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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 TALL FESCUE CULTIVARS AND SELECTIONS IN NEW JERSEY TURF TRIALS

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Tall fescue (*Festuca arundinacea* Schreb.) is a cool-season grass that is widely used as both a forage and turfgrass in many areas of the United States. Although classified as a cool-season grass, tall fescue is very adept at surviving extended periods of heat and drought stress. This ability to perform well under low soil moisture conditions has made tall fescue an attractive option for turf managers in situations where other cool-season species do not perform well. It should be noted that the ability of tall fescue to survive drought is not realized unless adequate soil moisture conditions exist prior to the stress. This allows the plant to produce a deep and extensive root system that can extract water from the deeper portions of the soil profile.

Tall fescue was first introduced into the United States in the 19th century as a forage grass. The first tall fescue cultivars (Kentucky 31 and Alta) to be used as turfgrasses were introduced in the early 1940s. These cultivars are light green in color, have a coarse leaf texture, grow vertically at a rapid rate, and exhibit low shoot density. Although Kentucky 31 is still sold on the market in large quantities, the turf quality of other new tall fescue varieties has improved greatly during the past 18 years. Plant breeders have focused their efforts on producing tall fescue varieties that are darker in color, lower-growing, denser, and more fine-leaved. The result of these efforts has been that many of the improved tall fescue cultivars exhibit turf quality that is comparable to many of the other cool-season turfgrass species at cutting heights above 1.5 inches. Tall fescue can now be used

effectively for a number of different situations including home lawns, athletic fields, parks, and low maintenance situations such as roadsides and industrial sites.

Currently, a great amount of research is being done on the role that endophytes can play in the success of tall fescue as a turfgrass. Endophytic fungi can often be found living in tall fescue plants and may play a role in drought tolerance and insect resistance. Developing cultivars that contain beneficial endophytes may lead to many more uses for tall fescue as a turfgrass.

PROCEDURES

Six tall fescue tests were established in New Jersey between 1994 and 1997. A single test was established each year at the Rutgers Plant Science Research Center at Adelphia (Tables 1, 2, 4, and 6). In 1996, a test was established at the Turfgrass Research Facility at North Brunswick (Table 3). Additionally, a test was established in 1997 at the Rutgers Snyder Research and Extension Farm in Pittstown (Table 5). All tests at Adelphia and North Brunswick were established in August or September by hand sowing 0.88 oz of seed per 3 X 5 ft plot. The Pittstown test consisted of 4 X 10 ft plots seeded with 2.86 oz of seed. A 6 inch border was left unseeded around each plot to reduce contamination between the plots. Each entry was replicated three times in a randomized complete block design. The Pittstown test also includes some entries that are made up of tall fescue mixed with Kentucky bluegrass.

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The tests were managed under different nitrogen and mowing regimes (Table 7). Mowing was usually done with reel mowers and the clippings were returned. The mowing of the plots was frequent enough to prevent excessive accumulation of clippings. Soil pH was generally kept between 6.0 and 6.5 by liming when necessary. At the Adelphia and North Brunswick locations, broadleaf weeds were controlled with spring or fall applications of 2,4-D + dicamba. On the Adelphia tests, the preemergent herbicide Dacthal was used to control annual grassy weeds. The 1996 and 1997 tests also received preemergent applications of Betasan to control annual bluegrass. The test at Pittstown was treated with Trimec Classic in the spring and fall of 1998.

The tests were maintained at medium-high fertility levels and 1.5 inch mowing heights with the exception of the 1994 test (low maintenance) and the 1996 Pittstown test (medium fertility and 3.5 inch cutting height). Tests were often managed more intensely to encourage more disease (i.e. Pythium blight and brown patch) and insect problems. This allowed the plots to be evaluated for disease and insect resistance.

All tests were evaluated for turf quality throughout the growing season. Rating was done visually using a 1 to 9 scale (9 representing the most desirable turf quality) and took into consideration turf color, density, leaf texture, growth habit, uniformity, and freedom from disease or insect damage. When possible, the plots were also rated for individual characteristics such as resistance to brown patch and billbugs, establishment, seedling emergence, drought stress, and spring green-up.

RESULTS AND DISCUSSION

Results of the tall fescue tests can be found in Tables 1 through 6. All tests, with the exception of those planted in 1997, are ranked by the overall (multiple-year) turf quality averages. Those tests planted in 1997 at Adelphia and Pittstown (Tables 5 and 6) are ranked by 1998 turf quality averages. It is important to note that

rankings based strictly on turf quality do not necessarily reflect the performance of cultivars for individual characteristics such as color, disease resistance, spring-green up, etc. For example, a cultivar may have excellent color and good density, but be very susceptible to brown patch. Turf managers must pay close attention to all available data and should not rely strictly on the overall turf quality average when judging cultivars for possible use in their location.

Turf Quality

In the 30 years since the first turf-type tall fescues were developed, great advances have been made in overall turf quality. The early forage cultivars such as Kentucky 31 and Fawn consistently ranked near the bottom of the tests in regard to turf quality. This increase in quality can be attributed to the efforts made by plant breeders to develop tall fescue cultivars that exhibit finer leaf texture, darker color, lower growth profile, and higher density. It is these advances that have encouraged greater use of tall fescues for turf.

Disease Resistance

The major disease of tall fescue is brown patch, caused by *Rhizoctonia solani*. As can be seen in Tables 2, 5, and 6, brown patch resistance in commercially available varieties is inadequate. Table 6 shows the rapid rate at which brown patch can increase in tall fescue turf. In August of 1998, two brown patch ratings were taken just five days apart. The second rating shows that disease severity increased during those five days in almost every entry. Due to the fact that a dense turf produces a microenvironment more favorable to brown patch, breeding brown patch resistance into available germplasm has been quite difficult.

Color

Probably the most noticeable aesthetic quality of turfgrass is color. Breeding efforts over the past few decades have focused on the development of tall fescue cultivars that are darker green. Improvements in color in newer varieties can be seen in Tables 3, 4, 5, and 6. Quite noticeable in the rankings are the improvements

that have been made in the newer varieties such as Picasso and Matador compared to older standards such as Kentucky 31.

SUMMARY

As plant breeders continue to develop high quality varieties, tall fescue is certain to be used on a more wide-scale basis. Improvements in color, density, and leaf texture have already made tall fescue a viable option for many turfgrass managers. Endophyte-infected tall fescue varieties have proven to be useful in certain stress situations, and will continue to be studied. Tall fescue has been shown to be susceptible to net blotch during establishment, especially under traffic. Plant breeders are making progress on improving this trait as can be seen

in the most recently developed tall fescue populations. A major weakness of tall fescue is brown patch susceptibility, which must be overcome if tall fescue is to be more widely accepted as a primary use, cool-season turfgrass.

ACKNOWLEDGMENTS

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Table 1. Performance of tall fescue cultivars and selections in a trial seeded in September 1994 at Adelphia, NJ.

