

# RUTGERS

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Experiment Station

## **2018 Turfgrass Proceedings**

***The New Jersey Turfgrass Association***

In Cooperation with  
Rutgers Center for Turfgrass Science  
Rutgers Cooperative Extension



# **2018 RUTGERS TURFGRASS PROCEEDINGS**

of the

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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 2018 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  
Dr. Bruce B. Clarke, Coordinator

## PERFORMANCE OF FINE FESCUE CULTIVARS AND SELECTIONS IN NEW JERSEY TURF TRIALS, 2018

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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 reputation as low maintenance grasses. 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 and wear 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 ft<sup>2</sup> 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, par-

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

## PROCEDURES

Six fine fescue turf trials were conducted from 2014 to 2017 at the Rutgers Plant Science Research and Extension Farm in Adelphia, NJ (Tables 1 to 6). All tests consisted of 3 x 5 ft plots. The fine fescues were sown at 3.7 lb per 1000 ft<sup>2</sup>.

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 7. 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 rated monthly during the growing season for turf quality as well as other characteristics such as gray leaf spot. Turf quality is a subjective characteristic that includes density, texture, color, growth habit, damage due to diseases or insects, and overall performance. Plots were rated by different evaluators to help minimize personal biases towards a particular trait. With exception of percent cover, all ratings were based on a scale of 1 to 9, where 9 represented the most desirable turf characteristic. Percent cover ratings were visually estimated on a scale of 0 to 100, where 100 represented a plot with complete ground cover. 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 AND DISCUSSION

Results in Tables 1 to 4 are presented with cultivars or selections grouped according to species and ranked according to best overall multiple-year turf quality average; Tables 5 and 6, also grouped by

species, are ranked according to turf quality average in 2018. A high quality average is generally indicative of good disease resistance, dark green color, high shoot density and uniformity, fine leaf texture, low growth habit, good mowing quality, and minimal damage due to insects. The trial data were further ranked according to additional evaluation parameters (i.e., establishment, color, percent cover, disease rating, etc.) to distinguish two or more cultivars or selections that were equally ranked based on turf quality ratings. In addition to trial data collected in 2018, data from previous years are also included in the tables. These data have been discussed in prior proceedings articles and are included here for viewer convenience.

Care should be taken when drawing conclusions from the data for 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 2017 tests (Tables 5 and 6) were immature, and some cultivars perform much differently during establishment than they do after a mature sod has developed.

### Turf Quality

For all trials included herein, the hard fescues, as a group, had the highest average turf quality, followed closely by the Chewings fescues (Tables 1 to 6). The strong creeping red fescues, slender creeping red fescues, and sheeps fescues were variable for turf quality, but, in general, had lower turf quality ratings than the hard fescues and the Chewings fescues.

In the 2014 fine fescue trial (Table 1), 14H2, 14H5, and 14H4 hard fescues had the highest turf quality. The highest ranked Chewings fescue was 14W4, the highest ranked strong creeping red fescue was DSRxBLMT, and the lowest quality entries were Oracle, PST-4GRP, and Fenway strong creeping red fescues, Lighthouse slender creeping red fescue, and Miser strong creeping red fescue.

In the 2014 fine fescue NTEP trial (Table 2), Resolute and DLFPS-FL-3066 hard fescues had the highest quality. The Chewings fescues with the highest quality included Compass II, Radar, and Bolster, and the strong creeping red fescues with the highest quality were Cardinal II, DLF-FRR 6162, DLFPS-FRR-3068, and PST-4BEN. Cultivars and selections with the lowest turf quality were Cascade Chewings fescue, Boreal strong creeping red fescue, and Beudin hard fescue.

For the 2015 fine fescue trial (Table 3), FH3, FH2, and FH4 hard fescues had the highest turf quality. Better performing Chewings fescues included FW2, FW3, and Radar, and better performing strong creeping red fescues were PPG-FRR 115 and PPG-FRR 116. Lighthouse slender creeping red fescue and Gibraltar Gold, Xeric, and Orbit strong creeping red fescues, Enchantment and J-5 Chewings fescues, and Ecostar Plus and Heron hard fescues had the lowest turf quality.

In the 2016 fine fescue trial (Table 4), A56, PPG-FL 113, and A51 hard fescues had the highest turf quality. WYR, Woodall, PPG-FRC 120, and Z16-RCF were top performing Chewings fescues, while 5Z5, PPG-FRR 116, and 5Z4 were top performing strong creeping red fescues, albeit quite a bit lower than the best performing hard fescues. Blue Mesa sheeps fescue and PST-4GRY and Oracle strong creeping red fescues had the lowest turf quality. The poorest performing Chewings fescues were PST-4CHT and PST-4SHR-CH, and the poorest performing hard fescue was Reliant IV.

In the 2017 fine fescue trial (Table 5), HAQ1, PPG-FL 124, PPG-FL 122, and PPG-FL 123 hard fescues, CHU1 Chewings fescue, and PPG-FRR 116 and PPG-FRR 121 strong creeping red fescues had the highest turf quality, while Eureka II hard fescue, Syn-4DUB Chewings fescue, and Epic strong creeping red fescue had the lowest turf quality. In the 2017 fine fescue CTBT trial (Table 6), PPG-FL 114, Z16-RHF, DLF-FL 53 M3, and DLF-FL 64 hard fescues and Radar Chewings fescue had the highest turf quality. The better performing strong creeping red fescues were ASC295 and PPG-FRR 115. Hard fescues with the lowest turf quality included Eureka II and ACF309, while Koket Chewings fescue and Boreal, DLF-FRR 76, DLF-FRR 75, and Z16-DRBM2X strong creeping red fescues had the lowest turf quality.

### Dollar Spot

Dollar spot (caused by *Clariireedia jacksonii*, formerly known as *Sclerotinia homoeocarpa*) is one of the most common diseases of cool-season turfgrasses and is particularly troublesome in fine fescue (Bonos et al., 2007). Dollar spot causes silver dollar-shaped spots of dead turf, which can converge to form larger areas of damage (Belanger et al., 2005; Bonos et al., 2007). As seen in the 2014 fine fescue trial (Table 1) and the 2014 fine fescue NTEP trial (Table 2), the hard fescues and Chewings

fescues were generally more resistant to dollar spot disease whereas the strong creeping red fescues were generally more susceptible. In the 2014 fine fescue trial (Table 1), 14H5, 7H4, and 14H1 hard fescues had the least dollar spot, and Navigator II, Fenway, Gibraltar Golf, Creeper, PPG-FRR 110, and Marvel strong creeping red fescues and Lighthouse slender red fescue had the most disease. In the 2014 fine fescue NTEP trial (Table 2), Gladiator, Resolute, DLFPS-FL-3066, and MNHD-14 hard fescues had the least dollar spot, and Marvel and Kent strong creeping red fescues were the most diseased.

