1999
RUTGERS
Turfgrass Proceedings

THE NEW JERSEY TURFGRASS ASSOCIATION

In Cooperation With

RUTGERS COOPERATIVE EXTENSION
NEW JERSEY AGRICULTURAL EXPERIMENT STATION
RUTGERS, THE STATE UNIVERSITY OF NEW JERSEY
NEW BRUNSWICK

1999 RUTGERS TURFGRASS PROCEEDINGS

of the

New Jersey Turfgrass Expo
December 7-9, 1999
Trump Taj Mahal
Atlantic City, New Jersey

Volume 31
Published July, 2000

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.

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.

Dr. Ann B. Gould, Editor
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PERFORMANCE OF FINE FESCUE CULTIVARS AND SELECTIONS IN NEW JERSEY TURF TRIALS

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The fine fescues consist of a number of species that can persist under limited soil moisture and low nitrogen fertility. However, the blue, hard, and strong creeping fescues do not tolerate a low height of cut as compared to some of the other turfgrasses. Fine fescues can form a dense, attractive turf cover. The species used for turf include bunch types [Chewings fescue (*Festuca rubra* L. subsp. *falax* Thuill.), hard fescue (*F. brevipila* (Hack.) Krajina, formerly *F. longifolia* Thuill.), sheeps fescue (*F. ovina* L.), *F. pseudovina*, and blue fescue (*F. glauca* Lam)] and rhizomatous types [slender creeping red fescue (*F. rubra* L. subsp. *littoralis*, formerly *F. rubra* L. subsp. *trichophylla* Gaud.) and strong creeping red fescue (*F. rubra* L. subsp. *rubra* Gaud.)].

The fine fescues are characterized by fine, wiry leaves that appear tube-like when the leaves roll during dry weather. Chewings fescues form the densest sod of the fine fescues for home lawns. The strong creeping and slender creeping red fescues produce a more open turf than the Chewings fescues due to their rhizomatous growth habit. The strong creeping red fescues, however, are more strongly rhizomatous and have a more open growth habit than the slender creeping red fescues. The hard fescues are less tolerant to close mowing than the Chewings fescues. Improved varieties of hard fescues have good turf-type characteristics and are similar in density and texture to the Chewings fescues, but with lower nutrient requirements, better disease resistance, and a slower growth rate. Sheeps fescues and blue fescues possess stiff, bluish-green leaves and require little maintenance.

The strong creeping red fescues have better establishment and seedling vigor than the Kentucky bluegrasses, but have similar color and density, making them ideal companion grasses in mixtures with Kentucky bluegrass. After establishment the fescues dominate in heavily shaded areas, whereas the Kentucky bluegrasses comprise the bulk of the stand in open areas. Other uses for which the fine fescues are well adapted include the use of hard fescues for soil erosion control in low maintenance areas, and the use of sheeps fescues for stabilization of sandy soils and banks along irrigation canals. The sheeps and blue fescues have also been used readily in wildflower mixes for soil stabilization, as well as for aesthetic purposes as they provide an attractive bluish foliar display.

High nitrogen fertilization and close mowing can reduce the occurrence of fine fescues in a turf of mixed species by decreasing heat tolerance and increasing plant succulence, thereby decreasing resistance to insect pests and diseases. For a fine fescue to persist it should be fertilized with no more than 2 lb nitrogen per 1000 ft^2 per year; sheeps fescues require less nitrogen nutrition than the other species. Most fine fescues can tolerate mowing heights of 1.5 to 2.0 inches, but perform best when the height of cut is at least at 2.5 inches.

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Fine fescues that contain the *Neotyphodium* endophyte can exhibit enhanced insect, disease, and environmental stress resistance. This endophyte is a fungus that grows within the crown and leaf sheath tissues of the turfgrass plant. The endophyte does not affect the natural growth of a plant during periods of low environmental stress; however, under stressful conditions the endophyte-plant relationship produces compounds that improve resistance to some biotic and abiotic stresses.

Breeding efforts continue to enhance turf-type qualities of the fine fescues and improve resistance to diseases, insects, and environmental stresses. Once improved plant material has been selected, endophytes can be incorporated to increase the stress resistance of these grasses. The Rutgers breeding program, in cooperation with the National Turfgrass Evaluation Program (NTEP), is involved in an extensive program evaluating many cultivars and experimental selections for their turf-type qualities.

PROCEDURES

Fine fescue trials were conducted at the Rutgers Plant Science Research and Extension Farm at Adelphia, New Jersey (Tables 1, 2, and 5), North Brunswick (Table 3), and the Snyder Farm in Pittstown (Table 4). Tests at Adelphia and the Snyder Farm were set up in open areas with good air circulation. The trial at North Brunswick was in an area with reduced air circulation. All entries were seeded in 3 X 5 ft plots at a rate of 3.7 lb/1000 ft^2. Plots were replicated at least three times in a randomized complete block design.

Tests were fertilized at different nitrogen rates, mowed at different heights, and subjected to varying levels of drought stress depending on the objectives of the test during the evaluation period (Table 6). After establishment, tests were only irrigated to avoid severe drought stress and dormancy. Plots were mowed at frequent enough intervals to avoid excessive accumulation of clippings. Weed control consisted of a yearly application of a preemergence herbicide for crabgrass and other annual grasses, and a broadleaf weed control herbicide applied either in spring or fall. The herbicide Pendulum was applied in the spring at the Snyder Farm for annual grassy weed control. Insecticides and fungicides were not applied to any tests.

The five tests were evaluated throughout the year by visually rating for turf quality. Turf quality is a subjective rating that is based on density, texture, uniformity, color, growth habit, and freedom from disease or insect damage. Half of each plot from the test seeded in 1996 at Adelphia was mechanically worn and evaluated for quality (Table 1). All three tests seeded in 1998 (Tables 3 to 5) were additionally evaluated for a variety of characteristics including seedling establishment, vigor, spring green-up, and leaf spot. All ratings were done on a 1 to 9 scale, where 9 represented the best quality turf, best establishment, or least disease.

RESULTS AND DISCUSSION

Data presented in Tables 1 to 5 are grouped by species and ranked by their multiple year quality average. This was done to facilitate comparison of cultivars and selections within a species. In general the Chewings and hard fescues had better performance than the other species with many selections producing a dense, attractive turf (Tables 1 to 5). Several of the newer selections within the strong creeping red fescues performed well at the three locations (Tables 3 to 5). Improvements in turf quality in the sheeps and slender creeping red fescues continue to be made. However, none of the sheeps and only a couple of the slender creeping red fescues had acceptable quality ratings (average = 5.5) in 1999 (Tables 1 to 5).

Establishment in the fine fescues varied among the cultivars within any given species; however, many of the newer selections rated above average in establishment and were significantly better than many of the older cultivars (Tables 3 to 5). In the test seeded September 1998 at Adelphia, several of the Chewings fescues (i.e., Intrigue, Longfellow II, and Shadow

II) and hard fescues (i.e., 4001, ABT-HF1, and SRX 3951) had very good resistance to leaf spot. Many cultivars and selections of the other species had poor resistance to leaf spot (Tables 3 to 5). Breeding efforts continue to improve turf-type characteristics in the fine fescues. The area of insect and disease resistance continues to be an important focus for the Rutgers program.