	Cultivar or Selection	-----Turf Quality ¹ -----				
		1995-1998 Avg.	1995 Avg.	1996 Avg.	1997 Avg.	1998 Avg.
1	Southern Choice	4.9	5.7	5.1	4.1	4.7
2	Jaguar III	4.8	5.5	4.4	4.3	4.9
3	Tomahawk	4.8	5.1	4.8	4.8	4.4
4	Pixie	4.7	5.3	4.8	4.6	4.1
5	Wrangler II	4.6	4.8	4.7	4.5	4.5
6	Gazelle	4.6	5.5	4.6	4.1	4.3
7	Starlet	4.6	5.0	4.5	4.4	4.5
8	Marksman	4.5	5.1	4.4	4.5	4.1
9	Safari	4.5	4.9	4.5	4.4	4.0
10	Renegade	4.4	5.0	4.3	4.2	4.0
11	Alamo	4.4	4.8	4.3	4.3	4.1
12	Falcon II	4.3	5.1	4.0	3.9	4.2
13	Rebel III	4.2	5.0	4.1	4.0	3.8
14	GQ	4.1	4.2	4.1	4.4	3.6
15	Monarch	4.0	4.1	3.8	4.1	4.0
16	Rebel 3D	3.9	4.9	3.8	3.5	3.5
17	Rebel Jr	3.9	4.6	3.7	3.7	3.7
18	Oasis	3.8	4.0	3.7	3.9	3.7
19	Crossfire	3.8	4.2	4.0	3.7	3.4
20	Eldorado	3.8	4.1	3.4	4.2	3.5
21	Tribute	3.7	4.4	3.6	3.5	3.4
22	Rebel II	3.7	3.7	3.8	3.9	3.3
23	Rebel	3.6	4.0	3.5	3.6	3.1
24	Thunderbird	3.5	3.9	3.4	3.5	3.0
25	Winchester	3.5	4.1	3.1	3.6	3.0
26	Wrangler	3.3	3.4	2.9	3.7	3.3
27	Arid	3.1	3.5	2.9	3.3	2.6
28	Falcon	2.7	3.2	2.6	3.0	2.2
29	Ky 31	1.6	2.1	1.5	1.5	1.1
30	Fawn	1.3	1.8	1.3	1.3	1.0

(Continued)

Table 1 (continued).

Cultivar or Selection	-----Turf Quality ¹ -----				
	1995-1998 Avg.	1995 Avg.	1996 Avg.	1997 Avg.	1998 Avg.
LSD at 5% =	0.5	0.7	0.7	0.9	0.8

¹9 = best turf quality

Table 2. Performance of tall fescue cultivars and selections in a trial seeded in August 1995 at Adelphia, NJ.

	Cultivar or Selection	-----Turf Quality ¹ -----				Brown Patch ² June 1998	Billbug Damage ³ July 1998
		1996-1998 Avg.	1996 Avg.	1997 Avg.	1998 Avg.		
1	Masterpiece	6.4	6.7	6.0	6.4	6.7	8.3
2	Syn R5AM-95	5.6	5.9	5.4	5.4	5.3	4.7
3	Tarheel	5.3	5.2	4.9	5.6	6.3	9.0
4	Syn R5AU-95	5.2	5.3	4.9	5.5	5.0	7.3
5	Wolfpack	5.2	4.6	5.4	5.6	5.3	9.0
6	Houndog V	5.0	5.3	4.6	5.2	5.3	7.3
7	Syn R5EL-95	5.0	5.2	4.9	4.8	6.3	6.3
8	Pixie	4.9	5.7	4.5	4.6	5.0	4.7
9	Safari	4.7	4.9	4.5	4.8	4.3	5.7
10	Syn R5GEN-95	4.7	4.7	4.5	4.9	4.7	5.7
11	Wrangler II	4.6	5.0	4.5	4.3	4.3	5.3
12	Onyx	4.5	5.1	4.3	4.1	4.3	4.7
13	Tomahawk	4.5	5.0	4.5	4.0	4.3	4.0
14	Bravo	4.5	4.5	3.9	5.0	4.3	8.3
15	Benton	4.4	4.4	4.2	4.4	4.3	5.0
16	Lancer	4.4	4.4	4.3	4.4	4.7	7.3
17	GQ	4.3	4.2	4.7	4.1	3.3	4.7
18	Rebel 3D	4.3	5.2	4.0	3.7	4.3	3.7
19	Shenandoah	4.3	3.6	4.4	4.9	4.0	7.7
20	Stetson	4.3	3.1	4.5	5.1	5.3	9.0
21	Monarch	4.2	3.9	4.4	4.4	4.7	7.3
22	Rebel Jr	4.2	4.1	4.3	4.2	4.3	4.3
23	Lion	4.1	3.5	4.1	4.8	4.7	7.0
24	Mini Mustang	4.1	4.1	4.1	4.2	3.3	6.3
25	Duke	4.1	4.0	4.2	4.1	4.0	4.7
26	Oasis	4.1	3.6	4.4	4.2	3.3	6.0
27	Montauk	4.0	4.0	3.9	4.2	4.7	5.0
28	Crossfire	4.0	3.8	4.1	4.1	3.3	4.7
29	Maverick II	3.9	3.6	4.0	4.0	4.0	5.7
30	Amigo	3.9	3.4	4.1	4.1	2.7	3.7

(Continued)

Table 2 (continued).

Cultivar or Selection	-----Turf Quality ¹ -----				Brown Patch ² June 1998	Billbug Damage ³ July 1998
	1996- 1998 Avg.	1996 Avg.	1997 Avg.	1998 Avg.		
31 Arriba	3.9	3.3	4.1	4.2	3.7	6.0
32 Trailblazer II	3.8	3.6	3.8	4.2	4.0	5.3
33 Rebel III	3.8	3.8	3.7	3.9	2.7	5.7
34 Rebel II	3.6	3.7	3.5	3.5	3.3	6.3
35 Savoy	3.5	3.1	3.7	3.8	4.0	5.7
36 Mesa	3.5	3.1	3.7	3.6	4.0	5.7
37 Mustang	3.4	3.7	3.2	3.2	4.3	6.7
38 Arid	3.2	3.1	3.2	3.1	4.0	5.3
39 Fawn	1.1	1.2	1.2	1.0	3.3	6.0
LSD at 5% =	0.5	0.7	0.7	0.6	1.5	2.5

¹9 = best turf quality

²9 = least brown patch disease

³9 = least billbug damage

Table 3. Performance of tall fescue cultivars and selections in a trial seeded in September 1996 at North Brunswick, NJ. (Includes all entries of the 1996 Tall Fescue NTEP Test.)

	Cultivar or Selection	-----Turf Quality ¹ -----			Spring Green-up ² April 8 1998	Color ³ May 5 1998
		1996-1998 Avg.	1997 Avg.	1998 Avg.		
1	Millennium	6.2	6.4	5.9	6.0	6.7
2	Picasso	6.0	6.0	6.0	3.3	7.3
3	Coronado	5.9	5.8	5.9	5.0	6.7
4	Plantation	5.9	5.7	6.0	5.0	6.0
5	Arid 3	5.6	5.9	5.3	3.0	7.7
6	Rembrandt	5.6	5.0	6.1	7.0	6.0
7	MB 213	5.6	5.9	5.3	4.0	7.3
8	Sunpro	5.5	5.4	5.5	5.0	6.3
9	BAR Fa6D USA	5.5	5.7	5.3	4.3	6.7
10	J-101	5.4	5.5	5.2	4.3	6.0
11	MB 26	5.4	5.9	4.8	4.0	7.3
12	Crossfire II	5.4	5.1	5.8	4.7	6.3
13	ZPS-5LZ	5.4	5.5	5.2	4.0	7.7
14	Gazelle	5.4	5.6	5.2	4.0	7.0
15	Pick FA XK-95	5.4	5.8	5.0	4.7	6.0
16	Arid 2	5.3	5.7	4.9	4.3	6.7
17	Shortstop II	5.3	5.4	5.1	5.7	7.0
18	Pick FA 15-92	5.3	5.2	5.3	5.0	7.3
19	Twilight II	5.3	5.3	5.3	4.3	6.3
20	Coyote	5.3	5.3	5.3	3.7	7.0
21	Tarheel	5.3	5.2	5.3	5.3	5.0
22	Masterpiece	5.3	5.0	5.7	5.3	5.7
23	Pick RT-95	5.3	4.8	5.7	3.3	6.0
24	ZPS-2PTF	5.3	5.0	5.6	5.7	5.7
25	Anthem II	5.2	5.5	5.0	5.7	5.3
26	Aztec II	5.2	5.3	5.0	7.3	6.0
27	Pick FA B-93	5.2	5.1	5.4	5.0	5.0
28	OFI-96-31	5.2	5.5	4.8	5.3	6.0
29	Shenandoah II	5.2	4.7	5.7	5.3	6.0
30	Pick GA-96	5.2	5.1	5.3	6.0	6.3

(Continued)

Table 3 (continued).

