

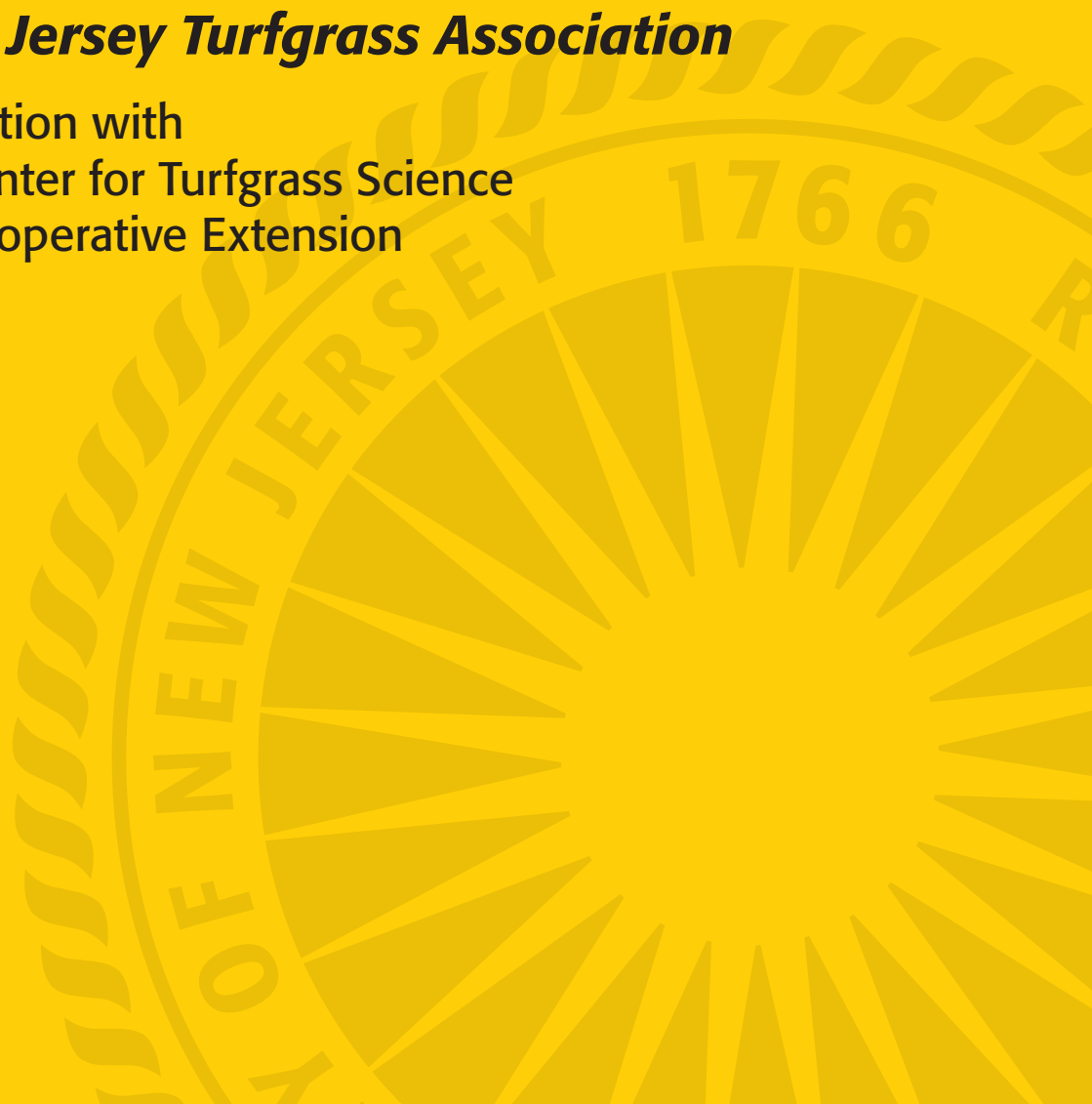
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The Rutgers Turfgrass Proceedings is published yearly by the Rutgers Center for Turfgrass Science, Rutgers Cooperative Extension, and the New Jersey Agricultural Experiment Station, School of Environmental and Biological Sciences, Rutgers, The State University of New Jersey 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.