### Color

In the United States, a dark green turf color is typically considered more desirable when compared to a light green turf color. In addition to the consideration of genetic color when rating for turf quality, the color of each cultivar was also assessed in the 2014 fine fescue NTEP test (Table 2). Kent, Navigator II, RAD-FR47, and FAD-FR33R strong creeping red fescues and RAD-FC44 Chewings fescue had the darkest green color, whereas Minimus, Beacon, and Gladiator hard fescues and DLFPS-FPS-FRC-3057 Chewings fescue had the lightest green color.

### Establishment

Most cultivars and selections were well-established within one month of seeding, as shown by the results from October establishment ratings presented in Table 6. Factors such as genetics, environmental conditions, and seed quality and storage can affect seedling establishment and vigor. In the 2017 fine fescue CTBT trial (Table 6), PPG-FRR 114, Boreal, Lustrous, and DLF-FRR 76 strong creeping red fescues and SeaMist slender creeping red fescue had the quickest establishment, while Z16-DRBM2X, ASR175, PST-4DR4, and PST-4SP14 were the slowest to establish.

### Percent Cover

Percent cover is a measure of the competitive ability of a turfgrass on a long-term basis; cultivars and selections with greater percent cover are better able to persist under the environment of a given trial, whereas poor cover is a characteristic of a declining turf stand. In the 2014 fine fescue NTEP trial (Table 2), Momentum and Bolster Chewings fescues had the highest percent cover, while Beudin and Navigator II had the lowest percent cover.

## 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.

Cultivar or Selection	-----Turf Quality <sup>1</sup> -----					Establishment <sup>2</sup> 8 Oct. 2014	Leaf Spot <sup>3</sup> -----		Dollar Spot <sup>3</sup> 31 Aug. 2018	
	2015-2018 Avg.	2015 Avg.	2016 Avg.	2017 Avg.	2018 Avg.		26 June 2015	29 April 2016		
<b>HARD FESCUE</b>										
1	14H2	5.8	5.6	6.2	6.0	5.5	4.7	7.7	5.7	7.3
2	14H5	5.8	5.8	5.9	5.7	5.5	4.3	7.3	5.7	8.0
3	14H4	5.6	5.5	6.0	5.5	5.4	4.3	8.0	5.7	7.3
4	Extra	5.5	5.5	5.9	5.7	5.1	4.7	7.7	3.7	7.3
5	14H6	5.5	5.7	5.7	5.4	5.3	4.7	8.0	5.0	7.3
6	Jetty	5.5	5.8	5.9	5.4	4.9	3.0	8.3	5.7	7.0
7	7HF	5.5	5.9	5.9	5.0	5.3	3.3	7.7	5.7	7.3
8	7H1	5.5	5.5	5.7	5.4	5.3	4.0	7.0	5.3	7.0
9	Clarinet	5.5	5.5	5.6	5.3	5.5	4.7	7.7	4.0	5.0
10	7H6	5.5	5.9	5.9	5.1	4.9	5.3	7.0	4.7	6.7
11	7H3	5.3	5.3	5.7	5.0	5.2	3.0	7.3	4.7	7.0
12	7H4	5.3	5.6	5.6	4.9	5.1	3.0	7.0	4.3	7.7
13	14H1	5.3	5.6	5.3	5.4	5.0	4.3	7.7	3.3	7.7
14	H572	5.3	5.4	5.7	5.0	5.0	3.0	8.0	5.7	7.3
15	14H7	5.3	5.3	5.3	5.3	5.2	4.7	8.0	4.3	6.3
16	Sword	5.2	5.1	5.7	5.1	4.9	2.7	8.0	3.3	7.0
17	Beacon	5.2	5.5	5.3	5.1	4.9	5.0	7.0	3.3	6.7
18	Minimus	5.2	5.5	5.3	5.1	4.8	5.3	7.7	4.0	7.0
19	Firefly	5.0	5.7	5.1	4.8	4.6	5.7	8.0	3.3	6.0
20	Chariot	5.0	5.7	5.0	4.8	4.4	5.7	6.7	3.0	6.7

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(Continued)

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

	Cultivar or Selection	-----Turf Quality <sup>1</sup> -----					Establishment <sup>2</sup> 8 Oct. 2014	Leaf Spot <sup>3</sup>		Dollar Spot <sup>3</sup> 31 Aug. 2018
		2015- 2018 Avg.	2015 Avg.	2016 Avg.	2017 Avg.	2018 Avg.		26 June 2015	29 April 2016	
<b>HARD FESCUE (continued)</b>										
21	PPG-FL 107	4.9	5.2	5.3	4.6	4.5	2.7	8.0	4.0	7.3
22	PST-4HES	4.9	5.4	5.0	4.7	4.7	3.3	6.3	3.7	6.3
23	AHF188	4.9	5.4	5.1	4.4	4.7	5.7	6.7	3.3	6.0
24	PPG-FL 108	4.9	5.1	4.9	4.8	4.6	4.7	6.3	3.0	5.3
25	Stonehenge	4.8	5.4	4.8	4.6	4.6	4.0	7.0	2.3	6.3
26	Rescue 911	4.8	6.0	4.6	4.7	4.0	5.3	8.0	3.3	5.3
27	Oxford	4.8	5.2	5.2	4.5	4.3	4.7	6.3	4.0	4.7
28	Nanook	4.8	5.2	4.9	4.7	4.3	2.7	7.0	3.7	6.3
29	Blueray	4.7	5.3	4.9	4.5	4.3	3.3	8.0	3.3	6.7
30	Reliant IV	4.7	5.3	4.7	4.6	4.2	6.0	7.0	2.7	5.3
31	PST-4BND	4.7	5.3	4.7	4.4	4.3	5.0	7.0	3.0	5.3
<b>CHEWINGS FESCUE</b>										
1	14W4	4.7	4.9	4.4	4.0	5.3	4.7	5.3	3.0	5.0
2	Conductor	4.6	4.9	4.6	3.8	5.2	5.0	5.0	6.0	6.0
3	14W2	4.6	4.6	4.5	3.7	5.4	5.0	4.0	5.3	6.3
4	PPG-FRC 119	4.6	5.3	4.6	3.6	4.7	6.0	6.3	3.7	5.3
5	14W1	4.5	5.2	4.1	3.9	4.6	4.3	4.7	3.0	5.0
6	Radar	4.4	5.1	3.9	3.7	4.9	6.7	5.0	2.7	6.0
7	Brittany II	4.3	5.5	4.0	3.5	4.3	5.7	7.0	4.3	4.0
8	Fairmont	4.3	4.7	4.2	3.7	4.7	4.7	5.7	4.0	5.0
9	Compass II	4.2	4.9	4.2	3.5	4.4	3.7	7.0	3.3	4.3
10	Momentum	4.2	5.0	3.9	3.4	4.5	5.0	6.7	4.0	5.0

(Continued)



