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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. It also allows these professionals to 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 1996 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 represents performance of turfgrass cultivars and selections in New Jersey turf trials. The primary objective of these papers is to facilitate the timely dissemination of original turfgrass research for use by the turfgrass industry.

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Dr. Ann B. Gould, Editor
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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 turfgrass widely used in areas characterized by hot summers and winters cold enough to induce long periods of dormancy or winterkill in warm-season grasses. Of all the widely-used cool-season turfgrasses, tall fescue is probably the most adept at surviving drought stress during periods of hot, dry weather. It is this characteristic that has caused turf managers to take a closer look at tall fescue for use in areas where Kentucky bluegrass, perennial ryegrass, and fine fescue had been previously used.

Most of the commonly used tall fescues, including Kentucky 31, Alta, and Fawn, are light green, possess a rather course texture and rapid rate of vertical growth, and lack good density. The widespread use of these varieties lead to the impression that tall fescue was a rather unattractive turfgrass. Since turf growers have had an ever increasing selection of recently developed, attractive, turf-type varieties of Kentucky bluegrass, perennial ryegrass, and fine fescues, tall fescues have been less often considered for turf in areas where these other species were well adapted. Fortunately, however, breeding efforts have produced many new turf-type tall fescues that, in many areas, have equal or better turf quality and performance characteristics than most Kentucky bluegrasses, perennial ryegrasses, or fine fescues.

PROCEDURES

Five tall fescue turf trials are presented in this paper: one was established at North Brunswick, NJ (Table 1), and the others were established at Adelphia, NJ (Tables 2 to 5). The two tests established in 1992 (Tables 1 and 2) contain all entries from the 1992 National Tall Fescue Test, which is one of many tests conducted by the National Turfgrass Evaluation Program (NTEP). NTEP coordinates efforts to evaluate entries at various locations throughout the United States and compiles the results. This provides valuable information on the performance of entries over a broad range of climatic and environmental conditions.

All tests except the 1992 test at Adelphia (Table 2) were established by hand sowing 0.88 oz of seed in 3 X 5 ft plots. The 1992 Adelphia test was seeded with 1.8 oz of seed in 3.5 X 5.5 ft plots. A six inch unseeded border was left around each plot to reduce cross-plot contamination. All entries were replicated three times in a randomized complete block design. To promote fast, uniform germination, plots received light, frequent irrigation. After germination, the plots were fertilized frequently with light rates of nitrogen from a complete fertilizer to ensure good establishment.

Depending on test objectives, tests were maintained at different levels of fertility, mowing height, and moisture stress. The nitrogen fertility and mowing height history of each test is

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presented in Table 6. Generally, such tests are intensively managed for the first few years after establishment to permit rapid screening for disease and insect resistance (high levels of nitrogen encourages the development of brown patch and Pythium blight, which are two very important diseases of tall fescue). Many tests are later allowed to undergo a transition to a lower maintenance regime, which includes increased mowing height, lower fertility, and no irrigation. This provides an opportunity to evaluate entries under conditions similar to those confronted when tall fescue is used as a low maintenance turf.

Weed control consisted of a yearly fall application of 2,4-D and dicamba for broadleaf weeds and a spring treatment of DCPA or bensulide for preemergent crabgrass. Reel mowers were generally used on all tests, and clippings were not removed. Tests were mowed at least two or three times per week during periods of active growth; at all times, mowing was frequent enough to prevent excessive clipping accumulation.

Throughout the growing season, all tests were visually rated for overall appearance (or turf quality), which included turf color, density, texture, uniformity, growth habit, and freedom from disease or insect damage. Since turf quality is a highly subjective characteristic, plots were rated by various people to reduce personal bias toward any particular trait. All tests except the 1992 and 1993 tests at Adelphia (Tables 2 and 3, respectively) were rated for brown patch during the summer of 1996. Spring green-up, color, and texture were assessed for the 1992 NTEP Test at Adelphia (Table 2). All turf characteristics were rated on a scale of 1 to 9, where 9 represented the most desirable turf quality, darkest green color, finest leaf texture, and the least disease. All data were subjected to analysis of variance, and mean separation was based on the least significant difference procedure (LSD).

RESULTS AND DISCUSSION

Entries within each test are ranked according to the overall (multi-year) turf quality average. Since the yearly turf quality ratings presented are an average of individual ratings taken at different times throughout the season, the tables do not reflect differences between entries at different times of the year. For example, a certain entry which ranks relatively high on a yearly average basis may have ranked much lower during July or August if it was highly susceptible to brown patch and quality ratings were taken during this time. Such a variety may have a much wider fluctuation in its individual ratings than a variety that ranks lower on a yearly average basis but has more consistent performance throughout the season. Thus, rankings based on the yearly average do not necessarily reflect performance throughout the growing season.

