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This publication includes lecture notes of papers presented at the 2005 New Jersey Turfgrass Expo. Publication of these lectures provides a readily available source of information covering a wide range of topics and includes technical and popular presentations of importance to the turfgrass industry.

This proceedings also includes research papers that contain original research findings and reviews of selected subjects in turfgrass science. These papers are presented primarily to facilitate the timely dissemination of original turfgrass research for use by the turfgrass industry.

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Dr. Ann Brooks 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 include several species from the genus *Festuca*. They are commonly identified by their very fine leaf texture. The species used for turf include both bunch types [Chewings fescue (*Festuca rubra* L. subsp. *fallax* (Thuill.) Nyman), hard fescue (*F. brevipila* R. Tracey), sheeps fescue (*F. ovina* L.), *F. pseudovina*, and blue fescue (*F. glauca* Vill.)] and rhizomatous types [slender creeping red fescue (*F. rubra* L. var. *littoralis* Vasey ex Beal) and strong creeping red fescue (*F. rubra* L. subsp. *rubra* Gaud.)].

Fine fescues are well suited for many low maintenance sites due to their excellent tolerance of drought and shade. These characteristics, along with their low nitrogen fertility requirement, allow them to persist under dry-land and low maintenance management regimes. Compared to Chewings and hard fescues, strong creeping and slender creeping red fescues spread through rhizomes and tend to have a more open turf canopy. The strong creeping red fescues are more strongly rhizomatous and have a more open growth habit than the slender creeping red fescues. Hard and Chewings fescues are bunch type grasses and most of the improved cultivars have improved turf-type characteristics, higher density, and finer texture compared to slender and strong creeping red fescues. Hard fescues also have lower nutrient requirements, better disease resistance under low maintenance, and a slower growth rate. Sheeps fescues and blue fescues have stiff, bluish-green leaves and require little maintenance.

Strong creeping red fescues are often used as a companion grass in mixtures with complementary Kentucky bluegrass because they have similar color, growth habit, and density. The strong creeping red fescues often have better establishment and seedling vigor than most Kentucky bluegrasses. After establishment, the fescues dominate in heavily shaded areas where the Kentucky bluegrass is not competitive. Hard fescues are used for soil erosion control in low maintenance areas, and sheeps fescues are used for stabilization of sandy soil and banks along irrigation canals. The sheeps and blue fescues are used in wildflower mixes for soil stabilization and for their brilliant bluish foliage in the ornamental landscape setting.

Fine fescues grow best under reduced nitrogen fertilization. Ideally, fine fescue should be fertilized with no more than 1 to 2 lb nitrogen per 1000 ft^2 per year. Hard, blue, and sheeps fescues require less nitrogen nutrition than the other species. With the exception of Chewings fescues, which can be mown closely to a 1/2-inch height of cut, the other fine fescue species do not tolerate a low height of cut. They can tolerate mowing heights of 1.5 to 2.0 inches, but perform best above 2.5 inches.

Fine fescues that contain the *Neotyphodium* endophyte can exhibit enhanced tolerance to insects, diseases, and environmental stress. This endophyte is a fungus that grows in the crown and leaf sheath tissues of the turfgrass plant. The impact of this endophyte on plant growth generally is not apparent during periods of low environmental stress; however, under stressful conditions, the endophyte-plant relationship produces compounds that improve resistance to many above ground feeding insects, some diseases such as red thread (Popay and Bonos, 2005), and abiotic stresses.

Breeding efforts continue to enhance the turf characteristics of the fine fescues and improve resistance to diseases, insects, and environmental stresses. Incorporation of endophytes into improved plant material provides an efficient way to increase stress tolerance. The Rutgers breeding program, in

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cooperation with the National Turfgrass Evaluation Program (NTEP), is involved in an extensive program evaluating many cultivars and experimental selections for turf performance.

PROCEDURES

Fine fescue trials were conducted at the Rutgers Plant Biology and Pathology Research and Extension Farm at Adelphia, NJ (Tables 1, 3, and 4), and the Horticultural Research Farm II at North Brunswick, NJ (Table 2). The tests at Adelphia were established in open areas with good air circulation. The trial at North Brunswick was in an area with less air circulation, and therefore, higher disease pressure. All entries were seeded in 3 X 5 ft plots at a rate of 3.7 lb/1000ft^2. Plots were replicated three times in a randomized complete block design.

Tests were fertilized at different nitrogen rates, but held at the same mowing height (Table 5). After establishment, tests were irrigated infrequently to avoid severe drought stress and dormancy. Plots were mowed frequently enough to avoid excessive accumulation of clippings. At Adelphia, broadleaf weeds were controlled with spring or fall applications of 2,4-D, dicamba, and MCPP; Dimension was used in spring and fall to control annual grassy weeds; and Merit was applied in July for grub control. At North Brunswick, Dimension was applied to control annual grassy weeds; Merit was applied in July for grub control; and Dylox was applied in August for cutworm control.