This publication includes lecture notes of papers presented at the 2017 GREEN EXPO Turf and Landscape Conference. 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, 2017

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The fine fescues (*Festuca* spp.) are a group of cool-season grasses that have distinct, fine-textured leaves. Compared to other cool-season grasses, the fine fescues are better adapted to cool, dry, and shaded environments. This species group is tolerant of infertile and acidic soils and drought conditions and exhibits the best performance under lower fertility levels. These qualities give the fine fescues a low maintenance reputation. The fine fescues perform best in well drained soils and are not suited for saturated soil conditions (Murphy, 1996). In general, these grasses have poor heat tolerance and lack tolerance to excessive nitrogen fertilization during periods of high temperatures (Meyer and Funk, 1989).

There are many species and subspecies of fine fescue, but only six are generally used as turfgrasses. There are three subspecies of *F. rubra*: strong creeping red fescue (*F. rubra* L. *rubra*), slender creeping red fescue (*F. rubra* L. var. *littoralis* Vasey ex Beal), and Chewings fescue [*F. rubra* L. subsp. *fallax* (Thuill.) Nyman]. Both the strong creeping red and slender creeping red fescues are referred to as creeping red fescues because they spread by rhizomes. As the name infers, the strong creeping red fescues have a more aggressive, spreading habit than slender creeping red fescues. Chewings fescue is a dense and low growing bunch type grass with the greatest tolerance to low mowing heights in comparison to the other fine fescues.

Hard fescue (*F. brevilipa* R. Tracey) is a bunch type grass that spreads by tillering. It has a dark green color and forms a dense cover. Compared to Chewings fescue, hard fescue is considered to be more tolerant of heat, drought, and low fertility. The species is widely used in many low maintenance situations due to increased disease resistance, even under low maintenance conditions.

Sheeps (*F. ovina* L.) and blue (*F. glauca* Vill.) fescues are the least widely used species of the fine fescues. They are bunch-type and have a wide variation in color from blue or green to a silvery-blue or silvery-green. These two species are rarely used in seed mixtures because of their color. They have a non-aggressive growth habit which makes them a good addition to wildflower mixes to aid in the prevention of erosion and to add an interesting color to the mix. These species are also becoming more popular in ornamental landscapes due to their color.

When heavily fertilized, fine fescues can become soft, succulent, and thatchy, which makes them more susceptible to diseases and summer stresses. A fertilizer rate of 1 to 2 lb nitrogen per 1000 ft² per year is ideal for fine fescues. The increasing demand for lower fertilizer and water usage makes fine fescues an option for use in certain situations to address some of these issues.

Many of the newer fine fescue cultivars contain a *Neotyphodium* endophyte that improves drought tolerance, resistance to above ground feeding insects, and in some cases, diseases. The presence of endophyte can reduce the need for chemical inputs normally used to treat for insects and diseases. *Neotyphodium* is a non-pathogenic fungus that grows intercellularly within the above-ground plant tissue. The beneficial effects of the endophyte are often very evident under stress conditions.

Although the Rutgers turfgrass breeding program has improved many of the characteristics desired for a superior fine fescue turf, further work is needed, particularly in the areas of disease and insect resistance and wear tolerance. Rutgers continues to cooperate with the National Turfgrass Evaluation Program (NTEP), which evaluates many cultivars, collections,

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and experimental selections for turf performance across a wide range of geographical locations.

PROCEDURES

Three fine fescue turf trials were conducted at the Rutgers Plant Science Research and Extension Farm in Adelphia, NJ (Tables 1 to 3). All tests consisted of 3 x 5 ft plots. The fine fescues were sown at 3.7 lb per 1000 ft².

Plots were replicated three times in a randomized complete block design. Tests were maintained at different fertility levels depending on the objectives of the test as well as the occurrence of disease or insects. Mowing height and fertilizer inputs of all tests are shown in Table 4. All tests were treated with pre-emergent herbicides and broadleaf weed control. The trials were irrigated to prevent severe stress and were mowed frequently with rotary mowers to avoid excessive accumulation of clippings.