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

Cultivar or Selection	-----Turf Quality <sup>1</sup> -----					Establishment <sup>2</sup> 8 Oct. 2014	Leaf Spot <sup>3</sup>		Dollar Spot <sup>3</sup> 31 Aug. 2018	
	2015- 2018 Avg.	2015 Avg.	2016 Avg.	2017 Avg.	2018 Avg.		26 June 2015	29 April 2016		
<b>CHEWINGS FESCUE (continued)</b>										
11	PPG-FRC 115	4.2	4.8	4.1	3.3	4.4	4.3	5.3	4.0	5.0
12	PPG-FRC 107	4.1	4.8	4.1	3.0	4.7	4.0	6.0	4.3	4.3
13	Sonar	4.1	4.8	3.7	3.5	4.3	5.7	6.0	3.0	4.3
14	Shadow II	4.0	5.0	3.4	3.4	4.4	4.0	5.3	3.0	4.0
15	PST-4C30D	4.0	4.9	3.7	3.3	4.1	4.3	4.0	3.3	4.0
16	Enchantment	4.0	5.2	3.9	3.4	3.4	6.0	5.3	3.7	2.7
17	PST-4CHT	4.0	4.8	3.9	3.5	3.8	3.0	5.0	3.3	3.0
18	Treasure II	4.0	4.7	4.0	3.3	3.8	2.7	7.0	3.3	3.7
19	Compass	3.9	5.2	3.1	3.1	4.3	6.0	5.0	2.0	4.7
20	Heathland	3.9	4.6	3.8	3.5	3.8	3.3	4.7	3.7	3.3
21	PST-4SHR-CH	3.9	5.1	3.1	3.3	4.1	5.3	5.7	2.3	3.7
22	J-5	3.9	4.8	3.9	3.2	3.7	3.7	5.7	2.7	4.3
23	Tiffany	3.9	4.7	3.4	3.2	4.1	4.3	4.3	3.3	4.3
24	PST-Syn-4SWT-13	3.9	4.7	3.6	3.7	3.3	4.3	5.7	2.3	3.3
25	Ambrose	3.8	5.0	3.3	3.0	3.8	4.7	5.7	2.7	4.0
26	PST-4CHY	3.7	4.7	3.4	3.3	3.4	4.3	5.3	2.3	2.3
27	Survivor	3.5	3.3	3.8	3.1	3.8	1.3	7.0	3.7	3.0
28	Shadow III	3.4	3.8	3.3	3.0	3.3	2.3	5.7	2.3	3.7

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(Continued)

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

Cultivar or Selection	-----Turf Quality <sup>1</sup> -----					Establishment <sup>2</sup> 8 Oct. 2014	Leaf Spot <sup>3</sup>		Dollar Spot <sup>3</sup> 31 Aug. 2018	
	2015-2018 Avg.	2015 Avg.	2016 Avg.	2017 Avg.	2018 Avg.		26 June 2015	29 April 2016		
<b>SHEEPS FESCUE</b>										
1	Marco Polo	4.5	5.3	4.5	3.8	4.2	5.7	8.3	4.7	6.0
2	Bighorn GT	4.4	5.0	4.5	4.2	3.8	3.3	8.7	3.7	5.7
3	Azure	4.0	5.2	4.2	3.4	3.3	4.7	8.3	4.7	4.7
4	Daisy	3.7	4.4	3.7	3.7	3.1	3.3	7.7	2.0	2.7
5	Seabreeze GT	3.6	5.1	2.9	3.3	3.0	2.7	5.7	1.0	1.7
6	PST-4SEA	3.6	4.8	3.1	3.1	3.2	3.7	5.0	1.3	2.7
7	Lighthouse	2.8	3.7	2.8	2.2	2.3	6.3	3.0	2.0	1.3
<b>STRONG CREEPING RED FESCUE</b>										
1	DSRxBLMT	4.3	4.7	4.1	3.9	4.5	4.3	4.0	3.3	4.7
2	Soilguard	4.2	4.2	4.3	4.1	4.0	1.3	7.0	3.3	4.0
3	Chorus	4.2	5.0	4.6	3.3	3.6	5.0	5.7	5.0	3.0
4	PPG-FRR 115	4.1	4.5	4.0	3.4	4.4	6.3	4.0	1.3	4.3
5	14R2	4.0	4.7	4.1	3.4	3.7	4.7	4.0	3.0	2.3
6	Cardinal II	3.9	4.4	3.7	3.3	4.1	6.0	3.3	2.3	4.0
7	ASC 295	3.8	4.8	3.4	3.1	4.0	5.7	5.0	2.0	3.0
8	14R1	3.8	4.7	3.9	2.9	3.5	5.0	3.3	2.3	2.3
9	FT345	3.7	4.8	3.9	2.8	3.5	3.3	5.0	2.7	2.0
10	PST-4BEN	3.7	4.1	3.6	3.5	3.7	5.3	4.3	2.3	3.7
11	PST-4RUE	3.7	4.0	4.0	3.3	3.5	5.3	3.3	1.7	4.3
12	14R4	3.7	4.6	3.9	3.1	3.3	4.3	4.0	4.0	2.0
13	PennASC295	3.7	4.7	3.4	2.9	3.7	4.7	5.3	2.3	2.7
14	Marvel	3.6	4.7	4.0	2.9	2.9	6.0	4.3	3.3	1.3
15	PST-4ED4	3.6	4.2	3.4	3.4	3.4	5.3	3.7	2.3	3.0

(Continued)

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

Cultivar or Selection	-----Turf Quality <sup>1</sup> -----					Establishment <sup>2</sup> 8 Oct. 2014	Leaf Spot <sup>3</sup>		Dollar Spot <sup>3</sup> 31 Aug. 2018	
	2015-2018 Avg.	2015 Avg.	2016 Avg.	2017 Avg.	2018 Avg.		26 June 2015	29 April 2016		
<b>STRONG CREEPING RED FESCUE (continued)</b>										
16	Pennlawn	3.5	4.2	3.7	2.8	3.3	6.7	3.7	2.7	1.7
17	Audubon	3.5	4.5	3.6	2.7	3.0	5.7	3.7	2.7	1.7
18	PST-4DR4-BS	3.4	4.1	3.5	2.9	3.3	5.3	3.7	2.3	3.0
19	PST-4CRD-U	3.4	4.4	3.9	2.4	3.0	3.7	4.7	2.7	2.0
20	PST-4SP14	3.4	4.1	3.6	2.6	3.3	5.3	3.3	2.0	3.0
21	Kent	3.4	4.3	3.0	2.9	3.4	5.3	3.7	1.0	4.0
22	Aberdeen	3.4	4.4	3.7	2.5	2.9	4.3	4.0	1.7	1.7
23	Pathfinder	3.4	4.7	3.0	2.4	3.3	5.7	3.3	1.7	2.3
24	PPG-FRR 110	3.4	4.6	3.4	2.3	3.2	5.3	4.0	2.7	1.3
25	RAD-FR35	3.3	4.3	3.5	2.2	3.3	4.0	4.3	3.3	2.0
26	Crossbow II	3.3	4.1	3.3	2.6	3.3	6.0	3.0	2.3	1.7
27	PST-Syn-4SP24	3.3	4.2	3.1	2.7	3.2	5.3	3.3	1.0	2.0
28	Cardinal	3.3	4.6	3.1	2.5	2.9	6.0	4.3	1.3	1.7
29	Navigator II	3.3	4.4	3.0	2.7	3.0	5.7	3.3	1.3	1.0
30	Gibraltar	3.2	4.3	3.2	2.5	2.8	5.7	4.0	2.0	1.7
31	Orbit	3.2	4.5	3.2	2.2	2.9	6.7	3.3	2.3	2.0
32	PST-4GRY	3.2	4.0	3.5	2.5	2.7	3.3	4.0	3.0	2.0
33	FF2	3.1	4.1	2.9	2.6	2.9	4.7	3.3	2.0	1.7
34	Miser	3.1	4.3	3.0	2.1	3.0	4.3	3.3	2.7	3.0
35	Creeper	3.1	4.1	3.3	2.2	2.9	2.7	4.7	2.0	1.3

