5.0
35	PST-SYN-2RO2	5.2	5.1	5.2

(Continued)

Table 3 (continued).

	Cultivar or Selection	-----Turf Quality <sup>1</sup> -----		
		2005-2006 Avg.	2005 Avg.	2006 Avg.
36	AllStar2	5.1	4.8	5.4
37	PST-2MAN BULK	5.1	5.0	5.1
38	PST-2Q4L BULK	5.0	5.4	4.6
39	Palmer III	5.0	5.0	5.1
40	PSW# 21-04	5.0	5.0	5.0
41	PST-2LGS BS	5.0	5.2	4.7
42	04-9 LP	5.0	4.8	5.1
43	PSW# 3-04	4.9	4.8	5.1
44	PST-2Q4 BULK	4.9	5.3	4.5
45	APR 1671	4.9	5.3	4.5
46	Passion	4.9	4.7	5.1
47	PR13	4.9	4.7	5.1
48	Quick Trans	4.9	5.5	4.2
49	Stellar	4.9	5.0	4.7
50	Sunkissed	4.8	4.4	5.2
51	NMSP-04	4.8	4.5	5.0
52	Grand Slam	4.8	4.5	5.0
53	Gator 3	4.8	4.6	5.0
54	Quickstart II	4.8	5.2	4.3
55	Vail II	4.8	4.2	5.3
56	Pizzazz	4.8	4.2	5.3
57	PST-SYN-2ROH	4.7	4.4	5.1
58	BOB-03	4.7	4.5	4.9
59	Dazzle	4.7	4.3	5.1
60	Top Hat 2	4.7	4.4	5.0
61	PST-2IN4 BS	4.7	4.3	5.1
62	Applaud	4.7	4.5	4.9
63	Peregrine	4.7	4.6	4.8
64	Mach I	4.7	4.3	5.0
65	RAD-PR22	4.7	4.6	4.7
66	PSW# 9-04	4.6	4.2	5.0
67	PSW# 17-04	4.6	4.4	4.9
68	Blazer 4	4.6	4.1	5.1
69	PST-SYN-2E10	4.6	4.6	4.6
70	WHC PSC BULK 3-03	4.6	4.4	4.8
71	APR 1661	4.6	5.0	4.1
72	Integra	4.6	4.4	4.7
73	Ringer	4.6	4.2	4.9
74	04-11 LP	4.5	4.3	4.8
75	SR 4220	4.5	4.6	4.5

(Continued)

Table 3 (continued).

	Cultivar or Selection	-----Turf Quality <sup>1</sup> -----		
		2005-2006 Avg.	2005 Avg.	2006 Avg.
76	PST-2LITA	4.5	4.4	4.6
77	PST-3BM BULK	4.5	4.6	4.4
78	Quest II	4.5	4.2	4.8
79	PSW# 7-04	4.5	4.3	4.6
80	RAD-PR17	4.5	4.2	4.7
81	Salinas	4.5	4.0	4.9
82	PSW# 16-04	4.5	4.2	4.7
83	NAP1-04	4.4	4.2	4.7
84	SRXOH 421	4.4	4.3	4.6
85	SR 4420	4.4	4.3	4.5
86	PST-2LA	4.3	4.0	4.7
87	RAD-PR24	4.3	3.9	4.7
88	Headstart 2	4.3	4.0	4.6
89	PST-2E* BULK	4.3	4.7	3.8
90	Radiant II	4.2	3.6	4.9
91	04-HEAT	4.2	4.3	4.1
92	Shining Star II	4.2	4.5	3.9
93	Pro-tyme	4.2	3.9	4.5
94	OS-04	4.2	4.2	4.1
95	PSW# 6-04	4.1	3.9	4.4
96	GLS2-04	4.1	3.9	4.3
97	R-JD 39 104	4.1	4.1	4.2
98	PST-2CH BULK	4.1	4.4	3.8
99	SR 4500	4.1	3.7	4.4
100	Fiesta 3	4.1	3.7	4.4
101	Quebec	4.1	3.6	4.5
102	PSW# 14-04	4.1	3.7	4.5
103	PST-SYN-2RAB-04	4.1	4.0	4.1
104	WHC A-04	4.1	3.9	4.2
105	PSW# 19-04	4.1	3.8	4.3
106	STP-04	4.0	3.8	4.2
107	PSW# 1-04	4.0	3.4	4.6
108	Radiant	4.0	3.6	4.4
109	Manhattan 4	4.0	3.6	4.4
110	Racer 2	4.0	3.7	4.2
111	PRS2-04	4.0	3.6	4.3
112	SRXOH COR2	3.9	3.5	4.4
113	PSW# 10-04	3.9	3.7	4.1
114	SRXOH 422	3.9	3.5	4.2
115	WHC C-04	3.9	3.8	3.9

(Continued)



Table 3 (continued).