	Cultivar or Selection	-----Turf Quality ¹ -----			Spring Green-up ² April 8 1998	Color ³ May 5 1998
		1996- 1998 Avg.	1997 Avg.	1998 Avg.		
31	Pick FA N-93	5.2	5.1	5.2	2.7	8.3
32	BAR Fa6 US1	5.2	5.3	5.0	5.7	7.3
33	Arabia	5.1	5.5	4.7	2.7	7.3
34	Bonsai 2000	5.1	5.1	5.1	6.3	4.3
35	BAR FA 6D	5.1	5.4	4.8	5.7	6.3
36	MB 28	5.1	5.7	4.4	5.3	6.3
37	PST-5TO	5.1	4.8	5.3	6.3	5.3
38	Coronado Gold	5.1	4.6	5.6	4.7	6.0
39	BAR Fa6 US2U	5.1	5.9	4.4	6.0	6.7
40	Pick FA 6-91	5.0	5.8	4.3	3.0	8.0
41	MB 29	5.0	5.3	4.7	4.0	7.7
42	MB 212	5.0	5.0	5.0	5.7	7.0
43	MB 216	5.0	5.3	4.7	5.3	6.7
44	PST-5E5	5.0	5.0	4.9	6.3	5.7
45	Pick FA 20-92	5.0	5.5	4.6	3.3	7.0
46	PST-523	5.0	5.2	4.8	6.3	4.3
47	BAR Fa6 US3	5.0	5.4	4.5	4.3	7.0
48	Rebel Sentry	4.9	5.2	4.6	6.0	6.3
49	Rebel 2000	4.9	5.2	4.6	3.7	7.0
50	TA-7	4.9	5.3	4.5	7.0	5.3
51	MB 214	4.9	5.2	4.6	4.3	7.0
52	MB 215	4.9	5.3	4.6	5.3	7.0
53	ISI-TF10	4.9	5.3	4.4	5.0	6.3
54	ISI-TF-9	4.9	5.1	4.6	6.0	4.7
55	SR 8210	4.9	5.1	4.6	5.7	5.0
56	Jaguar 3	4.9	4.6	5.2	6.7	5.7
57	Genesis	4.9	5.0	4.8	7.7	5.3
58	CU9501T	4.8	5.2	4.4	7.7	5.0
59	CU9502T	4.8	5.1	4.5	6.7	4.3
60	BAR FA 6LV	4.8	5.2	4.5	6.3	5.7

(Continued)

Table 3 (continued).

	Cultivar or Selection	-----Turf Quality ¹ -----			Spring Green-up ² April 8 1998	Color ³ May 5 1998
		1996- 1998 Avg.	1997 Avg.	1998 Avg.		
61	MB 211	4.8	5.0	4.7	4.3	6.7
62	WX3-275	4.8	4.6	4.9	3.7	5.7
63	Apache II	4.8	5.0	4.5	4.7	5.7
64	EA 41	4.8	4.9	4.6	5.3	7.0
65	OFI-931	4.8	5.2	4.4	5.0	4.7
66	Empress	4.8	4.8	4.8	5.0	5.3
67	Arcade	4.7	5.0	4.4	6.7	4.7
68	Alamo E+	4.7	4.6	4.7	4.3	6.3
69	Wolfpack	4.7	4.4	5.0	6.0	4.3
70	OFI-951	4.7	4.9	4.4	4.3	6.7
71	SRX 8500	4.7	5.1	4.2	2.7	6.0
72	Rebel 3D+B100	4.7	5.0	4.3	6.3	6.0
73	Koelaria 'Barkoel'	4.7	5.4	4.0	5.0	2.7
74	Pick FA UT-93	4.6	4.5	4.6	3.7	7.3
75	Bravo	4.6	4.8	4.5	6.3	5.7
76	Good-EN	4.6	5.0	4.3	5.0	5.3
77	MB 210	4.6	5.0	4.1	6.3	5.0
78	BAR FA6 US6F	4.6	5.1	4.2	7.0	5.3
79	PST-5M5	4.6	4.6	4.6	4.3	5.3
80	ATF-253	4.5	4.4	4.6	5.7	5.0
81	Regiment	4.5	4.9	4.1	7.7	4.3
82	Wyatt	4.5	4.6	4.4	5.3	3.3
83	WVBP-1B	4.5	4.7	4.2	6.0	5.0
84	Southern Choice	4.5	4.8	4.3	5.7	5.3
85	ISI-TF11	4.5	4.6	4.4	4.0	5.0
86	Tomahawk-E	4.5	4.7	4.3	5.0	5.7
87	Lion	4.5	4.4	4.5	3.3	6.0
88	Finelawn Petite	4.5	4.7	4.2	6.7	5.0
89	R5AU	4.4	4.9	3.9	6.7	4.7
90	Duster	4.4	4.6	4.2	5.3	5.0

(Continued)

Table 3 (continued).

	Cultivar or Selection	-----Turf Quality ¹ -----			Spring Green-up ² April 8 1998	Color ³ May 5 1998
		1996- 1998 Avg.	1997 Avg.	1998 Avg.		
91	OFI-FWY	4.4	4.5	4.3	5.3	5.3
92	Reserve	4.3	4.5	4.1	6.0	3.7
93	Mustang II	4.3	4.3	4.3	5.3	4.0
94	WVPB-1D	4.3	4.9	3.7	6.3	4.3
95	Renegade	4.3	4.9	3.6	5.3	4.0
96	Falcon II	4.3	4.5	4.0	7.3	3.7
97	Tulsa	4.2	4.7	3.7	6.0	4.7
98	OFI-96-32	4.2	4.6	3.8	6.0	5.7
99	EC-101	4.2	4.5	3.9	6.7	4.7
100	Cochise II	4.2	4.5	3.9	3.7	5.3
101	Comstock	4.2	4.3	4.0	7.7	4.3
102	PSII-TF-10	4.2	4.4	4.0	4.0	5.7
103	Leprechaun	4.2	4.5	3.8	4.7	4.3
104	Shenandoah	4.2	4.2	4.2	8.0	3.0
105	Redcoat	4.1	5.0	3.2	5.3	5.3
106	Pixie E+	4.1	4.2	3.9	4.7	4.7
107	Equinox	4.1	4.1	4.1	6.0	5.0
108	WPEZE	4.1	4.8	3.3	6.3	4.7
109	Marksman	4.1	4.4	3.7	7.0	4.0
110	Cortez	4.0	4.5	3.5	5.3	4.0
111	ATF-020	4.0	4.5	3.6	6.3	4.7
112	Velocity	4.0	4.3	3.7	5.3	6.3
113	PC-AO	4.0	4.1	3.8	7.0	5.0
114	Bandana	4.0	4.0	4.1	4.7	4.7
115	Safari	4.0	3.9	4.1	8.3	3.3
116	Titan 2	4.0	4.1	3.9	6.7	3.7
117	PSII-TF-9	4.0	4.4	3.7	6.0	4.3
118	DP 50-9011	3.9	4.	3.6	7.0	4.7
119	Kitty Hawk S.S.T.	3.9	4.1	3.7	5.0	4.7
120	SRX 8084	3.9	4.1	3.7	5.3	4.3

(Continued)

Table 3 (continued).