EVALUATION

All tests were visually rated throughout the year on a scale of 1 to 9, where 9 represented the most desirable turf quality. Turf quality is a subjective characteristic that includes density, texture, color, growth habit, damage due to diseases or insects, and overall performance. Trials were rated monthly throughout the growing season for turf quality as well as for other characteristics including diseases such as leaf spot (caused by *Bipolaris*, *Drechslera*, and *Exserohilum* fungi). Plots were rated by different evaluators to help minimize personal biases towards a particular trait.

Data for all trials were statistically analyzed using analysis of variance, and means were separated using Fisher's protected least significant difference (LSD) means separation test. Results in Tables 1 to 3 are presented with selections grouped according to species and ranked according to best overall, multiple-year turf performance (Tables 1, 2) or turf quality average assessed in 2017 (Table 3).

Care should be used when drawing conclusions from some of these trials. First, these tests were grown as monocultures in full sun. These conditions tend to cause different stresses that may not occur under other conditions. Second, the 2016 test (Table 3) was in its first year of evaluation. Some cultivars

perform much differently during establishment than they do after a mature sod has developed.

RESULTS AND DISCUSSION

Turf Quality

As a group, the hard fescues were rated highest for average turf quality, followed closely by the Chewings and strong creeping fescues (Tables 1 to 3).

For the 2014 trial (Table 1), which includes all entries from the 2014 NTEP Fine Fescue Trial, the highest quality selections and cultivars were 14H2, 14H5, Extra, and 14H4 hard fescues; PPG-FRC 119 and Comapss II Chewings fescues; Chorus strong creeping red fescue; and Sea Mist slender creeping red fescue, while the lowest quality selections and cultivars were Beudin and Miser hard fescues; Survivor and Shadow III Chewings fescues; Oracle and Boreal strong creeping red fescues; and Lighthouse slender creeping red fescue.

For the 2015 trial (Table 2), the highest quality selections and cultivars were FH3 Comp, FH2 Comp, FH4 Comp, Gladiator, MNHD-15, and PPG-FL 112 hard fescues; FW2 Comp, FW3 Comp, Compass II, Radar, and Woodall Chewings fescues; FR2 Comp and PPG-FRR 115 strong creeping red fescues; and Sea Mist slender creeping red fescue, while the lowest quality selections and cultivars were Heron and Jetty hard fescues; Enchantment and J-5 Chewings fescues; Kent, Xeric, and Orbit strong creeping red fescues; and Lighthouse slender creeping red fescue.

For the 2016 trial (Table 3) the highest quality selections and cultivars were A51 Comp, PPG-FL 113, and A56 Comp hard fescues; WYR Comp, Z16-RCF, and Woodall PPG-FRC 120 Chewings fescues; 5Z2 Comp, 5Z5 Comp, 5Z3 Comp, and 5Z4 Comp strong creeping red fescues; and Sea Mist slender creeping red fescue, while the lowest quality selections and cultivars were Reliant IV and PST-4BND hard fescues; PST-4SHR-CH and PST-4CHT Chewings fescues; and PST-4GRY and Oracle strong creeping red fescues.

SUMMARY

Overall, it is encouraging to see that many of the higher-ranking fine fescues within all species are

new experimental selections. Although advances in breeding efforts continue, there is still need for considerable improvement in resistance to red thread (caused by *Laetisaria fuciformis*) and summer patch (*Magnaporthiopsis poae*) (particularly in the hard fescues), and increased seed production.

One little-studied area that could make a significant impact on the use of fine fescues in a wider array of situations is the improvement of wear tolerance, particularly under drought stress conditions. Breeding efforts at Rutgers continue in an effort to develop high quality turfgrasses with the ability to make a great environmental impact with minimal environmental cost.

ACKNOWLEDGMENTS

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Table 1. Performance of fine fescue cultivars and selections in a turf trial seeded in September 2014 at Adelphia, NJ. Includes all entries from the 2014 National Fine Fescue Test (NTEP).