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 lack of damage from diseases or insects. Other characteristics rated included seedling establishment, spring green-up, percent cover, and resistance to leaf spot (caused by *Drechslera poae*) and cutworm (*Agriotis ipsilon*) feeding. All ratings, except percent cover, were taken using a 1 to 9 scale with 9 representing the best turf quality, best establishment, or least disease. Percent cover was taken on a 0 to 100 scale with 100 representing complete turfgrass cover.

RESULTS AND DISCUSSION

Data presented in Tables 1 through 4 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.

Turf Quality

In general, the hard fescues performed better than the other species with many selections forming a dense, attractive turf (Tables 1 to 4), followed by the Chewings fescues and strong creeping red fescues. Although improvement in the turf quality of blue, sheeps, and slender creeping red fescues continues, these species still rank lower than the others in turf quality. It is interesting to note that hard fescue x blue fescue hybrids show dramatic improvement when compared to their poor quality relatives (blue fescue) (Tables 1 to 4). This demonstrates the rapid progress that is possible when improving open-pollinated turfgrass species.

Establishment

Establishment in the fine fescues varied among the cultivars within any given species (Table 4). Oxford and Reliant hard fescues established very well, as did Ambassador and Shadow II Chewings fescues. Celestial, Aberdeen, Pathfinder, Cindy Lou, and Fenway strong creeping red fescue also exhibited good establishment.

Spring Green-Up

Spring green-up is a turfgrass color rating (where 1 = brown, dormant plot and 9 = green, actively growing plot) taken in late winter to early spring. Spring green-up is related to the geographic adaptability of a given cultivar. For example, cultivars adapted to the mid-Atlantic region, characterized by shorter days and higher temperatures, would typically have early spring green-up. Cultivars adapted to other areas or higher elevations would have a slower spring green-up because a much more dramatic shift in day length and temperature would be required to initialize spring growth. Hard fescues as a species exhibit earlier spring green-up than either Chewings or strong creeping red fescues. In the turf trial seeded in September 2003 at North Brunswick (Table 2), DP 77-9886 Chewings fescue and Musica strong creeping red fescue exhibited early spring green-up (Table 2). Most of the cultivars and selections in these genera remain variable for spring green-up, indicating the possibility of future improvement.

Disease Resistance

Leaf spot is a foliar disease that affects turfgrass during the spring. Tolerance to this disease is often associated with the carbohydrate status of the plant.

Therefore, plants that exhibit early spring green-up have more time to deplete carbohydrates stored within the plant and often show more signs of disease (Smiley, 2005). In the test seeded September 2003 at North Brunswick (Table 2), hard fescues had very good resistance to leaf spot, including both Oxford and Minotaur, with the majority of cultivars and selections scoring near 8.0. Strong creeping red fescues were generally more susceptible to this disease; however, some experimental selections, including Pick CRF 1-03 and ASC 245 and the cultivar Celestial, exhibited better resistance.

Insect Resistance

Cutworms are the larvae of night flying moths in the Noctuidea family. The larva feed on the stems and crowns of the turfgrass plant. They are typically considered only a minor problem in turf; however, severe infestations can cause significant damage especially when combined with low maintenance regimes (Turgeon, 2005). Endophytes play a key role in regulating insect resistance within the fine fescues. Cultivars and selections that contain high levels of compatible endophytes can produce toxic alkaloids that function as systemic biological insecticides. Turfgrass stands containing these endophytes typically show no damage from above ground feeding insects like the cutworm. The strong creeping red fescue cultivars and selections Cindy Lou, Fortitude, DP 77-9360 and the hard fescue Pick HF#2 showed increased tolerance to cutworm feeding (Table 2).

SUMMARY

Breeding efforts continue to improve turf-type characteristics in the fine fescues. In an effort to increase the overall sustainability of the turfgrass system, special attention is paid by the Rutgers breeding program to turfgrass drought, insect, and disease resistance. It is hoped to develop turfgrasses specifically adapted to the constant selection pressures but diminishing potable water supply that is increasingly experienced by turfgrass managers. We continue to look at the use of endophytes to supplement breeding efforts to improve the natural ability of a given cultivar to persist under stress. The success of the efforts of the Rutgers breeding program is well documented in the superior quality exhibited by many of the newer experimental selections; however, further improvements are always needed.

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Table 1. Performance of fine fescue cultivars and selections in a turf trial seeded in September 2002 at Adelphia, NJ.