Cultivar or Selection	-----Turf Quality ¹ -----			Spring Green-up ² April 8 1998	Color ³ May 5 1998
	1996- 1998 Avg.	1997 Avg.	1998 Avg.		
121 Rebel Jr	3.9	3.9	3.9	7.3	3.3
122 ATF-257	3.8	3.6	4.0	5.3	3.7
123 Bonsai	3.8	3.9	3.7	4.3	3.7
124 ATF-192	3.7	4.0	3.4	4.7	4.3
125 JSC-1	3.7	4.1	3.3	6.7	4.0
126 H7 Space GR 95	3.7	3.4	4.0	7.0	4.0
127 PRO 8430	3.6	3.4	3.8	4.0	3.7
128 JTTFC-96	3.5	3.6	3.3	7.3	3.0
129 Arid	3.0	3.3	2.8	9.0	2.7
130 DLF-1	3.0	3.2	2.8	8.3	3.3
131 JTTFA-96	3.0	3.1	2.9	9.0	2.0
132 Rebel II	2.9	3.0	2.8	9.0	2.7
133 DP 7952	2.5	2.6	2.5	8.7	2.3
134 AV-1	2.5	2.7	2.2	8.0	3.3
135 Kentucky 31 E+	1.9	2.0	1.7	9.0	2.0
LSD at 5% =	0.7	0.8	1.0	1.8	1.3

¹9 = best turf quality²9 = earliest spring green-up³9 = darkest color

Table 4. Performance of tall fescue cultivars and selections in a trial seeded in September 1996 at Adelphia, NJ. (Includes all entries of the 1996 Tall Fescue NTEP Test.)

	Cultivar or Selection	-----Turf Quality ¹ -----			Spring Green-up ² April 1998	Color ³ Aug. 1998	Green Cover (%) Sept. 1998	Leaf Texture ⁴ Aug. 1998	Leaf Texture ⁴ Oct. 1998	Leaf Texture ⁴ 1998 Avg.
		1997-1998 Avg.	1997 Avg.	1998 Avg.						
1	Millennium	6.1	6.1	6.0	5.0	5.3	76.7	4.3	6.3	5.3
2	Gazelle	6.1	6.3	5.9	4.7	5.0	81.7	5.3	7.7	6.5
3	Picasso	6.1	6.2	6.0	4.0	5.0	68.3	5.0	6.7	5.8
4	Rembrandt	6.0	5.7	6.2	5.7	4.3	80.0	5.0	7.3	6.2
5	Plantation	5.8	5.8	5.8	5.7	4.7	70.0	5.0	6.0	5.5
6	Coyote	5.7	6.0	5.4	4.0	5.0	78.3	5.0	5.3	5.2
7	Pick RT-95	5.7	5.4	6.1	5.0	4.3	75.0	6.0	7.3	6.7
8	Pick FA B-93	5.6	5.6	5.7	5.3	5.0	73.3	4.0	6.3	5.2
9	BAR FA 6 US3	5.6	6.0	5.2	5.0	5.3	63.3	5.0	4.7	4.8
10	Rebel Sentry	5.5	5.9	5.0	4.3	5.0	73.3	4.3	4.7	4.5
11	ZPS-2PTF	5.5	5.5	5.6	4.3	4.7	73.3	5.3	6.0	5.7
12	WRS2-1A	5.5	5.6	5.3	5.3	5.3	71.7	5.0	5.7	5.3
13	Bonsai 2000	5.4	5.2	5.5	5.3	4.0	76.7	5.3	6.7	6.0
14	MB-26	5.4	5.7	5.1	4.0	5.0	71.7	5.3	5.3	5.3
15	Shenandoah II	5.4	5.4	5.5	5.7	5.0	75.0	4.7	5.7	5.2
16	Apache II	5.4	5.5	5.3	4.7	4.0	75.0	4.3	6.3	5.3
17	Pick FA 20-92	5.4	5.4	5.4	4.7	5.3	73.3	5.3	6.3	5.8
18	Masterpiece	5.4	5.2	5.5	5.3	4.3	73.3	4.7	6.3	5.5
19	Arcade	5.3	5.0	5.6	5.3	5.0	76.7	5.0	6.7	5.8
20	Aztec II	5.3	5.3	5.3	5.7	4.7	75.0	4.7	6.7	5.7

(Continued)

Table 4 (continued).

	Cultivar or Selection	-----Turf Quality ¹ -----			Spring Green-up ² April 1998	Color ³ Aug. 1998	Green Cover (%) Sept. 1998	Leaf Texture ⁴ Aug. 1998	Leaf Texture ⁴ Oct. 1998	Leaf Texture ⁴ 1998 Avg.
		1997-1998 Avg.	1997 Avg.	1998 Avg.						
21	OFI-96-31	5.3	5.4	5.2	4.0	5.0	70.0	4.7	4.7	4.7
22	Tarheel	5.3	5.2	5.3	5.0	4.3	76.7	5.0	6.3	5.7
23	Coronado	5.3	5.4	5.1	4.7	5.0	78.3	4.7	5.3	5.0
24	OFI-951	5.3	5.5	5.0	4.7	4.7	73.3	4.7	5.3	5.0
25	Pick FA XK-96	5.3	5.4	5.3	4.3	4.3	66.7	5.0	7.3	6.2
26	Arid 3	5.2	5.5	4.8	4.7	5.3	75.0	5.3	5.0	5.2
27	TA-7	5.2	6.0	4.3	5.3	5.3	70.0	3.7	3.7	3.7
28	MB-29	5.2	5.7	4.7	4.0	5.3	70.0	4.3	4.7	4.5
29	Wolfpack	5.2	4.8	5.6	6.7	3.7	75.0	4.3	5.7	5.0
30	SRX 8500	5.2	5.4	5.0	4.3	4.0	71.7	5.0	5.7	5.3
31	CU 950 1T	5.1	5.3	4.8	6.3	5.3	73.3	4.0	5.7	4.8
32	Alamo E+	5.1	4.9	5.2	4.0	4.3	80.0	5.0	5.3	5.2
33	J-101	5.1	5.5	4.7	4.7	5.0	76.7	4.0	5.7	4.8
34	BAR FA 6D	5.1	5.2	4.9	5.3	5.0	71.7	5.7	6.0	5.8
35	BAR FA 6LV	5.1	5.5	4.6	4.7	5.3	71.7	5.3	5.3	5.3
36	MB-212	5.1	5.2	4.9	5.3	4.7	68.3	5.0	5.3	5.2
37	MB-213	5.1	5.7	4.5	4.0	5.3	76.7	4.3	4.7	4.5
38	Crossfire II	5.1	4.7	5.5	5.0	4.7	81.7	4.7	7.0	5.8
39	Pick FA N-93	5.1	4.8	5.4	3.7	5.0	70.0	5.0	5.3	5.2
40	OFI-931	5.1	5.0	5.1	5.7	4.3	76.7	4.7	5.3	5.0

(Continued)

Table 4 (continued).