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(Continued)

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

Cultivar or Selection	-----Turf Quality <sup>1</sup> -----					Establishment <sup>2</sup> 8 Oct. 2014	Leaf Spot <sup>3</sup>		Dollar Spot <sup>3</sup> 31 Aug. 2018	
	2015-2018 Avg.	2015 Avg.	2016 Avg.	2017 Avg.	2018 Avg.		26 June 2015	29 April 2016		
<b>STRONG CREEPING RED FESCUE (continued)</b>										
36	Gibraltar Gold	3.1	4.5	3.5	2.0	2.4	5.3	4.0	4.0	1.3
37	Shademaster III	3.0	4.1	3.2	2.0	2.8	3.7	4.3	2.7	1.7
38	PST-4CRD-P	3.0	4.2	3.1	1.9	2.7	5.7	4.0	1.0	3.7
39	Xeric	3.0	3.9	3.0	2.3	2.7	5.3	3.7	1.7	2.0
40	PST-4RED	3.0	4.0	2.9	2.2	2.7	4.3	4.0	1.7	2.0
41	Fenway	2.9	4.1	2.9	2.1	2.4	5.7	3.0	1.7	1.3
42	PST-4GRP	2.9	3.7	3.0	2.2	2.6	5.0	3.0	2.3	2.3
43	Oracle	2.8	3.6	2.8	2.4	2.6	6.0	2.7	1.3	1.7
<b>BLENDS/MIXTURES</b>										
1	Scottish Links Mixture	4.1	4.9	4.1	3.7	3.8	4.3	6.7	3.3	4.7
2	Irish links mixture	3.5	4.1	3.2	3.1	3.4	3.0	4.7	2.0	4.7
LSD at 5% =		0.4	0.6	0.6	0.6	0.7	1.1	1.5	1.7	1.6

<sup>1</sup>9 = best turf quality

<sup>2</sup>9 = fastest establishment

<sup>3</sup>9 = least disease

Table 2. 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 Turfgrass Evaluation Program Test (NTEP).

Cultivar or Selection	-----Turf Quality <sup>1</sup> -----					Establish-	-----Color <sup>3</sup> -----					Cover <sup>4</sup> -----(%)------				Dollar
	2015 2018- Avg,	2015 Avg.	2016 Avg.	2017 Avg.	2018 Avg.	8 Oct. 2014	8 Oct. 2015	14 Oct. 2016	25 Sep. 2017	19 Nov. 2018	8 Oct. 2015	14 Oct. 2016	25 Sep. 2017	19 Nov. 2018	31 Aug. 2018	
<b>HARD FESCUE</b>																
1 Resolute	5.6	5.4	5.9	5.4	5.6	4.7	7.7	8.0	8.0	6.0	87.7	93.3	99.0	96.0	7.0	
2 DLFPS-FL-3066	5.5	5.8	5.8	5.3	5.2	5.0	6.7	6.3	7.7	6.3	88.0	95.0	99.0	93.0	6.7	
3 MNHD-14	5.3	5.5	5.7	5.3	4.7	4.7	6.7	8.0	7.0	5.7	93.0	96.3	99.0	92.7	6.7	
4 Minimus	5.3	6.1	5.4	5.1	4.6	4.7	7.0	4.0	7.0	4.0	86.3	90.0	99.0	96.0	6.3	
5 DLFPS-FL-3060	5.3	5.4	5.8	5.3	4.6	4.0	6.3	8.0	7.0	5.3	92.0	93.3	99.0	89.7	6.0	
6 Gladiator	5.3	5.5	5.6	5.0	5.0	5.0	7.0	7.3	6.3	3.0	81.3	96.3	99.0	90.0	7.3	
7 Jetty	5.2	5.3	5.4	5.0	5.2	2.7	7.3	7.0	7.7	6.0	90.0	91.7	99.0	96.0	6.0	
8 Beacon	5.2	5.8	5.5	5.1	4.5	4.7	5.7	7.3	5.7	4.0	86.0	95.0	99.0	92.7	5.3	
9 PST-4BND	5.0	5.7	5.3	4.9	4.1	5.0	7.0	4.3	7.3	4.7	91.7	93.3	99.0	86.7	5.3	
10 Sword	4.9	4.5	5.4	4.9	4.6	2.3	7.3	7.0	7.0	7.0	93.0	90.0	99.0	96.0	6.3	
11 DLFPS-FRC-3060	4.2	5.2	3.5	3.6	4.4	5.7	6.7	6.0	6.7	6.3	91.7	80.0	99.0	92.7	4.3	
12 Beudin	3.0	4.2	2.7	2.7	2.5	5.0	5.0	5.0	5.7	4.7	80.0	51.7	81.7	43.3	1.7	
<b>CHEWINGS FESCUE</b>																
1 Compass II	4.6	5.3	4.2	3.9	5.1	5.7	6.3	5.3	6.7	5.3	92.7	95.0	96.0	96.0	5.7	
2 Radar	4.5	5.4	4.2	3.5	5.0	5.0	6.3	8.0	5.7	5.0	96.0	85.0	94.3	96.0	6.3	
3 Bolster	4.5	4.9	4.4	3.8	4.9	5.3	6.7	6.0	5.7	5.0	89.7	90.0	96.3	99.0	5.7	
4 DLF-FRC 3338	4.4	5.4	4.2	3.7	4.4	5.0	7.3	5.3	5.7	5.3	97.0	80.0	99.0	93.0	5.0	
5 DLFPS-FRC-3057	4.4	4.9	4.4	3.8	4.4	5.0	6.0	6.0	6.7	4.0	91.7	88.3	99.0	93.0	4.7	

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(Continued)

Table 2. Fine fescue turf trial seeded, 2014 (NTEP) (continued).