Another important point concerns the relative rankings of older, established varieties as they appear in newer tests. In most cases, as newly developed cultivars are included in new tests, varieties which ranked highest in previous tests tend to fall in the rankings relative to these newer entries. This does not mean that the performance of older varieties has declined; it indicates only that relative to the newer cultivars in the test, the turf quality of older varieties is not as high based on characteristics deemed important to the evaluator. Compared to the older varieties, each new generation of varieties is usually darker green and has a finer leaf texture and greater turf density. Although these characteristics probably have a great impact on turf quality ratings because they are most visually apparent, they may not actually represent the most desirable turf. For example, dark green color in turf has, traditionally, been an important characteristic, especially in the United States, even though color in a turf that is not nutrient deficient has little relationship to overall vigor. Indeed, in areas where annual bluegrass or *Poa trivialis* are common invading species, a dark color may be detrimental because the darker tall fescue will not blend well with these other lighter

green species. A finer, denser turf can also be a liability, especially with respect to diseases such as brown patch and Pythium blight. The dense canopy of these varieties may enhance disease severity by restricting air circulation and increasing humidity. The close proximity of the leaves may also facilitate disease spread. In any case, the disease in these dense, fine turfs can be much more severe and visually striking.

Although there are some varietal differences in resistance to brown patch (Tables 1, 4, and 5), it is apparent that much more work is needed to further identify sources of resistance to this extremely important disease of tall fescue. This is especially true if tall fescue is to be grown under high maintenance in locations with hot, humid summers.

Most of the improved, turf-type tall fescues tended to resume active growth later in the spring than the more common types such as Kentucky-31 (Table 2). This situation is also found in other cool-season turf species such as perennial ryegrass and Kentucky bluegrass. The more upright common type tall fescues, characterized by more rapid vertical growth, are generally the ones that green up earlier in the spring.

Major improvements in tall fescues have been made in the last twenty years. Compared to the relatively coarse, open turf characteristic of Kentucky 31 (a variety that is still very widely used), the newer turf-type varieties form a lower-growing, darker green, finer textured turf that can be easily mistaken for Kentucky bluegrass. In addition to good heat and drought tolerance, many tall fescue varieties contain a fungal endophyte that may increase resistance to certain insects and improve performance during periods of stress. Once additional advances are made in resistance to brown patch, which is probably the primary weakness of this turfgrass, it is likely that tall fescue will become much 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 turf trial seeded September 1992 at North Brunswick, NJ. (Includes entries from 1992 National Tall Fescue Test.)

	Cultivar or Selection	Turf Quality[1] 1993-1996 Avg.	Turf Quality[1] 1993 Avg.	Turf Quality[1] 1994 Avg.	Turf Quality[1] 1995 Avg.	Turf Quality[1] 1996 Avg.	Brown Patch[2] 1994-1996 Avg.	Brown Patch[2] July 1994 Avg.	Brown Patch[2] July 1995 Avg.	Brown Patch[2] July 1996 Avg.
1	Crossfire II	6.3	7.1	6.2	5.9	6.0	5.4	4.5	7.0	4.8
2	ISI-AFA	6.1	6.9	5.8	5.7	6.1	4.3	3.8	4.7	4.5
3	Houndog V	6.1	6.6	6.0	6.0	5.7	3.8	4.2	3.0	4.2
4	Falcon II	5.9	6.6	5.5	5.8	5.8	4.2	3.5	5.0	4.0
5	Jaguar III	5.9	5.9	5.9	5.8	6.0	5.7	5.8	5.7	5.5
6	Coyote	5.9	6.8	5.5	5.5	5.7	3.3	4.0	1.3	4.7
7	Coronado	5.8	6.6	5.7	5.7	5.2	4.0	4.8	3.3	3.8
8	Southern Choice	5.7	6.7	5.5	5.7	5.0	4.5	4.5	5.0	4.0
9	Genesis	5.7	6.5	5.5	5.4	5.3	4.0	4.0	4.0	4.0
10	Pixie	5.6	6.4	5.5	5.3	5.2	3.5	4.2	2.3	4.0
11	Tomahawk E+	5.6	6.4	5.3	5.2	5.3	4.4	4.2	4.3	4.8
12	Barlexas	5.5	6.2	5.2	5.2	5.4	3.6	4.0	2.7	4.0
13	Lancer	5.5	5.9	5.1	5.5	5.3	3.7	3.7	3.0	4.5
14	Marksman	5.3	6.1	5.2	5.1	4.9	3.8	3.7	3.7	4.2
15	ZPS-E2	5.3	6.0	5.1	5.1	5.0	4.1	4.2	3.0	5.2
16	Pick 90-10	5.3	6.3	4.8	4.7	5.4	2.8	3.3	1.3	3.7
17	Pick 90-6	5.3	6.7	4.8	4.9	4.7	3.9	4.8	3.0	4.0
18	PST-5PM	5.2	6.1	5.0	5.2	4.6	4.1	3.5	4.3	4.5
19	Micro DD	5.2	6.1	5.0	4.9	4.9	5.0	4.3	5.7	5.0
20	Finelawn Petite	5.2	6.6	4.6	4.8	4.8	4.1	3.5	4.7	4.2

Table 1 (continued).