	Cultivar or Selection	-----Turf Quality ¹ -----			Spring Green-up ² April 1998	Color ³ Aug. 1998	Green Cover (%) Sept. 1998	Leaf Texture ⁴ Aug. 1998	Leaf Texture ⁴ Oct. 1998	Leaf Texture ⁴ 1998 Avg.
		1997-1998 Avg.	1997 Avg.	1998 Avg.						
41	SR 8210	5.1	5.0	5.1	5.0	3.7	75.0	4.7	6.0	5.3
42	Empress	5.1	5.1	5.2	5.0	4.0	73.3	4.3	5.7	5.0
43	BAR FA 6 US1	5.1	5.6	4.5	4.7	4.7	55.0	4.7	5.3	5.0
44	BAR FA 6D USA	5.1	5.5	4.6	4.7	5.0	65.0	5.0	4.7	4.8
45	ISI TF-12	5.1	4.9	5.2	4.7	3.7	66.7	4.7	6.3	5.5
46	WRS2-1B	5.1	5.2	4.9	4.7	5.0	70.0	4.3	4.3	4.3
47	96 WROTF	5.1	5.0	5.2	4.7	5.0	68.3	4.0	5.0	4.5
48	Tulsa	5.0	5.1	4.9	4.3	5.0	76.7	4.7	5.3	5.0
49	Bravo	5.0	5.0	5.0	5.7	4.7	76.7	3.7	4.7	4.2
50	PST-5TO	5.0	4.7	5.2	5.0	4.7	73.3	4.7	6.0	5.3
51	PST-5E5	5.0	5.3	4.7	5.0	4.3	70.0	4.3	6.0	5.2
52	PST-523	5.0	5.0	5.1	5.0	3.7	73.3	4.0	6.3	5.2
53	Twilight II	4.9	5.3	4.5	4.3	4.3	75.0	4.0	4.7	4.3
54	MB-211	4.9	5.2	4.6	4.7	5.0	70.0	4.0	5.0	4.5
55	Southern Choice	4.9	5.0	4.8	5.0	3.3	61.7	4.0	5.0	4.5
56	Pick GA-96	4.9	4.8	4.9	4.0	4.0	70.0	5.0	5.7	5.3
57	ZPS-5L2	4.9	5.4	4.4	3.7	5.0	70.0	4.3	5.0	4.7
58	Coronado Gold	4.9	4.6	5.1	5.0	4.3	78.3	4.3	5.3	4.8
59	BAR FA 6 US2U	4.9	5.0	4.7	4.7	5.0	53.3	4.3	5.0	4.7
60	Arid 2	4.8	5.0	4.6	4.3	5.0	75.0	4.7	4.3	4.5

(Continued)

Table 4 (continued).

	Cultivar or Selection	-----Turf Quality ¹ -----			Spring Green-up ² April 1998	Color ³ Aug. 1998	Green Cover (%) Sept. 1998	Leaf Texture ⁴ Aug. 1998	Leaf Texture ⁴ Oct. 1998	Leaf Texture ⁴ 1998 Avg.
		1997-1998 Avg.	1997 Avg.	1998 Avg.						
61	Anthem	4.8	4.7	4.8	5.0	4.3	70.0	5.3	6.7	6.0
62	Wyatt	4.8	4.4	5.1	4.3	4.3	76.7	5.0	6.7	5.8
63	MB-28	4.8	5.2	4.4	4.0	4.7	71.7	3.7	4.3	4.0
64	MB-214	4.8	5.5	4.1	4.7	5.3	63.3	3.3	4.3	3.8
65	MB-216	4.8	5.4	4.1	4.3	4.3	61.7	3.3	3.3	3.3
66	BAR FA6 US6F	4.8	5.0	4.6	4.3	5.0	65.0	4.0	4.7	4.3
67	OFI-FWY	4.8	5.1	4.5	5.3	4.7	73.3	4.0	6.0	5.0
68	PST-5M5	4.8	5.1	4.6	5.0	3.7	70.0	4.3	4.3	4.3
69	Jaguar 3	4.8	4.3	5.3	5.3	4.3	71.7	4.7	6.0	5.3
70	Sunpro	4.8	4.8	4.8	4.3	4.7	71.7	4.7	5.7	5.2
71	Reserve	4.7	4.5	4.9	4.7	4.0	78.3	4.0	6.0	5.0
72	Rebel 2000	4.7	5.4	4.1	4.3	6.0	70.0	3.0	4.3	3.7
73	Arabia	4.7	5.2	4.2	4.0	5.3	71.7	4.3	4.7	4.5
74	Shortstop II	4.7	4.9	4.5	4.3	4.3	60.0	4.3	5.7	5.0
75	Pick FA 6-91	4.7	5.1	4.3	3.7	4.7	68.3	4.7	5.0	4.8
76	R5AU	4.7	4.6	4.8	5.0	4.7	71.7	4.0	5.3	4.7
77	Mustang II	4.7	4.3	5.0	5.3	3.7	76.7	4.3	5.3	4.8
78	MB-210	4.7	5.1	4.3	5.3	4.0	66.7	3.7	4.3	4.0
79	MB-215	4.7	5.4	4.0	4.3	4.7	70.0	4.0	4.3	4.2
80	Duster	4.7	4.7	4.7	5.0	4.3	70.0	4.7	5.3	5.0

(Continued)

Table 4 (continued).

	Cultivar or Selection	-----Turf Quality ¹ -----			Spring Green-up ² April 1998	Color ³ Aug. 1998	Green Cover (%) Sept. 1998	Leaf Texture ⁴ Aug. 1998	Leaf Texture ⁴ Oct. 1998	Leaf Texture ⁴ 1998 Avg.
		1997-1998 Avg.	1997 Avg.	1998 Avg.						
81	ISI TF-11	4.7	4.4	5.0	4.3	2.7	75.0	4.0	7.0	5.5
82	ATF-253	4.6	4.5	4.7	5.0	4.3	75.0	4.7	6.3	5.5
83	ATF-257	4.6	4.0	5.1	5.3	5.0	81.7	5.0	6.3	5.7
84	CU 950 2T	4.6	4.5	4.6	4.7	3.7	70.0	5.0	6.3	5.7
85	Pixie E+	4.6	4.8	4.5	5.0	4.7	76.7	3.3	4.7	4.0
86	Pick FA UT-93	4.6	4.8	4.5	4.0	4.3	70.0	5.0	5.3	5.2
87	PC-AO	4.6	4.7	4.5	5.7	4.0	71.7	3.3	5.0	4.2
88	WPBEE	4.6	5.0	4.3	5.0	3.3	68.3	3.3	4.3	3.8
89	Good - KN	4.6	5.0	4.3	5.3	4.0	66.7	4.0	4.7	4.3
90	Cochise II	4.6	4.3	4.8	4.7	4.7	76.7	4.7	5.3	5.0
91	ISI TF-10	4.6	5.1	4.1	4.7	4.0	65.0	3.3	3.7	3.5
92	ISI TF-9	4.6	4.4	4.7	4.3	3.3	73.3	4.0	6.0	5.0
93	ISI TF-13	4.6	4.2	4.9	5.0	3.3	65.0	5.0	5.7	5.3
94	Cortez	4.5	4.3	4.6	5.7	4.0	73.3	3.7	4.3	4.0
95	ATF-020	4.5	4.5	4.4	4.7	4.0	73.3	4.7	5.0	4.8
96	Regiment	4.5	4.5	4.4	5.0	4.0	75.0	4.7	5.7	5.2
97	WVPB-1B	4.5	4.9	4.0	5.0	4.3	68.3	3.7	4.0	3.8
98	OFI-96-32	4.5	4.8	4.2	4.7	4.3	70.0	3.7	4.0	3.8
99	Marksman	4.5	4.4	4.5	5.3	3.3	66.7	4.3	4.7	4.5
100	Renegade	4.5	4.9	4.1	5.3	3.3	65.0	4.0	3.3	3.7

(Continued)

Table 4 (continued).

