

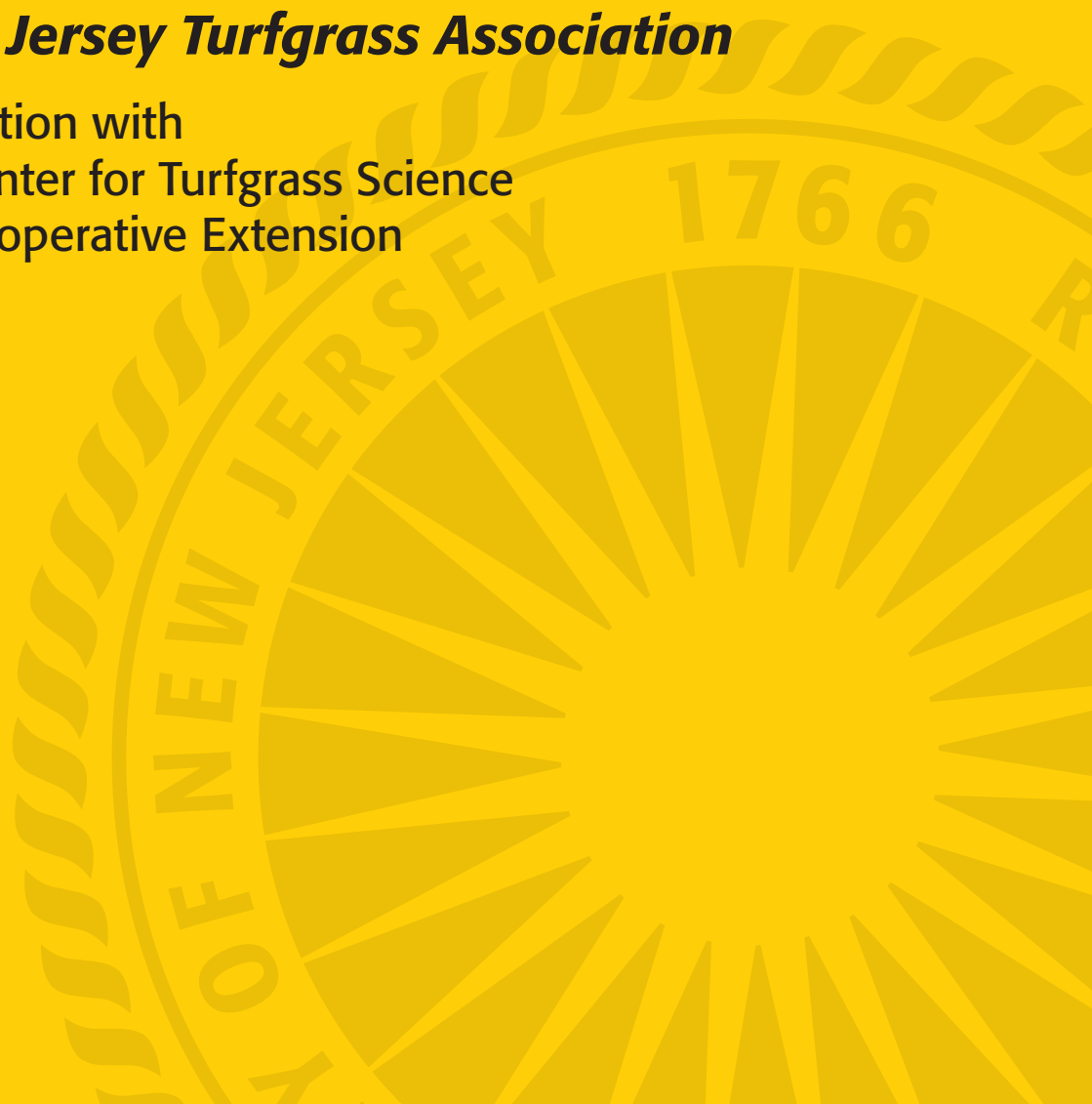
# RUTGERS

New Jersey Agricultural  
Experiment Station

## **2016 Turfgrass Proceedings**

***The New Jersey Turfgrass Association***

In Cooperation with  
Rutgers Center for Turfgrass Science  
Rutgers Cooperative Extension



# **2016 RUTGERS TURFGRASS PROCEEDINGS**

of the

## **GREEN EXPO Turf and Landscape Conference**

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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 2016 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 TALL FESCUE CULTIVARS AND SELECTIONS IN NEW JERSEY TURF TRIALS

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Tall fescue [*Schedonorus arundinaceus* (Schreb.) Dumort.], a cool season grass that is native to Europe and some parts of Africa (Buckner et al., 1979), was introduced to the United States in the 1600s (Beard, 2013). Tall fescue gained popularity after the release of the first commercial cultivar 'KY-31' in 1940, which enhanced forage production in United States. The utility of tall fescue extended to turfgrass after the release of the first turf type tall fescue cultivar 'Rebel' in 1979 (Funk et al., 1981). Since then, tall fescue has become one of the major cool season turf species used in the United States because of its winter hardiness, persistence, adaptability to a wider range of soils, and tolerance to shade and drought. Tall fescue has a deep root system that enhances drought tolerance and allows the plant to stay green longer in dry conditions. Tall fescue also has among the best heat tolerance of the cool-season grasses. These qualities have increased the use of tall fescue in home lawns, sports fields, golf course roughs, recreational fields, sod farms, and roadsides.

The Rutgers tall fescue breeding program has focused on turf quality (darker leaf color, lower growth habit, finer leaf texture, and denser turf canopy) and the presence of endophytes that convey resistance to insects that feed above ground. Endophytic fungi live symbiotically inside the stem and leaf tissues (intercellular areas) and produce alkaloids that enhance tolerance to above ground insect feeding (Funk et al., 1993). The incorporation of endophytic fungi in tall fescue has been a major breeding objective for many years.