	Cultivar or Selection	Turf Quality[1] 1993-1996 Avg.	Turf Quality[1] 1993 Avg.	Turf Quality[1] 1994 Avg.	Turf Quality[1] 1995 Avg.	Turf Quality[1] 1996 Avg.	Brown Patch[2] 1994-1996 Avg.	Brown Patch[2] July 1994 Avg.	Brown Patch[2] July 1995 Avg.	Brown Patch[2] July 1996 Avg.
21	Virtue	5.2	5.9	5.1	5.0	4.7	3.9	5.3	2.3	4.0
22	PST-5LX	5.2	6.5	4.7	4.8	4.8	4.5	3.3	6.3	3.8
23	Tulsa	5.1	6.2	4.5	4.9	4.9	3.8	3.3	4.3	3.7
24	Debutante	5.0	5.4	5.1	5.0	4.7	3.5	4.3	1.7	4.5
25	Safari	5.0	5.7	4.6	4.9	4.9	4.8	4.0	5.3	5.2
26	Rebel Jr.	5.0	5.6	4.9	4.9	4.6	5.3	4.8	7.3	3.8
27	Leprechaun	5.0	5.8	4.6	4.8	4.9	4.8	4.8	5.3	4.2
28	Vegas	5.0	5.9	5.1	4.9	4.2	4.4	5.7	4.0	3.5
29	Duster	5.0	6.3	4.5	4.5	4.8	3.2	3.5	2.7	3.3
30	Cochise	5.0	5.7	5.0	5.0	4.4	3.9	4.5	3.3	4.0
31	Starlet	5.0	6.5	4.4	4.4	4.7	3.9	2.7	5.3	3.8
32	Silverado	5.0	5.9	4.7	4.6	4.8	4.6	4.3	5.3	4.2
33	Apache II	5.0	6.1	4.7	4.7	4.4	3.1	2.7	3.0	3.5
34	SFL	4.9	5.1	5.1	4.9	4.7	4.9	4.0	5.3	5.3
35	Regiment	4.9	5.9	4.5	4.6	4.6	3.8	3.8	4.0	3.7
36	Gazelle	4.9	6.2	4.7	4.6	4.1	2.3	2.3	1.7	2.8
37	SR 8400	4.9	5.8	4.7	4.6	4.4	4.5	3.5	6.0	4.0
38	SR 8200	4.9	5.6	4.9	4.5	4.5	4.1	3.5	5.3	3.5
39	Eldorado	4.9	5.7	4.6	4.9	4.3	4.3	3.5	5.7	3.7
40	Renegade	4.8	5.7	4.5	4.4	4.7	3.3	3.0	3.0	4.0

Table 1 (continued).

	Cultivar or Selection	Turf Quality[1] 1993-1996 Avg.	Turf Quality[1] 1993 Avg.	Turf Quality[1] 1994 Avg.	Turf Quality[1] 1995 Avg.	Turf Quality[1] 1996 Avg.	Brown Patch[2] 1994-1996 Avg.	Brown Patch[2] July 1994 Avg.	Brown Patch[2] July 1995 Avg.	Brown Patch[2] July 1996 Avg.
41	Palisades	4.8	5.5	4.6	4.4	4.8	3.9	4.2	2.7	4.8
42	BAR Fa 2AB	4.8	6.0	4.4	4.4	4.5	3.2	4.0	1.7	3.8
43	Tomahawk	4.8	6.2	4.2	4.7	4.0	3.8	3.7	4.3	3.5
44	Duke	4.8	5.6	4.8	4.6	4.3	3.3	4.0	1.7	4.3
45	SR 8210	4.8	6.0	4.4	4.4	4.4	3.5	3.0	3.7	3.8
46	Mirage	4.8	5.6	4.6	4.3	4.7	4.4	5.3	4.0	4.0
47	Rebel 3D	4.8	6.4	4.4	4.5	3.9	3.9	4.3	4.3	3.0
48	PST-5VC	4.8	5.8	4.3	4.7	4.4	2.9	2.8	2.7	3.3
49	PST-5STB	4.8	6.4	4.1	4.7	3.9	4.2	3.5	5.0	4.2
50	PSTF-200	4.8	5.1	4.7	4.6	4.5	4.4	4.3	4.0	5.0
51	Ninja	4.8	5.6	4.4	4.4	4.6	3.4	3.2	4.0	3.0
52	Crossfire	4.7	4.9	4.7	4.5	4.7	4.6	5.8	3.3	4.7
53	M-2	4.7	4.9	4.4	4.6	4.9	3.8	4.3	2.7	4.5
54	Trailblazer II	4.7	5.7	4.6	4.5	3.9	3.4	3.8	3.3	3.2
55	Bonsai	4.7	6.1	4.5	4.3	3.7	4.1	3.0	5.0	4.2
56	Chieftain II	4.6	5.3	4.8	4.5	3.9	3.8	4.0	3.7	3.8
57	Bonsai Plus	4.6	5.5	4.3	4.1	4.5	3.8	3.7	3.3	4.5
58	Windsor II	4.6	5.1	4.9	4.3	4.1	5.1	6.0	4.0	5.2
59	Guardian	4.6	5.3	4.4	4.4	4.3	4.3	3.5	5.3	4.0
60	Pyramid	4.6	5.0	4.0	4.5	4.8	3.8	3.8	2.7	4.8

Table 1 (continued).