The Rutgers turfgrass breeding program continues to operate on the premise that the use of endophytes to enhance cultivar performance should not supersede breeding efforts to improve stress resistance, but should instead be used to further supplement a cultivar's natural ability to persist under such stresses. The successes of the Rutgers breeding program are documented through the superior quality exhibited by some of the newer experimental selections compared to existing cultivars. Further work, however, is still needed within the sheeps fescues (Tables 1 to 5).

ACKNOWLEDGMENTS

New Jersey Agricultural Experiment Station Publication No. E-12264-04-00. This work was conducted as part of NJAES Project No. 12264, supported by New Jersey Agricultural Experiment Station, State, And Hatch Act Funds, the Rutgers Center for Turfgrass Science, other grants, and gifts. Additional support was received from the United States Golf Association-Golf Course Superintendents Association of America Research Fund, the New Jersey Turfgrass Association, and the National Turfgrass Evaluation Program.

Table 1. Performance of fine fescue cultivars and selections in a turf trial seeded September 1996 at Adelphia, NJ.

	Cultivar or Selection	Turf Quality[1] 1997-1999 Avg.	Turf Quality[1] 1997 Avg.	Turf Quality[1] 1998 Avg.	Turf Quality[1] 1999 Avg.	Worn Quality[2] Sept. 1999
	CHEWINGS FESCUE					
1	Brittany	5.3	5.3	5.1	5.4	5.0
2	96-CF94-1	5.1	5.3	4.9	5.1	5.0
3	Shadow II	4.8	4.6	5.0	4.9	4.7
4	NJF-93	4.8	5.0	4.7	4.7	5.3
5	MB 64-93	4.6	4.5	4.7	4.5	4.7
6	MB-81	4.6	4.8	4.8	4.1	4.0
7	Victory E+	4.3	4.1	4.3	4.5	4.0
8	Tiffany	4.2	4.5	3.9	4.3	4.3
9	Southport	4.2	3.4	4.4	4.8	5.3
10	FC 51	4.2	4.4	3.8	4.4	4.0
11	FC 12	4.1	3.6	4.4	4.3	5.0
12	Jamestown II	3.9	3.7	3.8	4.3	5.0
13	Banner II	3.9	3.5	4.0	4.1	4.0
14	SR 5100	3.9	3.5	3.6	4.5	4.3
15	Shadow	2.8	2.3	2.6	3.5	3.7
	HARD FESCUE					
1	96-HF 94-1	5.6	5.9	5.9	5.0	7.3
2	Discovery	5.3	5.5	5.5	4.9	4.7
3	SR 3100	5.3	5.2	5.7	4.9	5.0
4	Ecostar	5.0	5.7	5.1	4.3	4.3
5	EL 20	5.0	5.6	5.1	4.1	4.3
6	Nordic	4.8	5.3	4.7	4.3	5.0
7	Heron	4.7	5.0	4.7	4.3	4.7
8	Aurora E+	4.5	4.8	5.0	3.9	4.7
9	Spartan	4.5	4.8	4.4	4.3	4.3
10	Reliant II	4.5	4.3	4.8	4.4	6.0

(Continued)

Table 1 (continued).

	Cultivar or Selection	1997-1999 Avg.	1997 Avg.	1998 Avg.	1999 Avg.	Worn Quality[2] Sept. 1999
			Turf Quality[1]			
	HARD FESCUE (continued)					
11	Reliant	4.4	4.6	4.6	4.1	4.3
12	Brigade	4.3	4.8	4.4	3.8	4.0
13	Serra	4.3	4.8	4.2	4.0	3.3
14	Warwick	3.7	3.3	4.2	3.7	4.0
	SHEEPS FESCUE					
1	Bighorn	4.4	4.1	4.7	4.2	4.0
2	MX-86	3.5	3.8	3.6	3.1	2.7
3	LO 44	2.6	2.3	2.4	2.1	2.7
	SLENDER CREEPING RED FESCUE					
1	Seabreeze	4.3	4.4	4.2	4.4	3.7
2	Dawson	3.8	4.1	3.7	3.5	1.3
	STRONG CREEPING RED FESCUE					
1	Pathfinder	5.2	4.7	5.0	5.9	7.7
2	PST 4ST	4.8	5.2	4.8	4.4	2.7
3	OFI-JH	4.8	5.1	4.1	5.1	4.0
4	PST 4VB E+	4.6	4.8	4.4	4.7	2.7
5	Flyer II	4.5	4.9	4.2	4.5	2.0
6	Shademaster II	4.3	4.4	3.8	4.7	4.0
7	RSTR-CR	4.3	4.2	4.0	4.7	4.7
8	PST 4DT	4.1	3.7	4.0	4.5	4.0
9	WX5 386	4.0	4.2	3.8	3.9	2.3
10	Flyer	3.9	3.9	3.7	4.1	3.7
11	Shademark	3.8	4.1	3.4	3.8	3.7
12	Melody	3.7	3.9	3.3	3.8	3.0
13	Common Creeper	3.6	3.8	3.3	3.6	3.3

(Continued)

Table 1 (continued).

Cultivar or Selection	1997-1999 Avg.	1997 Avg.	1998 Avg.	1999 Avg.	Worn Quality[2] Sept. 1999
		----------Turf Quality[1]----------			
LSD at 5% =	0.7	0.9	1.0	0.7	1.7

[1]9 = best turf quality
[2]9 = best turf quality after wear applied

Table 2. Performance of fine fescue cultivars and selections in a turf trial seeded in September 1997 at Adelphia, NJ.

	Cultivar or Selection	Turf Quality[1] 1998-1999 Avg.	Turf Quality[1] 1998 Avg.	Turf Quality[1] 1999 Avg.
	CHEWINGS FESCUES			
1	Shadow II	5.9	6.0	5.8
2	PCH comp	5.9	6.2	5.6
3	CIS FRC 2	5.9	6.4	5.3
4	Treazure E+	5.8	6.0	5.6
5	Ambassador	5.5	6.1	4.9
6	R94-299	5.4	6.0	4.8
7	FRC A-93-97	5.1	5.6	4.6
8	Victory II	5.1	5.5	4.7
9	SRX 5N5942-2	5.0	5.4	4.7
10	SRX 5941-2	5.0	5.5	4.5
11	SR 5100	4.9	5.3	4.6
12	FRC 4-92-97	4.8	5.4	4.3
13	FRC B-93-97	4.7	5.2	4.1
14	TMI-3CE	4.7	4.8	4.6
15	SRX 5022	4.7	5.0	4.3
16	Tiffany	4.5	4.9	4.2
17	Syn 4BCT	4.3	4.5	4.1
18	Sandpiper	4.3	4.3	4.3
19	FC 50	4.2	4.5	4.0
20	FC 51	4.1	4.6	3.7
21	Victory	4.1	4.2	3.9
22	Jamestown II	4.0	4.0	3.9
23	Dover	3.6	3.7	3.5
24	Shadow E+	3.1	2.8	3.5
25	SR 5000	1.3	1.2	1.4

(Continued)

Table 2 (continued).