One of the major limitations of tall fescue is its susceptibility to brown patch, a disease caused by

the fungus *Rhizoctonia solani*, in warm and humid regions. Brown patch, a soilborne disease of both cool season and warm season turfgrasses, causes blighted, circular to irregularly-shaped patches to form in the turf which quickly fade to light brown. Breeding for disease resistance is one of the main objectives of the Rutgers breeding program. The demand for disease resistant cultivars, with concurrent higher turf quality and superior performance, is high among consumers.

Red thread (caused by the fungus *Laetisaria fuciformis*) and pink patch caused by (*Limonomyces roseipellis*) are also problems when cool, humid conditions predominate. Symptoms appear as tan or pink circular patches of turf foliage with the signature red thread sclerotia on the leaf blades (red thread) and pink mycelial masses (pink patch) when humidity is high. One objective of the Rutgers turfgrass breeding program is to develop cultivars that are resistant to red thread to help reduce the need for fungicide applications and management costs for the end user.

The Rutgers turfgrass breeding program has continued to develop improved tall fescue cultivars. At present, thousands of germplasm sources have gone through numerous cycles of selection and hybridization to improve turf quality, disease resistance, billbug resistance, and wear and drought tolerance. To achieve these objectives, collected germplasm has also been incorporated in the breeding program to introduce beneficial genes into tall fescue populations. The program also utilizes a rainout shelter to screen for drought tolerance in tall fescue. As a result, this characteristic has greatly improved, which is a major goal for the tall fescue breeding program.

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## PROCEDURES

### Field Establishment and Maintenance

Five tall fescue trials were established at the Rutgers Plant Science Research and Extension Farm at Adelphia, NJ between 2012 and 2015 (Tables 1 to 5). All tests were established in September by hand sowing 1.41 oz of seed per 3 x 5 ft plot (5.9 lb per 1000 ft<sup>2</sup>), except for the 2012 NTEP test (Table 2) which was sown at the rate of 2.29 oz of seed per 4 x 6 ft plot (5.9 lb per 1000 ft<sup>2</sup>). All tests were arranged in randomized complete block design with three replications, and each plot had a 6-inch unseeded border to limit contamination.

Broadleaf weeds were controlled with spring or fall applications of 2,4-D, dicamba (Banvel), and MCPP. Dithiopyr (Dimension) was applied in spring to control annual grassy weeds. In July, metalaxyl (Subdue) was applied when required to prevent Pythium blight. Single applications of fertilizer did not exceed 1.0 lb nitrogen (N) per 1000 ft<sup>2</sup>. The amount and timing of N applied to the turf varied to encourage disease and other stresses (Table 6). Each trial at establishment received an application of 10-10-10 fertilizer at the rate of 1.0 lb per 1000 ft<sup>2</sup>. Field trials were mowed regularly (approximately 1 to 2 times per week) with rotary mowers to maintain a 1.5-inch height of cut.

The annual rate of N applied as well as mowing height for each test is presented in Table 6. Based on soil test results, lime was applied as needed to maintain a pH of 6.0 to 6.5. Irrigation was applied to each test as needed to avoid wilting.

### Visual Assessment

All tests were rated throughout the growing season for visual turf quality (i.e., overall appearance, turf color, uniformity, density, mowing quality, reduced vertical growth rate, leaf texture, and damage due to insects and diseases). Other ratings such as color and damage due to specific diseases were documented when significant differences were evident. All plots were rated on a 1 to 9 scale, where 9 represented the best results. Plots were evaluated by a number of turfgrass specialists to reduce the impact of personal bias for particular characteristics. All data were summarized and subjected to an analysis of variance. Means were separated using Fisher's

protected least significant difference (LSD) means separation test.

## RESULTS AND DISCUSSION

Results of tall fescue tests are found in Tables 1 through 5. Tests in Tables 1 to 4 are ranked by overall (multi-year) turf quality average; the test in Table 5 is ranked by turf quality in 2015. A high quality average is generally indicative of better disease resistance, a darker green color, greater turf density and uniformity, finer leaf texture, lower growth habit, improved mowing quality, and less damage due to insects.

### Turf Quality

Higher turf quality increases the utility of tall fescue in athletic fields, school grounds, sod farms, lawns, and parks. Turf quality characteristics include canopy density, uniformity, lower growth habit, finer leaf texture, dark green color, and tolerance to disease or environmental stress.

The selections and cultivars that had the highest quality ratings in the 2012 Tall Fescue test (Table 1) were Regenerate and 4th Millennium SRP, while the lowest quality selections and cultivars were Jaguar 4G and Arid 3. In the 2012 NTEP test (Table 2), the highest quality selections and cultivars were Regenerate, Rebounder, and Avenger II, with the lowest quality exhibited by BAR Fa 120878 and Ky-31. In the 2013 test (Table 3), the highest quality cultivars were Raptor III, 305 Comp, and TMT Comp; Scorpion II, 6-5-09TF, and AGRFA-190 ranked poorly. In the 2014 test (Table 4), the highest performing selections and cultivars were NT-3, 13TFC18, 3B3 Comp, and ROL Comp, and the lowest quality selections and cultivars were ATF 1255, Greystone, and PST-5BGR. In the 2015 test (Table 5), the highest performing selections and cultivars were SCR2 Comp, RS3 Comp, RS4 Comp, PPG-TF-239, and WN2 Comp, and the lowest quality selections and cultivars were Titan Ultra, Rendition RX, and Titan Rx.

### Color

The 2012 NTEP test (Table 2) was rated for color in 2015 September. This rating is based on a 1-9 scale where 1 = light green and 9 = dark green. The darkest selections and cultivars were RAD-TF-83 and 4th Millennium SRP, while the lightest colored

selections and cultivars were BAR Fa 120878 and Ky-31.

