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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 1999 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.

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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. Unlike most other cool-season turfgrasses, tall fescue has the ability to survive extended periods of heat and drought stress. The ability to perform well under low soil moisture conditions has made tall fescue an attractive option for turf managers in many situations. 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, which 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 to be used as turfgrass (Kentucky-31 and Alta) were introduced in the early 1940s. These cultivars do not produce high quality turf as they 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 in the past 20 years. Plant breeders have focused their efforts on producing tall fescue varieties that exhibit darker green color, lower growth habit, higher shoot density, and finer leaf texture. The result of these efforts has been that many of the improved tall fescue cultivars have a turf quality that is comparable to many of the other cool-season turfgrass species main-

tained at cutting heights above 1.5 inches. Tall fescue can now be used effectively for a number of medium-high maintenance situations, including athletic fields, parks, and home lawns. In addition, tall fescue is quite effective in low maintenance situations such as roadsides and industrial sites.

Currently, a great deal of research is being conducted on the beneficial role of endophytes in tall fescue. Endophytic fungi that live in tall fescue plants have been shown to enhance drought tolerance and insect resistance within the plant species. Development of cultivars that contain beneficial endophytes may increase the utility of tall fescue as a turfgrass. Plant collection trips are being made around the world in an effort to obtain new sources of endophytes. By diversifying the genetic base of endophytes available for research, plant breeders may be able to identify symbionts that will enhance resistance to insects and diseases.

PROCEDURES

Six tall fescue tests were established in New Jersey between 1995 and 1998. A single test was established each year at the Rutgers Plant Science Research Center at Adelphia (Tables 1, 3, 5, and 6). In 1996, a test was established at the Turfgrass Research Facility at North Brunswick (Table 2). In addition, a test was established in 1997 at the Rutgers Snyder Research and Extension Farm in Pittstown (Table 4). All tests at Adelphia and North Brunswick were established in August or September by

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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 mixtures of tall fescue and Kentucky bluegrass.

The tests were managed under different nitrogen and mowing regimes (Table 7). The Pittstown test was mowed with a rotary mower; mowing at the other sites was usually done with reel mowers. The mowing of the plots was frequent enough to prevent excessive accumulation of clippings, thus all of the clippings were returned throughout the year at all three sites. Soil pH was 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, Dacthal was used as a preemergent control of annual grassy weeds. The 1996 test at North Brunswick received a spring treatment of Dimension and a fall application of 2,4-D + dicamba. The test at Pittstown was treated with Pendulum in the spring.

The tests were maintained at medium-high fertility levels and 1.5 inch mowing heights with the exception of the Pittstown test (medium fertility and 3.0 inch cutting height). Tests were often managed more intensely in order to encourage more disease (i.e., Pythium blight and brown patch) and insect problems. This allowed the plots to be evaluated for resistance to diseases and insects.

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 diseases (brown patch, leaf spot, and red thread), 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 the 1998 test at Adelphia, are ranked by the overall (multiple-year) turf quality averages. The 1998 test at Adelphia (Table 6) is ranked by the 1999 turf quality average. 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. A cultivar may have excellent color and good density which makes it quite attractive in the spring and early summer; however, this same cultivar may be quite unattractive in the late summer because of damage due 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.

Turf Quality

In the 20 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 rank near the bottom of the tests in regard to turf quality. Tall fescue turf quality is currently improving at a brisk pace. Cultivars that perform well in one test may rank significantly lower as early as the following year, thus turf managers must be aware of recent data in order to take advantage of the best tall fescue varieties on the market.

Disease Resistance

The major disease of tall fescue is brown patch caused by *Rhizoctonia solani*. As can be seen in Tables 3 and 5, resistance to brown patch in commercially available varieties is inadequate. A severe outbreak of brown patch occurred in the 1997 test at Adelphia (Table 5). The brown

patch rating for this test is an average of two separate ratings taken on July 8 and July 26. Due to the similarities in severity of brown patch between the two dates, the data were averaged for simplicity. Every entry in the 1997 test was susceptible to brown patch, with only a few entries receiving an acceptable brown patch rating (6.0 or higher).

Dense turf produces a microenvironment more favorable to brown patch, thus breeding brown patch resistance into available germplasm has been quite difficult. During the past year at Rutgers, the focus of tall fescue breeding has shifted from strictly selecting extremely dense types to selecting germplasm that exhibits a slightly more open canopy. Although these open-type selections may not have the optimum density wanted by most turf managers, the anticipated reduction in brown patch severity may greatly reduce fungicide inputs.

Color

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 retain a darker green color. Improvements in color in newer varieties are reflected in the overall quality ratings in each of the tables. Much of the improvement that has been made in newer cultivars such as Picasso, Millennium, and Masterpiece can partly be attributed to a change in color from light green (i.e., Kentucky-31) to dark green.

SUMMARY

As plant breeders continue to develop high quality varieties, tall fescue is certain to be used on a much broader basis. Improvements in color, density, and leaf texture have already made tall fescue a viable option for many turfgrass managers. Tall fescue performs better than many other cool-season turfgrasses under drought conditions. 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. Fortunately, plant breeders are making progress on improving this trait as can be seen in the most recently developed populations. The major weakness of tall fescue is susceptibility to brown patch. This deficiency, above all others, must be overcome if tall fescue is to be more widely accepted as a primary use, cool season turfgrass.

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Table 1. Performance of tall fescue cultivars and selections in a trial seeded in August 1995 at Adelphia, NJ.