	Cultivar or Selection	Turf Quality[1] 1998-1999 Avg.	Turf Quality[1] 1998 Avg.	Turf Quality[1] 1999 Avg.
	HARD FESCUE			
1	Hard 97 E-	6.0	5.9	6.0
2	Hard 97 E+	5.8	5.9	5.6
3	Oxford	5.7	5.8	5.7
4	CIS FL12	5.5	5.3	5.7
5	SRX 3113	5.3	5.2	5.3
6	SRX 3324 E-2	5.2	5.0	5.3
7	FF B-97	5.1	5.3	4.9
8	SRX 3022-3	5.1	5.4	4.9
9	R-94	5.1	5.0	5.2
10	GBM comp	5.1	5.3	4.8
11	Nordic E+	5.1	5.0	5.1
12	SR 3100	5.0	4.9	5.0
13	LL-22	4.9	5.0	4.8
14	Osprey	4.9	4.9	4.9
15	GGE comp	4.9	5.0	4.8
16	CIS FL11	4.9	4.9	4.9
17	SRX 3MO941-2	4.9	4.9	4.8
18	Heron	4.9	5.2	4.5
19	CIS FL10	4.8	4.6	5.0
20	FF A-97	4.8	4.8	4.8
21	Ecostar	4.8	5.0	4.5
22	SR 3000	4.7	4.8	4.7
23	47TH	4.7	4.8	4.6
24	Attila	4.7	4.8	4.6
25	CIS FL8	4.6	4.7	4.6
26	FF-2-94-97	4.6	4.4	4.8
27	CIS FL9	4.6	4.3	4.8
28	FFD-97	4.6	4.5	4.6
29	FF-2-94 1-7	4.6	4.2	4.9
30	FF-5-94-97	4.6	4.6	4.5

(Continued)

Table 2 (continued).

	Cultivar or Selection	----------Turf Quality[1]---------- 1998-1999 Avg.	1998 Avg.	1999 Avg.
	HARD FESCUE (continued)			
31	Discovery	4.5	4.1	4.9
32	Serra	4.5	4.6	4.5
33	Syn 4R6	4.5	4.5	4.5
34	Syn 4CU	4.3	4.4	4.3
35	FF-6-94-97	4.3	4.4	4.1
36	Spartan	4.2	4.0	4.4
37	Syn 46U	4.2	4.1	4.3
38	Aurora E+	4.1	3.8	4.4
39	FF-7-94-97	4.0	4.3	3.7
40	4GH	3.8	4.0	3.7
41	Syn 4HI-97	3.7	3.7	3.6
42	18089	2.1	2.4	1.9
	SHEEPS AND BLUE FESCUE			
1	Syn 4MB	4.6	4.8	4.4
2	4UB	4.1	4.2	4.1
3	Bighorn	3.9	4.1	3.8
4	4HZ	3.9	4.3	3.5
5	FO D-93-97	3.5	3.4	3.5
6	FO I-92-97	3.4	3.5	3.3
7	FO G-93-97	3.4	3.6	3.2
	SLENDER CREEPING RED FESCUE			
1	ASRO 10	5.4	5.7	5.1
2	ASRO 25	5.3	5.0	5.7
3	ASRO 36	4.8	4.6	4.9
4	ASRO 14	4.7	4.5	5.0
5	ASRO 11	4.5	4.4	4.5

(Continued)

Table 2 (continued).

	Cultivar or Selection	Turf Quality[1] 1998-1999 Avg.	Turf Quality[1] 1998 Avg.	Turf Quality[1] 1999 Avg.
	SLENDER CREEPING RED FESCUE (continued)			
6	Seabreeze	4.9	5.2	4.7
7	SRX 5SL952-2	4.6	4.5	4.7
8	SRX 5SL953-2	4.4	4.2	4.5
9	4S3	4.1	3.9	4.3
10	Syn 4S3 E	4.0	3.8	4.2
11	Syn 4SD	3.9	3.7	4.1
12	Syn 4SDY	3.5	3.3	3.8
	STRONG CREEPING RED FESCUE			
1	CIS H FRR E+	5.2	5.1	5.3
2	CIS FRR 5	5.1	5.2	5.0
3	CIS FRR 6	5.0	5.1	4.9
4	4FR	5.0	5.3	4.7
5	47TCL	4.9	5.1	4.8
6	Syn 46T-97	4.9	5.1	4.7
7	Shademaster II	4.9	5.1	4.7
8	Syn 4TDD	4.9	5.0	4.7
9	SRX 52NJ961-1	4.8	5.2	4.5
10	Syn 4 FRR	4.8	5.1	4.5
11	Syn 4CRE-97	4.7	5.0	4.4
12	4TD	4.7	4.9	4.5
13	SRX 52MO962-1	4.7	4.8	4.5
14	Syn 4TB	4.6	4.8	4.5
15	Fenway E+	4.6	4.6	4.6
16	CIS HRR E+/E-	4.6	4.9	4.3
17	Syn 4PH	4.6	5.0	4.1
18	Syn 4V3	4.6	4.7	4.5
19	Syn 4BBL	4.5	4.7	4.3
20	Florentine	4.5	4.8	4.1

(Continued)

Table 2 (continued).

	Cultivar or Selection	1998-1999 Avg.	1998 Avg.	1999 Avg.
		----------Turf Quality[1]----------		
	STRONG CREEPING RED FESCUE (continued)			
21	SRX 5SL951-2	4.5	4.5	4.4
22	SRX 52NJ943-2	4.5	4.6	4.3
23	Fenway E-	4.4	4.3	4.5
24	SRX 52NJ94-1-2	4.3	4.4	4.1
25	Flyer II	4.2	4.2	4.2
26	Syn 4RTM	4.2	4.2	4.2
27	SRX 52NJ941-3	4.2	4.2	4.2
28	SRX 52NJ942-2	4.1	4.0	4.3
29	4CRE	4.0	4.2	3.7
30	SR 5200 E	3.8	3.5	4.1
31	FLM E+ comp	5.6	5.7	5.5
32	FLM E- comp	5.2	5.4	5.1
33	FLT comp	5.2	5.9	4.4
34	Pathfinder	5.1	5.1	5.0
35	OGSC 94	4.5	4.7	4.2
36	Trapeze	4.4	4.5	4.3
37	Aruba	4.1	4.5	3.7
38	Vista	4.0	4.0	4.0
40	Victor	3.4	3.0	3.8
41	Common Creeper	3.1	3.0	3.3
	LSD at 5% =	0.6	0.7	0.7

[1]9 = best turf quality

Table 3. Performance of fine fescue and tufted hairgrass cultivars and selections in a turf trial seeded in September 1998 at North Brunswick, NJ.