### Disease Resistance

**Brown patch**, a major disease of tall fescue, causes significant damage during humid and warm weather. Improved cultivars are available but none are completely resistant to this disease. In the 2012 test (Table 2), the selections and cultivars that were most resistant to this disease included Amity and LB08-4-12, whereas PST-Syn-5WIN, Stingray, and Renegade Supreme were least resistant. In the 2012 NTEP test (Table 2), the selections and cultivars that were most resistant were Avenger II, Technique, Rowdy, and MET 1, while the selections and cultivars that were least resistance were Warhawk, Marauder, and 204 Res. Blk 4. In the 2013 test (Table 3), entries that showed the greatest resistance were GTO, Raptor III, and Maestro, while those that were least resistant were PSM-6351, Renegade Supreme, TF 11-2 15, TF 11-2 14, and TF 11-2 4. In the 2014 test (Table 4), more resistant selections and cultivars were 3B3 Comp, PPG-TF 221, ROM Comp, and PPG-TF 211, while those that were least resistant were Jaguar 4G, TO8G2-R12, and NA-TDDM-VC. In the 2015 test (Table 5), the selections and cultivars that showed the greatest resistance were Amity, NAI-15-3N2, and Reflection, while the selections and cultivars that showed the least resistance were GO-MNKY, GO-MNKY-H, and GO-MINI.

**Red thread** can be problematic on tall fescue when the grass is growing slowly for reasons such as low fertility, drought stress, low light, or other environmental conditions not favorable for growth. The disease can occur from 40°F to 80°F; most aggressive symptoms develop at approximately 70°F. Developing genetic resistance to this disease would reduce the use of fungicides needed to control the disease and maintain a quality turf stand. In the 2014 Tall Fescue test (Table 4), the selections and cultivars most resistant to red thread were 13TFC18, PPG-TF 205, Regenerate, and PST-5BPO. Those that were least resistant included LS 1200, PPG-TF 221, PST-5W03, and Temple.

### Establishment

Improved establishment of tall fescue after seed sowing makes a sward denser and reduces soil erosion. Cultivars with improved establishment are in demand by turfgrass managers, sod growers, and

consumers. Rapid establishment is an objective for turf breeders to improve germination and tillering rates. The cultivars and selections that exhibited rapid establishment in the 2015 tall fescue test (Table 5) were PRT Comp, Firecracker SLS, and RS1 Comp. Those slowest to establish included GO-MNKY and GO-MNKY-H.

### SUMMARY

At Rutgers, turfgrass breeders are continuing to make progress in improving tall fescue to extend its acceptance in the turfgrass industry and among consumers. Resistance to brown patch, rapid establishment, and higher turf quality are among the primary goals of tall fescue breeding programs. Ongoing evaluation of cultivars and germplasm helps to identify superior lines that can be used by breeders to develop new cultivars. Efforts to collect germplasm and incorporate endophytes in tall fescue may lead to increased persistence and tolerance to above ground insect feeding and diseases. Therefore, the efforts to improve tall fescue would extend its utility to the areas where it has not been used before and would be suitable to different regions in United States.

### ACKNOWLEDGMENTS

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Table 1. Performance of tall fescue cultivars and selections in a turf trial established in September 2012 at Adelphia, NJ.

| Cultivar or Selection | -----Turf Quality <sup>1</sup> ----- |           |           |           |           | Brown Patch <sup>2</sup> |
|-----------------------|--------------------------------------|-----------|-----------|-----------|-----------|--------------------------|
|                       | 2013-2016 Avg.                       | 2013 Avg. | 2014 Avg. | 2015 Avg. | 2016 Avg. | 2016 Avg.                |
| 1 Regenerate          | 6.4                                  | 6.9       | 6.6       | 5.9       | 6.2       | 6.5                      |
| 2 4th Millennium SRP  | 6.4                                  | 6.5       | 6.2       | 6.3       | 6.4       | 6.3                      |
| 3 Annapolis           | 6.2                                  | 6.8       | 5.8       | 6.1       | 6.1       | 6.7                      |
| 4 Rebounder           | 6.2                                  | 7.0       | 6.0       | 6.2       | 5.5       | 5.2                      |
| 5 Traverse 2 SRP      | 6.2                                  | 6.4       | 6.0       | 6.0       | 6.2       | 5.8                      |
| 6 U41                 | 6.1                                  | 6.5       | 6.2       | 5.9       | 6.0       | 6.7                      |
| 7 Raptor III          | 6.1                                  | 6.4       | 5.7       | 6.1       | 6.2       | 6.7                      |
| 8 Hot Rod             | 6.0                                  | 5.9       | 5.8       | 6.1       | 6.1       | 6.0                      |
| 9 Avenger             | 6.0                                  | 6.1       | 6.0       | 6.0       | 5.9       | 6.7                      |
| 10 Supersonic         | 5.9                                  | 6.0       | 5.9       | 5.9       | 5.9       | 5.8                      |
| 11 YA2                | 5.9                                  | 6.2       | 5.8       | 5.8       | 5.8       | 4.5                      |
| 12 Amity              | 5.8                                  | 5.7       | 5.6       | 5.9       | 5.9       | 7.3                      |
| 13 MET3               | 5.8                                  | 5.9       | 5.5       | 5.6       | 6.1       | 6.3                      |
| 14 PPG-TF 150         | 5.8                                  | 5.5       | 5.5       | 6.1       | 5.9       | 5.7                      |
| 15 W41                | 5.7                                  | 5.6       | 5.5       | 5.9       | 5.9       | 5.7                      |
| 16 Paramount          | 5.7                                  | 5.6       | 5.6       | 5.8       | 5.8       | 5.5                      |
| 17 Valkyrie LS        | 5.7                                  | 6.0       | 5.3       | 5.6       | 5.7       | 6.5                      |
| 18 MET1               | 5.6                                  | 6.0       | 5.8       | 5.3       | 5.4       | 5.5                      |
| 19 LB08-4-12          | 5.6                                  | 5.7       | 5.5       | 5.5       | 5.9       | 6.8                      |
| 20 Firecracker SLS    | 5.6                                  | 5.8       | 5.5       | 5.5       | 5.7       | 5.8                      |
| 21 PPG-TF 116         | 5.6                                  | 6.2       | 5.3       | 5.4       | 5.5       | 5.8                      |
| 22 Titanium 2LS       | 5.6                                  | 6.1       | 5.3       | 5.6       | 5.5       | 5.5                      |
| 23 Leonardo           | 5.6                                  | 5.8       | 5.5       | 5.4       | 5.5       | 5.5                      |
| 24 Firebird 2         | 5.6                                  | 5.5       | 5.4       | 5.9       | 5.4       | 5.8                      |
| 25 PPG-TF 120         | 5.5                                  | 6.0       | 5.3       | 5.3       | 5.6       | 5.3                      |
| 26 PPG-TF-138         | 5.5                                  | 5.8       | 4.8       | 5.5       | 6.0       | 5.2                      |
| 27 PPG-TF 143         | 5.5                                  | 5.7       | 5.3       | 5.5       | 5.6       | 5.7                      |
| 28 PST-Syn-5A8        | 5.5                                  | 5.4       | 5.4       | 5.5       | 5.7       | 6.2                      |
| 29 PPG-TF 144         | 5.5                                  | 5.9       | 5.1       | 5.4       | 5.6       | 5.2                      |
| 30 RAD-TF84           | 5.5                                  | 6.2       | 5.0       | 5.3       | 5.5       | 3.7                      |
| 31 Screamer LS        | 5.5                                  | 5.3       | 5.2       | 5.6       | 5.8       | 6.5                      |
| 32 PPG-TF 106         | 5.5                                  | 6.2       | 5.2       | 5.4       | 5.2       | 5.2                      |
| 33 Cochise IV         | 5.5                                  | 6.3       | 4.9       | 5.2       | 5.5       | 4.5                      |
| 34 PPG-TF 173         | 5.5                                  | 5.5       | 5.3       | 5.6       | 5.6       | 4.7                      |
| 35 Rhambler 2 SPR     | 5.5                                  | 6.3       | 5.2       | 4.8       | 5.6       | 6.2                      |