	Cultivar or Selection	-----Turf Quality ¹ -----				
		1996-1999 Avg.	1996 Avg.	1997 Avg.	1998 Avg.	1999 Avg.
1	Masterpiece	6.2	6.7	6.0	6.4	5.6
2	Syn R5AM-95	5.6	5.9	5.4	5.4	5.6
3	Pride	5.5	6.5	5.1	5.6	4.9
4	Syn R5AU-95	5.3	5.3	4.9	5.5	5.4
5	Tarheel	5.2	5.2	4.9	5.6	4.9
6	Wolfpack	5.2	4.6	5.4	5.6	5.4
7	Hounddog 5	5.0	5.3	4.6	5.2	4.7
8	Syn R5EL-95	4.9	5.2	4.9	4.8	4.7
9	Pixie	4.8	5.7	4.5	4.6	4.4
10	LA 38	4.7	4.6	4.6	4.8	4.9
11	Syn R5GEN-95	4.7	4.7	4.5	4.9	4.6
12	Safari	4.7	4.9	4.5	4.8	4.4
13	Wrangler II	4.6	5.0	4.5	4.3	4.5
14	Tomahawk	4.6	5.0	4.5	4.0	4.9
15	Bravo	4.5	4.5	3.9	5.0	4.4
16	EA 41	4.4	4.4	4.0	4.4	4.7
17	Onyx	4.4	5.1	4.3	4.1	4.2
18	Shenandoah	4.4	3.6	4.4	4.9	4.7
19	Lancer	4.4	4.4	4.3	4.4	4.6
20	Benton	4.3	4.4	4.2	4.4	3.9
21	Lion	4.3	3.5	4.1	4.8	4.6
22	GQ	4.3	4.2	4.7	4.1	4.1
23	Stetson	4.3	3.1	4.5	5.1	4.6
24	Rebel Jr	4.3	4.1	4.3	4.2	4.5
25	Montauk	4.2	4.0	3.9	4.2	4.5
26	Mini Mustang	4.2	4.1	4.1	4.2	4.4
27	Rebel 3D	4.2	5.2	4.0	3.7	4.0
28	Monarch	4.2	3.9	4.4	4.4	4.2
29	Duke	4.1	4.0	4.2	4.1	4.1
30	Crossfire	4.1	3.8	4.1	4.1	4.3

(Continued)

Table 1 (continued).

	Cultivar or Selection	-----Turf Quality ¹ -----				
		1996-1999 Avg.	1996 Avg.	1997 Avg.	1998 Avg.	1999 Avg.
31	Oasis	4.1	3.6	4.4	4.2	4.3
32	LA 46	4.0	3.9	3.9	4.2	3.8
33	Maverick II	3.9	3.6	4.0	4.0	3.9
34	Trailblazer II	3.9	3.6	3.8	4.2	4.1
35	Rebel III	3.9	3.8	3.7	3.9	4.1
36	Arriba	3.8	3.3	4.1	4.2	3.7
37	Amigo	3.8	3.4	4.1	4.1	3.7
38	Rebel II	3.7	3.7	3.5	3.5	3.9
39	Savoy	3.6	3.1	3.7	3.8	3.8
40	Mesa	3.5	3.1	3.7	3.6	3.4
41	Mustang	3.4	3.7	3.2	3.2	3.5
42	Arid	3.1	3.1	3.2	3.1	3.0
43	Fawn	1.1	1.2	1.2	1.0	1.1
	LSD at 5% =	0.5	0.7	0.7	0.6	0.8

¹9 = best turf quality

Table 2. 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 1999	Red Thread ³ June 1999
		1997-1999 Avg.	1997 Avg.	1998 Avg.	1999 Avg.		
1	Millennium	6.4	6.4	5.9	6.8	3.3	5.3
2	Picasso	6.1	6.0	6.0	6.2	2.7	4.3
3	Plantation	5.9	5.7	6.0	6.0	3.7	3.7
4	Rembrandt	5.8	5.0	6.1	6.2	4.3	4.0
5	Coronado	5.8	5.8	5.9	5.6	4.3	4.7
6	Crossfire II	5.7	5.1	5.8	6.1	3.3	4.0
7	Masterpiece	5.6	5.0	5.7	6.3	4.3	5.0
8	Arid 3	5.6	5.9	5.3	5.6	2.3	5.7
9	BAR Fa6D USA	5.6	5.7	5.3	5.7	4.0	6.3
10	Scorpion	5.5	5.0	5.6	6.0	3.3	4.3
11	MB 213	5.5	5.9	5.3	5.3	2.7	5.0
12	Gazelle	5.5	5.6	5.2	5.7	3.0	2.7
13	Brandy	5.5	5.5	5.2	5.7	2.7	5.7
14	Coyote	5.5	5.3	5.3	5.8	2.0	3.7
15	Pick RT-95	5.5	4.8	5.7	5.9	3.3	4.7
16	Sunpro	5.4	5.4	5.5	5.3	2.7	6.0
17	Tarheel	5.3	5.2	5.3	5.5	4.0	5.0
18	BAR Fa6 US1	5.3	5.3	5.0	5.6	3.7	4.0
19	Anthem II	5.3	5.5	5.0	5.4	5.0	4.0
20	BAR Fa6 US2U	5.3	5.9	4.4	5.6	5.0	6.3
21	Watchdog	5.3	5.1	5.4	5.4	3.7	3.3
22	MB 26	5.3	5.9	4.8	5.1	3.0	5.3
23	Bonsai 2000	5.3	5.1	5.1	5.7	5.3	4.7
24	Shenandoah II	5.3	4.7	5.7	5.5	3.7	3.7
25	Arid 2	5.3	5.7	4.9	5.1	3.0	5.0
26	Pick FA 15-92	5.3	5.2	5.3	5.2	3.0	5.3
27	Pick FA N-93	5.2	5.1	5.2	5.4	2.3	5.3
28	Pick FA XK-95	5.2	5.8	5.0	5.0	4.0	4.7
29	Twilight II	5.2	5.3	5.3	5.1	3.0	5.0
30	BAR FA 6D	5.2	5.4	4.8	5.5	4.0	6.0

(Continued)

Table 2 (continued).