	Cultivar or Selection	Turf Quality[1] 1993-1996 Avg.	Turf Quality[1] 1993 Avg.	Turf Quality[1] 1994 Avg.	Turf Quality[1] 1995 Avg.	Turf Quality[1] 1996 Avg.	Brown Patch[2] 1994-1996 Avg.	Brown Patch[2] July 1994 Avg.	Brown Patch[2] July 1995 Avg.	Brown Patch[2] July 1996 Avg.
61	Alamo	4.6	5.2	4.5	4.2	4.4	3.9	4.2	3.0	4.5
62	Avanti	4.5	5.5	4.2	4.2	4.1	4.5	5.3	4.3	3.8
63	BAR Fa 0855	4.5	5.1	4.6	4.3	4.0	5.6	6.7	5.3	4.7
64	Aztec	4.5	5.1	4.4	4.4	4.0	5.1	4.8	6.3	4.2
65	Titan II	4.4	4.9	4.5	4.0	4.3	3.8	3.8	3.3	4.3
66	Montauk	4.4	5.3	4.3	4.4	3.7	3.3	3.3	3.0	3.5
67	Shenandoah	4.4	4.8	4.8	4.4	3.7	3.9	4.3	3.3	4.2
68	PSTF-401	4.4	5.1	4.3	4.2	4.0	4.6	4.2	4.3	5.2
69	ISI-CRC	4.4	5.1	4.4	4.1	3.9	5.1	5.2	5.7	4.5
70	FA-22	4.3	5.2	3.8	4.0	4.3	3.8	2.7	5.0	3.7
71	Cafa 101	4.3	4.9	4.3	4.2	4.0	4.8	4.5	5.3	4.5
72	Austin	4.3	5.0	4.3	4.5	3.5	4.3	4.7	4.0	4.2
73	SR 8300	4.2	4.6	4.0	3.8	4.4	3.8	3.5	3.3	4.7
74	CAS-LA20	4.2	4.8	4.2	4.1	3.6	3.6	2.8	5.0	3.0
75	Oasis	4.2	4.5	3.8	4.0	4.4	4.2	3.8	4.3	4.5
76	BAR Fa 124	4.2	4.9	3.9	4.0	3.9	3.3	3.2	3.0	3.7
77	Monarch	4.1	4.9	3.8	4.0	3.8	2.9	3.5	2.0	3.3
78	Phoenix	4.1	4.6	4.5	3.8	3.6	4.1	5.2	2.7	4.3
79	Astro 2000	4.1	4.4	4.3	4.0	3.7	4.2	5.2	2.7	4.7
80	Shortstop	4.1	4.9	4.0	3.7	3.7	2.8	2.8	1.3	4.2

Table 1 (continued).

	Cultivar or Selection	Turf Quality[1] 1993-1996 Avg.	1993 Avg.	1994 Avg.	1995 Avg.	1996 Avg.	Brown Patch[2] 1994-1996 Avg.	July 1994 Avg.	July 1995 Avg.	July 1996 Avg.
81	PSTF-LF	4.1	4.8	3.9	3.6	3.8	4.3	4.3	5.0	3.7
82	Bonanza II	4.0	4.9	3.8	3.7	3.8	4.2	4.2	4.0	4.3
83	Kittyhawk	4.0	4.4	3.8	4.1	3.5	3.4	4.0	3.0	3.2
84	Murietta	3.9	4.5	3.4	3.7	4.1	2.6	2.3	3.0	2.5
85	Finelawn 88	3.9	4.3	4.0	3.9	3.5	4.1	4.2	3.7	4.5
86	Rebel II	3.9	4.2	3.6	3.9	3.7	3.9	4.3	3.7	3.8
87	CAS-MA21	3.8	4.5	3.6	3.5	3.7	2.9	3.3	1.7	3.7
88	Wrangler	3.8	4.1	3.4	3.9	3.6	3.8	4.3	3.3	3.7
89	Olympic II	3.7	4.2	3.5	3.8	3.5	3.9	4.3	3.3	4.2
90	Bonanza	3.7	4.4	3.5	3.5	3.3	3.2	4.2	2.3	3.0
91	Rebel	3.7	4.0	3.6	3.8	3.3	3.8	4.2	3.7	3.5
92	Apache	3.5	4.0	3.2	3.5	3.3	3.1	3.2	2.7	3.5
93	Twilight	3.5	4.7	3.3	3.0	2.8	3.0	3.3	2.7	3.0
94	Titan	3.4	3.5	3.4	3.5	3.3	4.8	5.3	4.7	4.5
95	Arid	3.3	3.6	3.1	3.3	3.1	3.9	3.7	4.0	4.0
96	Falcon	3.2	3.5	3.2	3.3	2.6	3.6	3.8	2.7	4.2
97	Mustang	3.1	3.6	2.8	3.1	2.7	3.4	4.0	2.7	3.7
98	Olympic	3.1	3.7	2.7	3.2	2.6	2.9	2.8	2.3	3.7
99	Anthem	3.0	3.2	2.7	3.2	2.9	3.0	4.0	1.0	4.0
100	GA-Jessup E+	2.6	2.8	2.7	2.7	2.1	4.8	6.2	4.0	4.3

Table 1 (continued).