Cultivar or Selection	-----Turf Quality <sup>1</sup> -----					Establish- ---ment <sup>2</sup> --- 8 Oct. 2014	-----Color <sup>3</sup> -----					Cover <sup>4</sup> -----(%)------				Dollar --Spot <sup>5</sup> -- 31 Aug. 2018
	2015 2018- Avg,	2015 Avg.	2016 Avg.	2017 Avg.	2018 Avg.		8 Oct. 2014	8 Oct. 2015	14 Oct. 2016	25 Sep. 2017	19 Nov. 2018	8 Oct. 2015	14 Oct. 2016	25 Sep. 2017	19 Nov. 2018	
<b>CHEWINGS FESCUE (continued)</b>																
6 Momentum	4.3	4.8	4.0	3.8	4.8	4.7	7.7	7.0	7.0	6.0	93.0	90.0	99.0	99.0	5.7	
7 Castle	4.2	4.8	4.1	3.5	4.3	4.7	7.3	5.0	7.0	7.3	94.3	86.7	89.7	80.0	4.3	
8 BAR VV-VP3-CT	4.1	5.2	3.5	3.8	4.1	5.0	7.3	5.3	5.7	4.7	86.7	83.3	94.3	86.7	3.7	
9 RAD-FC44	4.0	4.8	3.6	3.6	3.9	4.7	7.7	6.0	7.0	8.0	88.3	75.0	94.7	86.7	3.3	
10 BAR 6FR 126	3.5	4.4	3.2	2.9	3.3	5.0	6.0	5.0	6.0	4.3	90.7	63.3	70.0	66.7	2.3	
11 Cascade	3.4	4.5	2.9	3.0	3.2	5.7	6.3	5.0	6.0	5.0	81.7	63.3	91.3	76.7	2.7	
<b>SHEEPS FESCUE</b>																
1 Quatro	4.4	5.4	3.8	4.4	4.0	4.7	6.3	6.0	7.0	5.3	93.3	83.3	99.0	93.0	5.0	
<b>SLENDER CREEPING RED FESCUE</b>																
1 Sea Mist	4.5	5.2	4.0	4.0	4.6	5.0	6.0	5.3	5.7	4.7	94.7	78.3	97.7	89.7	3.7	
2 Seabreeze GT	3.8	4.2	3.6	3.4	4.1	2.0	6.0	6.0	5.3	6.3	79.7	81.7	76.3	86.3	3.7	
3 BAR FRT 5002	3.4	4.3	2.8	3.0	3.4	4.3	5.3	4.0	5.0	5.0	78.3	71.7	69.7	80.0	2.3	
<b>STRONG CREEPING RED FESCUE</b>																
1 Cardinal II	3.9	4.3	3.8	3.3	4.4	5.3	7.3	7.3	7.0	6.0	83.3	93.3	88.0	93.0	4.3	
2 DLF-FRR 6162	3.9	4.5	3.8	3.5	3.9	5.3	5.7	6.0	7.0	6.0	87.3	85.0	93.0	76.7	4.0	
3 DLFPS-FRR-3068	3.9	5.0	4.1	2.9	3.7	4.3	6.0	8.0	8.0	6.7	93.0	91.7	66.7	63.3	2.7	
4 PST-4BEN	3.9	4.4	3.7	3.5	3.9	5.3	6.7	6.0	7.3	6.0	94.0	66.7	97.7	76.7	3.7	
5 7C34	3.8	4.9	3.8	2.7	3.8	5.0	6.3	6.0	6.7	6.3	93.3	85.0	46.7	83.3	2.7	

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(Continued)

Table 2. Fine fescue turf trial seeded, 2014 (NTEP) (continued).

Cultivar or Selection	-----Turf Quality <sup>1</sup> -----					Establish- ---ment <sup>2</sup> --- 8 Oct. 2014	-----Color <sup>3</sup> -----					Cover <sup>4</sup> -----(%)------				Dollar --Spot <sup>5</sup> -- 31 Aug. 2018
	2015 2018- Avg,	2015 Avg.	2016 Avg.	2017 Avg.	2018 Avg.		8 Oct. 2015	14 Oct. 2016	25 Sep. 2017	19 Nov. 2018	8 Oct. 2015	14 Oct. 2016	25 Sep. 2017	19 Nov. 2018		
<b>STRONG CREEPING RED FESCUE (continued)</b>																
6 Marvel	3.5	4.7	3.7	2.7	3.1	5.0	6.3	5.0	7.0	6.0	97.3	90.0	56.7	70.0	1.0	
7 PST-4ED4	3.5	4.1	3.6	3.1	3.3	5.0	6.7	4.0	6.3	5.7	71.7	66.7	86.7	63.3	3.0	
8 PST-4DR4	3.5	4.1	3.7	2.6	3.4	4.7	7.0	6.0	6.0	6.7	81.3	70.0	63.3	70.0	2.7	
9 PST-4RUE	3.5	4.0	3.5	2.8	3.5	5.3	7.0	5.0	5.3	6.7	88.3	65.0	75.0	76.7	3.0	
10 DLFPS-FRR-3069	3.4	4.4	3.5	2.7	3.1	3.3	7.7	8.0	7.0	6.7	89.7	88.3	55.0	66.7	2.3	
11 Navigator II	3.3	4.5	3.1	2.5	3.2	4.7	7.3	8.0	7.3	7.7	83.0	73.3	65.0	56.7	1.7	
12 RAD-FR47	3.3	4.4	3.9	2.1	3.0	5.3	6.7	6.0	6.7	7.7	95.7	68.3	36.7	60.0	1.7	
13 RAD-FR33R	3.2	4.1	3.2	2.5	3.0	5.0	7.0	6.7	7.0	7.7	85.0	80.0	63.3	66.7	1.7	
14 Kent	3.2	4.3	2.9	2.3	3.2	6.0	6.3	5.0	7.0	8.3	91.7	85.0	55.0	66.7	1.3	
15 Boreal	2.8	3.4	2.5	2.5	2.6	5.7	6.7	6.7	7.3	7.3	86.0	90.0	73.3	60.0	1.7	
LSD at 5% =	0.4	0.5	0.7	0.6	0.7	0.9	1.8	0.5	1.6	1.4	18.1	5.2	20.4	16.4	1.5	

<sup>1</sup>9 = best turf quality

<sup>2</sup>9 = fastest establishment

<sup>3</sup>9 = best genetic color

<sup>4</sup>100 = complete plot cover

<sup>5</sup>9 = least disease

Table 3. Performance of fine fescue cultivars and selections in a turf trial seeded in September 2015 at Adelphia, NJ.