	Cultivar or Selection	-----Turf Quality ¹ -----				Spring Green-up ² April 1999	Red Thread ³ June 1999
		1997-1999 Avg.	1997 Avg.	1998 Avg.	1999 Avg.		
31	ZPS-5LZ	5.2	5.5	5.2	4.9	2.7	5.0
32	MB 28	5.2	5.7	4.4	5.4	3.0	5.7
33	MB 212	5.2	5.0	5.0	5.5	4.3	4.7
34	Aztec II	5.1	5.3	5.0	5.1	5.0	5.0
35	Arabia	5.1	5.5	4.7	5.1	2.0	5.7
36	OFI-96-31	5.1	5.5	4.8	5.0	3.7	5.0
37	Rebel Sentry	5.1	5.2	4.6	5.4	3.3	5.7
38	Shortstop II	5.1	5.4	5.1	4.6	3.0	4.0
39	MB 29	5.0	5.3	4.7	5.0	3.3	6.0
40	BAR FA 6LV	5.0	5.2	4.5	5.4	4.3	5.3
41	BAR Fa6 US3	5.0	5.4	4.5	5.2	4.7	6.3
42	Coronado Gold	5.0	4.6	5.6	4.8	2.7	4.3
43	Jaguar 3	5.0	4.6	5.2	5.2	5.0	3.0
44	CU 950 2T	5.0	5.1	4.5	5.4	5.3	5.3
45	Genesis	5.0	5.0	4.8	5.1	4.3	4.7
46	Arcade	5.0	5.0	4.4	5.5	3.0	5.0
47	PST-5TO	5.0	4.8	5.3	4.7	3.0	4.3
48	WX3-275	5.0	4.6	4.9	5.3	2.0	5.3
49	MB 216	4.9	5.3	4.7	4.8	4.7	7.0
50	Bulldawg	4.9	5.1	5.3	4.4	3.0	2.3
51	Olympic Gold	4.9	5.0	4.9	4.8	3.7	5.0
52	CIS TF-10	4.9	5.3	4.4	4.9	3.3	4.3
53	SR 8210	4.9	5.1	4.6	4.9	4.0	3.7
54	PST-523	4.9	5.2	4.8	4.7	5.3	5.7
55	Empress	4.9	4.8	4.8	4.9	2.3	5.3
56	CU 950 1T	4.9	5.2	4.4	5.0	4.7	7.0
57	MB 215	4.9	5.3	4.6	4.7	3.3	6.3
58	Rebel 2000	4.8	5.2	4.6	4.6	3.3	5.3
59	MB 214	4.8	5.2	4.6	4.6	3.3	5.7
60	Pick FA 20-92	4.8	5.5	4.6	4.3	3.0	4.0

(Continued)

Table 2 (continued).

	Cultivar or Selection	-----Turf Quality ¹ -----				Spring Green-up ² April 1999	Red Thread ³ June 1999
		1997-1999 Avg.	1997 Avg.	1998 Avg.	1999 Avg.		
61	EA 41	4.8	4.9	4.6	4.8	3.0	4.3
62	Alamo E+	4.8	4.6	4.7	5.0	2.3	4.0
63	Chapel Hill	4.8	5.3	4.5	4.5	4.7	5.7
64	MB 211	4.8	5.0	4.7	4.7	2.7	4.3
65	Apache II	4.8	5.0	4.5	4.8	3.7	5.3
66	Bravo	4.8	4.8	4.5	5.0	4.0	4.7
67	CIS TF-9	4.7	5.1	4.6	4.5	4.0	6.0
68	OFI-931	4.7	5.2	4.4	4.6	4.0	5.7
69	Wyatt	4.7	4.6	4.4	5.2	3.3	3.7
70	Pick FA 6-91	4.7	5.8	4.3	4.0	3.0	5.3
71	OFI-951	4.7	4.9	4.4	4.8	4.3	5.0
72	Wolfpack	4.7	4.4	5.0	4.6	4.3	5.3
73	SRX 8500	4.6	5.1	4.2	4.6	2.7	5.0
74	Southern Choice	4.6	4.8	4.3	4.8	2.7	4.3
75	OFI-FWY	4.6	4.5	4.3	5.0	5.0	4.7
76	ATF-253	4.6	4.4	4.6	4.8	3.3	6.3
77	Koos 96-14	4.6	5.0	4.3	4.5	3.7	5.0
78	BAR FA6 US6F	4.6	5.1	4.2	4.5	4.3	4.3
79	PST-5M5	4.6	4.6	4.6	4.6	3.0	5.3
80	Rebel 3D	4.6	5.0	4.3	4.4	3.3	5.3
81	Regiment	4.6	4.9	4.1	4.7	5.3	5.3
82	Tomahawk E+	4.6	4.7	4.3	4.6	4.3	5.7
83	MB 210	4.5	5.0	4.1	4.5	4.3	5.3
84	Finelawn Petite	4.5	4.7	4.2	4.6	4.0	5.3
85	Lion	4.5	4.4	4.5	4.5	3.0	4.7
86	CIS TF-11	4.4	4.6	4.4	4.3	3.3	4.0
87	R5AU	4.4	4.9	3.9	4.4	4.0	4.7
88	Pick FA UT-93	4.4	4.5	4.6	4.0	3.0	4.3
89	Mustang II	4.3	4.3	4.3	4.5	4.3	4.7
90	Duster	4.3	4.6	4.2	4.2	3.7	5.0

(Continued)

Table 2 (continued).

	Cultivar or Selection	-----Turf Quality ¹ -----				Spring Green-up ² April 1999	Red Thread ³ June 1999
		1997-1999 Avg.	1997 Avg.	1998 Avg.	1999 Avg.		
91	WVBP-1B	4.3	4.7	4.2	4.1	5.3	5.3
92	Reserve	4.3	4.5	4.1	4.4	4.3	6.0
93	Cochise II	4.3	4.5	3.9	4.4	3.3	4.7
94	Barkoel' Koelaria	4.3	5.4	4.0	3.5	2.0	5.0
95	Falcon II	4.3	4.5	4.0	4.3	6.0	5.0
96	Redcoat	4.2	5.0	3.2	4.5	5.0	6.3
97	Comstock	4.2	4.3	4.0	4.3	5.0	6.0
98	Tulsa	4.2	4.7	3.7	4.2	4.7	4.7
99	WVPB-1D	4.2	4.9	3.7	4.0	5.0	6.3
100	PSII-TF-10	4.2	4.4	4.0	4.2	4.3	6.0
101	Shenandoah	4.2	4.2	4.2	4.1	5.3	3.7
102	Renegade	4.1	4.9	3.6	3.9	4.7	4.3
103	Bandana	4.1	4.0	4.1	4.4	3.3	3.3
104	OFI-96-32	4.1	4.6	3.8	3.9	4.3	5.3
105	Pixie E+	4.1	4.2	3.9	4.2	4.0	5.7
106	EC-101	4.1	4.5	3.9	3.9	4.3	5.3
107	Equinox	4.1	4.1	4.1	4.0	4.3	4.3
108	Leprechaun	4.1	4.5	3.8	3.9	4.7	4.7
109	Marksman	4.1	4.4	3.7	4.1	5.3	5.7
110	ATF-020	4.0	4.5	3.6	3.9	4.0	6.3
111	Cortez	4.0	4.5	3.5	3.9	4.7	4.7
112	Safari	4.0	3.9	4.1	3.9	7.0	4.7
113	Velocity	3.9	4.3	3.7	3.8	3.0	5.7
114	Pedestal	3.9	4.1	3.8	3.9	5.0	6.0
115	PSII-TF-9	3.9	4.4	3.7	3.7	4.7	3.7
116	ATF-257	3.9	3.6	4.0	4.1	3.3	4.7
117	Kitty Hawk	3.9	4.1	3.7	3.8	3.7	6.3
118	DP 50-9011	3.9	4.2	3.6	3.8	4.0	4.7
119	Good-EN	3.8	4.8	3.3	3.4	4.3	5.0
120	Titan 2	3.8	4.1	3.9	3.5	5.7	4.7

(Continued)

Table 2 (continued).