	Cultivar or Selection	Turf Quality[1] 2003-2005 Avg.	Turf Quality[1] 2003 Avg.	Turf Quality[1] 2004 Avg.	Turf Quality[1] 2005 Avg.
	CHEWINGS FESCUE				
1	SRX 51G	5.8	5.9	5.7	5.9
2	CIS-FRC-12	5.7	5.5	5.5	6.0
3	Zodiac	5.7	5.5	5.6	5.9
4	CIS-FRC-11	5.6	5.4	5.4	6.2
5	RAD-FC3	5.4	5.5	5.4	5.3
6	SRX 51FF	5.4	5.7	4.9	5.5
7	Shadow II	5.3	5.6	5.1	5.2
8	CIS-FRCL-1	5.3	5.0	5.2	5.7
9	Ambrose	5.2	5.7	5.0	5.0
10	Long Fellow II	5.2	6.0	5.0	4.6
11	FRC A-93	5.1	5.2	4.9	5.3
12	00-D	5.1	5.5	4.9	5.0
13	FC2	5.0	5.2	5.0	5.0
14	7 Seas	5.0	5.5	5.0	4.6
15	Ambassador	5.0	5.2	4.7	5.0
16	Treazure	5.0	5.1	4.6	5.2
17	RAD-FC1	5.0	5.1	4.7	5.1
18	4CHX bulk	4.9	5.4	5.1	4.3
19	SRX 51II	4.9	5.1	4.7	4.9
20	SRX NJD	4.9	5.3	4.9	4.4
21	BAR CHF-8FUS2	4.8	5.1	4.7	4.6
22	02-CHFSHHY	4.7	5.0	4.5	4.6
23	Victory II	4.7	5.2	4.2	4.6
24	02-CHFMED	4.7	5.1	4.2	4.6
25	FRC B-98	4.6	4.8	4.3	4.7
26	SRX 51HH	4.6	5.0	4.3	4.5
27	SR 5100	4.6	5.1	4.3	4.4
28	Banner II	4.4	4.9	3.9	4.5
29	Jamestown II	4.2	4.5	3.7	4.4
30	Victory	4.2	4.4	4.0	4.1
31	SRX 51LAM	3.1	3.5	3.2	2.6

(Continued)

Table 1 (continued).

	Cultivar or Selection	Turf Quality[1] 2003-2005 Avg.	2003 Avg.	2004 Avg.	2005 Avg.
		HARD FESCUE			
1	SPE comp	6.4	6.1	6.3	6.7
2	Firefly	6.3	5.6	6.6	6.7
3	HF 2nd-02	6.0	5.6	6.3	6.0
4	SR 3150	5.9	5.9	6.0	5.8
5	PST HE-1	5.9	5.9	6.0	5.9
6	Oxford	5.8	5.8	5.5	6.0
7	SRX 3324	5.7	5.0	6.2	6.0
8	HOE	5.7	5.4	5.9	5.8
9	SRX 3STDNE	5.5	5.0	5.8	5.6
10	02-H-FO	5.5	5.3	5.5	5.6
11	SRX 3100	5.4	5.3	5.2	5.6
12	CIS FL-24	5.4	5.1	5.4	5.7
13	Eureka II	5.3	5.4	5.2	5.5
14	00-AFF	5.3	5.2	5.3	5.4
15	Reliant II	5.2	5.2	5.3	5.2
16	Chariot	5.2	5.1	5.0	5.5
17	Hard Top	5.1	5.4	4.8	5.1
18	SRX 3K	5.0	4.8	5.2	5.1
19	Osprey	5.0	4.9	5.1	5.1
20	FFA-97	5.0	4.7	4.9	5.3
21	Heron	5.0	4.9	5.0	4.9
22	GAFF	4.9	5.6	4.5	4.7
23	Minotaur	4.8	4.8	4.9	4.6
24	FO A-98	4.7	4.9	4.6	4.8
25	FO B-98	4.7	4.8	4.5	4.8
26	Stonehenge	4.7	4.6	4.4	5.0
27	Aurora II	4.7	4.3	5.2	4.5
28	Aurora Gold	4.5	4.8	4.3	4.5
29	FF9-94	4.3	4.8	4.0	4.1
		SLENDER CREEPING RED FESCUE			
1	BAR SCF 8FUS	4.4	5.4	4.5	3.2
2	SRX 55Q26	4.3	4.7	4.4	3.9
3	SRX 55Q4	4.3	4.1	4.5	4.2
4	SRX 55SLE	4.2	4.4	4.1	3.9
5	Seabreeze	4.1	5.2	3.8	3.2

(Continued)

Table 1 (continued).