(Continued)

Table 1. Tall fescue turf trial, 2012 (continued).

| Cultivar or Selection | -----Turf Quality <sup>1</sup> ----- |              |              |              |              | Brown Patch <sup>2</sup><br>2016<br>Avg. |
|-----------------------|--------------------------------------|--------------|--------------|--------------|--------------|------------------------------------------|
|                       | 2013-<br>2016<br>Avg.                | 2013<br>Avg. | 2014<br>Avg. | 2015<br>Avg. | 2016<br>Avg. |                                          |
| 36 Rowdy              | 5.5                                  | 6.4          | 4.7          | 5.3          | 5.4          | 6.2                                      |
| 37 Wichita            | 5.4                                  | 6.1          | 5.1          | 5.0          | 5.5          | 5.7                                      |
| 38 PPG-TF 153         | 5.4                                  | 5.7          | 5.5          | 5.2          | 5.4          | 5.3                                      |
| 39 LB08-1-12          | 5.4                                  | 6.2          | 5.2          | 5.0          | 5.4          | 4.3                                      |
| 40 PS-Fa-10-2         | 5.4                                  | 5.5          | 5.1          | 5.4          | 5.7          | 5.3                                      |
| 41 PSG 07-9TF         | 5.4                                  | 6.5          | 5.4          | 4.6          | 5.2          | 3.5                                      |
| 42 Selkirk            | 5.4                                  | 5.6          | 5.2          | 5.5          | 5.3          | 5.2                                      |
| 43 Trinity            | 5.4                                  | 5.5          | 5.2          | 5.1          | 5.9          | 6.5                                      |
| 44 Xtender            | 5.4                                  | 5.6          | 5.0          | 5.3          | 5.8          | 4.3                                      |
| 45 PSG 709509         | 5.4                                  | 5.8          | 4.8          | 5.3          | 5.6          | 5.0                                      |
| 46 F711               | 5.4                                  | 5.2          | 5.2          | 5.3          | 5.8          | 6.2                                      |
| 47 Bullseye           | 5.4                                  | 5.8          | 5.0          | 5.0          | 5.6          | 5.2                                      |
| 48 PPG-TF 146         | 5.3                                  | 5.6          | 5.2          | 5.1          | 5.5          | 5.0                                      |
| 49 SR 8650            | 5.3                                  | 5.5          | 5.2          | 5.4          | 5.2          | 5.3                                      |
| 50 PSM-6351           | 5.3                                  | 6.1          | 5.1          | 5.1          | 5.1          | 4.8                                      |
| 51 PPG-TF 154         | 5.3                                  | 5.5          | 5.1          | 5.0          | 5.8          | 5.2                                      |
| 52 PSG 07-05          | 5.3                                  | 6.2          | 4.9          | 4.7          | 5.4          | 4.7                                      |
| 53 PPG-TF 169         | 5.3                                  | 5.5          | 5.6          | 5.2          | 5.0          | 4.2                                      |
| 54 LB08-9-12          | 5.3                                  | 5.5          | 5.3          | 5.0          | 5.4          | 4.3                                      |
| 55 Firecracker LS     | 5.3                                  | 5.0          | 5.0          | 5.3          | 5.8          | 6.2                                      |
| 56 LB08-8-12          | 5.3                                  | 5.3          | 5.4          | 5.1          | 5.3          | 5.0                                      |
| 57 WDA1               | 5.3                                  | 5.4          | 5.3          | 5.3          | 5.2          | 4.7                                      |
| 58 PPG-TF 140         | 5.2                                  | 5.8          | 5.0          | 4.9          | 5.2          | 5.3                                      |
| 59 PSG 6008           | 5.2                                  | 5.9          | 4.8          | 5.1          | 5.2          | 4.2                                      |
| 60 Mustang 4          | 5.2                                  | 5.1          | 5.1          | 5.0          | 5.7          | 6.3                                      |
| 61 Terrano            | 5.2                                  | 5.9          | 5.0          | 4.9          | 5.0          | 5.0                                      |
| 62 PPG-TF 141         | 5.2                                  | 5.8          | 5.0          | 4.9          | 5.1          | 4.8                                      |
| 63 Ares               | 5.2                                  | 5.6          | 4.9          | 4.9          | 5.3          | 4.5                                      |
| 64 PST-5T20           | 5.2                                  | 5.8          | 4.5          | 5.3          | 5.1          | 4.5                                      |
| 65 PST-5JUBY          | 5.2                                  | 5.0          | 5.2          | 5.5          | 5.1          | 4.8                                      |
| 66 LB08-7-12          | 5.2                                  | 5.8          | 4.9          | 4.7          | 5.2          | 6.3                                      |
| 67 LB08-3-12          | 5.2                                  | 5.1          | 5.1          | 4.8          | 5.5          | 4.2                                      |
| 68 LB07-3-11          | 5.2                                  | 6.0          | 4.9          | 4.6          | 5.2          | 3.5                                      |
| 69 Fesnova            | 5.1                                  | 6.0          | 5.0          | 4.7          | 4.8          | 4.3                                      |
| 70 Monet              | 5.1                                  | 5.4          | 4.8          | 5.1          | 5.0          | 5.8                                      |