Cultivar or Selection	----- Turf Quality <sup>1</sup> -----				Establishment <sup>2</sup> 22 Sept. 2015	Leaf Spot <sup>3</sup> 5 May 2016
	2016- 2018 Avg.	2016 Avg.	2017 Avg.	2018 Avg.		
<b>HARD FESCUE</b>						
1 FH3	5.8	5.5	6.3	5.5	5.7	5.0
2 FH2	5.6	5.5	5.5	5.6	6.3	5.7
3 FH4	5.4	5.1	5.7	5.5	5.7	4.7
4 MNHD-15	5.3	5.1	5.7	5.2	6.0	5.7
5 FH1	5.3	5.3	5.3	5.2	6.0	5.7
6 H572	5.2	4.9	5.5	5.3	6.0	4.3
7 PPG-FL 112	5.1	5.1	5.6	4.6	6.0	5.0
8 PPG-FL 113	5.0	5.1	5.1	4.9	6.0	5.0
9 Gladiator	5.0	5.4	5.4	4.2	7.3	4.3
10 Beacon	5.0	5.0	5.5	4.4	6.7	4.3
11 Minimus	4.8	5.3	5.2	3.9	6.3	4.3
12 Sword	4.8	5.1	4.9	4.4	6.0	5.3
13 Stonehenge II	4.8	4.9	4.8	4.6	5.3	4.3
14 Firefly	4.7	5.0	4.8	4.3	6.7	5.0
15 PPG-FL 108	4.5	4.4	4.5	4.7	5.7	4.3
16 PST-4BND	4.4	4.6	4.6	3.9	5.3	4.3
17 Blueray	4.2	4.7	4.6	3.4	6.0	5.0
18 Reliant IV	4.2	4.4	4.9	3.5	5.3	3.7
19 Viking H20	4.2	4.4	4.7	3.5	6.0	4.0
20 Jetty	4.2	2.9	4.8	4.8	1.3	4.7
21 Chariot	4.0	4.1	4.3	3.7	6.3	3.7
22 Stonehenge	4.0	4.6	4.3	3.2	6.3	3.3
23 Ecostar Plus	3.9	4.3	3.9	3.7	6.7	4.7
24 Heron	3.8	3.8	4.3	3.2	4.0	3.7
<b>CHEWINGS FESCUE</b>						
1 FW2	5.2	5.2	5.0	5.4	7.7	5.0
2 FW3	5.0	5.2	4.7	5.0	6.7	6.3
3 Radar	5.0	4.4	4.7	5.3	7.7	5.3
4 Compass II	4.9	4.6	5.0	5.0	6.3	5.3
5 Woodall	4.9	5.0	4.5	5.1	8.3	5.0
6 PPG-FRC 119	4.7	4.8	4.4	4.9	7.3	4.0
7 PPG-FRC 120	4.6	4.8	4.1	4.9	5.7	6.3
8 FW1	4.5	5.2	4.3	4.7	7.7	7.0
9 Fairmont	4.4	4.5	3.9	4.7	7.3	4.7
10 Castle	4.2	4.4	4.2	4.0	7.7	4.0

(Continued)



Table 3. Fine fescue turf trial, 2015 (continued).

Cultivar or Selection	----- Turf Quality <sup>1</sup> -----				Establishment <sup>2</sup> 22 Sept. 2015	Leaf Spot <sup>3</sup> 5 May 2016
	2016- 2018 Avg.	2016 Avg.	2017 Avg.	2018 Avg.		
<b>CHEWINGS FESCUE (continued)</b>						
11 Sonar	4.1	4.2	4.1	3.9	6.3	4.7
12 PPG-FRC 118	4.0	4.1	3.9	4.0	6.7	4.0
13 Wrigley 2	4.0	4.3	4.0	3.7	8.7	4.0
14 Ambrose	4.0	4.0	3.9	4.0	4.7	5.7
15 Shadow II	3.9	4.1	3.5	4.2	6.0	3.7
16 PST-4CHT	3.9	4.3	3.8	3.3	3.7	4.3
17 PST-4CHY	3.6	4.5	3.5	3.4	3.7	4.3
18 Compass	3.6	3.6	3.5	3.5	6.7	2.3
19 Shadow III	3.6	3.3	3.5	3.6	2.0	4.3
20 PST-4SHR-CH	3.5	3.8	3.3	3.4	6.7	3.7
21 Enchantment	3.4	2.6	3.7	3.4	1.0	4.3
22 J-5	3.4	3.7	3.2	3.3	7.0	3.7
<b>SHEEPS FESCUE</b>						
1 Marco Polo	4.1	4.2	4.1	3.9	7.7	5.3
2 Bighorn GT	4.0	4.2	4.3	3.6	6.7	4.7
3 PPG-FO 102	3.8	3.8	4.0	3.5	5.3	2.3
<b>SLENDER CREEPING RED FESCUE</b>						
1 Sea Mist	4.7	4.7	4.4	4.9	7.3	5.0
2 SLS	4.3	4.8	4.1	4.1	6.7	6.3
3 PST-4SEA	3.6	4.0	3.8	3.2	3.3	3.3
4 Seabreeze GT	3.1	3.7	3.0	2.4	2.3	4.0
5 Lighthouse	2.0	2.3	1.8	1.7	9.0	1.7
<b>STRONG CREEPING RED FESCUE</b>						
1 PPG-FRR 115	5.0	5.0	5.0	5.1	6.3	4.7
2 PPG-FRR 116	4.8	4.9	4.9	4.8	6.3	4.3
3 DSR	4.7	5.2	4.3	4.6	5.3	5.7
4 FR2	4.7	5.4	4.7	3.9	6.0	5.3
5 FR3	4.6	5.4	4.4	4.1	7.0	5.3
6 FR4	4.5	4.6	4.3	4.6	7.7	4.0
7 FR1	4.4	4.9	4.2	3.9	7.0	4.0
8 Fenway (Z1-15-OSBM)	4.2	4.3	4.3	4.1	5.7	4.3
9 DRBM2X	4.2	4.3	4.2	4.0	4.3	4.7
10 ASC 295	4.2	4.3	4.0	4.2	6.7	4.3

(Continued)

Table 3. Fine fescue turf trial, 2015 (continued).

Cultivar or Selection	----- Turf Quality <sup>1</sup> -----				Establishment <sup>2</sup> 22 Sept. 2015	Leaf Spot <sup>3</sup> 5 May 2016
	2016- 2018 Avg.	2016 Avg.	2017 Avg.	2018 Avg.		
<b>STRONG CREEPING RED FESCUE (continued)</b>						
11 Cardinal II	3.8	4.5	4.3	2.5	6.0	4.7
12 Navigator II	3.7	4.3	4.0	2.7	7.3	4.0
13 RUF1	3.5	4.3	3.5	2.7	4.0	5.7
14 Marvel	3.5	4.1	3.7	2.6	6.7	4.3
15 Shademaster III	3.4	4.2	3.6	2.6	3.3	6.0
16 SR 5250	3.4	3.9	4.0	2.4	5.7	4.7
17 PST-4BEN	3.4	4.1	4.1	2.1	7.0	4.0
18 Cardinal	3.4	4.3	3.6	2.2	5.3	5.3
19 PPG-FRR 114	3.3	3.8	3.7	2.5	6.7	1.7
20 PST-4GRY	3.3	3.9	3.9	2.2	2.3	4.3
21 PST-4DR4	3.3	3.9	3.6	2.4	6.0	4.0
22 Garnet	3.3	3.9	3.6	2.4	4.7	2.7
23 Epic	3.2	3.3	3.5	2.8	3.3	2.0
24 PST-4SP14	3.2	3.7	3.5	2.3	5.0	3.7
25 PST-4RED	3.1	3.4	3.8	2.3	2.7	3.7
26 PST-4ED4	3.1	4.0	3.2	2.3	5.7	3.0
27 Audubon	3.1	3.5	3.9	2.0	8.3	3.0
28 PST-4RUE-14	3.1	3.5	3.6	2.2	6.0	2.7
29 Kent	3.1	3.5	3.3	2.5	7.3	3.3
30 PST-4CRD-U	3.1	3.4	3.6	2.2	2.3	5.0
31 FR 35	3.0	3.8	3.0	2.1	6.7	3.7
32 Fenway	3.0	3.4	3.6	2.0	8.7	1.3
33 PST-4CRD-P	3.0	3.8	3.2	1.9	7.7	3.7
34 Orbit	2.9	3.7	2.7	2.4	7.7	3.7
35 Xeric	2.9	3.4	3.4	1.9	7.3	1.7
36 Gibraltar Gold	2.9	3.4	3.4	1.8	5.7	3.7
<b>BLENDS/MIXTURES</b>						
1 Scottish Links Mixture	3.6	3.5	3.5	3.9	5.7	4.0
2 Irish Links Mixture	2.9	3.5	2.7	2.5	4.7	3.0
LSD at 5% =	0.6	0.8	0.8	0.7	1.8	1.8

<sup>1</sup>9 = best turf quality<sup>2</sup>9 = fastest establishment<sup>3</sup>9 = least disease

Table 4. Performance of fine fescue cultivars and selections in a turf trial seeded in September 2016 at Adelphia, NJ.