	Cultivar or Selection	-----Turf Quality ¹ -----				Spring Green-up ² April 1999	Red Thread ³ June 1999
		1997-1999 Avg.	1997 Avg.	1998 Avg.	1999 Avg.		
121	SRX 8084	3.8	4.1	3.7	3.6	3.7	3.7
122	Rebel Jr	3.8	3.9	3.9	3.5	6.0	5.3
123	H7 Space GR 95	3.8	3.4	4.0	3.9	5.7	5.7
124	PRO 8430	3.7	3.4	3.8	4.0	3.0	3.7
125	JSC-1	3.7	4.1	3.3	3.6	5.0	6.3
126	Bonsai	3.7	3.9	3.7	3.4	4.0	5.7
127	ATF-192	3.6	4.0	3.4	3.4	2.7	5.3
128	JTTFC-96	3.3	3.6	3.3	3.0	4.3	3.3
129	JTTFA-96	3.1	3.1	2.9	3.2	8.0	2.7
130	DLF-1	2.9	3.2	2.8	2.7	6.3	6.7
131	Arid	2.8	3.3	2.8	2.5	7.7	5.7
132	Rebel II	2.8	3.0	2.8	2.5	5.7	4.0
133	DP 7952	2.4	2.6	2.5	2.1	7.0	3.7
134	AV-1	2.4	2.7	2.2	2.2	5.3	4.7
135	Kentucky-31 E+	1.6	2.0	1.7	1.2	8.0	9.0
	LSD at 5% =	0.7	0.8	1.0	1.0	1.5	2.9

¹9 = best turf quality

²9 = earliest spring green-up

³9 = least red thread

Table 3. Performance of tall fescue cultivars and selections in a trial seeded in September 1996 at Adelphia, NJ.

	Cultivar or Selection	-----Turf Quality ¹ -----				Spring Green-up ² April 1999	Brown Patch ³ July 1999
		1997-1999 Avg.	1997 Avg.	1998 Avg.	1999 Avg.		
1	Rembrandt	5.9	5.7	6.2	5.8	6.7	4.7
2	Plantation	5.9	5.8	5.8	5.9	5.7	6.7
3	Picasso	5.9	6.2	6.0	5.4	4.7	6.0
4	Millennium	5.8	6.1	6.0	5.3	4.7	5.3
5	Gazelle	5.7	6.3	5.9	5.0	5.3	4.0
6	Pick RT-95	5.6	5.4	6.1	5.3	5.3	5.7
7	Coyote	5.5	6.0	5.4	5.2	4.7	5.3
8	WRS2-1A	5.4	5.6	5.3	5.4	6.7	6.3
9	Scorpion	5.4	5.5	5.6	5.2	4.3	5.7
10	Rebel Sentry	5.4	5.9	5.0	5.1	4.7	7.3
11	Watchdog	5.4	5.6	5.7	5.1	6.0	5.7
12	Pick FA 20-92	5.4	5.4	5.4	5.3	4.7	6.0
13	Shenandoah II	5.3	5.4	5.5	5.2	5.7	4.7
14	Masterpiece	5.3	5.2	5.5	5.3	6.3	7.0
15	Crossfire II	5.3	4.7	5.5	5.5	6.0	7.3
16	BAR FA 6 US3	5.3	6.0	5.2	4.6	5.0	6.0
17	Wolfpack	5.2	4.8	5.6	5.1	7.0	5.7
18	Tarheel	5.2	5.2	5.3	4.9	5.7	6.3
19	Pick FA XK-96	5.2	5.4	5.3	5.0	5.0	6.3
20	MB-26	5.2	5.7	5.1	4.9	4.0	5.7
21	Bonsai 2000	5.2	5.2	5.5	4.9	6.7	5.3
22	Apache II	5.2	5.5	5.3	4.6	5.0	4.7
23	WRS2-1B	5.1	5.2	4.9	5.3	5.7	7.7
24	PST-523	5.1	5.0	5.1	5.2	7.0	7.3
25	OFI-96-31	5.1	5.4	5.2	4.8	4.3	6.0
26	MB-29	5.1	5.7	4.7	4.8	3.7	7.3
27	MB-212	5.1	5.2	4.9	5.2	5.7	5.3
28	Empress	5.1	5.1	5.2	5.0	5.0	6.0
29	CU 950 1T	5.1	5.3	4.8	5.1	7.0	5.7
30	Coronado	5.1	5.4	5.1	4.7	5.7	6.0

(Continued)

Table 3 (continued).