	Cultivar or Selection	Turf Quality[1] 2003-2005 Avg.	2003 Avg.	2004 Avg.	2005 Avg.
	SLENDER CREEPING RED FESCUE (cont.)				
6	SRX 55QSLC	4.0	4.0	4.0	4.1
7	Seabreeze GT	3.9	5.1	3.5	3.2
8	SRX 55Q27	3.9	4.1	3.9	3.7
9	SRX 55Q28	3.9	3.8	3.9	3.9
10	PST-Syn-4TU	3.8	3.8	4.1	3.6
11	PST-Syn-4EU	3.8	3.5	4.3	3.7
12	Dawson E	3.8	4.9	3.5	3.0
13	SRX 55Q25	3.6	3.8	3.6	3.3
	STRONG CREEPING RED FESCUE				
1	FRR-NGS-02	6.0	5.6	6.3	6.1
2	Fortitude	5.9	6.1	5.9	5.6
3	CIS-FRR-30	5.5	5.6	5.6	5.4
4	PST 8000 FF	5.5	5.5	5.4	5.5
5	00-A FRR	5.4	5.6	5.2	5.3
6	FRR-02G	5.3	5.4	5.1	5.2
7	DW2	5.3	5.0	5.3	5.5
8	TL7 comp	5.3	5.4	5.3	5.0
9	FRR-02P	5.1	5.4	5.1	4.9
10	CIS-FRR-29	5.1	4.9	5.1	5.3
11	RCM comp	5.1	5.4	4.9	4.9
12	Navigator	5.1	5.3	5.0	4.9
13	CIS-FRR-26	5.0	4.8	5.0	5.2
14	BMVC-502	5.0	5.2	4.9	4.9
15	CIS-FRR-28	5.0	5.0	5.0	4.9
16	CIS-FRR-27	5.0	4.9	5.1	4.9
17	Wendy Jean	4.9	5.0	5.1	4.6
18	RAD-FR3	4.8	5.0	5.0	4.6
19	Pathfinder	4.6	4.9	4.5	4.5
20	Aberdeen	4.6	5.1	4.3	4.4
21	Fenway	4.4	4.2	4.5	4.7
22	Audubon	4.3	5.2	4.1	3.6
23	SRX 52961	4.2	4.7	4.3	3.7
24	Cindy Lou	4.2	5.4	3.7	3.6
25	Inverness	4.2	4.3	4.3	4.1

(Continued)

Table 1 (continued).

	Cultivar or Selection	Turf Quality[1] 2003-2005 Avg.	2003 Avg.	2004 Avg.	2005 Avg.
26	Jasper II	4.1	5.2	3.9	3.3
27	Camilla	4.1	5.0	4.1	3.2
28	PST-4VS bulk	4.0	4.5	4.1	3.3
29	Florentine GT	3.9	4.8	3.6	3.5
30	01-FR 1	3.9	4.9	3.7	3.1
31	PST-SYN-4CRY	3.9	3.8	3.9	3.8
32	Bargena II	3.8	4.6	3.6	3.3
33	PST-4F2	3.8	3.4	4.4	3.7
34	PST-Syn-4VLS	3.8	4.6	3.8	2.9
35	SR 5210	3.8	3.9	3.5	3.9
36	Florentine GT	3.8	4.2	4.0	3.0
37	FRR GHCL	3.7	4.4	3.7	3.0
38	Jasper	3.6	4.2	3.4	3.3
39	Trapeze	3.6	4.2	3.3	3.2
40	SR 5200 E	3.5	3.3	3.4	3.7
41	PST-SYN-4CRX	3.4	3.6	3.8	2.9
42	PST-Syn-4TG	3.4	3.5	3.5	3.1
	HARD FESCUE X BLUE FESCUE HYBRIDS				
1	PST-Syn-4BU2	5.2	5.0	5.3	5.3
2	SRX 3BHF	5.1	5.0	5.4	5.1
3	PST-4MB	4.5	4.4	4.5	4.5
4	Little Bighorn	4.3	4.4	4.4	4.1
	BLUE FESCUE				
1	SR 3200	3.5	3.4	3.4	3.6
	KOELERIA				
1	Barleria	3.9	5.2	2.9	3.6
2	Barkoel	3.7	4.5	3.0	3.5
	LSD at 5% =	0.4	0.5	0.6	0.7

[1]9 = best turf quality

Table 2. Performance of fine fescue cultivars and selections in a turf trial seeded in September 2003 at North Brunswick, NJ. (Includes all entries in the 2003 National Fineleaf Fescue Test.)

	Cultivar or Selection	Turf Quality[1] 2004-2005 Avg.	Turf Quality[1] 2004 Avg.	Turf Quality[1] 2005 Avg.	Spring Green-up[2] April 2005	Leaf Spot[3] May 2005	Cutworm[4] Aug. 2005	Cover (%) Sept. 2005
	CHEWINGS FESCUE							
1	Zodiac	5.7	6.5	4.9	6.3	5.0	6.0	58.3
2	SRX 51G	5.5	6.9	4.3	7.0	6.3	3.0	23.7
3	7 Seas	5.5	6.3	4.7	6.0	4.0	4.0	55.0
4	DP 77-9885	5.4	6.2	4.5	4.0	7.0	4.0	48.3
5	IS-FRC 17	5.1	6.0	4.1	5.7	6.7	3.3	33.3
6	Compass	5.0	5.8	4.2	5.3	4.3	4.7	45.0
7	PST-4TZ	4.7	6.2	3.3	6.7	5.7	2.3	10.0
8	Longfellow II	4.7	5.7	3.7	6.0	6.7	3.0	16.7
9	DP 77-9886	4.6	5.3	3.9	8.3	5.3	2.0	34.0
10	Ambassador	4.5	5.2	3.7	4.0	4.7	3.0	35.0
11	Longfellow II	4.5	5.6	3.6	5.0	4.7	2.3	18.3
12	Culumbra II	4.2	5.1	3.4	5.3	7.0	2.0	17.0
13	Intrigue	4.0	4.9	3.2	5.7	4.3	3.0	16.7
14	J-5	3.9	4.6	3.3	5.3	4.7	2.0	15.0
15	Cascade	3.2	3.8	2.6	7.0	2.3	1.3	10.0
	HARD FESCUE							
1	IS-FL 28	5.3	5.8	4.8	6.7	7.7	6.3	45.0
2	Pick HF #2	5.0	5.6	4.5	6.3	8.3	7.3	30.0
3	Reliance	4.6	5.3	3.8	6.0	8.0	6.0	20.0
4	Oxford	4.6	4.8	4.4	6.7	8.0	6.0	50.0
5	Berkshire	4.5	4.7	4.3	4.3	7.7	5.3	36.7
6	Firefly	4.4	5.1	3.7	5.0	8.0	5.7	30.0
7	Predator	4.3	4.6	4.0	4.0	8.0	6.0	43.3
8	Minotaur	3.7	3.9	3.5	5.0	7.3	6.3	33.3
9	SR 3000	3.7	4.0	3.4	3.3	8.0	5.0	25.0
10	Chariot	3.6	4.1	3.1	4.7	7.3	3.3	22.3
11	SRX 3K	3.5	3.9	3.1	1.3	8.0	4.0	20.0
12	Scaldis	3.0	3.1	2.9	4.0	7.7	4.3	15.0
	SLENDER CREEPING RED FESCUE							
1	SRX 55R	3.7	4.6	2.8	5.3	5.0	1.3	3.0
2	Seabreeze	3.3	3.8	2.8	5.3	4.7	1.0	13.3
3	Dawson E	2.8	3.5	2.1	4.3	3.3	1.0	5.0