Cultivar or Selection	-----Turf Quality <sup>1</sup> -----		
	2017-2018 Avg.	2017 Avg.	2018 Avg.
<b>HARD FESCUE</b>			
1 A56	5.5	5.4	5.6
2 PPG-FL 113	5.3	5.5	5.1
3 A51	5.3	5.7	4.9
4 A55	5.2	5.3	5.1
5 Z16-RHF	5.2	5.0	5.3
6 A52	5.2	4.7	5.6
7 Jetty	5.0	4.8	5.2
8 Sword	5.0	5.3	4.6
9 PPG-FL 115	4.9	5.0	4.8
10 A53	4.9	4.8	5.1
11 A54	4.9	4.5	5.2
12 Gladiator	4.9	5.0	4.7
13 Minimus	4.8	5.0	4.5
14 SPHD16	4.8	4.5	5.0
15 Beacon	4.5	4.8	4.2
16 Viking H2O	4.4	4.7	4.1
17 Blue-ray	4.3	4.5	4.1
18 PST-4BND	4.1	3.9	4.3
19 Reliant IV	4.0	4.1	3.9
<b>CHEWINGS FESCUE</b>			
1 WYR	5.2	5.3	5.1
2 Woodall	5.0	4.9	5.0
3 PPG-FRC 120	5.0	4.9	5.0
4 Z16-RCF	5.0	5.0	5.0
5 WTC	4.8	4.8	4.7
6 Fairmont	4.8	4.8	4.7
7 Compass II	4.5	4.6	4.4
8 Radar	4.4	4.5	4.2
9 Treasure II	4.4	4.4	4.4
10 PST-4SWT	4.0	4.3	3.6
11 Ambrose	3.7	3.8	3.6
12 PST-4CHT	3.5	3.1	3.8
13 PST-4SHR-CH	3.5	3.4	3.6

(Continued)

Table 4. Fine fescue turf trial, 2016 (continued).

Cultivar or Selection	-----Turf Quality <sup>1</sup> -----		
	2017-2018 Avg.	2017 Avg.	2018 Avg.
<b>SHEEPS FESCUE</b>			
1 Azure	3.9	4.0	3.8
2 Blue Mesa	3.0	3.1	2.9
<b>SLENDER CREEPING RED FESCUE</b>			
1 Sea Mist	4.1	4.4	3.9
<b>STRONG CREEPING RED FESCUE</b>			
1 5Z5	4.9	5.1	4.8
2 PPG-FRR 116	4.7	4.8	4.7
3 5Z4	4.7	5.1	4.2
4 Z16-DR	4.6	4.7	4.6
5 5Z3	4.6	5.1	4.2
6 PH	4.6	4.8	4.3
7 5Z1	4.6	5.0	4.1
8 5Z2	4.6	5.2	3.9
9 Z16-RCRF	4.5	4.7	4.3
10 PST-Syn-45PR	4.4	4.0	4.7
11 Cardinal II	4.2	4.4	4.0
12 Z16-DRBM2X	4.0	4.1	3.9
13 Z16-DRBM	3.9	4.0	3.8
14 Ruddy	3.9	4.7	3.0
15 Navigator II	3.9	4.5	3.2
16 PST-4BEN	3.9	4.4	3.3
17 PST-4DR4	3.9	4.3	3.4
18 Shademaster III	3.8	4.0	3.7
19 Marvel	3.7	4.4	3.0
20 PST-4SP14	3.7	3.9	3.5
21 PST-4CRD-U	3.7	4.2	3.1
22 Kent	3.7	4.1	3.2
23 PST-4ED4	3.6	3.9	3.3
24 PST-4CRD-P	3.6	4.3	2.9
25 Orbit	3.6	4.1	3.0

(Continued)

Table 4. Fine fescue turf trial, 2016 (continued).

Cultivar or Selection	-----Turf Quality <sup>1</sup> -----		
	2017-2018 Avg.	2017 Avg.	2018 Avg.
<b>STRONG CREEPING RED FESCUE (continued)</b>			
26 PST-4RUE-14	3.6	3.8	3.3
27 Xeric	3.5	4.1	3.0
28 Wendy Jean	3.4	4.0	2.8
29 Fenway	3.1	3.5	2.7
30 Oracle	2.8	3.1	2.4
31 PST-4GRY	2.6	2.0	3.2
LSD at 5%=	0.5	0.6	0.8

<sup>1</sup>9 = best turf quality

Table 5. Performance of fine fescue cultivars and selections in a turf trial seeded in September 2017 at Adelphia, NJ.

Cultivar or Selection	Turf Quality <sup>1</sup> 2018 Avg.
<b>HARD FESCUE</b>	
1 HAQ1	5.9
2 PPG-FL 124	5.8
3 PPG-FL 122	5.7
4 PPG-FL 123	5.7
5 Jetty	5.6
6 Z16-RHF	5.5
7 BM2 SEL	5.4
8 PPG-FL 115	5.4
9 HAQ2	5.4
10 PPG-FL 113	5.4
11 Minimus	5.3
12 FL 58 SEL M2	5.2
13 Gladiator	5.0
14 Beacon	5.0
15 Sword	4.9
16 Viking H2O	4.6
17 SR 3150	4.5
18 Reliant IV	4.3
19 AHF-177	4.1
20 Spartan II	3.9
21 Eureka II	3.5
<b>CHEWINGS FESCUE</b>	
1 CHU1	5.7
2 Z16-RCF	5.4
3 PPG-FRC 126	5.3
4 CHU2	5.3
5 Radar	5.2
6 Fairmont	5.2
7 CHP1	5.1
8 PPG-FRC 120	5.1
9 Woodall	4.9
10 Leeward	4.9

(Continued)

Table 5. Fine fescue turf trial, 2017 (continued).