	Cultivar or Selection	-----Turf Quality <sup>1</sup> -----		
		2005-2006 Avg.	2005 Avg.	2006 Avg.
116	PSW# 20-04	3.9	3.4	4.3
117	PST-2RT	3.8	3.7	4.0
118	PSW# 23-04	3.8	3.7	4.0
119	Hawkeye	3.8	3.4	4.2
120	Pin Stripe	3.8	3.5	4.2
121	CRR-04	3.8	3.5	4.1
122	PST-SYN-2SOM	3.8	3.6	4.0
123	Phantom	3.8	3.4	4.1
124	Exacta	3.8	3.4	4.1
125	Sunshine 2	3.8	3.4	4.1
126	PR A-97	3.7	3.2	4.2
127	Brightstar SLT	3.7	3.2	4.2
128	PSW# 4-04	3.7	3.3	4.0
129	PSW# 15-04	3.7	3.4	3.9
130	PSW# 18-04	3.6	3.2	4.0
131	R-JD 114 104	3.6	3.1	4.2
132	Lowgrow II	3.6	3.4	3.8
133	Charismatic	3.6	3.2	4.0
134	Extreme	3.6	3.4	3.8
135	Wizard	3.6	3.5	3.7
136	PST-SYN-2SON	3.6	3.6	3.5
137	PSW# 11-04	3.6	3.0	4.1
138	04-14 LP	3.6	3.1	4.0
139	SRXOH COR1	3.5	3.3	3.8
140	SR 4350	3.5	3.3	3.8
141	Catalina	3.5	2.9	4.1
142	PSW# 8-04	3.5	3.1	3.9
143	Prelude III	3.5	3.2	3.8
144	Monterey II	3.5	3.0	4.0
145	Panther	3.5	2.9	4.1
146	PSW# 2-04	3.5	3.3	3.6
147	Line Drive	3.5	3.1	3.8
148	ASAP	3.4	3.1	3.8
149	Goalkeeper	3.4	3.2	3.6
150	WHC D-04	3.4	3.1	3.7
151	Churchill	3.3	3.1	3.6
152	Omega 3	3.3	3.0	3.7
153	Caddieshack	3.3	2.9	3.8
154	PSW# 22-04	3.3	3.1	3.5
155	SRXOH ABER	3.3	3.1	3.5

(Continued)

Table 3 (continued).

	Cultivar or Selection	-----Turf Quality <sup>1</sup> -----		
		2005-2006 Avg.	2005 Avg.	2006 Avg.
156	Top Gun	3.3	2.9	3.6
157	Continental	3.2	3.0	3.5
158	SW ER7026	3.2	3.0	3.4
159	Headstart	3.2	3.0	3.4
160	Admire	3.1	2.6	3.7
161	MSP 3414	3.1	2.8	3.4
162	Accent	2.9	2.6	3.2
163	R-JD 13-17 103	2.8	2.3	3.4
164	R-JD 7B 104	2.8	2.5	3.2
165	WHC B-04	2.8	2.4	3.2
166	Cutter	2.8	2.6	3.0
167	R-JD 7 103	2.6	2.2	3.0
168	R-JD 3-9 103	2.4	1.7	3.1
169	Penguin	2.4	1.7	3.0
170	MSP 3275	2.4	2.0	2.7
171	P201	2.3	1.9	2.6
172	SW ER7045	2.1	1.9	2.2
173	Linn	1.1	1.0	1.1
	LSD at 5% =	0.6	0.7	0.6

<sup>1</sup>9 = best turf quality

Table 4. Performance of perennial ryegrass cultivars and selections in a turf trial established in August 2005 at Adelphia, NJ.