	Cultivar or Selection	-----Turf Quality ¹ -----			Spring Green-up ² April 1998	Color ³ Aug. 1998	Green Cover (%) Sept. 1998	Leaf Texture ⁴ Aug. 1998	Leaf Texture ⁴ Oct. 1998	Leaf Texture ⁴ 1998 Avg.
		1997-1998 Avg.	1997 Avg.	1998 Avg.						
101	Kitty Hawk S.S.T	4.5	4.3	4.6	5.0	3.7	81.7	4.3	4.7	4.5
102	EA 41	4.5	4.1	4.9	4.7	5.0	73.3	5.3	5.7	5.5
103	PS11 TF-9	4.5	4.6	4.4	5.3	3.7	73.3	3.7	4.0	3.8
104	Genesis	4.5	4.8	4.2	4.7	4.0	66.7	3.7	4.0	3.8
105	Redcoat	4.4	4.6	4.2	5.3	4.0	68.3	3.7	5.0	4.3
106	Equinox	4.4	4.2	4.5	5.3	4.3	76.7	4.0	4.7	4.3
107	Safari	4.4	4.4	4.4	5.7	3.0	71.7	4.3	5.3	4.8
108	Lion	4.4	4.4	4.4	4.0	4.0	70.0	3.0	4.7	3.8
109	Finelawn Petite	4.4	4.7	4.1	5.7	4.0	66.7	3.3	3.7	3.5
110	SRX 8084	4.4	4.3	4.5	4.7	3.3	70.0	4.0	6.0	5.0
111	PRO 8430	4.4	4.1	4.7	4.7	3.0	71.7	4.0	5.7	4.8
112	Rebel 3D	4.4	5.1	3.7	5.0	3.3	60.0	3.0	3.7	3.3
113	ISI TF-14	4.4	4.4	4.4	4.7	3.7	66.7	4.3	5.0	4.7
114	AA-983	4.3	4.6	4.0	4.3	5.0	66.7	4.3	4.7	4.5
115	Pick FA 15-92	4.3	4.3	4.4	4.0	5.0	73.3	4.7	5.3	5.0
116	EC-101	4.3	4.6	3.9	5.0	4.0	65.0	4.0	4.0	4.0
117	WVPB-1D	4.3	4.3	4.2	5.0	3.7	73.3	4.0	4.3	4.2
118	WX3-275	4.3	4.2	4.4	3.3	4.3	73.3	4.7	5.7	5.2
119	Bandana	4.3	4.1	4.5	4.7	3.7	71.7	4.0	5.0	4.5
120	Shenandoah	4.3	4.2	4.4	5.3	3.0	71.7	4.3	5.0	4.7

(Continued)

Table 4 (continued).

	Cultivar or Selection	-----Turf Quality ¹ -----			Spring Green-up ² April 1998	Color ³ Aug. 1998	Green Cover (%) Sept. 1998	Leaf Texture ⁴ Aug. 1998	Leaf Texture ⁴ Oct. 1998	Leaf Texture ⁴ 1998 Avg.
		1997-1998 Avg.	1997 Avg.	1998 Avg.						
121	Rebel Jr.	4.3	4.3	4.2	5.0	3.3	60.0	3.0	4.3	3.7
122	Debutante	4.3	4.4	4.2	4.7	2.7	70.0	4.7	5.0	4.8
123	ATF-192	4.2	4.1	4.3	5.3	4.0	71.7	4.3	5.0	4.7
124	Falcon II	4.2	4.3	4.1	5.0	3.7	71.7	3.3	4.7	4.0
125	Titan 2	4.2	3.7	4.7	5.0	2.7	78.3	4.7	5.7	5.2
126	PS11 TF-10	4.2	4.5	3.9	4.7	3.7	68.3	3.3	4.7	4.0
127	JTTF A-96	4.1	3.7	4.4	5.7	2.7	71.7	4.0	6.0	5.0
128	Comstock	4.1	4.2	4.0	5.3	4.3	73.3	3.7	4.0	3.8
129	Leprechaun	4.1	4.4	3.7	4.7	3.3	56.7	3.7	4.0	3.8
130	Bonsai	4.1	3.9	4.3	4.3	4.3	73.3	4.3	4.7	4.5
131	Tomahawk E+	4.0	4.0	4.1	4.7	4.0	61.7	3.7	4.7	4.2
132	Shenandoah	4.0	3.8	4.3	5.3	2.7	63.3	4.0	5.0	4.5
133	Veranda	4.0	3.7	4.2	5.7	2.7	66.7	4.7	4.3	4.5
134	JSC-1	3.8	4.0	3.5	4.3	3.3	66.7	3.3	4.3	3.8
135	JTTF C-96	3.8	3.6	4.0	5.0	3.0	68.3	4.0	4.0	4.0
136	DP 50-9011	3.6	3.5	3.7	5.0	4.3	61.7	4.0	4.7	4.3
137	DLF-1	3.2	3.3	3.2	4.7	3.3	71.7	3.7	3.0	3.3
138	Rebel II	3.1	3.2	3.1	5.3	2.3	60.0	2.7	4.3	3.5
139	DP 7952	3.0	2.9	3.2	5.3	2.3	71.7	3.0	5.3	4.2
140	AV-1	3.0	3.1	3.0	5.0	3.3	61.7	3.0	3.7	3.3

(Continued)

Table 4 (continued).

	Cultivar or Selection	-----Turf Quality ¹ -----			Spring Green-up ² April 1998	Color ³ Aug. 1998	Green Cover (%) Sept. 1998	Leaf Texture ⁴ Aug. 1998	Leaf Texture ⁴ Oct. 1998	Leaf Texture ⁴ 1998 Avg.
		1997-1998 Avg.	1997 Avg.	1998 Avg.						
141	Arid	2.8	2.7	2.8	5.3	2.0	68.3	2.3	2.7	2.5
142	Kentucky 31 E+	1.3	1.4	1.1	7.0	1.0	53.3	1.3	1.0	1.2
	LSD at 5% =	0.5	0.6	0.6	1.2	1.3	11.5	1.1	1.3	0.9

¹9 = best turf quality²9 = earliest spring green-up³9 = darkest green color⁴9 = finest leaf texture

Table 5. Performance of tall fescue cultivars, selections, and mixtures in a trial seeded in September 1997 at Pittstown, NJ.