	Cultivar or Selection	Turf Quality[1] 1999 Avg.	Seedling Vigor[2] Oct. 1998	Winter Color[3] March 1999	Spring Green-up[4] April 1999	Vigor[5] June 1999	Green Cover (%) Aug. 1999	Green Cover (%) Oct. 1999	Leaf Spot[6] 1999 Avg.
	CHEWINGS FESCUE								
1	Longfellow II	6.6	6.3	5.3	6.7	6.3	60.0	93.7	5.7
2	ABT-CHW-2	6.4	5.7	6.3	6.0	5.3	56.7	86.7	6.2
3	SROFF7	6.3	5.3	5.7	6.0	6.0	66.7	86.0	5.2
4	Intrigue	6.1	4.3	6.3	7.3	5.3	61.7	89.3	5.8
5	Treazure	5.9	5.7	6.0	6.0	7.7	56.7	78.3	5.2
6	Ambassador	5.9	4.0	7.3	6.3	5.0	51.7	65.3	6.0
7	ABT-CHW-3	5.8	6.3	5.0	4.0	5.3	53.3	82.7	6.5
8	Shadow II	5.6	4.0	6.7	5.0	5.7	50.0	63.7	6.0
9	Pick FRC A-93	5.2	4.7	6.3	5.7	3.7	37.7	83.3	5.3
10	SROFF6	5.1	5.7	6.0	7.7	4.3	31.7	58.3	5.2
11	SR 5100	5.0	7.3	5.7	5.7	4.3	61.7	58.3	4.3
12	Pick FRC 4-92	4.9	5.7	5.7	5.7	4.0	14.0	65.0	5.5
13	PST-4HM	4.9	2.7	4.7	2.7	6.0	71.0	36.7	5.3
14	Tiffany	4.9	6.3	6.3	5.3	3.7	38.3	71.0	3.2
15	Magic	4.9	6.0	5.7	4.0	3.3	24.3	75.0	4.8

(Continued)

Table 3 (continued).

	Cultivar or Selection	Turf Quality[1] 1999 Avg.	Seedling Vigor[2] Oct. 1998	Winter Color[3] March 1999	Spring Green-up[4] April 1999	Vigor[5] June 1999	Green Cover (%) Aug. 1999	Green Cover (%) Oct. 1999	Leaf Spot[6] 1999 Avg.
				CHEWINGS FESCUE (continued)					
16	Bridgeport	4.9	8.3	5.7	5.7	3.0	31.7	75.0	4.8
17	ACF 083	4.6	6.3	7.0	7.0	3.7	35.0	63.3	4.0
18	MB-63	4.6	7.0	5.3	6.0	3.3	25.0	55.0	4.2
19	ACF 092	4.6	5.0	6.0	7.3	5.0	23.3	45.0	5.2
20	Culombra	4.6	8.3	6.0	5.0	4.0	19.3	55.0	4.7
21	Brittany	4.5	8.7	4.7	5.0	2.7	17.3	76.7	5.5
22	Banner III	4.4	3.0	6.0	5.0	3.7	39.3	29.0	5.3
23	ABT-CHW-1	4.3	6.3	5.0	5.7	3.0	25.0	46.7	5.7
24	Sandpiper	4.2	8.7	5.0	5.0	3.7	22.7	48.3	4.0
25	BAR CHF 8 FUF2	3.9	6.7	5.3	4.7	3.0	12.3	29.0	5.2
26	Jamestown II	3.6	7.0	5.0	5.7	3.3	15.0	36.7	4.3
				HARD FESCUE					
1	4001	6.5	5.0	5.0	3.7	7.3	90.3	70.0	7.0
2	ABT-HF1	6.2	6.3	5.0	4.0	7.0	83.3	66.7	7.5
3	SRX 3961	6.2	5.3	4.0	4.0	7.3	86.0	53.3	6.7
4	ABT-HF-2	6.0	5.7	4.7	3.3	6.3	85.0	66.7	6.2
5	Minotaur	5.9	3.7	4.0	3.0	5.7	91.7	71.7	6.7

(Continued)

Table 3 (continued).

	Cultivar or Selection	Turf Quality[1] 1999 Avg.	Seedling Vigor[2] Oct. 1998	Winter Color[3] March 1999	Spring Green-up[4] April 1999	Vigor[5] June 1999	Green Cover (%) Aug. 1999	Green Cover (%) Oct. 1999	Leaf Spot[6] 1999 Avg.
				HARD FESCUE (continued)					
6	SROFF1	5.9	2.0	5.3	2.3	5.3	91.7	55.0	6.7
7	ABT-HF-3	5.8	4.0	5.0	2.3	5.7	80.0	51.7	7.3
8	ABT-HF-4	5.7	3.7	4.3	2.3	6.3	77.7	50.0	7.2
9	Oxford	5.7	5.0	4.7	3.7	6.3	81.7	58.3	6.7
10	SROFF2	5.7	3.7	4.7	3.3	5.0	81.7	55.0	6.2
11	PST-4MI3	5.7	4.0	3.3	2.7	5.7	80.7	63.3	7.7
12	Reliant II	5.6	6.0	4.7	3.7	5.3	73.3	70.7	5.2
13	BAR HF 8 FUS	5.4	3.7	6.3	3.7	4.3	70.0	64.3	5.0
14	Nordic	5.3	3.7	4.3	3.3	6.0	61.7	39.3	5.8
15	Rescue 911	5.3	5.3	4.0	2.0	5.0	75.0	51.0	6.5
16	CIS FL 11	5.2	5.3	3.7	3.0	6.3	65.0	56.7	5.8
17	SROFF4	5.2	5.0	4.0	3.0	5.3	66.7	50.0	5.7
18	SROFF3	5.2	3.0	4.7	4.0	4.0	60.0	68.3	5.7
19	Pick FF A-97	5.1	4.0	4.7	3.3	5.3	68.3	40.0	6.0
20	CIS FL 12	5.0	5.0	5.7	3.3	5.3	70.0	35.0	4.8
21	Discovery	5.0	3.7	4.0	3.0	5.7	61.7	46.7	5.5
22	Attila E	4.9	4.7	4.7	3.3	5.7	65.0	48.3	4.7
23	Defiant	4.8	4.3	5.3	4.7	6.0	63.3	36.0	6.2
24	AHF 009	4.7	4.3	4.7	2.7	5.7	56.7	45.0	5.5
25	Osprey	4.7	2.0	6.7	3.3	5.7	65.0	31.0	6.3

(Continued)

Table 3 (continued).

	Cultivar or Selection	Turf Quality[1] 1999 Avg.	Seedling Vigor[2] Oct. 1998	Winter Color[3] March 1999	Spring Green-up[4] April 1999	Vigor[5] June 1999	Green Cover (%) Aug. 1999	Green Cover (%) Oct. 1999	Leaf Spot[6] 1999 Avg.
	HARD FESCUE (continued)								
26	Heron	4.6	5.0	4.7	3.3	4.3	56.7	24.0	5.8
27	Scaldis	4.4	4.7	5.3	3.7	6.7	60.0	29.3	7.3
28	MB-82	4.0	4.0	5.0	3.0	6.3	50.0	23.3	5.3
29	AHF 008	3.8	4.3	4.0	3.0	4.7	51.7	27.3	6.0
	SHEEPS AND BLUE FESCUE								
1	Bighorn	4.6	5.0	3.0	2.7	5.3	51.7	27.7	7.0
2	Quatro	4.2	4.7	6.3	4.0	3.3	46.7	63.3	5.7
3	SR 3200	4.0	4.3	3.3	3.0	5.3	37.7	28.3	6.7
	SLENDER CREEPING RED FESCUE								
1	BAR SCF 8 FUS 3	5.1	4.3	5.0	3.7	3.3	22.3	68.3	4.5
2	ASR 049	4.4	4.3	4.7	3.3	4.3	15.7	40.0	4.7
3	SROFF9	3.9	4.0	4.7	4.3	3.7	12.7	20.3	4.2
4	SROFF8	3.8	3.7	4.7	4.3	2.7	18.3	30.7	3.3
5	Seabreeze	3.8	5.3	4.3	5.0	4.0	11.3	48.3	3.8
6	SROFF10	3.8	2.0	4.0	4.0	5.7	5.3	6.0	6.2
7	Dawson E+	3.5	4.3	4.0	5.0	3.3	11.0	13.7	4.2

(Continued)

Table 3 (continued).