(Continued)



Table 1. Tall fescue turf trial, 2012 (continued).

| Cultivar or Selection | -----Turf Quality <sup>1</sup> ----- |           |           |           |           | Brown Patch <sup>2</sup> |
|-----------------------|--------------------------------------|-----------|-----------|-----------|-----------|--------------------------|
|                       | 2013-2016 Avg.                       | 2013 Avg. | 2014 Avg. | 2015 Avg. | 2016 Avg. | 2016 Avg.                |
| 71 LB08-6-12          | 5.1                                  | 5.6       | 4.4       | 5.1       | 5.3       | 5.7                      |
| 72 Falcon V           | 5.0                                  | 5.0       | 4.9       | 4.9       | 5.4       | 6.5                      |
| 73 PS-Fa-09-7-10      | 5.0                                  | 6.0       | 4.9       | 4.3       | 4.9       | 4.2                      |
| 74 Persuasion         | 5.0                                  | 5.3       | 4.8       | 4.6       | 5.3       | 4.0                      |
| 75 LB07-1-11          | 5.0                                  | 5.7       | 4.8       | 4.6       | 5.0       | 3.8                      |
| 76 LB08-5-12          | 5.0                                  | 5.5       | 4.4       | 4.7       | 5.2       | 4.2                      |
| 77 Guardian 41        | 5.0                                  | 5.4       | 4.4       | 5.0       | 5.0       | 4.2                      |
| 78 PS-Fa-09-7-21      | 5.0                                  | 5.8       | 4.7       | 4.6       | 4.8       | 3.5                      |
| 79 LS 1200            | 4.9                                  | 5.2       | 4.8       | 4.8       | 5.0       | 5.3                      |
| 80 PPG-TF 125         | 4.9                                  | 4.8       | 4.9       | 5.2       | 4.8       | 4.5                      |
| 81 PSG 5908           | 4.9                                  | 5.7       | 4.5       | 4.7       | 4.8       | 4.8                      |
| 82 Shenandoah III     | 4.9                                  | 4.8       | 4.6       | 5.1       | 5.1       | 4.3                      |
| 83 Dynamite LS        | 4.9                                  | 5.3       | 4.5       | 4.5       | 5.3       | 5.0                      |
| 84 Penn RK4           | 4.9                                  | 5.2       | 4.7       | 4.6       | 5.0       | 4.5                      |
| 85 PST-5WAL           | 4.9                                  | 5.0       | 4.6       | 4.8       | 5.1       | 5.7                      |
| 86 Black Tie          | 4.9                                  | 5.1       | 4.8       | 4.7       | 4.9       | 4.2                      |
| 87 STR 86QRH          | 4.9                                  | 5.4       | 4.7       | 4.8       | 4.5       | 3.5                      |
| 88 LB07-4-11          | 4.8                                  | 5.5       | 4.6       | 4.4       | 4.9       | 4.7                      |
| 89 Dynamic II         | 4.8                                  | 5.6       | 4.5       | 4.6       | 4.7       | 4.8                      |
| 90 PST-Syn-5WAZ       | 4.8                                  | 4.4       | 4.7       | 5.0       | 5.1       | 6.0                      |
| 91 LB08-2-12          | 4.8                                  | 5.3       | 4.6       | 4.5       | 4.8       | 5.2                      |
| 92 Hudson             | 4.8                                  | 5.7       | 4.6       | 4.3       | 4.7       | 4.5                      |
| 93 PSG 39-05          | 4.8                                  | 5.5       | 4.5       | 4.7       | 4.5       | 4.2                      |
| 94 Talledaga          | 4.8                                  | 5.4       | 4.4       | 4.6       | 4.7       | 6.2                      |
| 95 LB07-5-11          | 4.8                                  | 5.2       | 4.7       | 4.2       | 4.9       | 3.8                      |
| 96 PS-Fa-09-7-Bulk    | 4.8                                  | 5.1       | 4.5       | 4.6       | 4.8       | 5.0                      |
| 97 Crossfire 3        | 4.8                                  | 5.8       | 4.1       | 4.3       | 4.8       | 3.8                      |
| 98 PST-5FDR           | 4.7                                  | 5.6       | 4.8       | 4.3       | 4.2       | 4.3                      |
| 99 3rd Millennium     | 4.7                                  | 5.4       | 4.3       | 4.6       | 4.6       | 5.0                      |
| 100 PST-Syn-5WAB      | 4.7                                  | 4.2       | 4.6       | 4.9       | 5.2       | 5.2                      |
| 101 LB07-7-11         | 4.7                                  | 5.5       | 4.6       | 4.3       | 4.5       | 4.8                      |
| 102 Darlington        | 4.7                                  | 5.6       | 4.3       | 4.3       | 4.5       | 4.2                      |
| 103 PST-5SXD          | 4.7                                  | 5.1       | 4.4       | 4.7       | 4.6       | 3.3                      |
| 104 PS-Fa-09-7-11     | 4.7                                  | 5.5       | 4.4       | 4.2       | 4.6       | 4.5                      |
| 105 8NJMD             | 4.7                                  | 5.0       | 4.3       | 4.7       | 4.7       | 4.7                      |