Turf Quality <sup>1</sup> Cultivar or Selection	2018 Avg.
<b>CHEWINGS FESCUE (continued)</b>	
11 LaCrosse	4.9
12 Compass II	4.8
13 CHP2	4.8
14 Sonar	4.6
15 Longfellow 3	4.5
16 Wrigley 2	4.5
17 Castle	4.4
18 SR 5130	4.3
19 Ambrose	4.2
20 Windward	3.9
21 Syn-4DUB	2.3
<b>SHEEPS FESCUE</b>	
1 PST-4GUDS Bulk	4.3
2 Azure	3.9
3 Quatro	3.8
4 Blue Mesa	3.5
<b>SLENDER CREEPING RED FESCUE</b>	
1 Seamist	4.6
2 PPG-FRT 103	4.0
3 Shoreline	3.4
<b>STRONG CREEPING RED FESCUE</b>	
1 PPG-FRR 116	5.1
2 PPG-FRR 121	5.0
3 Chantilly	4.7
4 Cardinal II	4.6
5 Navigator II	4.6
6 Ruddy	4.4
7 Z16-RCRF	4.4
8 Marvel	4.4
9 PPG-FRR 122	4.3
10 Garnet	4.2

(Continued)

Table 5. Fine fescue turf trial, 2017 (continued).

Turf Quality <sup>1</sup> Cultivar or Selection	2018 Avg.
<b>STRONG CREEPING RED FESCUE (continued)</b>	
11 Cindy Lou	4.2
12 Rose City	4.1
13 Z16-DR	4.0
14 Orbit	3.9
15 Z16-DRBM	3.8
16 Class One	3.5
17 Jasper II	3.4
18 Z16-DRBM2X	3.1
19 ORC 126	2.9
20 Oracle	2.3
21 Epic	2.3
LSD at 5% =	0.9

<sup>1</sup>9 = best turf quality



Table 6. Performance of fine fescue cultivars and selections in a turf trial seeded in September 2017 at Adelphia, NJ. Includes all entries from the 2017 Cooperative Turfgrass Breeders Test (CTBT).

Cultivar or Selection	Turf Quality <sup>1</sup> 2018 Avg.	Establishment <sup>2</sup> 12 Oct. 2017
<b>HARD FESCUE</b>		
1 PPG-FL 115	6.6	6.3
2 Z16-RHF	6.0	6.0
3 DLF-FL 53 M3	5.9	5.3
4 DLF-FL 64	5.9	5.3
5 PPG-FL 113	5.8	6.3
6 DLF-FL 63	5.8	5.7
7 ACF314	5.6	6.7
8 Beacon	5.5	6.3
9 DLF-FL 54 M3	5.3	5.7
10 AHF205	5.2	5.3
11 ACF303	5.2	6.3
12 AHF225	5.0	6.3
13 ACF328	5.0	7.0
14 AHF218	4.9	7.3
15 SR 3150	4.8	7.0
16 ACF319	4.7	6.7
17 AHF222	4.7	6.0
18 AHF211	4.5	7.0
19 ACF327	4.4	8.3
20 PST-4BND	4.4	4.7
21 Eureka II	3.9	7.0
22 ACF309	3.7	7.0
<b>CHEWINGS FESCUE</b>		
1 Radar	5.7	7.7
2 DLF-FRC 50	5.6	7.0
3 PPG-FRC 120	5.6	6.7
4 DLF-FRC 54	5.4	6.0
5 Z16-RCF	5.3	6.3
6 PPG-FRC 118	5.1	7.3
7 Sonar	4.9	8.0
8 PPG-FRC 113	4.8	4.3
9 DLF-FRC 51	4.8	8.0
10 Culumbra II	4.4	6.3

(Continued)

Table 6. Fine fescue turf trial, 2017 (CTBT) (continued).

Cultivar or Selection	Turf Quality <sup>1</sup> 2018 Avg.	Establishment <sup>2</sup> 12 Oct. 2017
<b>CHEWINGS FESCUE (continued)</b>		
11 Survivor	4.4	8.0
12 PST-4SWT	4.1	7.3
13 DLF-FRC 52	3.7	5.7
14 Koket	2.2	7.3
<b>SHEEPS FESCUE</b>		
1 PST-4GUD	4.6	3.7
2 PPG-FO 102	4.4	4.0
3 Bighorn GT	3.9	5.7
<b>SLENDER CREEPING RED FESCUE</b>		
1 SeaMist	3.9	8.7
2 Seabreeze GT	3.3	4.3
<b>STRONG CREEPING RED FESCUE</b>		
1 ASC295	4.6	5.0
2 PPG-FRR 115	4.5	7.7
3 DLF-FRR 79	4.3	6.3
4 PST-4CR7	4.2	8.3
5 PPG-FRR 116	4.1	7.3
6 ASC359	4.1	7.3
7 ASR197	4.1	8.3
8 ASC350	4.0	8.0
9 PPG-FRR 111	4.0	4.0
10 ASC361	4.0	7.3
11 ASC362	3.7	7.0
12 DLF-FRR 72 M2	3.7	8.3
13 PST-4BEN	3.7	5.0
14 ASC351	3.6	8.0
15 ASC348	3.6	6.0
16 ASC356	3.5	7.3
17 DLF-FRR 77	3.5	6.7
18 PST-4SP14	3.5	3.7
19 PST-4DR4	3.5	3.7
20 Z16-DRBM	3.5	7.7

(Continued)

Table 6. Fine fescue turf trial, 2017 (CTBT) (continued).

Cultivar or Selection	Turf Quality <sup>1</sup> 2018 Avg.	Establishment <sup>2</sup> 12 Oct. 2017
<b>STRONG CREEPING RED FESCUE (continued)</b>		
21 PST-4RUE	3.4	4.0
22 PST-4ED4	3.4	8.0
23 Shademaster III	3.4	6.3
24 ASC347	3.4	6.3
25 ASR175	3.3	3.7
26 PPG-FRR 114	3.2	9.0
27 Lustrous	3.2	8.7
28 ASC354	3.1	6.3
29 Xeric	3.0	7.0
30 Z16-DRBM2X	2.8	3.0
31 DLF-FRR 75	2.2	7.3
32 DLF-FRR 76	2.0	8.7
33 Boreal	1.9	9.0
LSD at 5% =	0.7	1.5

<sup>1</sup> 9 = best turf quality

<sup>2</sup> 9 = fastest establishment

Table 7. Yearly nitrogen (N) applied and mowing height (Ht) on fine fescue trials established at Adelphia, NJ.

	2014		2015		2016		2017		2018	
	N <sup>1</sup>	Ht <sup>2</sup>	N	Ht	N	Ht	N	Ht	N	Ht
Table 1 (2014).....	-	1.5	1.5	1.5	1.5	1.5	1.0	1.5	1.5	1.5
Table 2 (2014 NTEP).....	-	1.5	1.5	1.5	1.5	1.5	1.0	1.5	1.5	1.5
Table 3 (2015).....			-	1.5	1.0	1.5	1.0	1.5	1.5	1.5
Table 4 (2016).....					-	1.5	1.0	1.5	1.5	1.5
Table 5 (2017).....							-	1.5	1.5	1.5
Table 6 (2017 CTBT).....								-	1.5	1.5

<sup>1</sup>Annual N applied (lb/1000 ft<sup>2</sup>)

<sup>2</sup>Mowing height in inches