(Continued)

Table 2 (continued).

	Cultivar or Selection	Turf Quality[1] 2004-2005 Avg.	Turf Quality[1] 2004 Avg.	Turf Quality[1] 2005 Avg.	Spring Green-up[2] April 2005	Leaf Spot[3] May 2005	Cutworm[4] Aug. 2005	Cover (%) Sept. 2005
	STRONG CREEPING RED FESCUE							
1	Fortitude	6.0	6.5	5.5	4.0	4.7	7.0	58.3
2	Epic	5.9	6.4	5.4	3.7	5.7	5.7	51.7
3	IS-FRR 30	5.6	6.3	4.9	3.0	5.0	6.0	56.7
4	Pick CRF 1-03	5.6	6.1	5.1	3.3	5.7	5.3	56.7
5	Wendy Jean	5.4	6.0	4.8	4.7	3.0	6.0	50.0
6	Cindy Lou	5.3	5.5	5.2	3.7	3.0	7.3	63.3
7	DLF-RCM	5.1	5.7	4.7	4.0	4.7	5.0	48.3
8	DP 77-9360	5.1	5.0	5.1	4.7	4.3	7.3	58.3
9	IS-FRR 29	5.0	5.5	4.5	2.7	3.7	6.0	56.7
10	PST-8000	4.9	5.7	4.0	4.3	5.3	4.3	30.0
11	C-SMX	4.8	5.5	4.2	5.3	4.0	4.7	41.7
12	DP 77-9578	4.8	5.3	4.4	3.7	4.0	5.0	45.0
13	Pathfinder	4.6	4.6	4.6	5.0	2.0	6.3	60.0
14	DP 77-9579	4.6	5.1	4.0	4.0	3.3	5.7	41.7
15	Celestial	4.5	5.4	3.6	3.3	6.3	2.7	15.0
16	TL1	4.5	5.4	3.6	3.7	3.3	4.0	40.0
17	BMXC-502	4.4	5.2	3.6	3.7	5.0	3.0	26.7
18	Jasper II	4.3	5.4	3.1	4.0	3.3	1.7	10.0
19	Razor	4.2	4.7	3.8	4.0	4.3	3.3	33.3
20	Musica	4.1	5.3	3.0	8.7	5.0	1.0	5.3
21	Celestial	4.1	4.8	3.4	4.0	5.3	2.0	18.3
22	Audubon	3.9	4.5	3.3	3.7	3.7	2.0	35.0
23	C03-4676	3.9	4.4	3.5	4.7	3.0	3.0	30.0
24	Fenway	3.8	3.5	4.1	4.7	2.0	5.0	56.7
25	Tiara	3.7	4.4	2.9	2.0	5.7	2.3	15.0
26	IS-FRR 23	3.7	4.2	3.2	3.3	3.3	3.3	30.0
27	Navigator	3.6	4.3	2.9	5.0	2.0	2.3	11.7
28	Shademaster	2.8	2.8	2.7	5.3	2.0	2.3	20.0
29	Oracle	2.5	2.5	2.5	3.3	1.7	2.3	21.7
30	Boreal	2.1	2.2	2.0	3.3	2.0	1.0	21.7
	SHEEPS FESCUE							
1	Quatro	3.6	3.9	3.3	6.0	4.7	5.7	28.3

(Continued)

Table 2 (continued).