Cultivar or Selection	-----Turf Quality ¹ -----			
	2015-2017 Avg.	2015 Avg.	2016 Avg.	2017 Avg.
HARD FESCUE				
1 14H2	5.9	5.6	6.2	6.0
2 14H5	5.8	5.8	5.9	5.7
3 Extra	5.7	5.5	5.9	5.7
4 14H4	5.7	5.5	6.0	5.5
5 DLFPS-FL/3066	5.6	5.8	5.8	5.3
6 7H6	5.6	5.9	5.9	5.1
7 14H6	5.6	5.7	5.7	5.4
8 7HF	5.6	5.9	5.9	5.0
9 Resolute	5.6	5.4	5.9	5.4
10 7H1	5.5	5.5	5.7	5.4
11 Minimus	5.5	6.1	5.4	5.1
12 DLFPS-FL/3060	5.5	5.4	5.8	5.3
13 MNHD-14	5.5	5.5	5.7	5.3
14 Clarinet	5.5	5.5	5.6	5.3
15 Beacon	5.5	5.8	5.5	5.1
16 14H1	5.4	5.6	5.3	5.4
17 H572	5.4	5.4	5.7	5.0
18 7H4	5.4	5.6	5.6	4.9
19 Gladiator	5.4	5.5	5.6	5.0
20 7H3	5.3	5.3	5.7	5.0
21 14H7	5.3	5.3	5.3	5.3
22 PST-4BND	5.3	5.7	5.3	4.9
23 Jetty	5.2	5.3	5.4	5.0
24 Firefly	5.2	5.7	5.1	4.8
25 Chariot	5.2	5.7	5.0	4.8
26 Rescue 911	5.1	6.0	4.6	4.7
27 PPG-FL 107	5.1	5.2	5.3	4.6
28 PST-4HES	5.0	5.4	5.0	4.7
29 AHF188	5.0	5.4	5.1	4.4
30 Oxford	5.0	5.2	5.2	4.5
31 Nanook	4.9	5.2	4.9	4.7
32 Sword	4.9	4.5	5.4	4.9
33 PPG-FL 108	4.9	5.1	4.9	4.8
34 Stonehenge	4.9	5.4	4.8	4.6
35 Reliant IV	4.9	5.3	4.7	4.6

(Continued)

Table 1. Fine fescue turf trial, 2014 (NTEP) (continued).

Cultivar or Selection	-----Turf Quality ¹ -----				
	2015-2017 Avg.	2015 Avg.	2016 Avg.	2017 Avg.	
HARD FESCUE (continued)					
36	Blueray	4.9	5.3	4.9	4.5
37	PST-4BND	4.8	5.3	4.7	4.4
38	Marco Polo	4.6	5.3	4.5	3.8
39	DLFPS-FRC/3060	4.1	5.2	3.5	3.6
40	Beudin	3.2	4.2	2.7	2.7
41	Miser	3.1	4.3	3.0	2.1
CHEWINGS FESCUE					
1	PPG-FRC 119	4.5	5.3	4.6	3.6
2	Compass II	4.5	5.3	4.2	3.9
3	14W4	4.4	4.9	4.4	4.0
4	DLF-FRC 3338	4.4	5.4	4.2	3.7
5	Conductor	4.4	4.9	4.6	3.8
6	14W1	4.4	5.2	4.1	3.9
7	Radar	4.4	5.4	4.2	3.5
8	C14-OS3	4.4	4.9	4.4	3.8
9	DLFPS-FRC/3057	4.3	4.9	4.4	3.8
10	C571	4.3	5.5	4.0	3.5
11	14W2	4.3	4.6	4.5	3.7
12	Fairmont	4.2	4.7	4.2	3.7
13	Momentum	4.2	4.8	4.0	3.8
14	Enchantment	4.2	5.2	3.9	3.4
15	BAR VV-VP3-CT	4.2	5.2	3.5	3.8
16	RAD-FC32	4.1	4.8	4.1	3.5
17	PPG-FRC 115	4.1	4.8	4.1	3.3
18	PST-4CHT	4.0	4.8	3.9	3.5
19	Treasure II	4.0	4.7	4.0	3.3
20	PST-Syn-4SWT-13	4.0	4.7	3.6	3.7
21	Sonar	4.0	4.8	3.7	3.5
22	RAD-FC44	4.0	4.8	3.6	3.6
23	PPG-FRC 107	4.0	4.8	4.1	3.0
24	PST-4C30D	4.0	4.9	3.7	3.3
25	Heathland	4.0	4.6	3.8	3.5

(Continued)

Table 1. Fine fescue turf trial, 2014 (NTEP) (continued).