	Cultivar or Selection	Turf Quality[1] 1993-1996 Avg.	Turf Quality[1] 1993 Avg.	Turf Quality[1] 1994 Avg.	Turf Quality[1] 1995 Avg.	Turf Quality[1] 1996 Avg.	Brown Patch[2] 1994-1996 Avg.	Brown Patch[2] July 1994 Avg.	Brown Patch[2] July 1995 Avg.	Brown Patch[2] July 1996 Avg.
101	Kentucky-31	2.2	2.5	2.2	2.3	1.9	3.4	4.8	2.0	3.5
102	Kentucky-31 E+	2.2	2.5	2.3	2.3	1.6	4.4	5.8	3.7	3.8
103	GA-Jessup E-	2.1	2.5	2.1	2.3	1.6	4.7	5.3	4.3	4.3
104	Georgia 5	1.8	2.1	1.8	2.0	1.4	4.3	4.7	4.3	3.8
	LSD at 5% =	0.5	0.7	0.8	0.7	0.9	1.3	1.8	NS	1.3

[1] 9 = best turf quality
[2] 9 = least brown patch

Table 2. Performance of tall fescue cultivars and selections in a turf trial seeded September 1992 at Adelphia, NJ. (Includes all entries from the 1992 National Tall Fescue Test.)

	Cultivar or Selection	Turf Quality[1] 1993-1996 Avg.	Turf Quality[1] 1993 Avg.	Turf Quality[1] 1994 Avg.	Turf Quality[1] 1995 Avg.	Turf Quality[1] 1996 Avg.	Spring[2] Green-up April 1996 Avg.	Leaf[3] Color Nov. 1996 Avg.	Texture[4] Nov. 1996 Avg.
1	Jaguar III	6.8	6.4	7.2	6.7	6.7	5.7	6.0	7.3
2	Houndog V	6.5	6.6	6.7	6.0	6.8	3.7	6.7	5.7
3	Barlexas	6.5	6.4	6.1	6.3	7.2	3.0	7.7	7.0
4	ISI-AFA	6.4	6.1	6.8	6.1	6.7	4.3	6.0	6.3
5	Tulsa	6.2	5.7	6.6	6.1	6.5	3.7	6.3	7.0
6	Coyote	6.2	6.1	6.0	6.1	6.7	2.7	7.7	6.0
7	Crossfire II	6.2	5.9	5.9	5.9	7.1	4.3	7.0	7.0
8	Genesis	6.2	6.2	6.0	6.0	6.4	3.7	6.7	6.0
9	Coronado	6.2	5.9	5.9	6.2	6.6	3.0	9.0	6.7
10	Falcon II	6.1	6.4	5.8	6.1	6.1	4.0	6.7	6.0
11	Pixie	6.0	6.2	6.0	5.8	6.1	4.0	6.3	5.3
12	Southern Choice	6.0	6.1	5.6	5.9	6.4	3.7	6.7	6.0
13	Lancer	6.0	5.8	5.7	6.0	6.3	2.7	7.7	6.0
14	Tomahawk E+	5.9	5.7	5.9	6.3	5.9	4.0	5.7	6.3
15	PST-5PM	5.9	5.6	6.2	6.0	5.8	3.7	6.3	6.7
16	Pick 90-10	5.8	5.4	5.3	5.8	6.6	3.0	7.3	6.3
17	ZPS-E2	5.7	5.5	6.2	5.5	5.7	4.0	5.7	6.3
18	Duster	5.7	5.9	5.6	5.5	5.7	3.3	5.7	5.7
19	PST-5VC	5.7	5.4	5.8	5.5	6.0	5.0	5.3	6.3
20	Ninja	5.6	5.1	5.2	5.7	6.5	3.3	6.3	7.3

Table 2 (continued).