Cultivar or Selection	Turf Quality[1] 2004-2005 Avg.	Turf Quality[1] 2004 Avg.	Turf Quality[1] 2005 Avg.	Spring Green-up[2] April 2005	Leaf Spot[3] May 2005	Cutworm[4] Aug. 2005	Cover (%) Sept. 2005
LSD at 5% =	0.6	0.7	0.9	1.8	1.8	2.2	25.8

[1]9 = best turf quality
[2]9 = earliest spring green-up
[3]9 = least disease
[4]9 = least insect feeding

Table 3. Performance of fine fescue cultivars and selections in a turf trial seeded in September 2003 at Adelphia, NJ. (Includes all entries of the 2003 National Fineleaf Fescue Test - NTEP.)

	Cultivar or Selection	Turf Quality[1] 2004-2005 Avg.	Turf Quality[1] 2004 Avg.	Turf Quality[1] 2005 Avg.
	CHEWINGS FESCUE			
1	SRX 51G	6.6	6.5	6.3
2	PST-Syn-4TL	5.8	6.1	6.3
3	IS-FRC 17	5.8	5.8	5.9
4	Culumbra II	5.8	5.2	4.6
5	Longfellow II	5.8	5.7	5.6
6	IS-FRC 12	5.8	5.9	6.0
7	RAD-FC3	5.7	5.9	6.1
8	RAD-FCPCX	5.7	5.6	5.5
9	Zodiac	5.6	5.9	6.1
10	IS-FRC 8	5.5	5.2	4.9
11	RAD-FCCX	5.5	5.2	4.8
12	7 Seas	5.4	5.0	4.6
13	PST-4TZ	5.4	5.7	6.0
14	PST-Syn-4RC	5.3	4.9	4.5
15	Dp 77-9885	5.1	4.8	4.4
16	PST-Syn-4CH3	5.1	4.8	4.5
17	Intrigue	5.1	4.6	4.0
18	Ambassador	5.1	5.3	5.5
19	Compass	5.1	5.2	5.4
20	B2CF	5.1	4.6	4.1
21	SRX 51FF	5.0	4.8	4.6
22	SRX OH51H	5.0	4.8	4.5
23	Bar CHF 8FUS2	5.0	4.5	4.0
24	Shadow II	4.9	4.9	4.8
25	Ambrose	4.9	5.2	5.6
26	Dp 77-9886	4.8	4.9	5.1
27	03-CHFSHHY	4.8	4.5	4.1
28	PST-Syn-4TY	4.7	4.8	4.9
29	Treasure	4.7	4.9	5.0
30	Brittany	4.7	4.4	4.1
31	J-5	4.6	4.6	4.6
32	PST-Syn-4FRC	4.5	4.4	4.2
33	Bargreen	4.5	4.5	4.6
34	Cascade	4.0	4.1	4.2
35	Jamestown II	3.7	3.4	3.1

(Continued)

Table 3 (continued).

	Cultivar or Selection	Turf Quality[1] 2004-2005 Avg.	Turf Quality[1] 2004 Avg.	Turf Quality[1] 2005 Avg.
		HARD FESCUE		
1	Pick HF # 2	6.2	6.4	6.7
2	Firefly	5.9	6.3	6.7
3	IS-FL 35	5.9	6.2	6.6
4	IS-FL 28	5.8	6.2	6.7
5	Predator	5.7	6.2	6.7
6	PST-4HES	5.7	6.0	6.3
7	SRX NJU	5.7	6.1	6.4
8	IS-FL 36	5.7	6.3	6.9
9	Oxford	5.6	5.8	6.0
10	Reliance	5.6	5.9	6.1
11	PST-Syn-4NY	5.5	5.7	5.9
12	Berkshire	5.5	5.8	6.2
13	4HM	5.4	5.9	6.4
14	SR 3150	5.3	5.9	6.5
15	SR 3100	5.3	5.5	5.6
16	Nordic	5.3	4.8	4.3
17	RAD-FLPCX	5.2	5.5	5.7
18	SRX CA3DE	5.2	4.7	4.1
19	IS-FL 29	5.2	5.4	5.7
20	SRX 3STDNE	5.1	5.2	5.3
21	SRX 3324	5.0	5.5	6.0
22	PST-Syn-4HT	4.9	5.3	5.6
23	Osprey	4.9	5.3	5.6
24	Discovery	4.9	5.1	5.3
25	SRX 3K	4.8	5.0	5.2
26	Aurora	4.8	5.1	5.4
27	4BIL	4.8	5.0	5.2
28	03-XHF	4.8	5.1	5.4
29	Hardtop	4.8	5.1	5.4
30	SR 3000	4.7	5.0	5.3
31	Chariot	4.7	4.9	5.0
32	Minotaur	4.7	4.7	4.8
33	4CU3	4.6	4.6	4.6
34	Stonehenge	4.6	5.0	5.3
35	Reliant II	4.6	4.8	5.0

(Continued)

Table 3 (continued).