Cultivar or Selection	-----Turf Quality ¹ -----				
	2015-2017 Avg.	2015 Avg.	2016 Avg.	2017 Avg.	
CHEWINGS FESCUE (continued)					
26	J-5	3.9	4.8	3.9	3.2
27	Shadow II	3.9	5.0	3.4	3.4
28	PST-4SHR-CH	3.8	5.1	3.1	3.3
29	PST-4CHY	3.8	4.7	3.4	3.3
30	Tiffany	3.8	4.7	3.4	3.2
31	Compass	3.8	5.2	3.1	3.1
32	Ambrose	3.8	5.0	3.3	3.0
33	BAR 6FR 126	3.5	4.4	3.2	2.9
34	Cascade	3.5	4.5	2.9	3.0
35	Survivor	3.4	3.3	3.8	3.1
36	Shadow III	3.4	3.8	3.3	3.0
STRONG CREEPING RED FESCUE					
1	Chorus	4.3	5.0	4.6	3.3
2	DSRxBLMT	4.2	4.7	4.1	3.9
3	Soilguard	4.2	4.2	4.3	4.1
4	14R2	4.1	4.7	4.1	3.4
5	DLFPS-FRR/3068	4.0	5.0	4.1	2.9
6	PPG-FRR 115	4.0	4.5	4.0	3.4
7	DLF-FRR 6162	3.9	4.5	3.8	3.5
8	PST-4BEN	3.9	4.4	3.7	3.5
9	14R1	3.9	4.7	3.9	2.9
10	14R4	3.8	4.6	3.9	3.1
11	FT345	3.8	4.8	3.9	2.8
12	7C34	3.8	4.9	3.8	2.7
13	PPG-FRR 111	3.8	4.3	3.8	3.3
14	PST-4RUE	3.8	4.0	4.0	3.3
15	ASC 295	3.8	4.8	3.4	3.1
16	PST-4BEN	3.7	4.1	3.6	3.5
17	PST-4ED4	3.7	4.2	3.4	3.4
18	Marvel	3.7	4.7	3.7	2.7
19	PennASC295	3.7	4.7	3.4	2.9
20	Audubon	3.6	4.5	3.6	2.7

(Continued)

Table 1. Fine fescue turf trial, 2014 (NTEP) (continued).

Cultivar or Selection	-----Turf Quality ¹ -----				
	2015-2017 Avg.	2015 Avg.	2016 Avg.	2017 Avg.	
STRONG CREEPING RED FESCUE (continued)					
21	PST-4ED4	3.6	4.1	3.6	3.1
22	PST-4CRD-U	3.6	4.4	3.9	2.4
23	Pennlawn	3.5	4.2	3.7	2.8
24	DLFPS-FRR/3069	3.5	4.4	3.5	2.7
25	Aberdeen	3.5	4.4	3.7	2.5
26	PST-4DR4-BS	3.5	4.1	3.5	2.9
27	PST-4DR4	3.5	4.1	3.7	2.6
28	RAD-FR47	3.5	4.4	3.9	2.1
29	PST-4RUE	3.5	4.0	3.5	2.8
30	PST-4SP14	3.4	4.1	3.6	2.6
31	Cardinal	3.4	4.6	3.1	2.5
32	PPG-FRR 110	3.4	4.6	3.4	2.3
33	Pathfinder	3.4	4.7	3.0	2.4
34	Navigator II	3.4	4.5	3.1	2.5
35	RAD-FR35	3.4	4.3	3.5	2.2
36	PST-4GRY	3.4	4.0	3.5	2.5
37	Gibraltar Gold	3.4	4.5	3.5	2.0
38	Gibraltar	3.3	4.3	3.2	2.5
39	PST-Syn-4SP24	3.3	4.2	3.1	2.7
40	Crossbow II	3.3	4.1	3.3	2.6
41	Orbit	3.3	4.5	3.2	2.2
42	RAD-FR33R	3.3	4.1	3.2	2.5
43	FF2	3.2	4.1	2.9	2.6
44	Creeper	3.2	4.1	3.3	2.2
45	Kent	3.2	4.3	2.9	2.3
46	Shademaster III	3.1	4.1	3.2	2.0
47	Xeric	3.1	3.9	3.0	2.3
48	PST-4CRD-P	3.1	4.2	3.1	1.9
49	Fenway	3.0	4.1	2.9	2.1
50	PST-4RED	3.0	4.0	2.9	2.2
51	PST-4GRP	3.0	3.7	3.0	2.2
52	Oracle	2.9	3.6	2.8	2.4
53	Boreal	2.8	3.4	2.5	2.5