	Cultivar or Selection	Turf Quality[1] 1993-1996 Avg.	Turf Quality[1] 1993 Avg.	Turf Quality[1] 1994 Avg.	Turf Quality[1] 1995 Avg.	Turf Quality[1] 1996 Avg.	Spring[2] Green-up April 1996 Avg.	Leaf[3] Color Nov. 1996 Avg.	Texture[4] Nov. 1996 Avg.
21	Tomahawk	5.6	5.5	5.5	5.3	6.0	4.7	7.7	6.3
22	Apache II	5.5	5.4	5.7	5.3	5.7	2.7	6.7	5.0
23	Duke	5.5	5.6	5.1	5.8	5.6	4.7	6.0	5.7
24	Micro DD	5.5	5.5	5.5	5.3	5.8	2.3	7.7	6.3
25	Regiment	5.5	5.5	5.2	5.4	5.8	5.3	5.0	7.3
26	Rebel 3D	5.5	5.6	5.3	5.2	5.8	3.3	6.3	4.7
27	PST-5LX	5.5	5.6	5.7	5.3	5.3	2.3	6.3	6.0
28	Finelawn Petite	5.5	5.8	5.4	5.1	5.5	3.5	5.9	4.5
29	Guardian	5.4	5.7	5.4	5.6	5.1	5.3	4.7	6.0
30	Pick 90-6	5.4	5.3	4.8	5.8	5.8	3.3	6.7	7.3
31	Leprechaun	5.4	5.3	5.2	5.7	5.5	3.7	5.7	6.3
32	Bar Fa 2AB	5.4	5.1	4.7	5.4	6.4	2.7	6.3	6.0
33	Eldorado	5.4	5.7	5.3	5.4	5.2	4.0	6.3	4.3
34	Safari	5.4	5.3	5.5	5.8	5.0	7.3	5.0	6.3
35	Trailblazer II	5.4	5.5	5.1	5.8	5.1	3.3	6.3	5.7
36	Vegas	5.4	5.2	5.7	5.3	5.3	4.0	5.7	4.7
37	Gazelle	5.4	5.9	5.1	5.1	5.3	3.0	7.3	6.3
38	SFL	5.3	4.9	5.2	5.8	5.5	3.3	6.7	6.7
39	Rebel Jr.	5.3	5.3	5.7	5.2	5.2	5.0	4.7	4.7
40	Virtue	5.3	5.1	5.4	5.7	4.9	4.3	7.0	5.0

Table 2 (continued).

	Cultivar or Selection	Turf Quality[1] 1993-1996 Avg.	Turf Quality[1] 1993 Avg.	Turf Quality[1] 1994 Avg.	Turf Quality[1] 1995 Avg.	Turf Quality[1] 1996 Avg.	Spring[2] Green-up April 1996 Avg.	Leaf[3] Color Nov. 1996 Avg.	Texture[4] Nov. 1996 Avg.
41	Alamo	5.3	4.9	5.3	5.6	5.2	4.3	4.3	5.3
42	SR 8210	5.2	5.3	5.3	5.3	4.9	3.3	4.0	5.3
43	Silverado	5.2	5.7	5.0	4.8	5.2	4.0	5.0	5.3
44	Marksman	5.2	5.3	5.1	5.4	4.9	3.7	5.3	5.3
45	Palisades	5.2	5.2	5.1	5.2	5.2	4.0	5.0	5.7
46	SR 8200	5.2	5.3	5.0	5.4	4.9	4.3	4.3	4.7
47	Titan II	5.1	5.5	5.7	5.0	4.4	4.7	4.3	5.3
48	Montauk	5.1	5.4	4.9	5.3	4.9	5.0	5.0	4.7
49	Grande	5.1	5.2	5.4	5.1	4.8	5.0	3.7	5.0
50	Renegade	5.1	5.3	4.9	5.1	5.2	2.7	5.0	4.7
51	M-2	5.1	5.1	5.2	5.3	4.9	5.3	4.7	5.0
52	Bonsai Plus	5.1	5.2	5.1	5.0	5.1	3.7	6.0	5.7
53	PRO-9178	5.1	5.4	5.0	4.9	5.1	4.0	5.3	5.3
54	FA-22	5.1	5.0	5.2	5.2	4.9	4.0	4.0	7.3
55	Debutante	5.1	5.3	4.8	5.1	5.0	3.3	4.0	4.7
56	Chieftain II	5.1	5.3	5.1	4.8	5.0	4.0	6.0	4.0
57	Mirage	5.0	5.1	5.2	4.8	5.0	3.7	5.3	5.7
58	403	5.0	4.8	5.0	5.5	4.6	5.3	5.7	5.0
59	Windsor II	5.0	5.0	5.0	5.2	4.7	6.0	4.0	5.3
60	Cochise	5.0	5.1	4.5	5.1	5.1	5.0	6.0	5.7

Table 2 (continued).