	Cultivar or Selection	Turf Quality[1] 1999 Avg.	Seedling Vigor[2] Oct. 1998	Winter Color[3] March 1999	Spring Green-up[4] April 1999	Vigor[5] June 1999	Green Cover (%) Aug. 1999	Green Cover (%) Oct. 1999	Leaf Spot[6] 1999 Avg.
	STRONG CREEPING RED FESCUE								
1	ABT-CR-2	6.6	4.7	6.7	5.3	5.3	60.0	88.3	5.2
2	Jasper II	6.5	6.0	5.7	4.7	6.0	66.7	94.0	5.2
3	ABT-CR-3	6.5	6.3	5.0	4.3	4.3	71.7	98.7	4.2
4	PK comp	6.3	7.7	5.0	4.3	5.7	68.3	95.3	4.0
5	SRX 52961	6.1	6.3	6.0	4.0	5.3	88.3	92.3	4.2
6	CIS FRR 5	6.0	5.0	6.0	5.0	5.3	78.3	94.7	4.3
7	CIS FRR 7	6.0	7.7	5.3	4.3	5.7	45.0	90.0	4.3
8	Pathfinder	5.9	6.0	6.7	5.3	3.7	50.0	94.7	4.0
9	PST-EFL	5.9	7.0	5.3	4.3	4.3	75.0	94.3	3.7
10	Florentine	5.6	7.0	5.3	4.0	4.0	61.7	87.7	2.7
11	SPT-47TCR	5.6	3.7	7.0	4.3	3.0	55.0	96.7	3.3
12	PST-4FR	5.6	4.3	7.3	5.7	3.0	68.3	86.0	3.7
13	FLE comp	5.5	8.0	5.3	4.0	4.7	66.7	91.7	3.2
14	ASC 082	5.3	3.7	6.3	5.0	4.0	60.0	96.3	4.2
15	Shademaster II	5.3	6.7	6.0	4.0	4.7	36.0	93.0	3.2
16	BAR CF 8 FUS1	5.2	5.3	6.0	4.7	3.7	53.3	88.0	3.5
17	Gen 92	5.2	2.3	6.3	4.7	4.0	56.7	92.7	3.3
18	ASC 172	4.9	2.0	5.3	4.3	3.3	46.7	80.0	4.5
19	DGSC 94	4.9	8.7	6.0	4.7	3.0	36.7	92.0	3.3
20	SROFF12	4.8	4.7	5.7	4.3	2.7	50.0	71.7	3.2

(Continued)

Table 3 (continued).

	Cultivar or Selection	Turf Quality[1] 1999 Avg.	Seedling Vigor[2] Oct. 1998	Winter Color[3] March 1999	Spring Green-up[4] April 1999	Vigor[5] June 1999	Green Cover (%) Aug. 1999	Green Cover (%) Oct. 1999	Leaf Spot[6] 1999 Avg.
	STRONG CREEPING RED FESCUE (continued)								
21	Salsa	4.7	8.7	5.0	7.0	6.0	32.7	71.7	2.3
22	SRX 52LAV	4.6	6.0	5.0	3.7	3.3	51.7	56.7	2.3
23	ASC 087	4.4	3.7	6.3	6.0	3.7	38.3	66.7	3.7
24	Shademark	4.4	7.3	6.0	3.7	2.7	23.3	75.7	2.5
25	SROFF11	3.4	4.7	5.0	4.7	3.3	18.3	43.3	2.0
26	Common Creeper	3.3	6.7	4.7	5.0	3.7	10.3	33.3	4.5
27	Boreal	2.7	7.3	5.0	5.3	3.7	6.7	11.0	3.5
28	Claudia	1.8	1.0	5.3	2.3	2.7	18.7	8.3	2.8
	OTHER								
1	Reveille Texas blue hyb	4.6	1.3	7.7	3.7	7.3	90.0	65.0	5.7
2	SR 6000 hairgrass	3.7	7.0	2.7	3.3	7.0	3.3	2.3	7.0
3	SROFF5 hairgrass	3.1	2.0	4.3	2.0	3.3	14.0	12.0	6.0
4	Nortran hairgrass	2.9	4.3	2.3	3.7	8.0	1.3	1.3	8.5
5	SR Deso hairgrass	2.2	2.3	3.3	7.0	4.3	2.3	2.3	6.0
6	Norcoast hairgrass	1.5	1.7	1.7	2.7	2.7	4.3	2.3	5.5

(Continued)

Table 3 (continued).

Cultivar or Selection	Turf Quality[1] 1999 Avg.	Seedling Vigor[2] Oct. 1998	Winter Color[3] March 1999	Spring Green-up[4] April 1999	Vigor[5] June 1999	Green Cover (%) Aug. 1999	Green Cover (%) Oct. 1999	Leaf Spot[6] 1999 Avg.
LSD at 5% =	0.8	1.7	1.2	1.4	1.4	22.3	26.8	1.2

[1]9 = best turf quality
[2]9 = best seedling vigor
[3]9 = best winter color
[4]9 = earliest spring green-up
[5]9 = best plant vigor
[6]9 = least leaf spot

Table 4. Performance of fine fescue cultivars and selections in a turf trial seeded in September 1998 at Pittstown, NJ.