(Continued)

Table 1. Fine fescue turf trial, 2014 (NTEP) (continued).

Cultivar or Selection	-----Turf Quality ¹ -----				
	2015-2017 Avg.	2015 Avg.	2016 Avg.	2017 Avg.	
SLENDER CREEPING RED FESCUE					
1	Sea Mist	4.4	5.2	4.0	4.0
2	Seabreeze GT	3.7	4.2	3.6	3.4
3	PST-4SEA	3.7	4.8	3.1	3.1
4	BAR FRT 5002	3.4	4.3	2.8	3.0
5	Lighthouse	2.9	3.7	2.8	2.2
SHEEPS FESCUE					
1	Bighorn GT	4.6	5.0	4.5	4.2
2	Quatro	4.5	5.4	3.8	4.4
3	Daisy	3.9	4.4	3.7	3.7
BLENDS/MIXTURES					
1	Azure	4.3	5.2	4.2	3.4
2	Scottish Links	4.2	4.9	4.1	3.7
3	Irish Links	3.5	4.1	3.2	3.1
<hr/>					
	LSD at 5% =	0.6	0.6	0.6	0.6

¹9 = best turf quality

Table 2. Performance of fine fescue cultivars and selections in a turf trial seeded in September 2015 at Adelphia, NJ.

Cultivar or Selection	-----Turf Quality ¹ -----		
	2016-2017 Avg.	2016 Avg.	2017 Avg.
HARD FESCUE			
1 FH3 Comp	5.9	5.5	6.3
2 FH2 Comp	5.5	5.5	5.5
3 FH4 Comp	5.4	5.1	5.7
4 Gladiator	5.4	5.4	5.4
5 MNHD-15	5.4	5.1	5.7
6 PPG-FL 112	5.4	5.1	5.6
7 FH1 Comp	5.3	5.3	5.3
8 Minimus	5.3	5.3	5.2
9 Beacon	5.3	5.0	5.5
10 H572	5.2	4.9	5.5
11 PPG-FL 113	5.1	5.1	5.1
12 Sword	5.0	5.1	4.9
13 Firefly	4.9	5.0	4.8
14 Stonehenge II	4.9	4.9	4.8
15 Blueray	4.7	4.7	4.6
16 Reliant IV	4.6	4.4	4.9
17 PST-4BND	4.6	4.6	4.6
18 Viking H20	4.6	4.4	4.7
19 PPG-FL 108	4.5	4.4	4.5
20 Stonehenge	4.5	4.6	4.3
21 Chariot	4.2	4.1	4.3
22 Marco Polo	4.2	4.2	4.1
23 Ecostar Plus	4.1	4.3	3.9
24 Heron	4.0	3.8	4.3
25 Jetty	3.9	2.9	4.8
CHEWINGS FESCUE			
1 FW2 Comp	5.1	5.2	5.0
2 FW3 Comp	5.0	5.2	4.7
3 Compass II	4.8	4.6	5.0
4 Radar	4.8	4.4	4.7
5 Woodall	4.8	5.0	4.5
6 PPG-FRC 119	4.6	4.8	4.4
7 PPG-FRC 120	4.5	4.8	4.1
8 FW1 Comp	4.4	5.2	4.3
9 FC32	4.3	4.4	4.2
10 Fairmont	4.2	4.5	3.9

(Continued)

Table 2. Fine fescue turf trial, 2015 (continued).