	Cultivar or Selection	Turf Quality[1] 1993-1996 Avg.	Turf Quality[1] 1993 Avg.	Turf Quality[1] 1994 Avg.	Turf Quality[1] 1995 Avg.	Turf Quality[1] 1996 Avg.	Spring[2] Green-up April 1996 Avg.	Leaf[3] Color Nov. 1996 Avg.	Texture[4] Nov. 1996 Avg.
61	PSTF-401	4.9	4.6	5.2	5.2	4.5	5.0	5.0	6.0
62	Bar Fa 124	4.9	4.8	4.9	5.0	4.8	5.0	4.0	7.0
63	Aztec	4.9	4.5	5.0	5.2	4.7	4.3	4.7	4.0
64	Cafa 101	4.9	5.1	4.8	4.8	4.7	6.0	4.0	4.0
65	Austin	4.8	5.0	5.1	4.9	4.4	5.3	5.0	4.3
66	Bar Fa 0855	4.8	5.0	4.7	4.9	4.7	4.7	4.0	5.3
67	Pyramid	4.8	5.1	5.0	4.6	4.4	4.3	4.7	5.0
68	Bonanza II	4.7	4.7	5.0	5.0	4.3	4.7	4.3	4.7
69	PSTF-200	4.7	4.6	4.9	5.1	4.3	6.0	5.0	5.0
70	SR 8300	4.7	4.7	4.6	5.2	4.3	4.7	4.0	5.3
71	ISI-CRC	4.7	4.7	4.4	4.8	4.7	5.3	4.3	5.0
72	Avanti	4.7	4.7	4.7	5.0	4.2	5.3	4.3	5.3
73	CAS-MA21	4.6	4.8	4.7	4.6	4.5	5.0	4.3	4.0
74	Finelawn 88	4.6	4.5	4.5	5.0	4.6	5.0	5.3	5.3
75	Starlet	4.6	4.8	4.4	4.5	4.8	3.0	6.3	4.7
76	Monarch	4.6	5.0	4.6	4.3	4.5	4.7	5.3	4.7
77	Bonsai	4.6	4.5	4.2	4.7	5.0	3.0	7.3	6.0
78	CAS-LA20	4.6	4.2	4.3	4.9	4.8	3.7	5.7	5.3
79	PSTF-LF	4.5	4.6	4.7	4.6	4.1	4.7	5.0	3.7
80	PST-5STB	4.5	4.4	4.4	4.6	4.5	5.3	7.3	5.3

Table 2 (continued).

	Cultivar or Selection	Turf Quality[1] 1993-1996 Avg.	Turf Quality[1] 1993 Avg.	Turf Quality[1] 1994 Avg.	Turf Quality[1] 1995 Avg.	Turf Quality[1] 1996 Avg.	Spring[2] Green-up April 1996 Avg.	Leaf[3] Color Nov. 1996 Avg.	Texture[4] Nov. 1996 Avg.
81	Kittyhawk	4.4	4.8	4.4	3.9	4.5	4.3	4.3	5.3
82	Shenandoah	4.3	4.5	4.4	4.4	3.9	6.0	3.3	2.7
83	Bonanza	4.3	4.7	4.4	4.3	3.7	5.7	4.3	4.0
84	Astro 2000	4.2	4.1	4.0	4.5	4.0	5.3	5.0	4.3
85	Olympic II	4.1	4.5	4.0	4.4	3.5	6.3	4.3	6.0
86	Phoenix	4.0	3.9	4.4	4.4	3.3	7.0	4.7	4.3
87	Twilight	3.8	3.9	3.5	4.0	3.7	2.3	8.7	5.7
88	Arid	3.4	3.7	3.6	3.8	2.4	8.7	2.3	2.3
89	Falcon	3.1	3.6	3.0	3.4	2.5	7.7	2.7	2.3
90	Anthem	2.8	2.9	2.8	3.0	2.4	8.7	3.0	2.7
91	Kentucky-31 E+	1.9	2.2	1.9	2.0	1.4	8.7	2.3	1.0
92	Kentucky-31	1.8	2.0	1.8	2.1	1.4	8.7	2.0	1.0
	LSD at 5 % =	0.6	0.7	0.8	0.7	0.8	1.1	1.6	1.8

[1] 9 = best turf quality
[2] 9 = most rapid spring green-up
[3] 9 = darkest green color
[4] 9 = finest texture

Table 3. Performance of tall fescue cultivars and selections in a turf trial seeded October 1993 at Adelphia, NJ.

	Cultivar or Selection	Turf Quality[1] 1994-1996 Avg.	1994 Avg.	1995 Avg.	1996 Avg.
1	Jaguar III	6.0	6.7	5.4	5.9
2	Gazelle	5.9	6.4	5.5	5.8
3	Pixie	5.5	6.3	5.1	5.2
4	Rebel Jr	4.9	5.7	4.6	4.5
5	Rebel 3D	4.6	4.9	4.1	4.6
6	GQ	4.2	4.6	4.4	3.7
7	Arriba	4.2	4.6	3.8	4.2
8	Wrangler	4.0	4.3	4.0	3.7
9	Rebel II	4.0	4.5	3.7	3.8
10	Oasis	4.0	4.5	3.7	3.7
11	Rebel III	3.9	3.8	4.0	4.0
12	Tribute	3.8	4.2	3.8	3.4
13	Amigo	3.8	4.3	3.4	3.7
14	Mesa	3.2	3.4	3.2	3.1
15	Brigantine E+	3.2	3.0	3.2	3.4
16	Titan	3.1	3.5	2.7	3.1
17	Arid	3.1	3.4	2.8	3.0
18	Fawn	1.8	2.1	1.7	1.7
19	Kentucky-31	1.7	2.2	1.6	1.4
	LSD at 5% =	0.7	0.9	0.7	0.7

[1] 9 = best turf quality

Table 4. Performance of tall fescue cultivars in a turf trial seeded September 1994 at Adelphia, NJ.