	Cultivar or Selection	Turf Quality[1] 1999 Avg.	Emergence[2] Oct. 1998	Establishment[3] March 1999	Winter Color[4] May 1999	Leaf Spot[5] Aug. 1999	Green Live Tissue[6] Oct. 1999
	CHEWINGS FESCUE						
1	Pick FRC B-93	5.5	4.7	7.7	5.3	5.0	5.0
2	Shadow ll	5.4	3.7	6.3	5.3	6.3	5.7
3	ACF 092	5.4	3.7	7.7	3.7	4.7	5.3
4	Pick FRC 4-92	5.3	5.3	7.7	5.0	5.0	5.0
5	Pick FRC A-93	5.3	4.0	7.0	4.7	5.3	5.0
6	ABT-CHW-3	5.3	4.3	7.0	4.7	5.7	5.3
7	Banner III	5.3	3.7	7.3	5.3	4.7	4.7
8	Pick FRC 4-92	5.3	4.3	7.3	5.3	4.7	4.7
9	Intrigue	5.2	4.0	7.3	5.7	6.0	5.0
10	FC 39	5.2	5.0	7.7	5.0	5.7	5.7
11	PST-4HM	5.2	2.7	5.3	5.3	5.3	7.7
12	ABT-CHW-2	5.2	4.7	7.3	5.7	6.3	4.3
13	FC 49	5.2	4.0	7.3	4.3	5.0	4.7
14	Ambassador	5.1	4.0	7.0	5.0	5.3	5.3
15	BAR CHF 8 FUS 2	5.1	4.3	7.3	5.0	4.7	5.3
16	Longfellow II	5.1	4.3	7.3	5.3	6.3	5.3
17	FC 11	5.1	5.0	7.7	4.3	5.3	5.0
18	FC 51	5.1	4.3	7.7	4.7	5.0	4.3
19	MB-63	5.1	5.0	7.7	5.0	4.3	5.3
20	ABT-CHW-1	5.1	5.0	7.3	4.3	5.7	4.3
21	Pick FRC 2-96	5.1	5.0	7.0	6.0	5.0	5.0
22	FC 50	5.0	4.3	7.3	4.3	5.0	5.0
23	Culombra	5.0	6.0	8.7	4.0	4.3	5.3
24	Hood	5.0	5.7	8.3	4.7	4.7	5.3
25	FC 28	5.0	5.3	8.3	4.7	5.3	4.3
26	ACF 083	4.9	4.3	7.7	4.3	3.7	3.7
27	Pick FRC A-93	4.9	4.3	6.8	5.0	5.0	5.5
28	Victory RS	4.9	6.7	8.7	4.0	5.0	5.0
29	Tiffany	4.8	4.3	7.0	4.7	4.3	4.7
30	Brittany	4.8	5.7	8.0	3.7	4.7	4.7

(Continued)

Table 4 (continued).

	Cultivar or Selection	Turf Quality[1] 1999 Avg.	Emergence[2] Oct. 1998	Establishment[3] March 1999	Winter Color[4] May 1999	Leaf Spot[5] Aug. 1999	Green Live Tissue[6] Oct. 1999
			CHEWINGS FESCUE (continued)				
31	Bridgeport	4.8	5.7	7.7	4.0	4.7	5.0
32	Victory II	4.7	4.0	7.3	4.7	5.3	4.7
33	Victory	4.7	5.0	8.3	5.0	4.3	5.3
34	Pick FRC A-97	4.7	4.0	7.3	5.0	4.3	3.0
35	Sandpiper	4.7	6.3	8.3	4.0	3.3	4.0
36	Magic	4.6	4.3	8.0	4.7	4.7	4.3
37	Treazure	4.6	3.3	7.0	5.0	5.0	5.0
38	SR 5100	4.4	6.0	8.3	4.0	4.7	4.7
39	Jamestown II	4.1	5.3	8.0	3.7	4.3	3.7
40	FLED	4.0	6.3	8.7	4.7	2.7	4.0
			HARD FESCUE				
1	Heron	5.9	4.0	5.7	6.0	5.3	7.3
2	4001	5.9	4.0	6.3	6.0	4.3	7.7
3	ABT-HF-2	5.8	4.0	6.3	5.3	5.7	7.3
4	ABT-HF1	5.7	4.3	6.7	5.0	5.0	8.0
5	Oxford	5.6	5.0	6.3	5.3	5.0	7.3
6	SRX 3961	5.6	5.0	6.7	5.3	5.3	8.0
7	Pick GBM	5.4	4.7	7.0	4.3	5.7	6.7
8	EL 20	5.4	4.3	6.3	5.3	5.3	7.0
9	ABT-HF-3	5.4	4.0	6.0	4.3	5.3	6.7
10	Pick FF A-97	5.4	4.7	6.7	5.7	5.0	7.0
11	FL 54	5.4	3.7	6.3	5.0	5.3	7.3
12	AHF 009	5.3	4.0	6.7	4.3	4.3	6.7
13	BAR HF 8 FUS	5.3	3.3	5.3	6.0	4.7	6.7
14	AHF 008	5.3	4.3	6.3	6.0	5.0	6.3
15	Pick FF A-97	5.3	3.3	6.0	5.0	5.0	7.0
16	EL 41	5.3	4.7	6.7	4.7	4.7	6.7
17	Scaldis	5.3	2.7	5.0	4.7	5.3	6.3
18	Reliant II	5.3	4.3	6.7	5.0	5.0	6.3
19	Osprey	5.3	2.0	5.0	5.3	5.3	7.3
20	ABT-HF 4	5.2	3.7	6.0	4.0	5.7	6.7

(Continued)

Table 4 (continued).

	Cultivar or Selection	Turf Quality[1] 1999 Avg.	Emergence[2] Oct. 1998	Establishment[3] March 1999	Winter Color[4] May 1999	Leaf Spot[5] Aug. 1999	Green Live Tissue[6] Oct. 1999
			HARD FESCUE (continued)				
21	Attila E	5.2	3.7	6.0	5.0	4.3	6.3
22	Rescue 911	5.1	4.0	5.7	4.3	6.0	7.0
23	CIS FL 11	5.1	3.7	6.3	5.0	5.3	7.3
24	CIS FL 12	5.1	3.7	6.0	5.3	5.3	6.7
25	LL 22	5.1	4.7	6.3	5.0	6.0	7.3
26	Minotaur	5.0	2.7	6.3	4.7	5.3	6.3
27	Nordic	5.0	3.7	6.3	4.7	5.3	6.3
28	Spartan	5.0	3.3	6.0	5.0	4.7	7.0
29	PST-4MB	4.9	3.3	6.0	3.7	6.0	6.0
30	Defiant	4.9	3.0	6.0	5.7	4.7	7.0
31	Discovery	4.9	3.0	5.0	5.3	5.7	7.0
32	MB-82	4.9	1.3	3.7	4.7	5.3	6.7
33	Pick FF 6-94	4.7	2.0	4.7	5.0	5.7	6.3
34	Pick FOD-93	4.7	4.3	7.0	3.7	4.7	6.0
35	Pick FOG-93	4.3	3.0	5.7	4.0	6.7	6.0
36	18909	3.5	2.7	5.3	4.7	4.0	5.0
			SHEEPS AND BLUE FESCUE				
1	Quatro	5.1	3.7	5.7	4.3	5.0	6.3
2	SR 3200	4.7	4.3	6.7	4.7	5.3	6.0
3	FO 53	4.7	3.3	6.3	4.0	5.0	5.7
4	Teal	4.6	3.0	6.3	4.7	4.3	5.7
5	Biqhorn	4.6	4.3	6.3	3.3	5.7	6.0
6	FO 52	4.6	2.7	5.7	4.3	5.0	6.3
7	Azay	4.4	4.0	6.7	3.7	3.3	5.3
			SLENDER CREEPING RED FESCUE				
1	BAR SCF 8 FUS3	5.8	3.7	7.3	4.0	5.3	7.3
2	ASF 049	5.5	4.7	7.3	3.0	5.0	7.7
3	Dawson E+	4.7	3.7	7.0	3.0	4.3	6.3
4	Seabreeze	4.6	4.3	7.3	3.3	4.3	5.7

(Continued)

Table 4 (continued).