Cultivar or Selection	-----Turf Quality ¹ -----		
	2016-2017 Avg.	2016 Avg.	2017 Avg.
CHEWINGS FESCUE (continued)			
11 PST-4CHT	4.2	4.3	3.8
12 Sonar	4.2	4.2	4.1
13 Wrigley 2	4.2	4.3	4.0
14 PPG-FRC 118	4.0	4.1	3.9
15 Ambrose	4.0	4.0	3.9
16 PST-4CHY	3.8	4.5	3.5
17 Shadow II	3.8	4.1	3.5
18 Compass	3.6	3.6	3.5
19 PST-4SHR-CH	3.6	3.8	3.3
20 Shadow III	3.6	3.3	3.5
21 Enchantment	3.4	2.6	3.7
22 J-5	3.4	3.7	3.2
STRONG CREEPING RED FESCUE			
1 FR2 Comp	5.0	5.4	4.7
2 PPG-FRR 115	5.0	5.0	5.0
3 FR3 Comp	4.9	5.4	4.4
4 PPG-FRR 116	4.9	4.9	4.9
5 Fenway (Z1-15-DSR)	4.8	5.2	4.3
6 FR1 Comp	4.6	4.9	4.2
7 FR4 Comp	4.4	4.6	4.3
8 PPG-FRR 111	4.4	4.5	4.3
9 ASC 295	4.2	4.3	4.0
10 Navigator II	4.1	4.3	4.0
11 PST-4BEN	4.1	4.1	4.1
12 Cardinal	4.0	4.3	3.6
13 SR 5250	4.0	3.9	4.0
14 Marvel	3.9	4.1	3.7
15 PST-4GRY	3.9	3.9	3.9
16 RUF1	3.9	4.3	3.5
17 Shademaster III	3.9	4.2	3.6
18 PST-4DR4	3.8	3.9	3.6
19 Garnet	3.8	3.9	3.6
20 PPG-FRR 114	3.8	3.8	3.7

(Continued)

Table 2. Fine fescue turf trial, 2015 (continued).

Cultivar or Selection	-----Turf Quality ¹ -----		
	2016-2017 Avg.	2016 Avg.	2017 Avg.
STRONG CREEPING RED FESCUE (continued)			
21 Audubon	3.7	3.5	3.9
22 PST-4SP14	3.6	3.7	3.5
23 PST-4RED	3.6	3.4	3.8
24 PST-4ED4	3.6	4.0	3.2
25 PST-4RUE-14	3.6	3.5	3.6
26 PST-4CRD-U	3.5	3.4	3.6
27 Fenway (Z1-14-2835)	3.5	3.4	3.6
28 PST-4CRD-P	3.5	3.8	3.2
29 Epic	3.4	3.3	3.5
30 FR 35	3.4	3.8	3.0
31 Gibraltar Gold	3.4	3.4	3.4
32 Kent	3.4	3.5	3.3
33 Xeric	3.4	3.4	3.4
34 Orbit	3.2	3.7	2.7
SLENDER CREEPING RED FESCUE			
1 Sea Mist	4.6	4.7	4.4
2 SLS Comp	4.4	4.8	4.1
3 PST-4SEA	3.9	4.0	3.8
4 Seabreeze GT	3.4	3.7	3.0
5 Lighthouse	2.1	2.3	1.8
SHEEPS FESCUE			
1 Bighorn GT	4.2	4.2	4.3
2 PPG-FO 102	3.9	3.8	4.0
DESCHAMPSIA			
1 SMD Comp	3.2	4.1	2.2
2 CHD Comp	3.0	4.1	1.8
3 ETD Comp	2.8	3.8	1.8
4 MWD Comp	2.6	3.4	1.7
5 ECD Comp	2.6	3.4	1.7
6 DLR Comp	2.5	3.5	1.6

(Continued)

Table 2. Fine fescue turf trial, 2015 (continued).