	Cultivar, Selection, or Mixture	Turf	Establishment ²	Color ³	Brown Patch ⁴
		Quality ¹ 1998 Avg.	Sept. 17 1997	Sept. 26 1997	July 24 1998
1	TF 23	6.1	5.3	7.0	5.7
2	Velocity	5.8	4.3	6.0	5.7
3	Rebel 2000	5.7	6.0	5.7	6.7
4	Masterpiece	5.5	6.0	5.7	6.3
5	WX6-2000	5.4	5.0	6.3	5.0
6	Shenandoah II	5.4	5.0	6.3	4.7
7	Rebel Sentry	5.4	6.3	6.3	4.7
8	Plantation	5.4	5.7	6.0	6.0
9	Hounddog 5 + Kenblue Kbg	5.3	7.0	5.7	6.0
10	Millennium	5.3	6.0	5.7	4.7
11	Hounddog 5 + SR-2000 Kbg	5.2	6.0	5.3	5.7
12	Hounddog 5	5.0	6.3	5.3	5.3
13	TFC-7001E+	5.0	6.3	5.7	5.0
14	Rebel 3D	5.0	5.7	4.7	6.0
15	Tarheel	4.9	6.7	4.7	6.3
16	Hounddog V	4.9	6.7	5.0	5.7
17	Coronado Gold	4.8	5.3	5.3	4.0
18	WX3-275	4.8	6.0	5.0	5.0
19	SR-8430	4.8	6.3	5.0	5.7
20	MA74	4.8	5.0	6.7	3.0
21	Wolfpack	4.7	5.3	4.3	5.7
22	Pride	4.7	6.3	5.3	5.0
23	Coronado	4.7	3.0	6.0	3.7
24	Jaguar 3	4.7	7.0	5.3	4.7
25	Twilight II	4.6	6.7	6.7	3.7
26	Matador	4.6	5.3	6.0	3.3
27	SR-2000 Kbg	4.6	3.0	4.3	8.0
28	SRX-8BPTF	4.6	6.3	6.3	3.3
29	Bonsai 2000	4.6	6.7	5.3	5.0
30	SR-8210	4.6	7.0	5.7	3.3

(Continued)

Table 5 (continued).

	Cultivar, Selection, or Mixture	Turf Quality ¹ 1998 Avg.	Establishment ² Sept. 17 1997	Color ³ Sept. 26 1997	Brown Patch ⁴ July 24 1998
31	Affirmed Perennial Ryegrass	4.6	8.7	5.3	5.0
32	Crewcut	4.5	5.0	5.0	5.0
33	Lion	4.5	5.0	6.0	3.7
34	Onyx	4.5	4.3	7.0	3.0
35	Debutante	4.4	5.7	4.3	5.0
36	Tomahawk	4.4	6.3	4.0	4.3
37	SRX-8MO941-2	4.3	5.7	5.3	3.3
38	SRX-8084	4.2	6.3	5.3	5.0
39	Rebel Jr.	4.2	5.7	4.7	5.3
40	Shenandoah	4.1	6.7	5.3	4.0
41	Titan 2	4.0	8.0	5.0	6.0
42	Equinox	4.0	6.3	5.3	3.7
43	Bonsai	4.0	6.3	5.0	3.3
44	Kenblue Kbg	3.9	4.0	2.0	8.0
45	SR-8200	3.8	6.7	4.7	4.3
46	Anthem II	3.6	7.0	5.7	2.0
47	Grande	3.5	7.0	4.7	4.3
48	SR-8300	3.4	6.0	4.0	4.0
49	Avanti	3.3	6.3	4.3	3.7
50	Kentucky 31	2.5	7.7	3.0	4.7
	LSD at 5% =	0.7	0.9	0.9	1.7

¹9 = best turf quality²9 = best establishment³9 = darkest color⁴9 = least brown patch disease

Table 6. Performance of tall fescue cultivars and selections in a trial seeded in September 1997 at Adelphia, NJ.

	Cultivar or Selection	Turf Quality ¹ 1998 Avg.	Establish- ment ² Sept. 1997	Color ³ Nov. 1997	Net Blotch ⁴ May 1998	Brown Patch ⁴ Aug. 14 1998	Brown Patch ⁴ Aug. 19 1998	Brown Patch ⁴ Aug. 1998 Avg.
1	MT-3	6.8	7.0	6.7	6.3	6.7	6.0	6.3
2	TFC-7001 E+	6.5	6.7	8.0	5.0	4.3	3.3	3.8
3	DLSD	6.3	7.0	6.0	5.0	6.3	6.3	6.3
4	BR-1	6.3	7.0	6.0	5.3	6.7	6.3	6.5
5	DDL	6.1	6.0	6.3	6.3	5.3	4.0	4.7
6	Matador	5.9	7.0	7.3	5.3	5.0	4.0	4.5
7	ISI-TF-23	5.9	5.7	6.7	3.7	6.0	5.3	5.7
8	Coyote	5.8	5.7	6.0	5.3	4.3	3.3	3.8
9	5LZ	5.8	5.3	6.3	5.7	5.0	3.3	4.2
10	Tuscany	5.8	6.0	6.7	6.0	6.7	4.7	5.7
11	TFC-7001 E+	5.7	7.3	7.0	4.7	6.0	4.0	5.0
12	Twilight II	5.7	6.0	6.0	4.7	3.0	2.0	2.5
13	ISI-TF-303	5.4	5.0	6.0	4.3	2.0	1.7	1.8
14	J-101	5.4	6.0	6.0	5.3	4.0	3.0	3.5
15	Picasso	5.4	5.0	6.3	5.0	5.0	4.0	4.5
16	Syn 5PH	5.3	5.7	6.0	4.7	6.0	5.0	5.5
17	5DU	5.3	5.3	6.0	5.7	3.3	3.0	3.2
18	Plantation	5.3	5.3	5.7	4.0	6.0	6.0	6.0
19	Sunpro	5.3	7.3	6.3	3.0	4.3	3.0	3.7
20	Millennium	5.2	5.0	6.0	5.0	6.0	4.7	5.3
21	Syn 5DH	5.2	4.7	5.7	5.7	4.0	3.3	3.7
22	WX6-2000	5.2	5.0	6.7	3.7	6.0	5.0	5.5
23	EA-40	5.1	5.0	6.3	4.3	4.0	3.3	3.7
24	Laramie	5.1	6.0	6.3	4.7	5.0	2.7	3.8
25	Syn 5NRR	5.0	5.7	5.3	4.0	3.7	2.3	3.0
26	5LMD	5.0	5.0	6.3	5.3	4.0	2.7	3.3
27	MA-71	5.0	6.0	5.7	4.7	3.7	2.3	3.0
28	Syn 57E	5.0	5.3	5.7	5.0	5.3	4.7	5.0
29	Syn R5EH-97	4.9	6.0	5.0	4.3	6.3	5.7	6.0
30	Shenandoah II	4.9	4.7	6.0	4.3	5.7	4.0	4.8

(Continued)

Table 6 (continued).