	Cultivar or Selection	Turf Quality[1] 1999 Avg.	Emergence[2] Oct. 1998	Establishment[3] March 1999	Winter Color[4] May 1999	Leaf Spot[5] Aug. 1999	Green Live Tissue[6] Oct. 1999
	STRONG CREEPING RED FESCUE						
1	PST EFL	5.4	5.3	8.7	4.7	4.3	5.0
2	Florentine	5.4	5.3	7.7	4.3	4.3	5.0
3	Jasper	5.4	5.0	7.7	5.0	5.0	5.7
4	Pick FDM	5.2	5.3	8.0	4.3	5.7	5.3
5	ABT-CR-3	5.1	5.3	8.3	4.0	5.0	4.0
6	Jasper II	5.1	5.3	8.3	4.7	4.7	5.7
7	PST-4FR	5.1	3.3	7.0	5.0	4.3	5.0
8	ABT-CR-2	5.0	4.0	7.0	5.7	5.0	4.7
9	BAR CF 8 FUS1	4.9	4.7	7.7	5.0	4.3	5.0
10	FR 46	4.9	3.3	6.3	4.7	6.3	5.7
11	ASC 082	4.9	4.0	6.7	3.7	5.0	4.3
12	ASC 087	4.8	4.3	7.7	4.7	4.0	4.3
13	Jasper E-	4.8	5.0	8.3	4.3	4.0	5.3
14	PST-47TCR	4.8	3.7	7.0	5.7	4.7	4.0
15	CIS FRR 7	4.8	5.0	7.7	4.7	4.7	4.0
16	ASC 172	4.7	2.3	5.7	4.3	5.7	5.7
17	DGSC 94	4.7	6.7	9.0	4.0	3.7	4.7
18	FR-01 -4-25	4.7	3.0	6.3	6.7	4.3	4.7
19	FC 27	4.7	5.0	8.0	4.3	4.7	4.3
20	Jasper	4.7	5.3	8.0	3.7	4.3	4.7
21	Pathfinder	4.7	5.7	8.3	4.3	3.7	4.3
22	ISI FRR 5	4.6	5.0	7.7	4.0	4.7	4.0
23	Trapeze	4.6	5.3	7.7	4.3	4.0	5.0
24	SRX 52961	4.5	5.0	8.3	4.7	4.3	4.7
25	Shademaster II	4.3	5.7	8.0	4.0	3.7	4.7
26	FR 47	4.2	4.0	7.0	5.0	5.3	4.0
27	Salsa	4.2	7.7	9.0	4.3	4.0	5.0
28	Boreal	4.2	6.0	9.0	3.7	3.7	3.0
29	Shademark	4.0	5.3	9.0	4.0	3.3	3.3
30	SRX 52LAV	4.0	4.3	8.0	4.3	4.3	3.7

(Continued)

Table 4 (continued).

	Cultivar or Selection	Turf Quality[1] 1999 Avg.	Emergence[2] Oct. 1998	Establishment[3] March 1999	Winter Color[4] May 1999	Leaf Spot[5] Aug. 1999	Green Live Tissue[6] Oct. 1999
	STRONG CREEPING RED FESCUE (continued)						
31	Common Creeper	4.0	7.0	9.0	3.0	3.3	2.3
32	Claudia	3.3	1.3	2.0	4.7	4.3	2.7
	OTHER						
1	Syn 4U6	5.3	4.3	6.3	5.3	5.0	6.7
2	Syn 42 RR	4.1	4.3	7.7	3.3	4.0	3.3
3	SR 6000 hairgrass	3.8	6.0	8.3	2.3	6.0	4.7
4	SIRIR hairgrass	3.8	4.0	7.3	2.7	3.7	4.0
5	DAVL hairgrass	3.2	4.7	7.3	2.0	2.7	2.7
6	Nortran hairgrass	3.1	4.0	7.3	2.0	7.7	2.3
7	Kometa	3.0	2.0	4.7	3.3	4.7	2.0
8	META hairgrass	2.9	2.0	4.7	3.0	5.0	3.0
9	DATE hairgrass	2.8	5.7	9.0	3.3	4.7	2.0
10	Norcoast	1.9	2.7	6.3	1.0	2.7	1.0
11	SPR-237 hairgrass	1.7	4.3	8.3	1.3	3.7	1.0
	LSD at 5% =	0.5	1.0	1.0	1.0	1.2	1.3

[1]9 = best turf quality
[2]9 = best emergence
[3]9 = best establishment
[4]9 = best winter color
[5]9 = least leaf spot
[6]9 = most green live tissue

Table 5. Performance of fine fescue cultivars and selections in a test seeded in September 1998 at Adelphia, NJ. (Includes all entries of the 1998 National Fine-leaf Fescue Test - NTEP.)

	Cultivar or Selection	Turf Quality[1] 1999 Avg.	Establishment[2] Sept. 1998	Leaf spot[3] Nov. 1998	Leaf spot[3] April 1999
		CHEWINGS FESCUE			
1	Longfellow II	6.1	6.3	7.0	8.0
2	ABT CHW-2	6.1	5.0	5.7	6.7
3	SRO FF 7	6.0	5.7	6.3	6.7
4	Ambassador	5.9	5.0	5.7	7.3
5	Treazure	5.7	5.3	6.3	6.3
6	Shadow II	5.7	5.7	6.3	7.7
7	BAR CHF 8 FUS2	5.6	6.0	6.0	5.3
8	Intrigue	5.6	6.0	5.3	7.7
9	ABT-CHW-3	5.6	6.5	5.5	7.5
10	ABT CHW-1	5.5	5.3	6.3	5.3
11	Culombra	5.3	7.0	5.3	6.7
12	Carmen	5.3	6.0	6.7	5.3
13	FC 28	5.3	6.3	6.3	4.3
14	SRO FF 6	5.3	6.7	6.0	6.0
15	SR 5100	5.3	6.3	5.3	5.0
16	Hood	5.3	6.7	5.7	4.7
17	ACF 082	5.2	5.7	5.0	7.3
18	PST-4HM	5.2	4.0	6.0	4.7
19	SC-39	5.2	5.7	5.7	6.0
20	MB-63	5.2	6.7	5.7	5.7
21	Pick FRC 4-92	5.1	6.0	5.0	6.0
22	Magic	5.1	6.3	6.7	6.7
23	Brittany	5.0	6.7	5.0	6.0
24	ACF 083	5.0	6.0	4.3	5.3
25	Pick FRC A-93	5.0	5.3	6.0	8.0
26	Tiffany	4.9	6.3	6.0	5.0
27	Banner III	4.9	5.7	6.0	6.0
28	Sandpiper	4.8	7.0	5.0	4.7
29	LRF-98-490	4.8	5.7	5.3	5.0
30	FC 49	4.7	5.3	3.7	5.3

(Continued)

Table 5 (continued).