	Cultivar or Selection	Turf Quality[1] 2004-2005 Avg.	Turf Quality[1] 2004 Avg.	Turf Quality[1] 2005 Avg.
		HARD FESCUE (cont.)		
36	03-HFEXP	4.6	4.7	4.9
37	Ecostar	4.5	5.0	5.4
38	Rescue 911	4.3	4.4	4.4
39	Scaldis	4.2	4.4	4.6
		SLENDER CREEPING RED FESCUE		
1	Seabreeze II	5.5	4.6	3.7
2	Bar SCF 8FUS3	5.4	4.8	4.2
3	SRX 55R	5.1	4.5	3.9
4	SR 5100	5.0	4.9	4.8
5	Seabreeze	4.9	4.1	3.3
6	Barcrown	4.7	4.5	4.3
7	SRX 55SLQ	4.5	4.3	4.1
8	Dawson E	4.1	3.9	3.7
		STRONG CREEPING RED FESCUE		
1	Epic	5.8	5.5	5.1
2	RAD-FR1	5.8	5.2	4.5
3	PST-Syn-4L8	5.7	5.3	4.9
4	Fortitude	5.6	5.6	5.5
5	IS-FRR 23	5.4	4.9	4.5
6	DW2	5.3	4.9	4.5
7	IS-FRR-30	5.2	5.1	5.0
8	Dp 77-9578	5.2	4.9	4.5
9	PST-8000	5.2	4.9	4.5
10	PST-Syn-48E	5.2	5.2	5.2
11	IS FRR 29	5.2	4.9	4.6
12	Dp 77-9360	5.2	5.0	4.8
13	Pick CRF 1-03	5.1	4.9	4.6
14	RAD-FRPCCX	5.1	4.9	4.6
15	Musica	5.1	5.1	5.0
16	DLF-RCM	5.1	5.0	5.0
17	C-SMX	5.1	4.9	4.6
18	Tiara	5.1	4.6	4.1
19	SRX 52961	5.1	5.1	5.1
20	BMXC-502	5.0	4.8	4.5

(Continued)

Table 3 (continued).

	Cultivar or Selection	Turf Quality[1] 2004-2005 Avg.	Turf Quality[1] 2004 Avg.	Turf Quality[1] 2005 Avg.
	STRONG CREEPING RED FESCUE (cont.)			
21	Wendy Jean	5.0	5.0	5.0
22	TL1	4.9	4.7	4.5
23	Razor	4.9	4.4	3.9
24	SRX CA529	4.9	4.4	3.9
25	Dp 77-9579	4.8	4.6	4.4
26	Celestial	4.7	4.3	3.8
27	Jasper II	4.7	4.5	4.2
28	Audubon	4.7	4.0	3.4
29	Aberdeen	4.7	4.6	4.4
30	PST-Syn-4P8	4.7	4.8	4.8
31	Pathfinder	4.7	4.5	4.3
32	01-Fr-1	4.7	4.4	4.0
33	PST-4UX bulk	4.6	4.5	4.4
34	ASC 266	4.6	4.2	3.9
35	Bargena III	4.5	4.2	3.8
36	4EL	4.4	3.7	2.9
37	C03-4676	4.3	4.0	3.7
38	PST-Syn-4CRZ	4.3	3.8	3.4
39	Navigator	4.3	4.0	3.7
40	SR 5210	4.2	4.1	3.9
41	SRX CA521	4.2	4.0	3.8
42	Aruba	4.0	3.9	3.7
43	Fenway	3.9	3.9	3.9
44	Florentine GT	3.8	3.5	3.2
45	Shademaster	3.4	3.1	2.7
46	SR 5200E	3.4	3.2	3.1
47	Oracle	3.3	3.0	2.8
48	Boreal	3.2	3.0	2.8
49	Bargena II	3.2	3.0	2.8
	HARD FESCUE X BLUE FESCUE HYBRIDS			
1	PST-4BUG	5.6	5.7	5.8
2	SRX 3BH	5.2	5.3	5.3
3	Little Bighorn	4.7	4.6	4.4
4	4MB-BS	4.6	4.6	4.5

(Continued)

Table 3 (continued).

	Cultivar or Selection	Turf Quality[1] 2004-2005 Avg.	Turf Quality[1] 2004 Avg.	Turf Quality[1] 2005 Avg.
		BLUE FESCUE		
1	SR 3210	4.3	4.1	4.0
2	SR 3200	3.8	4.0	4.1
		SHEEPS FESCUE		
1	Quatro	4.8	4.9	5.0
		KOELERIA		
1	Barkoel	4.6	4.3	4.0
	LSD at 5% =	0.5	0.6	0.6

[1]9 = best turf quality

Table 4. Performance of fine fescue cultivars and selections in a turf trial seeded in September 2004 at Adelphia, NJ.