	Cultivar or Selection	-----Turf Quality ¹ -----				Spring Green-up ² April 1999	Brown Patch ³ July 1999
		1997-1999 Avg.	1997 Avg.	1998 Avg.	1999 Avg.		
31	CIS TF-12	5.1	4.9	5.2	5.1	3.7	7.3
32	Arcade	5.1	5.0	5.6	4.8	4.7	6.3
33	96 WROTF	5.1	5.0	5.2	5.0	4.7	5.7
34	ZPS-5L2	5.0	5.4	4.4	5.3	3.7	5.7
35	Tulsa	5.0	5.1	4.9	5.0	6.0	5.3
36	SRX 8500	5.0	5.4	5.0	4.7	3.7	5.7
37	SR 8210	5.0	5.0	5.1	4.8	5.0	6.0
38	Southern Choice	5.0	5.0	4.8	5.1	5.7	5.3
39	PST-5TO	5.0	4.7	5.2	5.1	6.0	6.0
40	Pick FA N-93	5.0	4.8	5.4	4.8	3.3	5.3
41	Olympic Gold	5.0	5.3	4.7	5.1	4.3	5.0
42	OFI-951	5.0	5.5	5.0	4.6	5.3	6.0
43	OFI-931	5.0	5.0	5.1	4.9	5.0	4.3
44	Jaguar 3	5.0	4.3	5.3	5.3	7.7	6.7
45	Bravo	5.0	5.0	5.0	5.0	5.3	6.3
46	Aztec II	5.0	5.3	5.3	4.5	4.7	5.7
47	Arid 3	5.0	5.5	4.8	4.8	4.0	6.0
48	Alamo E+	5.0	4.9	5.2	4.7	3.7	5.0
49	Chapel Hill	4.9	6.0	4.3	4.4	6.0	5.7
50	PST-5M5	4.9	5.1	4.6	5.0	4.3	5.7
51	Bulldawg	4.9	4.8	4.9	4.8	4.7	6.0
52	MB-28	4.9	5.2	4.4	5.0	4.3	4.7
53	MB-213	4.9	5.7	4.5	4.6	4.0	7.0
54	Twilight II	4.8	5.3	4.5	4.5	4.0	6.7
55	Sunpro	4.8	4.8	4.8	4.7	4.7	6.0
56	MB-211	4.8	5.2	4.6	4.5	4.0	6.3
57	Coronado Gold	4.8	4.6	5.1	4.7	5.3	6.0
58	Brandy	4.8	5.5	4.7	4.1	3.7	4.3
59	BAR FA6 US6F	4.8	5.0	4.6	4.8	4.7	5.0
60	BAR FA 6D USA	4.8	5.5	4.6	4.3	3.7	5.3

(Continued)

Table 3 (continued).

	Cultivar or Selection	-----Turf Quality ¹ -----				Spring Green-up ² April 1999	Brown Patch ³ July 1999
		1997-1999 Avg.	1997 Avg.	1998 Avg.	1999 Avg.		
61	BAR FA 6D	4.8	5.2	4.9	4.3	6.0	4.3
62	BAR FA 6 US1	4.8	5.6	4.5	4.4	4.7	5.3
63	ATF-188	4.8	4.4	5.1	4.9	5.0	5.7
64	Anthem II	4.8	4.7	4.8	4.9	5.3	6.0
65	Reserve	4.7	4.5	4.9	4.7	6.0	5.0
66	R5AU	4.7	4.6	4.8	4.6	5.3	5.7
67	Mustang II	4.7	4.3	5.0	4.8	6.0	5.3
68	Duster	4.7	4.7	4.7	4.6	5.3	4.7
69	CIS TF-11	4.7	4.4	5.0	4.6	4.0	5.7
70	BAR FA 6LV	4.7	5.5	4.6	4.1	4.3	5.0
71	BAR FA 6 US2U	4.7	5.0	4.7	4.4	5.0	4.7
72	ATF-257	4.7	4.0	5.1	5.0	5.7	7.0
73	ATF-253	4.7	4.5	4.7	4.9	4.3	6.3
74	Arid 2	4.7	5.0	4.6	4.6	4.0	4.7
75	Shortstop II	4.6	4.9	4.5	4.5	4.0	3.3
76	Regiment	4.6	4.5	4.4	4.8	7.0	7.0
77	Redcoat	4.6	4.6	4.2	4.9	6.3	6.0
78	Pixie E+	4.6	4.8	4.5	4.4	5.3	6.0
79	Pick FA 6-91	4.6	5.1	4.3	4.3	3.0	6.3
80	OFU-FWY	4.6	5.1	4.5	4.2	4.3	4.7
81	MB-216	4.6	5.4	4.1	4.3	3.3	6.0
82	MB-214	4.6	5.5	4.1	4.1	5.0	5.7
83	MB-210	4.6	5.1	4.3	4.6	4.7	6.0
84	KOOS 96-14	4.6	5.0	4.3	4.7	5.3	5.3
85	EA 41	4.6	4.1	4.9	4.8	3.7	5.0
86	CU 950 2T	4.6	4.5	4.6	4.6	7.0	5.3
87	Arabia	4.6	5.2	4.2	4.4	4.0	5.0
88	Rebel 2000	4.5	5.4	4.1	4.0	3.7	6.0
89	PS11 TF-9	4.5	4.6	4.4	4.5	5.7	6.0
90	Pick FA UT-93	4.5	4.8	4.5	4.2	3.3	5.0

(Continued)

Table 3 (continued).

	Cultivar or Selection	-----Turf Quality ¹ -----				Spring Green-up ² April 1999	Brown Patch ³ July 1999
		1997-1999 Avg.	1997 Avg.	1998 Avg.	1999 Avg.		
91	OFI-96-32	4.5	4.8	4.2	4.5	5.3	5.7
92	Marksman	4.5	4.4	4.5	4.5	4.7	7.0
93	Good EN	4.5	5.0	4.3	4.3	5.7	6.3
94	Cochise II	4.5	4.3	4.8	4.3	6.3	4.7
95	CIS TF-13	4.5	4.2	4.9	4.4	5.0	6.7
96	WVPB-1D	4.4	4.3	4.2	4.6	6.0	7.3
97	WVPB-1B	4.4	4.9	4.0	4.3	6.3	6.7
98	Renegade	4.4	4.9	4.1	4.3	5.0	5.7
99	Rebel 3D	4.4	5.1	3.7	4.3	5.0	6.0
100	Pick FA 15-92	4.4	4.3	4.4	4.6	4.3	5.3
101	Pedestal	4.4	4.7	4.5	4.0	4.3	5.7
102	MB-215	4.4	5.4	4.0	3.8	3.3	5.7
103	Lion	4.4	4.4	4.4	4.5	4.3	5.7
104	Finelawn Petite	4.4	4.7	4.1	4.2	5.0	6.7
105	Cortez	4.4	4.3	4.6	4.3	5.0	6.3
106	CIS TF-9	4.4	4.4	4.7	4.2	5.3	6.0
107	CIS TF-14	4.4	4.4	4.4	4.4	3.3	6.7
108	CIS TF-10	4.4	5.1	4.1	4.1	4.0	6.0
109	Bandana	4.4	4.1	4.5	4.5	5.0	6.3
110	ATF-020	4.4	4.5	4.4	4.3	4.3	6.0
111	WX3-275	4.3	4.2	4.4	4.2	2.7	5.0
112	Shenandoah	4.3	4.2	4.4	4.2	6.7	6.3
113	PRO 8430	4.3	4.1	4.7	4.0	4.3	5.0
114	Kitty Hawk	4.3	4.3	4.6	4.1	5.0	5.3
115	Genesis	4.3	4.8	4.2	3.8	5.0	5.3
116	Falcon II	4.3	4.3	4.1	4.4	6.7	5.7
117	Equinox	4.3	4.2	4.5	4.2	6.0	5.3
118	EC-101	4.3	4.6	3.9	4.5	5.0	5.0
119	SRX 8084	4.2	4.3	4.5	3.9	5.0	4.7
120	Safari	4.2	4.4	4.4	3.8	7.0	5.0

(Continued)

Table 3 (continued).