Cultivar or Selection	-----Turf Quality ¹ -----		
	2016-2017 Avg.	2016 Avg.	2017 Avg.
MIXTURES			
1 Scottish Links	3.5	3.5	3.5
2 Irish Links	3.1	3.5	2.7
LSD at 5%=	0.7	0.8	0.8

¹9 = best turf quality

Table 3. Performance of fine fescue cultivars and selections in a turf trial seeded in September 2016 at Adelphia, NJ.

Cultivar or Selection	Turf Quality ¹ 2017 Avg.
HARD FESCUE	
1 A51 Comp	5.7
2 PPG-FL 113	5.5
3 A56 Comp	5.4
4 Sword	5.3
5 A55 Comp	5.3
6 A5C7 Comp	5.2
7 Gladiator	5.0
8 Minimus	5.0
9 PPG-FL 115	5.0
10 Z16-RHF	5.0
11 Jetty	4.8
12 A53 Comp	4.8
13 AHF-177	4.8
14 Beacon	4.8
15 A52 Comp	4.7
16 Viking H2O	4.7
17 A54 Comp	4.5
18 SPHD16 Comp	4.5
19 Blue-ray	4.5
20 Reliant IV	4.1
21 PST-4BND	3.9
CHEWINGS FESCUE	
1 WYR Comp	5.3
2 Z16-RCF	5.0
3 Woodall	4.9
4 PPG-FRC 120	4.9
5 WTC Comp	4.8
6 Fairmont	4.8
7 Compass II	4.6
8 Radar	4.5
9 Treasure II	4.4
10 PST-4SWT	4.3
11 Ambrose	3.8
12 PST-4SHR-CH	3.4
13 PST-4CHT	3.1

(Continued)

Table 3. Fine fescue turf trial, 2016 (continued).

Cultivar or Selection	Turf Quality ¹ 2017 Avg.
STRONG CREEPING RED FESCUE	
1 5Z2 Comp	5.2
2 5Z5 Comp	5.1
3 5Z3 Comp	5.1
4 5Z4 Comp	5.1
5 5Z1 Comp	5.0
6 PH Comp	4.8
7 PPG-FRR 116	4.8
8 Ruddy	4.7
9 Z16-RCRF	4.7
10 Z16-DR	4.7
11 Navigator II	4.5
12 Marvel	4.4
13 PST-4BEN	4.4
14 Cardinal II	4.4
15 PST-4DR4	4.3
16 PST-4CRD-P	4.3
17 PST-4CRD-U	4.2
18 Kent	4.1
19 Orbit	4.1
20 Xeric	4.1
21 Z16-DRBM2X	4.1
22 Wendy Jean	4.0
23 Z16-DRBM	4.0
24 PST-Syn-45PR	4.0
25 Shademaster III	4.0
26 PST-4SP14	3.9
27 PST-4ED4	3.9
28 PST-4RUE-14	3.8
29 Fenway	3.5
30 Oracle	3.1
31 PST-4GRY	2.0
SLENDER CREEPING RED FESCUE	
1 Sea Mist	4.4

(Continued)

Table 3. Fine fescue turf trial, 2016 (continued).

Cultivar or Selection	Turf Quality ¹ 2017 Avg.
SHEEPS FESCUE	
1 Blue Mesa	3.1
BLUE FESCUE	
1 Azure	4.0
LSD at 5% =	0.6

¹9 = best turf quality

Table 4. Yearly nitrogen (N) applied and mowing height (Ht) on fine fescue tests established at Adelphia, NJ.

	2015		2016		2017	
	Ht ²	N ¹	Ht	N	Ht	NHt
Table 1 (2014 NTEP).....	1.5	2.5	1.5	2.5	1.00	2.5
Table 2 (2015).....			1.0	2.5	1.00	2.5
Table 3 (2016).....					1.25	2.5

¹Annual N applied (lb/1000 ft²)

²Mowing height in inches