	Cultivar or Selection	Turf Quality[1] 2005 Avg.	Establishment[2] Oct. 2004
	CHEWINGS FESCUE		
1	PST-4TZ	6.6	7.3
2	Compass	6.0	6.0
3	PST-SYN-4CHY	6.0	6.3
4	IT comp	5.8	7.0
5	IS-FRR 23	5.8	6.0
6	PST-SYN-4CHM	5.8	7.0
7	SRX51G	5.7	5.3
8	Ambassador	5.5	8.0
9	PST-SYN-4CH3	5.5	5.7
10	FR6-JD 03	5.4	7.3
11	Longfellow II	5.3	6.7
12	Longfellow	5.3	5.3
13	Shadow II	5.1	8.3
14	PST-SYN-FRCE	5.0	6.7
15	SRXOH51H	5.0	7.0
16	Culumbra II	4.5	7.7
17	SR 5100	4.4	7.0
18	Ambrose	4.3	4.3
19	Jamestown II	3.8	6.7
	HARD FESCUE		
1	IS-FL 36-04	7.2	6.7
2	IS-FL 35-04	6.9	6.0
3	SRX3NJU	6.9	7.0
4	IS-FL 28-03	6.8	6.3
5	RH comp	6.7	7.0
6	SRX3961	6.7	6.7
7	MH comp	6.3	7.3
8	IS-FL 35-03	6.2	6.0
9	IS-FL 36-03	6.2	6.3
10	SRXCA396	6.0	7.0
11	Oxford	5.9	8.3
12	Viking	5.9	3.7
13	Nordic	5.7	7.3
14	BR-HF	5.5	6.7
15	IS-FL 28-04	5.5	7.0

(Continued)

Table 4 (continued).

	Cultivar or Selection	Turf Quality[1] 2005 Avg.	Establishment[2] Oct. 2004
	HARD FESCUE (cont.)		
16	Ecostar	5.4	7.3
17	Eureka II	5.4	7.0
18	Reliant	5.4	8.0
19	Rescue 911	5.3	7.3
20	Aurora II	5.2	7.3
21	PST-4BIL-BS	5.2	7.0
22	PST-4CU3	5.1	7.0
23	Stonehenge	5.0	6.3
24	SR 3100	5.0	5.3
25	04-EXPHF	4.8	7.3
26	Little Bighorn	4.8	7.0
27	SRX 3K	4.6	7.0
28	SRXCA3DE	4.5	5.3
	SLENDER CREEPING RED FESCUE		
1	Seabreeze GT	5.0	6.3
2	SRX55R	5.0	7.0
3	Splendor	4.5	4.7
4	Dawson	4.5	6.0
5	ASR050	4.1	5.7
	STRONG CREEPING RED FESCUE		
1	IS-FRR 43	5.5	6.7
2	PST-8000	5.2	6.7
3	LR comp	5.2	5.7
4	SRX52961	4.7	6.0
5	Celestial	4.6	8.0
6	ASC-266	4.5	6.3
7	Epic	4.5	6.0
8	PST-4VS-BS	4.5	7.0
9	Pathfinder	4.5	8.0
10	Cindy Lou	4.4	8.0
11	SW RSL6032	4.4	7.0
12	Aberdeen	4.3	8.3
13	Foxy	4.2	4.7
14	Bar-Fr-4001	4.2	8.0
15	SRXCA529	4.2	6.7

(Continued)

Table 4 (continued).

	Cultivar or Selection	Turf Quality[1] 2005 Avg.	Establishment[2] Oct. 2004
	STRONG CREEPING RED FESCUE (cont.)		
16	SW RSR6046	4.2	6.0
17	Audubon	4.1	7.7
18	Gibraltor	4.1	7.7
19	Inverness	4.0	7.3
20	SRXCA521	4.0	6.7
21	Navigator	3.9	5.7
22	Vista	3.9	7.3
23	Aruba	3.9	7.3
24	Fenway	3.8	8.0
25	SW RSR6064	3.5	7.7
26	Florentine	3.5	7.3
27	SR 5210	3.4	7.7
28	SW CYGNUS	2.9	6.3
	HARD FESCUE X BLUE FESCUE HYBRIDS		
1	SRX3BHO	5.0	6.7
2	PST-SYN-4BU3-04	4.8	5.3
	BLUE FESCUE		
1	SR 3210	4.0	7.3
2	SR 3200	4.0	7.0
	SHEEPS FESCUE		
1	04-SHF	4.3	6.3
	DESCHAMPSIA		
1	EDD comp	3.4	6.3
2	SR 6000	3.2	6.3
3	BPP comp	3.1	5.0
4	DC-JD 03	1.9	5.7
5	SRX673-20	1.5	1.0
6	SRX673-21	1.5	1.7

(Continued)

Table 4 (continued).

	Cultivar or Selection	Turf Quality[1] 2005 Avg.	Establishment[2] Oct. 2004
		KOELERIA	
1	SRX6KOEL	4.7	6.0
2	SRX6AA	4.6	6.0
	LSD at 5% =	0.7	1.1

[1]9 = best turf quality
[2]9 = best establishment

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

	2003		2004		2005	
	N[1]	Ht[2]	N	Ht	N	Ht
Table 1 (2002 Adelphia)	2.1	1.5	1.5	1.5	1.0	1.5
Table 2 (2003 North Brunswick)			1.5	1.5	2.6	1.5
Table 3 (2003 Adelphia)			1.3	1.5	1.5	1.5
Table 4 (2004 Adelphia)					1.5	1.5

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