	Cultivar or Selection	Turf Quality[1] 1995-1996 Avg.	Turf Quality[1] 1995 Avg.	Turf Quality[1] 1996 Avg.	Brown Patch[2] July 1996
1	Southern Choice	5.4	5.7	5.1	4.3
2	Pixie	5.0	5.3	4.8	3.3
3	Gazelle	5.0	5.5	4.6	3.7
4	Jaguar III	5.0	5.5	4.4	4.7
5	Tomahawk	4.9	5.1	4.8	3.0
6	Wrangler II	4.8	4.8	4.7	3.0
7	Marksman	4.7	5.1	4.4	4.0
8	Starlet	4.7	5.0	4.5	3.3
9	Safari	4.7	4.9	4.5	4.3
10	Renegade	4.7	5.0	4.3	4.7
11	Falcon II	4.6	5.1	4.0	3.7
12	Rebel III	4.5	5.0	4.1	3.3
13	Alamo	4.5	4.8	4.3	3.0
14	Rebel 3D	4.4	4.9	3.8	3.3
15	Rebel Jr	4.2	4.6	3.7	3.3
16	GQ	4.1	4.2	4.1	4.7
17	Crossfire	4.1	4.2	4.0	4.3
18	Tribute	4.0	4.4	3.6	4.3
19	Monarch	3.9	4.1	3.8	4.0
20	Oasis	3.9	4.0	3.7	3.3
21	Rebel	3.8	4.0	3.5	4.3
22	Rebel II	3.7	3.7	3.8	4.3
23	Eldorado	3.7	4.1	3.4	3.3
24	Thunderbird	3.7	3.9	3.4	3.7
25	Winchester	3.6	4.1	3.1	3.3
26	Arid	3.2	3.5	2.9	3.3
27	Wrangler	3.2	3.4	2.9	3.7
28	Falcon	2.9	3.2	2.6	3.0
29	Kentucky-31	1.8	2.1	1.5	2.7
30	Fawn	1.6	1.8	1.3	2.3

Table 4 (continued).

Cultivar or Selection	Turf Quality[1] 1995-1996 Avg.	Turf Quality[1] 1995 Avg.	Turf Quality[1] 1996 Avg.	Brown Patch[2] July 1996
LSD at 5% =	0.6	0.7	0.7	1.4

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

Table 5. Performance of tall fescue cultivars and selections in a turf trial seeded August 1995 at Adelphia, NJ.

	Cultivar or Selection	Turf Quality[1] 1996 Avg.	Brown Patch[2] June 1996
1	Masterpiece	6.7	4.7
2	Syn R5AM-95	5.9	5.0
3	Pixie	5.7	5.0
4	Hounddog V	5.3	4.3
5	Syn R5AU-95	5.3	4.7
6	Tarheel	5.2	5.0
7	Syn R5EL-95	5.2	4.3
8	Rebel 3D	5.2	4.7
9	Wrangler II	5.0	4.0
10	Tomahawk	5.0	4.7
11	Safari	4.9	4.3
12	Syn R5GEN-95	4.7	5.0
13	Bravo	4.5	4.0
14	Benton	4.4	4.7
15	Lancer	4.4	4.7
16	GQ	4.2	4.7
17	Rebel Jr	4.1	4.3
18	Mini Mustang	4.1	3.7
19	Duke	4.0	4.7
20	Montauk	4.0	4.7
21	Monarch	3.9	4.7
22	Crossfire	3.8	4.3
23	Rebel III	3.8	3.0
24	Mustang	3.7	4.0
25	Rebel II	3.7	4.0
26	Maverick II	3.6	4.7
27	Oasis	3.6	4.7
28	Trailblazer II	3.6	4.3
29	Shenandoah	3.6	4.7
30	Amigo	3.4	3.7

Table 5 (continued).

	Cultivar or Selection	Turf Quality[1] 1996 Avg.	Brown Patch June 1996
31	Arriba	3.3	4.3
32	Stetson	3.1	4.0
33	Arid	3.1	4.0
34	Savoy	3.1	4.3
35	Mesa	3.1	4.3
36	Fawn	1.2	3.3
	LSD at 5% =	0.7	1.1

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

Table 6. Yearly nitrogen (N) applied and mowing height (Ht) on tall fescue tests established at North Brunswick and Adelphia, NJ.

	1993		1994		1995		1996	
	N[1]	Ht[2]	N	Ht	N	Ht	N	Ht
Table 1 (1992 North Brunswick)	3.8	1.5	3.4	1.5	1.4	1.5	1.3	1.5
Table 2 (1992 Adelphia)	5.6	1.5	2.9	2.0	3.9	2.0	2.8	2.0
Table 3 (1993 Adelphia)			3.5	1.5	4.8	2.0	2.8	2.0
Table 4 (1994 Adelphia)					4.8	2.0	2.8	2.0
Table 5 (1995 Adelphia)							5.0	1.5

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