	Cultivar or Selection	-----Turf Quality ¹ -----				Spring Green-up ² April 1999	Brown Patch ³ July 1999
		1997-1999 Avg.	1997 Avg.	1998 Avg.	1999 Avg.		
121	Rebel Jr	4.2	4.3	4.2	4.1	5.3	5.7
122	PS11 TF-10	4.2	4.5	3.9	4.1	5.0	5.7
123	Debutante	4.2	4.4	4.2	4.0	5.3	6.3
124	Comstock	4.2	4.2	4.0	4.2	6.0	5.0
125	ATF-192	4.2	4.1	4.3	4.2	4.3	5.3
126	Velocity	4.2	4.6	4.0	4.0	3.3	5.0
127	Shenandoah	4.1	3.8	4.3	4.1	6.7	6.3
128	Leprechaun	4.1	4.4	3.7	4.2	4.7	6.0
129	JTTFA-96	4.1	3.7	4.4	4.0	8.3	6.3
130	Veranda	4.0	3.7	4.2	3.9	6.3	6.3
131	Titan 2	4.0	3.7	4.7	3.6	6.0	5.3
132	Bonsai	4.0	3.9	4.3	3.8	4.0	6.7
133	Tomahawk E+	3.9	4.0	4.1	3.7	4.0	4.3
134	JTTFC-96	3.8	3.6	4.0	3.9	7.0	6.7
135	JSC-1	3.8	4.0	3.5	3.9	5.0	5.3
136	DP 50-9011	3.7	3.5	3.7	3.9	5.0	6.0
137	DLF-1	3.2	3.3	3.2	3.1	6.7	5.3
138	Rebel II	3.1	3.2	3.1	3.0	6.7	7.0
139	DP 7952	3.0	2.9	3.2	3.1	7.7	5.0
140	AV-1	3.0	3.1	3.0	3.0	5.0	4.3
141	Arid	2.6	2.7	2.8	2.4	7.7	5.3
142	Kentucky-31 E+	1.2	1.4	1.1	1.0	7.0	5.3
	LSD at 5% =	0.5	0.6	0.6	0.7	1.4	1.5

¹9 = best turf quality²9 = earliest spring green-up³9 = least brown patch

Table 4. Performance of tall fescue cultivars, selections, and mixtures in a trial seeded in September 1997 at Pittstown, NJ.

		-----Turf Quality ¹ -----		
Cultivar or Selection		1998-1999 Avg.	1998 Avg.	1999 Avg.
1	Rebel 2000	5.6	5.7	5.6
2	Bingo	5.5	6.1	4.9
3	Millennium	5.4	5.3	5.5
4	Shenandoah II	5.4	5.4	5.3
5	Velocity	5.4	5.8	4.9
6	Plantation	5.3	5.4	5.2
7	WX6-2000	5.3	5.4	5.1
8	Rebel Sentry	5.2	5.4	4.9
9	Masterpiece	5.2	5.5	4.9
10	Hounddog 5	5.1	5.0	5.2
11	MA 74	5.1	4.8	5.5
12	Hounddog 5 + SR-2000*	5.0	5.2	4.9
13	Hounddog 5 + Kenblue*	5.0	5.3	4.7
14	Hounddog 5	4.9	4.9	4.9
15	Rebel 3D	4.9	5.0	4.8
16	Twilight II	4.8	4.6	5.0
17	TFC-7000 E+	4.8	5.0	4.6
18	Affirmed Per. Rye	4.8	4.6	5.0
19	Lion	4.8	4.5	5.1
20	Matador	4.7	4.6	4.9
21	Coronado	4.7	4.7	4.7
22	Coronado Gold	4.7	4.8	4.5
23	Tarheel	4.7	4.9	4.4
24	Onyx	4.7	4.5	4.8
25	Jaguar 3	4.6	4.7	4.5
26	Wolfpack	4.6	4.7	4.5
27	SR-8210	4.6	4.6	4.6
28	Bonsai 2000	4.5	4.6	4.5
29	SRX-8BPTF	4.5	4.6	4.4
30	SRX-8MO941-2	4.5	4.3	4.7

(Continued)

Table 4 (continued).

	Cultivar or Selection	-----Turf Quality ¹ -----		
		1998-1999 Avg.	1998 Avg.	1999 Avg.
31	Pride	4.4	4.7	4.1
32	Equinox	4.3	4.0	4.7
33	WX3-275	4.3	4.8	3.8
34	SR-8430	4.3	4.8	3.8
35	Bonsai	4.3	4.0	4.6
36	SRX-8084	4.3	4.2	4.4
37	Debutante	4.3	4.4	4.1
38	Crewcut	4.2	4.5	3.9
39	Tomahawk	4.2	4.4	3.9
40	SR-2000*	4.2	4.6	3.7
41	Rebel Jr	4.1	4.2	4.0
42	Anthem II	4.1	3.6	4.5
43	Shenandoah	4.0	4.1	3.9
44	SR-8200	3.9	3.8	3.9
45	Grande	3.7	3.5	3.9
46	Titan 2	3.7	4.0	3.4
47	SR-8300	3.6	3.4	3.7
48	Avanti	3.5	3.3	3.7
49	Kenblue*	3.1	3.9	2.3
50	Kentucky-31	2.2	2.5	2.0
	LSD at 5% =	0.5	0.7	0.7