	Cultivar or Selection	Turf Quality <sup>1</sup> 2006 Avg.	Gray Leaf Spot <sup>2</sup> 2005 Avg.	Establishment <sup>3</sup> Oct. 2005
1	IS-PR 314	6.7	9.0	7.3
2	PSG Q-05	6.4	9.0	7.0
3	IS-PR 315	6.3	8.0	7.0
4	APR 1803	6.3	8.5	7.0
5	APR 1856	6.2	7.7	8.0
6	2B5 Comp	6.2	8.0	6.3
7	DP1	6.2	8.8	7.3
8	APR 1866	6.2	8.2	8.0
9	2L4 Comp	6.2	7.8	7.3
10	LCK	6.2	6.7	7.7
11	PSG G-05	6.2	9.0	8.0
12	PSG BB-05	6.2	9.0	8.3
13	APR 1925	6.1	7.8	6.7
14	PSG E-05	6.1	9.0	7.7
15	APR 1854	6.1	8.2	7.3
16	APR 1852	6.0	7.8	8.0
17	APR 1887	6.0	8.7	7.3
18	APR 1882	5.9	8.2	8.0
19	Palmer GLS	5.9	8.3	7.3
20	APR 1916	5.9	8.3	7.7
21	APR 1926	5.9	8.2	7.7
22	SR 4600	5.9	9.0	7.3
23	2B3 Comp	5.9	7.8	7.0
24	2B4 Comp	5.8	7.2	7.0
25	APR 1906	5.8	8.5	7.7
26	Homerun	5.8	7.3	8.0
27	PSG 81-Bulk 05	5.8	8.8	7.3
28	2L1 Comp	5.8	7.7	7.0
29	PST-Syn-2AGP	5.8	6.8	7.7
30	APR 1885	5.7	8.2	7.0
31	Phenom	5.7	8.5	7.3
32	PSG U-05	5.7	9.0	7.3
33	PSG 78-SP-Bulk 05	5.7	9.0	7.3
34	APR 1853	5.7	7.8	8.0
35	2B2 Comp	5.7	7.3	6.3

(Continued)

Table 4 (continued).

	Cultivar or Selection	Turf Quality <sup>1</sup> 2006 Avg.	Gray Leaf Spot <sup>2</sup> 2005 Avg.	Establishment <sup>3</sup> Oct. 2005
36	MRF PR-025	5.7	7.3	8.3
37	APR 1912	5.7	7.8	6.7
38	2L2 Comp	5.7	8.0	7.3
39	PSG F-05	5.7	9.0	8.0
40	APR 1857	5.6	6.5	7.7
41	APR 1884	5.6	8.8	6.7
42	2B1 Comp	5.6	7.5	7.0
43	APR 1880	5.6	8.2	7.3
44	PSG Z-05	5.6	8.3	8.0
45	Harrier	5.5	8.5	8.0
46	APR 1855	5.5	7.8	7.0
47	2L3 Comp	5.4	8.2	7.3
48	PST-Syn-2A03	5.4	6.7	7.3
49	APR 1851	5.4	8.7	8.0
50	Paragon GLR	5.4	7.3	8.7
51	APR 1888	5.3	8.3	7.3
52	APR 1889	5.3	8.0	7.0
53	Apple GL	5.3	8.7	7.7
54	APR 1874	5.3	6.0	7.3
55	APR 1879	5.3	8.5	6.3
56	APR 1895	5.3	8.3	7.7
57	APR 1893	5.3	7.8	6.7
58	Applaud II	5.3	7.3	7.3
59	APR 1883	5.2	8.3	7.7
60	APR 1907	5.2	8.3	7.3
61	SRX 4692	5.2	8.0	7.3
62	APR 1902	5.1	7.7	6.3
63	1G Squared	5.1	8.3	6.7
64	PSG 92-Bulk 05	5.1	6.8	7.3
65	APR 1670	5.1	7.5	8.0
66	Manhattan 5 GLR	5.1	7.7	7.7
67	APR 1900	5.0	7.7	7.3
68	PST-2MGG-05	5.0	4.7	7.7
69	APR 1878	5.0	8.2	7.0
70	Dart	5.0	8.3	7.7
71	PST-Syn-2MGS	5.0	6.5	7.7
72	PST-2GSB	5.0	7.0	7.3
73	APR 1873	4.9	7.0	7.7
74	APR 1872	4.9	6.0	7.0
75	05-J PR	4.9	7.3	6.0

(Continued)

Table 4 (continued).