(Continued)

Table 1. Tall fescue turf trial, 2012 (continued).

| Cultivar or Selection | -----Turf Quality <sup>1</sup> ----- |              |              |              |              | Brown Patch <sup>2</sup><br>2016<br>Avg. |
|-----------------------|--------------------------------------|--------------|--------------|--------------|--------------|------------------------------------------|
|                       | 2013-<br>2016<br>Avg.                | 2013<br>Avg. | 2014<br>Avg. | 2015<br>Avg. | 2016<br>Avg. |                                          |
| 106 PST-5W03          | 4.7                                  | 4.7          | 4.6          | 4.8          | 4.5          | 5.5                                      |
| 107 PPG-TF 115        | 4.6                                  | 5.4          | 4.1          | 4.2          | 4.8          | 5.7                                      |
| 108 Rebel Xtreme      | 4.6                                  | 5.7          | 4.5          | 4.2          | 4.2          | 5.0                                      |
| 109 Inferno           | 4.6                                  | 5.4          | 4.4          | 4.4          | 4.3          | 4.8                                      |
| 110 8NJMT             | 4.6                                  | 5.0          | 4.4          | 4.6          | 4.5          | 5.0                                      |
| 111 LB07-2-11         | 4.6                                  | 5.0          | 4.6          | 4.3          | 4.7          | 3.8                                      |
| 112 PSG 85QR          | 4.6                                  | 5.5          | 4.0          | 4.4          | 4.7          | 3.7                                      |
| 113 PS-Fa-09-7-23     | 4.6                                  | 5.3          | 4.4          | 4.2          | 4.5          | 3.2                                      |
| 114 Gazelle II        | 4.6                                  | 4.9          | 4.4          | 4.4          | 4.6          | 4.2                                      |
| 115 PS-Fa-09-7-7      | 4.6                                  | 4.9          | 4.3          | 4.4          | 4.7          | 4.3                                      |
| 116 Van Gogh          | 4.6                                  | 4.8          | 4.5          | 4.5          | 4.4          | 4.7                                      |
| 117 PS-Fa-09-7-1      | 4.6                                  | 4.4          | 4.2          | 4.5          | 5.1          | 4.0                                      |
| 118 Cumberland        | 4.5                                  | 4.8          | 4.3          | 4.3          | 4.8          | 5.0                                      |
| 119 8GR841            | 4.5                                  | 5.1          | 4.2          | 4.5          | 4.4          | 3.2                                      |
| 120 Corona            | 4.5                                  | 5.2          | 4.1          | 4.1          | 4.6          | 5.2                                      |
| 121 Duration          | 4.5                                  | 4.7          | 4.1          | 4.5          | 4.8          | 4.5                                      |
| 122 PS-Fa-09-7-5      | 4.5                                  | 4.7          | 4.2          | 4.4          | 4.7          | 5.2                                      |
| 123 Spyder LS         | 4.5                                  | 4.7          | 4.3          | 4.5          | 4.5          | 4.3                                      |
| 124 Speedway          | 4.5                                  | 4.6          | 4.5          | 4.3          | 4.5          | 4.8                                      |
| 125 PST-Syn-5MET      | 4.5                                  | 4.0          | 4.5          | 4.5          | 4.8          | 4.7                                      |
| 126 PPG-TF 101        | 4.4                                  | 4.9          | 4.0          | 4.1          | 4.8          | 5.8                                      |
| 127 Blackwatch 2      | 4.4                                  | 4.5          | 4.4          | 4.6          | 4.2          | 4.3                                      |
| 128 Six Point         | 4.4                                  | 4.5          | 4.0          | 4.4          | 4.7          | 5.2                                      |
| 129 Rendition RX      | 4.4                                  | 5.0          | 4.3          | 4.0          | 4.2          | 5.0                                      |
| 130 Endeavor II       | 4.3                                  | 4.4          | 3.9          | 4.6          | 4.5          | 5.8                                      |
| 131 Rain Dance        | 4.3                                  | 4.2          | 4.2          | 4.2          | 4.6          | 4.5                                      |
| 132 Renegade Supreme  | 4.3                                  | 4.9          | 4.1          | 4.0          | 4.3          | 2.8                                      |
| 133 LB07-6-11         | 4.3                                  | 4.8          | 4.3          | 3.9          | 4.2          | 3.5                                      |
| 134 Falcon IV         | 4.3                                  | 5.0          | 3.8          | 4.1          | 4.3          | 4.0                                      |
| 135 Covenant II       | 4.3                                  | 4.7          | 4.2          | 4.2          | 4.1          | 4.2                                      |
| 136 Shenandoah Sport  | 4.3                                  | 5.1          | 4.2          | 4.0          | 3.9          | 4.0                                      |
| 137 PS-Fa-09-7-24     | 4.3                                  | 5.0          | 3.9          | 3.9          | 4.2          | 4.3                                      |
| 138 PST-525D          | 4.3                                  | 4.0          | 4.1          | 4.5          | 4.4          | 4.3                                      |
| 139 Rebel XLR         | 4.2                                  | 4.3          | 4.1          | 4.3          | 4.3          | 5.3                                      |
| 140 STR 8GRQR         | 4.2                                  | 4.3          | 4.2          | 4.2          | 4.1          | 3.5                                      |

(Continued)

Table 1. Tall fescue turf trial, 2012 (continued).