¹9 = best turf quality

*denotes Kentucky bluegrass

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

Cultivar or Selection	-----Turf Quality ¹ -----			Brown Patch ²
	1998-1999 Avg.	1998 Avg.	1999 Avg.	1999 Avg.
1 MT-3 comp	6.7	6.8	6.7	5.5
2 DLSD comp	6.7	6.3	7.1	6.0
3 TFC-7001 E+	6.4	6.5	6.3	6.2
4 SR 8250	6.1	6.3	5.9	6.3
5 Bingo	5.9	5.9	5.9	4.3
6 Finesse	5.8	5.8	5.9	5.3
7 DDL	5.7	6.1	5.3	3.7
8 TFC-7001 E+	5.7	5.7	5.7	5.8
9 Coyote	5.5	5.8	5.2	4.8
10 WX6-2000	5.4	5.2	5.6	6.0
11 Syn 5PH	5.3	5.3	5.2	4.8
12 Syn 5DH	5.3	5.2	5.4	4.0
13 Twilight II	5.3	5.7	5.0	5.5
14 5LZ	5.2	5.8	4.6	4.5
15 Brandy	5.1	5.4	4.7	4.5
16 Plantation	5.1	5.3	4.9	5.2
17 Shenandoah II	5.1	4.9	5.3	5.7
18 Picasso	5.1	5.4	4.9	5.0
19 Syn 5NRR	5.0	5.0	4.9	5.2
20 Syn 57E	5.0	5.0	5.0	4.5
21 Matador	5.0	5.9	4.1	3.3
22 Syn R5EH-97	5.0	4.9	5.0	5.5
23 Millennium	5.0	5.2	4.8	4.8
24 CIS TF-303	5.0	5.4	4.5	5.0
25 5DU	4.9	5.3	4.4	4.0
26 EA 40	4.9	5.1	4.7	4.5
27 MA 71	4.9	5.0	4.7	4.5
28 Sunpro	4.9	5.3	4.5	4.3
29 Jaguar 3	4.8	4.5	5.2	5.3
30 LA 38	4.8	4.8	4.8	3.5

(Continued)

Table 5 (continued).

	Cultivar or Selection	-----Turf Quality ¹ -----			Brown Patch ² 1999 Avg.
		1998- 1999 Avg.	1998 Avg.	1999 Avg.	
31	Bonsai 2000	4.8	4.9	4.8	4.7
32	Masterpiece	4.8	4.5	5.2	6.7
33	Pixie E+	4.7	4.8	4.6	6.3
34	Endeavor	4.7	4.3	5.0	7.2
35	5HU	4.7	4.8	4.5	5.0
36	Apache II	4.7	4.9	4.4	4.3
37	Arabia	4.6	4.9	4.3	4.3
38	Alamo	4.6	4.7	4.6	5.2
39	Arid II	4.6	4.8	4.4	5.8
40	Syn 5RMY	4.6	4.3	4.8	5.7
41	5LMD	4.6	5.0	4.1	3.8
42	Syn R5GR-97	4.6	4.5	4.6	5.5
43	LA 46	4.6	4.7	4.5	4.3
44	Exp-LWE	4.6	4.3	4.9	4.2
45	Laramie	4.6	5.1	4.2	4.0
46	WX5-365-19	4.6	4.6	4.6	4.8
47	Rembrandt	4.6	4.2	5.0	5.7
48	R5AE	4.5	4.5	4.4	5.2
49	Coronado Gold	4.5	4.6	4.3	5.2
50	523-97	4.5	4.5	4.5	5.2
51	Wolfpack	4.5	4.1	5.0	5.5
52	5M5	4.5	4.4	4.5	5.0
53	Syn R534-97	4.5	4.4	4.7	6.2
54	Equinox	4.5	4.3	4.7	7.3
55	523M	4.4	4.2	4.5	5.2
56	Syn 5FH	4.4	4.3	4.6	5.7
57	5 E5	4.4	4.4	4.3	4.5
58	MA 74	4.4	4.2	4.6	4.2
59	Anthem II	4.4	4.4	4.3	4.7
60	CIS TF-301	4.4	4.7	4.1	4.0

(Continued)

Table 5 (continued).

	Cultivar or Selection	-----Turf Quality ¹ -----			Brown Patch ² 1999 Avg.
		1998- 1999 Avg.	1998 Avg.	1999 Avg.	
61	CIS TF-302	4.4	4.5	4.3	4.7
62	Syn 5TOR	4.3	4.0	4.7	4.3
63	Tar Heel	4.3	4.0	4.7	5.0
64	Tomahawk E+	4.3	4.1	4.5	5.2
65	Duster	4.3	4.5	4.1	4.7
66	Lion	4.3	4.0	4.5	4.3
67	Onyx	4.3	4.7	3.9	4.5
68	Bravo	4.3	4.1	4.6	6.0
69	Lancer	4.3	4.2	4.3	4.2
70	Hounddog 5	4.3	4.3	4.3	4.2
71	Syn 5R94Y	4.2	3.7	4.6	5.8
72	Gazelle	4.2	4.6	3.9	4.2
73	Syn R5EL-97	4.2	4.1	4.3	5.7
74	Syn R5MM-97	4.2	4.1	4.3	5.8
75	Bandana	4.2	4.2	4.1	5.0
76	5HOE-97	4.1	4.0	4.2	4.2
77	Syn 5DU	4.1	4.4	3.9	3.5
78	R5AU	3.9	3.9	4.0	5.0
79	Syn R5GEN-97	3.9	3.5	4.3	6.2
80	Stetson	3.8	3.5	4.1	5.7
81	Mini-Mustang	3.8	3.6	3.9	5.0
82	Bonsai	3.6	3.4	3.7	5.7
83	Safari	3.5	3.1	4.0	5.0
84	Tomahawk	3.5	3.5	3.6	4.5
85	Crewcut	3.5	3.3	3.6	4.5
86	Debutante	3.4	3.4	3.3	4.7
87	Crossfire II	3.4	3.2	3.6	6.3
88	WX3 275	3.3	3.1	3.6	5.5
89	Silverado	3.2	2.9	3.4	4.5
90	Coronado E+	3.2	2.8	3.5	4.3

(Continued)

Table 5 (continued).

Cultivar or Selection	-----Turf Quality ¹ -----			Brown Patch ² 1999 Avg.
	1998- 1999 Avg.	1998 Avg.	1999 Avg.	
91 Grande	3.2	2.8	3.6	4.8
92 Advanti	3.2	3.1	3.3	6.0
93 Shenandoah	3.0	2.9	3.2	4.0
94 Crossfire	3.0	2.8	3.2	5.7
95 Amigo	2.9	2.3	3.4	4.7
96 Eldorado	2.3	2.0	2.7	5.2
97 Olympic II	2.2	1.9	2.5	5.2
98 Monarch	2.2	1.5	3.0	5.3
99 Kentucky-31	1.4	1.4	1.4	5.2
LSD at 5% =	0.6	0.7	0.7	1.9

¹9 = best turf quality

²9 = least brown patch

Table 6. Performance of tall fescue cultivars and selections in a trial seeded in September 1998 at Adelphia, NJ.