	Cultivar or Selection	Turf Quality ¹ 1998 Avg.	Establishment ² Sept. 1997	Color ³ Nov. 1997	Net Blotch ⁴ May 1998	Brown Patch ⁴ Aug. 14 1998	Brown Patch ⁴ Aug. 19 1998	Brown Patch ⁴ Aug. 1998 Avg.
31	Arabia	4.9	5.0	6.7	5.3	4.3	2.7	3.5
32	Apache II	4.9	7.0	5.7	4.3	6.0	6.0	6.0
33	Bonsai 2000	4.9	7.3	5.3	3.3	5.3	3.7	4.5
34	Pixie E+	4.8	6.7	5.3	4.7	4.7	4.3	4.5
35	LA-38	4.8	5.7	4.7	4.3	3.0	2.7	2.8
36	Arid II	4.8	5.7	6.0	4.3	3.3	3.0	3.2
37	5HU	4.8	6.0	6.0	4.0	3.7	3.3	3.5
38	ISI-TF-301	4.7	4.7	6.0	4.7	4.3	3.7	4.0
39	LA-46	4.7	4.3	6.0	4.7	5.3	3.0	4.2
40	Onyx	4.7	5.0	6.0	3.7	3.0	2.3	2.7
41	Alamo	4.7	6.3	5.7	4.3	3.7	3.3	3.5
42	Gazelle	4.6	4.0	6.0	4.3	3.7	2.3	3.0
43	WX5-365-19	4.6	5.3	6.0	3.3	3.3	2.3	2.8
44	Coronado Gold	4.6	5.7	4.7	4.0	5.3	4.3	4.8
45	R5AE	4.5	6.0	5.3	4.0	5.7	5.7	5.7
46	523-97	4.5	5.7	6.0	4.0	5.0	4.7	4.8
47	Syn R5GR-97	4.5	6.0	5.3	3.7	5.0	3.7	4.3
48	Duster	4.5	6.0	5.0	4.0	4.3	2.7	3.5
49	Masterpiece	4.5	6.0	5.3	3.7	5.0	4.3	4.7
50	Jaguar 3	4.5	6.0	5.0	4.3	5.0	4.3	4.7
51	ISI-TF-302	4.5	5.7	5.7	4.7	1.7	2.0	1.8
52	5E5	4.4	5.7	5.7	4.0	6.0	5.3	5.7
53	5M5	4.4	6.0	6.0	5.0	6.0	5.0	5.5
54	Syn 5DU	4.4	4.3	6.0	5.0	4.0	3.7	3.8
55	Syn R534-97	4.4	6.3	5.3	4.3	6.7	5.7	6.2
56	Anthem II	4.4	5.7	5.3	3.3	3.3	2.0	2.7
57	Exp-LWE	4.3	6.0	5.3	3.0	4.7	3.3	4.0
58	5R94E	4.3	6.0	5.0	3.7	6.3	5.7	6.0
59	Syn 5RMY	4.3	6.3	5.3	4.0	6.7	6.0	6.3
60	Hounddog V	4.3	6.3	4.7	4.3	5.3	4.3	4.8

(Continued)

Table 6 (continued).

	Cultivar or Selection	Turf Quality ¹ 1998 Avg.	Establishment ² Sept. 1997	Color ³ Nov. 1997	Net Blotch ⁴ May 1998	Brown Patch ⁴ Aug. 14 1998	Brown Patch ⁴ Aug. 19 1998	Brown Patch ⁴ Aug. 1998 Avg.
61	Syn 5FH	4.3	5.0	5.0	4.0	5.3	5.0	5.2
62	Equinox	4.3	5.3	5.0	3.0	3.0	2.0	2.5
63	523M	4.2	6.0	5.7	4.0	5.7	5.3	5.5
64	MA-74	4.2	4.3	4.7	4.3	5.0	3.3	4.2
65	Lancer	4.2	5.3	5.0	4.0	4.3	3.3	3.8
66	Bandana	4.2	5.7	5.0	3.3	4.7	4.3	4.5
67	Rembrandt	4.2	4.3	6.0	3.0	3.7	2.3	3.0
68	Tomahawk E+	4.1	5.7	5.3	4.3	5.0	4.0	4.5
69	Syn R5MM-97	4.1	6.0	5.3	4.0	5.3	4.3	4.8
70	Wolfpack	4.1	6.7	4.3	4.3	6.3	6.0	6.2
71	Syn R5EL-97	4.1	6.0	5.0	3.3	5.7	5.0	5.3
72	Bravo	4.1	5.3	5.0	3.3	5.0	3.3	4.2
73	Lion	4.0	4.7	5.0	4.0	4.0	2.3	3.2
74	Syn 5TOR	4.0	4.0	4.7	3.3	4.7	3.3	4.0
75	Tar Heel	4.0	4.7	5.0	3.7	6.0	5.0	5.5
76	5HOE-97	4.0	5.0	5.7	4.0	2.3	1.7	2.0
77	R5AU	3.9	6.0	5.0	4.3	5.0	4.3	4.7
78	Syn 5R94Y	3.7	5.7	4.3	4.0	6.0	4.7	5.3
79	EA-67	3.6	5.7	4.7	3.3	4.7	3.0	3.8
80	Mini-Mustang	3.6	6.3	5.0	3.7	5.0	3.7	4.3
81	Syn R5GEN-97	3.5	6.0	4.3	3.7	5.3	5.0	5.2
82	Tomahawk	3.5	6.7	5.0	3.7	4.0	3.0	3.5
83	Stetson	3.5	6.0	4.3	3.0	4.7	3.3	4.0
84	Bonsai	3.4	5.3	3.7	3.7	5.0	2.7	3.8
85	Debutante	3.4	5.7	4.0	3.3	5.0	2.3	3.7
86	Crewcut	3.3	5.7	4.3	2.7	4.7	2.7	3.7
87	Crossfire II	3.2	6.3	3.7	3.0	4.7	4.0	4.3
88	Safari	3.1	4.3	4.3	3.0	5.3	4.0	4.7
89	Advanti	3.1	6.0	3.0	3.3	5.0	3.7	4.3
90	WX3 275	3.1	5.0	5.0	4.0	3.3	2.0	2.7

(Continued)

Table 6 (continued).

	Cultivar or Selection	Turf Quality ¹ 1998 Avg.	Establishment ² Sept. 1997	Color ³ Nov. 1997	Net Blotch ⁴ May 1998	Brown Patch ⁴ Aug. 14 1998	Brown Patch ⁴ Aug. 19 1998	Brown Patch ⁴ Aug. 1998 Avg.
91	Silverado	2.9	3.3	4.3	3.7	5.3	3.7	4.5
92	Shenandoah	2.9	6.0	3.7	2.3	6.0	3.7	4.8
93	Coronado E+	2.8	2.0	5.7	4.0	3.7	2.7	3.2
94	Grande	2.8	6.3	3.7	3.3	5.3	4.0	4.7
95	Crossfire	2.8	5.0	3.7	2.3	5.0	5.3	5.2
96	Amigo	2.3	6.0	2.0	2.3	4.0	3.3	3.7
97	Eldorado	2.0	3.0	4.0	2.0	3.3	3.7	3.5
98	Olympic II	1.9	2.7	4.3	2.3	4.0	3.7	3.8
99	Monarch	1.5	2.0	4.3	2.7	3.7	3.7	3.7
100	Kentucky 31	1.4	6.0	1.0	2.0	5.0	4.7	4.8
	LSD at 5% =	0.7	0.9	1.0	1.1	1.7	1.8	1.6

¹9 = best turf quality

²9 = quickest establishment

³9 = darkest color

⁴9 = least disease

Table 7. Yearly nitrogen (N) applied and mowing height (Ht) on tall fescue tests established at Adelphia, North Brunswick, and Pittstown, NJ.

	1995		1996		1997		1998	
	N ¹	Ht ²	N	Ht	N	Ht	N	Ht
Table 1 (1994 Adelphia)	4.8	2.0	2.8	2.0	2.1	2.0	0.7	2.0
Table 2 (1995 Adelphia)			5.0	1.5	3.3	1.5	3.6	1.5
Table 3 (1996 North Brunswick)					4.4	1.5	3.6	1.5
Table 4 (1996 Adelphia)					4.5	1.5	3.8	1.5
Table 5 (1997 Pittstown)							2.6	3.5
Table 6 (1997 Adelphia)							2.8	1.5

¹Annual N applied (lbs/1000 ft²).

²Mowing height in inches.