| Cultivar or Selection | -----Turf Quality <sup>1</sup> ----- |              |              |              |              | Brown Patch <sup>2</sup><br>2016<br>Avg. |
|-----------------------|--------------------------------------|--------------|--------------|--------------|--------------|------------------------------------------|
|                       | 2013-<br>2016<br>Avg.                | 2013<br>Avg. | 2014<br>Avg. | 2015<br>Avg. | 2016<br>Avg. |                                          |
| 141 PST-Syn-5WIN      | 4.2                                  | 4.2          | 4.2          | 4.2          | 4.1          | 3.0                                      |
| 142 Shenandoah Elite  | 4.1                                  | 3.9          | 4.2          | 4.4          | 4.1          | 3.3                                      |
| 143 PST-5SIS          | 4.1                                  | 3.8          | 4.1          | 4.4          | 4.2          | 4.7                                      |
| 144 Tarnation GT      | 4.1                                  | 4.7          | 3.6          | 3.8          | 4.3          | 5.3                                      |
| 145 Rebel Advance     | 4.1                                  | 4.3          | 4.0          | 4.1          | 3.9          | 4.0                                      |
| 146 Titanium LS       | 4.1                                  | 4.0          | 4.0          | 4.2          | 4.1          | 4.3                                      |
| 147 Stingray          | 4.1                                  | 4.5          | 3.8          | 4.0          | 3.9          | 3.0                                      |
| 148 PST-5BGR          | 4.0                                  | 4.3          | 4.0          | 4.1          | 3.7          | 5.2                                      |
| 149 Quest             | 4.0                                  | 4.8          | 3.9          | 3.9          | 3.6          | 4.5                                      |
| 150 Grande II         | 4.0                                  | 4.2          | 4.0          | 4.0          | 3.7          | 3.8                                      |
| 151 Finelawn Elite    | 4.0                                  | 4.1          | 3.8          | 3.9          | 4.0          | 4.3                                      |
| 152 Titan Ultra       | 4.0                                  | 4.2          | 3.7          | 3.8          | 4.1          | 4.0                                      |
| 153 Titanium          | 3.9                                  | 4.0          | 3.7          | 4.0          | 4.1          | 5.3                                      |
| 154 Virtue II         | 3.9                                  | 3.6          | 3.7          | 4.0          | 4.3          | 5.0                                      |
| 155 Greystone         | 3.8                                  | 3.9          | 3.7          | 3.9          | 3.9          | 3.5                                      |
| 156 Cezanne RZ        | 3.8                                  | 4.0          | 3.5          | 4.0          | 3.8          | 4.8                                      |
| 157 Penn ATF 1376     | 3.8                                  | 4.4          | 3.5          | 3.8          | 3.6          | 3.5                                      |
| 158 Sitka             | 3.7                                  | 4.5          | 3.8          | 3.5          | 3.2          | 4.2                                      |
| 159 Penn ATF 1258     | 3.7                                  | 4.0          | 3.3          | 3.8          | 3.9          | 4.7                                      |
| 160 Coronado TDH      | 3.7                                  | 4.0          | 3.4          | 3.6          | 3.7          | 5.3                                      |
| 161 Tar Heel II       | 3.7                                  | 3.6          | 3.4          | 3.8          | 3.9          | 4.8                                      |
| 162 Titan Rx          | 3.6                                  | 3.9          | 3.4          | 3.8          | 3.3          | 3.5                                      |
| 163 Jaguar 4G         | 3.5                                  | 3.8          | 3.3          | 3.6          | 3.5          | 3.8                                      |
| 164 Arid 3            | 3.5                                  | 3.7          | 3.1          | 3.6          | 3.4          | 3.5                                      |
| LSD at 5% =           | 0.4                                  | 0.8          | 0.6          | 0.6          | 0.6          | 1.7                                      |

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

<sup>2</sup>9 = least disease

Table 2. Performance of tall fescue cultivars and selections in the National Turf Test (NTEP) established in September 2012 at Adelphia, NJ.

| Cultivar or Selection | -----Turf Quality <sup>1</sup> ----- |              |              |              |              | Color <sup>2</sup><br>Oct.<br>2016 | Brown Patch <sup>3</sup><br>2016<br>Avg. |
|-----------------------|--------------------------------------|--------------|--------------|--------------|--------------|------------------------------------|------------------------------------------|
|                       | 2013-<br>2016<br>Avg.                | 2013<br>Avg. | 2014<br>Avg. | 2015<br>Avg. | 2016<br>Avg. |                                    |                                          |
| 1 Regenerate          | 6.5                                  | 6.6          | 6.5          | 6.8          | 6.1          | 8.0                                | 6.7                                      |
| 2 Rebounder           | 6.1                                  | 5.9          | 6.1          | 6.4          | 5.9          | 7.7                                | 5.3                                      |
| 3 Avenger II          | 6.1                                  | 5.5          | 6.3          | 6.0          | 6.5          | 6.0                                | 8.0                                      |
| 4 Rockwell            | 6.0                                  | 6.0          | 6.0          | 5.9          | 6.1          | 7.3                                | 7.0                                      |
| 5 4th Millennium SRP  | 6.0                                  | 6.2          | 6.1          | 6.2          | 5.5          | 8.3                                | 6.7                                      |
| 6 Thor                | 6.0                                  | 6.1          | 5.9          | 6.1          | 5.9          | 6.7                                | 5.8                                      |
| 7 Amity               | 6.0                                  | 5.8          | 6.0          | 6.5          | 5.5          | 7.3                                | 6.8                                      |
| 8 Titanium 2LS        | 5.9                                  | 6.1          | 6.3          | 5.8          | 5.5          | 7.3                                | 6.8                                      |
| 9 MET 1               | 5.9                                  | 5.8          | 6.0          | 5.8          | 6.1          | 7.7                                | 7.2                                      |
| 10 Firecracker SLS    | 5.9                                  | 6.4          | 5.8          | 5.6          | 5.9          | 7.3                                | 6.5                                      |
| 11 Supersonic         | 5.9                                  | 6.0          | 6.1          | 5.8          | 5.6          | 6.3                                | 5.7                                      |
| 12 Annapolis          | 5.9                                  | 6.5          | 5.4          | 6.0          | 5.6          | 8.0                                | 5.0                                      |
| 13 Traverse 2 SRP     | 5.9                                  | 6.2          | 6.0          | 6.0          | 5.2          | 8.0                                | 4.8                                      |
| 14 Fayette            | 5.8                                  | 6.3          | 5.3          | 5.8          | 5.7          | 7.3                                | 6.8                                      |
| 15 IS-TF 269 SEL      | 5.8                                  | 6.2          | 5.9          | 5.5          | 5.6          | 8.0                                | 6.7                                      |
| 16 Raptor III         | 5.7                                  | 5.8          | 5.7          | 5.8          | 5.4          | 7.3                                | 5.2                                      |
| 17 MET-3              | 5.7                                  | 5.5          | 5.8          | 5.7          | 5.6          | 7.0                                | 6.5                                      |
| 18 Rowdy              | 5.6                                  | 6.0          | 5.5          | 5.4          | 5.6          | 7.0                                | 7.3                                      |
| 19 Reflection         | 5.6                                  | 5.5          | 6.0          | 5.7          | 5.2          | 8.0                                | 4.3                                      |
| 20 Hot Rod            | 5.6                                  | 5.4          | 5.8          | 5.7          | 5.4          | 7.7                                | 6.0                                      |
| 21 Paramont           | 5.6                                  | 5.2          | 6.0          | 5.7          | 5.4          | 6.7                                | 7.0                                      |
| 22 Firewall           | 5.6                                  | 5.3          | 5.8          | 5.6          | 5.6          | 7.0                                | 5.7                                      |
| 23 Screamer LS        | 5.5                                  | 5.6          | 5.7          | 5.4          | 5.5          | 6.7                                | 6.0                                      |
| 24 Temple             | 5.5                                  | 5.7          | 5.7          | 5.3          | 5.3          | 7.0                                | 4.7                                      |
| 25 IS-TF 311          | 5.5                                  | 5.5          | 5.4          | 5.5          | 5.6          | 7.0                                | 6.3                                      |