	Cultivar or Selection	Turf Quality ¹ 1999 Avg.	Establishment ² Sept. 1998	Leaf Spot ³ Nov. 1998	Wilt ⁴ June 1999
1	MS6 comp	5.9	7.0	7.7	5.3
2	MI3 comp	5.8	7.0	7.3	6.0
3	8001	5.8	6.0	7.3	6.7
4	601 comp	5.7	6.7	7.3	4.3
5	DLSD	5.6	6.0	6.0	6.7
6	MC1 comp	5.6	5.7	7.0	6.0
7	Bingo	5.5	6.0	4.7	6.7
8	Rebel Sentry	5.5	6.7	6.0	4.7
9	Focus	5.5	6.0	6.3	6.0
10	LRF-98-440	5.4	6.3	5.7	5.0
11	MS5 comp	5.4	6.7	7.3	5.3
12	MS4 comp	5.3	6.3	7.0	4.7
13	Rembrandt	5.3	5.7	5.3	5.0
14	Masterpiece	5.3	6.7	5.7	5.0
15	LRF-98-442	5.2	6.0	6.0	6.0
16	Finesse	5.2	5.3	5.7	6.0
17	Picasso	5.2	6.3	6.7	5.3
18	SR 8250	5.1	6.0	6.3	4.3
19	Pride	5.1	6.3	4.7	6.0
20	R5GR-98	5.1	6.0	6.0	6.0
21	98GA12	5.1	6.3	5.3	5.7
22	Plantation	5.1	6.0	6.0	7.3
23	LRF-98-251	5.0	5.7	6.0	6.7
24	LRF-98-436	5.0	5.3	5.7	7.3
25	Laramie	5.0	6.3	6.7	6.0
26	Brandy	5.0	6.7	6.0	5.7
27	MA 87	4.8	6.0	5.7	6.3
28	Rebel 3D	4.8	6.0	6.0	5.0
29	R5MM-98	4.8	6.0	5.0	6.7
30	R5EH-98	4.8	6.3	6.3	4.0

(Continued)

Table 6 (continued).

	Cultivar or Selection	Turf Quality ¹ 1999 Avg.	Establishment ² Sept. 1998	Leaf Spot ³ Nov. 1998	Wilt ⁴ June 1999
31	Millennium	4.8	5.7	5.3	5.0
32	98GA11	4.7	6.0	5.0	6.3
33	Cochise II	4.7	6.0	5.3	4.3
34	MA 138	4.6	6.0	6.0	4.7
35	LRF-98-441	4.6	5.7	5.3	6.0
36	Pixie	4.6	5.7	4.7	4.0
37	98GA7	4.6	5.3	4.3	5.3
38	98GA3	4.6	5.3	4.0	6.0
39	Rebel 2000	4.5	6.3	6.0	5.0
40	98GA10	4.5	6.3	6.0	4.0
41	Wolfpack	4.5	5.0	4.7	6.7
42	MA 95	4.4	5.3	3.7	6.0
43	MA 71	4.4	5.3	3.7	6.0
44	AG-T981	4.4	5.3	4.3	5.0
45	Tarheel	4.4	5.7	5.3	5.7
46	Cochise	4.4	6.0	5.0	4.7
47	EA 96	4.3	4.3	4.3	7.0
48	EA 40	4.3	5.7	4.0	5.7
49	Rebel Jr	4.3	6.3	4.7	6.0
50	MA 90	4.2	5.3	3.3	5.3
51	Coronado Gold	4.2	5.7	4.7	5.3
52	R5PCP-98	4.2	5.3	6.0	5.3
53	AG-T982	4.2	4.0	5.0	5.7
54	Ninja	4.2	5.0	4.0	5.7
55	MA 98	4.1	5.0	2.7	6.3
56	MA 108	4.0	4.7	4.0	7.0
57	MA 91	3.9	5.7	3.0	4.3
58	LA 113	3.9	4.0	3.0	5.7
59	Cortez	3.9	5.0	2.0	6.0
60	MA 74	3.8	5.3	3.0	6.0

(Continued)

Table 6 (continued).

	Cultivar or Selection	Turf Quality ¹ 1999 Avg.	Establishment ² Sept. 1998	Leaf Spot ³ Nov. 1998	Wilt ⁴ June 1999
61	MA 104	3.8	5.0	4.0	4.7
62	LA 107	3.8	4.7	4.7	5.3
63	LA 45	3.8	4.3	5.0	5.0
64	LA 46	3.7	5.0	4.3	7.0
65	Arid	3.2	4.7	2.7	6.3
66	98GA2	2.8	4.0	3.3	5.3
67	98GA8	2.4	4.3	3.0	6.0
68	98GA4	2.4	4.0	2.7	5.3
69	Reveille (Texas bluegrass)	1.8	2.0	4.3	4.0
70	Kentucky-31	1.8	3.7	1.7	4.7
71	98GA1	1.8	4.0	1.3	5.0
72	98GA6	1.5	3.3	2.3	3.3
73	98GA5	1.5	4.0	2.3	3.7
74	98GA9	1.4	3.7	2.0	4.7
	LSD at 5% =	0.5	1.4	2.3	1.1

¹9 = best turf quality

²9 = best establishment

³9 = least leaf spot

⁴9 = least wilt stress from drought

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

	1996		1997		1998		1999	
	N ¹	Ht ²	N	Ht	N	Ht	N	Ht
Table 1 (1995 Adelphia)	5.0	1.5	3.3	1.5	3.6	1.5	1.2	1.5
Table 2 (1996 North Brunswick)			4.4	1.5	3.6	1.5	4.1	1.5
Table 3 (1996 Adelphia)			4.5	1.5	3.8	1.5	2.8	1.5
Table 4 (1997 Pittstown)					2.6	3.5	2.7	3.0
Table 5 (1997 Adelphia)					2.8	1.5	2.1	1.5
Table 6 (1998 Adelphia)							2.8	1.5

¹Annual N applied (lbs/1000 ft²)

²Mowing height in inches