	Cultivar or Selection	Turf Quality <sup>1</sup> 2006 Avg.	Gray Leaf Spot <sup>2</sup> 2005 Avg.	Establishment <sup>3</sup> Oct. 2005
76	PST-2MNG	4.9	5.8	8.0
77	APR 1875	4.9	8.5	7.0
78	SR 4550	4.8	5.8	8.0
79	IS-PR 316	4.8	6.2	7.7
80	\$ilver Dollar	4.8	5.5	7.7
81	APR 1899	4.8	8.3	7.3
82	APR 1890	4.8	8.2	7.0
83	Integra II	4.8	8.0	7.3
84	PSG X-05	4.8	7.8	6.0
85	IG2	4.7	4.7	7.7
86	PSG M-05	4.7	5.2	7.7
87	PST-2LGS	4.7	6.2	7.7
88	PST-2GSM	4.7	5.2	8.0
89	PST-2AG\$	4.7	6.0	7.0
90	PST-2AGH	4.7	5.3	7.7
91	APR 1877	4.7	6.5	7.0
92	Gray Star	4.6	4.7	8.0
93	APR 1923	4.6	6.2	7.0
94	PSG 80-SP-Bulk 05	4.6	5.0	5.7
95	PST-Syn-2COL	4.6	5.7	7.0
96	05-F PR	4.6	6.3	5.3
97	PSG 45-SP-Bulk 05	4.6	8.2	7.0
98	PST-Syn-2GC	4.6	5.2	7.3
99	PST-Syn-2RCC	4.6	5.7	7.3
100	APR 1876	4.5	7.8	7.7
101	APR 1911	4.5	7.8	7.0
102	Citation Fore	4.5	4.2	8.3
103	APR 1918	4.4	8.2	8.0
104	PSG A-05	4.4	4.0	7.7
105	PST-2F15	4.4	4.3	7.3
106	PST-2TQL	4.4	4.8	6.3
107	MRF PR-004	4.4	3.5	6.7
108	Amazing	4.4	2.8	7.3
109	PSG L-05	4.4	4.8	6.3
110	MRF PR-007	4.3	4.5	7.0
111	Wind Dance 2	4.3	3.3	6.3
112	MHT MSP 3729	4.3	6.2	7.7
113	PSG V-05	4.3	5.8	7.0
114	PST-2LAN	4.3	4.0	7.7
115	PST-Syn-2BMR	4.3	6.7	5.3

(Continued)

Table 4 (continued).

	Cultivar or Selection	Turf Quality <sup>1</sup> 2006 Avg.	Gray Leaf Spot <sup>2</sup> 2005 Avg.	Establishment <sup>3</sup> Oct. 2005
116	SR 4220	4.3	3.5	8.0
117	PST-2PC	4.3	4.7	7.7
118	MRF PR-010	4.2	4.8	6.3
119	MRF PR-012	4.2	3.8	6.0
120	MRF PR-019	4.2	4.5	6.0
121	PSG Y-05	4.2	8.0	7.7
122	PST-21N4	4.2	3.7	7.3
123	Chaparral II	4.2	3.2	6.7
124	SRX 4682	4.2	7.5	6.0
125	SR 4420	4.2	3.2	8.0
126	PSG J-05	4.2	5.2	6.0
127	Grand Slam	4.2	2.7	7.3
128	PST-2Q4	4.2	6.3	7.0
129	PST-Syn-2SOV	4.2	5.0	6.0
130	MRF PR-002	4.1	4.2	6.7
131	MRF PR-008	4.1	3.5	7.0
132	MRF PR-016	4.1	4.0	7.7
133	PSG 85-SP-Bulk 05	4.1	4.0	5.7
134	PST-2RHO	4.1	4.3	7.3
135	APR 1922	4.1	6.5	7.3
136	Peregrine	4.1	2.7	8.0
137	Top Hat 2	4.1	2.8	8.0
138	05-E PR	4.1	5.3	6.0
139	PSG 45-Bulk 05	4.1	7.8	6.7
140	MRF PR-005	4.0	4.5	7.3
141	MRF PR-013	4.0	3.0	7.3
142	MRF PR-015	4.0	4.3	6.7
143	Gator 3	4.0	2.5	8.0
144	APR 1671	4.0	5.8	7.7
145	Shining Star II	4.0	7.2	7.3
146	MRF PR-017	4.0	4.2	6.0
147	PST-2C4	4.0	5.8	8.0
148	PST-Syn-2CAX	4.0	4.7	6.0
149	MRF PR-003	4.0	4.0	6.0
150	MRF PR-023	4.0	3.7	7.3
151	MRF PR-024	4.0	3.7	7.0
152	IS-PR 313	4.0	4.0	7.0
153	PSG I-05	4.0	3.8	6.3
154	MRF PR-020	3.9	3.8	7.7
155	PSG O-05	3.9	4.2	5.3

(Continued)

Table 4 (continued).