	Cultivar or Selection	Turf Quality[1] 1999 Avg.	Establishment[2] Sept. 1998	Leaf spot[3] Nov. 1998	Leaf spot[3] April 1999
		CHEWINGS FESCUE (continued)			
31	Bridgeport	4.7	6.3	4.3	5.0
32	Jamestown II	4.4	7.7	4.3	3.0
33	FC 51	4.3	5.0	5.3	6.3
34	FC 50	4.3	4.7	3.3	5.7
35	FLED	3.3	6.7	4.7	1.7
		HARD FESCUE			
1	ABT-HF1	6.1	4.3	7.7	6.3
2	4001	5.9	4.0	6.3	6.3
3	SRO FF 2	5.8	5.0	6.7	6.3
4	Oxford	5.6	4.3	6.7	5.3
5	Discovery	5.5	4.0	8.0	4.7
6	ABT-HF-2	5.5	4.0	6.7	5.3
7	ABT-HF-4	5.5	4.7	7.0	6.3
8	FL 54	5.5	4.7	6.7	6.0
9	Osprey	5.4	3.7	6.7	5.0
10	Nordic	5.4	4.0	5.7	6.7
11	SRO FF 4	5.4	5.0	6.3	6.3
12	Reliant II	5.4	4.7	6.3	5.3
13	CIS FL 11	5.3	4.7	7.3	5.3
14	ABT-HF-3	5.1	4.7	6.0	6.7
15	EL 41	5.1	4.7	6.0	4.7
16	ASC 009	5.1	5.0	5.7	6.7
17	CIS FL 12	5.1	5.3	6.0	5.0
18	BAR HF 8 FUS	5.1	4.7	6.7	4.7
19	Ecostar	5.1	4.7	6.7	6.7
20	SRO FF 1	5.1	4.0	6.7	6.3
21	SRO FF 3	5.0	4.3	6.7	6.0
22	LL 22	5.0	5.0	6.3	6.3
23	Minotaur	4.9	4.0	6.0	6.7
24	EL 20	4.9	4.7	6.7	6.3
25	Defiant	4.8	4.0	5.0	4.7

(Continued)

Table 5 (continued).

	Cultivar or Selection	Turf Quality[1] 1999 Avg.	Establishment[2] Sept. 1998	Leaf spot[3] Nov. 1998	Leaf spot[3] April 1999
		HARD FESCUE (continued)			
26	MB-82	4.8	3.7	6.0	6.0
27	Attila	4.6	4.7	6.7	4.0
28	Heron	4.6	4.3	6.7	4.3
29	PST-4MB	4.6	4.0	6.7	6.0
30	ASC 008	4.5	4.3	7.0	6.7
31	Pick FF A-97	4.5	4.0	6.3	4.3
32	Scaldis	4.4	3.7	7.0	4.7
33	Rescue 911	4.4	4.3	5.7	5.0
34	LRF-98-488	4.2	4.7	5.7	4.0
35	LRF-98-487	4.2	5.0	6.3	4.7
36	LRF-98-489	4.0	4.3	7.3	3.3
37	LRF-98-491	3.7	4.0	6.3	3.7
		SHEEPS AND BLUE FESCUE			
1	Quatro	4.7	4.7	6.0	2.0
2	Bighorn	4.6	4.3	7.3	7.0
3	SR 3200	4.0	4.7	6.7	4.0
		SLENDER CREEPING RED FESCUE			
1	ASC 049	5.5	6.0	5.3	3.0
2	BAR SCF 8 FUS 3	5.3	5.0	6.0	4.0
3	Seabreeze	5.1	6.3	6.0	4.0
4	SRO FF 9	4.8	6.3	6.0	2.3
5	SRO FF 8	4.7	5.7	6.0	2.7
6	Dawson E+	4.6	6.3	3.3	2.3
7	SRO FF 10	4.4	5.0	4.7	5.0

(Continued)

Table 5 (continued).

	Cultivar or Selection	Turf Quality[1] 1999 Avg.	Establishment[2] Sept. 1998	Leaf spot[3] Nov. 1998	Leaf spot[3] April 1999
	STRONG CREEPING RED FESCUE				
1	Jasper II	5.8	6.7	4.3	5.7
2	SRX 52961	5.7	7.0	5.0	5.3
3	PK Comp	5.7	7.0	5.0	6.0
4	CIS FRR 7	5.6	7.7	5.7	5.0
5	ABT CR-2	5.5	6.3	5.3	6.0
6	ABT-CR-3	5.4	6.0	5.0	6.3
7	Florentine	5.3	7.7	5.3	4.3
8	PST-EFL	5.2	7.3	5.7	4.7
9	FLE Comp	5.2	7.0	5.0	5.0
10	PathFinder	5.1	7.3	4.7	4.0
11	PST-47 TCR	4.9	5.7	4.7	5.7
12	BAR CF 8 FUS 1	4.8	5.7	3.0	5.3
13	DGSC 94	4.8	7.7	3.3	4.7
14	PST-4FR	4.8	5.7	5.3	4.3
15	CIS FRR 5	4.8	6.7	4.3	5.3
16	ShadeMaster C66II	4.7	6.3	5.3	4.3
17	Shademark	4.7	7.0	4.3	2.3
18	ASC 087	4.5	6.3	3.3	4.0
19	Salsa	4.4	7.0	4.7	2.7
20	SRO FF 12	4.4	7.3	3.0	4.0
21	ASC 082	4.3	5.3	4.0	5.7
22	Trapeze	4.2	6.7	3.7	4.3
23	FR-47	4.2	5.0	3.3	6.0
24	FR-27	4.2	6.7	4.0	4.0
25	SRX 52LAV	4.1	6.3	3.3	4.3
26	FR-46	4.0	4.7	2.7	6.3
27	SRO FF 11	3.8	7.7	2.7	2.7
28	FR-01-4-25	3.7	4.3	2.7	5.0
29	ASC 172	3.4	4.7	2.0	6.3
30	Boreal	3.2	7.7	3.7	2.0
31	Common Creeper	3.0	8.3	3.0	1.3
32	Claudia	1.2	1.3	.	.

(Continued)

Table 5 (continued).

	Cultivar or Selection	Turf Quality[1] 1999 Avg.	Establishment[2] Sept. 1998	Leaf spot[3] Nov. 1998	Leaf spot[3] April 1999
			DESCHAMPSIA		
1	SR 6000	4.5	5.8	6.0	7.5
2	SR 6000	3.9	5.0	4.3	8.7
3	Nortran	3.1	4.7	6.0	8.0
4	SR DESO	2.1	3.7	2.0	3.7
5	Norcoast	1.1	4.3	1.0	4.0
	LSD at 5% =	0.6	1.0	1.5	1.7

[1]9 = best turf quality
[2]9 = best establishment
[3]9 = least leaf spot

Table 6. Yearly nitrogen (N) applied and mowing height (Ht) on fine 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 (1996 Adelphia)	1.4	2.0	1.7	1.5	2.1	1.5	2.1	1.5
Table 2 (1997 Adelphia)			1.4	1.5	2.6	1.5	1.9	1.5
Table 3 (1998 North Brunswick)					1.5	1.5	2.0	1.5
Table 4 (1998 Pittstown)					1.5	3.0	1.0	3.0
Table 5 (1998 Adelphia)					1.5	1.5	1.9	1.5

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