	Cultivar or Selection	Turf Quality <sup>1</sup> 2006 Avg.	Gray Leaf Spot <sup>2</sup> 2005 Avg.	Establishment <sup>3</sup> Oct. 2005
156	PSG 83-SP-Bulk 05	3.9	4.3	6.3
157	Manhattan 4	3.9	3.2	7.3
158	Quicksilver	3.9	2.5	7.3
159	PST-2101	3.9	3.3	6.7
160	MRF PR-021	3.9	4.2	7.3
161	Delaware XL	3.9	2.3	7.7
162	RAD-PR17	3.8	4.8	5.3
163	PSG H-05	3.8	3.5	7.0
164	PSG 86-SP-Bulk 05	3.8	4.7	6.3
165	PSG 86-Bulk 05	3.8	4.7	6.7
166	PST-Syn-2TQM	3.8	4.5	6.7
167	MRF PR-027	3.8	3.3	8.0
168	PSG 90-Bulk 05	3.8	3.0	6.7
169	PST-2-Blue	3.8	2.7	7.0
170	MRF PR-006	3.7	3.8	6.3
171	PSG D-05	3.7	4.5	6.3
172	MRF PR-011	3.7	3.2	6.7
173	MRF PR-022	3.7	4.3	6.7
174	Headstart 2	3.7	2.0	7.7
175	PSG P-05	3.7	3.7	6.7
176	PST-Syn-2RZ	3.7	3.2	6.0
177	Charger II	3.7	3.2	7.7
178	LS 2200	3.7	2.3	7.3
179	PSG 84-SP-Bulk 05	3.7	2.5	6.3
180	MRF PR-014	3.6	2.7	7.7
181	MRF PR-018	3.6	2.2	7.0
182	Affirmed	3.6	2.2	7.7
183	LS 2100	3.6	2.5	7.0
184	PST-2RT	3.6	2.7	7.7
185	MRF PR-009	3.6	3.2	7.3
186	Hawkeye	3.6	1.3	7.7
187	PST-Syn-2SNS	3.6	3.2	6.7
188	Brightstar SLT	3.5	1.8	8.0
189	Mach 1	3.5	2.7	7.7
190	PSG N-05	3.5	3.0	6.7
191	PSG K-05	3.5	3.3	6.0
192	MRF PR-001	3.5	3.2	7.0
193	Confetti	3.4	2.3	6.3
194	PSG B-05	3.4	2.0	6.7
195	PSG 82-Bulk 05	3.4	2.8	6.0

(Continued)

Table 4 (continued).

	Cultivar or Selection	Turf Quality <sup>1</sup> 2006 Avg.	Gray Leaf Spot <sup>2</sup> 2005 Avg.	Establishment <sup>3</sup> Oct. 2005
196	SR 4350	3.3	2.7	7.0
197	APR 1924	3.3	2.3	6.7
198	Show Time	3.3	2.3	7.7
199	SR 4500	3.3	2.3	7.3
200	PSG 73-Bulk 05	3.3	2.2	6.3
201	Charismatic	3.2	1.2	7.7
202	PSG 93 Bulk 05	3.2	4.3	6.3
203	PSG AA-05	3.2	2.7	6.0
204	PSG C-05	3.2	3.0	6.3
205	PST-2M4	3.2	2.3	6.7
206	PSG W-05	3.2	2.2	6.3
207	05 I PR	3.1	5.5	5.0
208	Churchill	3.1	1.8	8.7
209	Exacta	3.0	1.7	6.7
210	PSG S-05	3.0	2.3	7.0
211	PSG T-05	3.0	1.8	6.7
212	PST-2RIV	2.9	4.0	6.3
213	MRF PR-026	2.9	1.2	7.7
214	MSP 3639	2.9	1.5	8.3
215	PSG R-05	2.9	1.7	6.7
216	Monterey II	2.7	1.2	7.0
217	Spreader III	2.5	1.0	8.0
218	PSG 77-Bulk 05	2.4	1.7	6.3
	LSD at 5% =	0.6	1.0	1.3

<sup>1</sup>9 = best turf quality<sup>1</sup>9 = least disease<sup>1</sup>9 = best seedling establishment



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

	2004		2005		2006	
	N <sup>1</sup>	Ht <sup>2</sup>	N	Ht	N	Ht
Table 1 (2004 Adelphia - NTEP) .....	1.3	1.5	4.0	1.5	4.5	1.5
Table 2 (2004 North Brunswick - NTEP) .....	0.5	1.5	3.0	1.5	3.0	1.5
Table 3 (2004 Adelphia) .....	0.5	1.5	3.5	1.5	2.3	1.5
Table 3 (2005 Adelphia) .....			0.8	1.5	3.5	1.5

<sup>1</sup>Annual N applied (lb/1000 ft<sup>2</sup>)

<sup>2</sup>Mowing height in inches



*Cooperating Agencies:* Rutgers, The State University of New Jersey, U.S. Department of Agriculture, and County Boards of Chosen Freeholders. Rutgers Cooperative Extension, a unit of the Rutgers New Jersey Agricultural Experiment Station, is an equal opportunity program provider and employer.