(Continued)

Table 2. Tall fescue turf trial, 2012 (NTEP) (continued).

| Cultivar or Selection | -----Turf Quality <sup>1</sup> ----- |              |              |              |              | Color <sup>2</sup><br>Oct.<br>2016 | Brown Patch <sup>3</sup><br>2016<br>Avg. |
|-----------------------|--------------------------------------|--------------|--------------|--------------|--------------|------------------------------------|------------------------------------------|
|                       | 2013-<br>2016<br>Avg.                | 2013<br>Avg. | 2014<br>Avg. | 2015<br>Avg. | 2016<br>Avg. |                                    |                                          |
| 26 PSG-PO1            | 5.5                                  | 5.4          | 5.3          | 5.7          | 5.6          | 7.0                                | 5.5                                      |
| 27 Black Tail         | 5.5                                  | 5.8          | 5.5          | 5.2          | 5.4          | 8.0                                | 5.3                                      |
| 28 GTO                | 5.5                                  | 5.3          | 5.8          | 5.4          | 5.3          | 7.3                                | 6.2                                      |
| 29 PPG-TF-135         | 5.5                                  | 5.0          | 5.5          | 5.7          | 5.7          | 6.7                                | 6.5                                      |
| 30 Hemi               | 5.5                                  | 5.2          | 5.8          | 5.4          | 5.5          | 6.7                                | 6.7                                      |
| 31 ATF 1612           | 5.5                                  | 5.4          | 5.6          | 5.6          | 5.2          | 7.3                                | 5.3                                      |
| 32 Firebird 2         | 5.5                                  | 5.7          | 5.6          | 5.3          | 5.1          | 6.7                                | 5.0                                      |
| 33 Crossfire 4        | 5.5                                  | 5.8          | 5.6          | 5.4          | 5.0          | 7.0                                | 3.8                                      |
| 34 Maestro            | 5.4                                  | 5.3          | 5.4          | 5.3          | 5.6          | 6.3                                | 6.8                                      |
| 35 Valkyrie LS        | 5.4                                  | 5.3          | 5.8          | 5.4          | 5.2          | 6.0                                | 5.3                                      |
| 36 Thunderstruck      | 5.4                                  | 6.3          | 5.5          | 5.0          | 4.9          | 8.0                                | 4.5                                      |
| 37 Diablo             | 5.4                                  | 5.8          | 5.4          | 5.3          | 5.0          | 8.0                                | 4.5                                      |
| 38 Kingdom            | 5.4                                  | 5.8          | 5.8          | 5.2          | 4.8          | 7.0                                | 3.7                                      |
| 39 Technique          | 5.4                                  | 5.4          | 5.3          | 5.4          | 5.3          | 6.3                                | 7.5                                      |
| 40 IS-TF 308 SEL      | 5.4                                  | 5.0          | 5.6          | 5.2          | 5.6          | 7.0                                | 4.8                                      |
| 41 F711               | 5.4                                  | 5.0          | 5.7          | 5.3          | 5.4          | 7.7                                | 6.8                                      |
| 42 Olympus            | 5.3                                  | 6.0          | 5.8          | 5.0          | 4.5          | 7.3                                | 3.2                                      |
| 43 Faith              | 5.3                                  | 5.5          | 5.3          | 5.2          | 5.3          | 7.7                                | 6.0                                      |
| 44 Xtender            | 5.3                                  | 5.5          | 5.3          | 4.8          | 5.7          | 7.0                                | 5.3                                      |
| 45 Nightcrawler       | 5.3                                  | 6.4          | 5.2          | 4.8          | 4.8          | 6.3                                | 5.0                                      |
| 46 Bloodhound         | 5.3                                  | 4.9          | 5.4          | 5.4          | 5.4          | 6.3                                | 5.7                                      |
| 47 W41                | 5.3                                  | 5.1          | 5.8          | 4.9          | 5.2          | 7.0                                | 5.7                                      |
| 48 Wichita            | 5.2                                  | 5.7          | 5.2          | 5.2          | 4.9          | 7.3                                | 5.5                                      |
| 49 Bullseye           | 5.2                                  | 5.9          | 5.3          | 4.9          | 4.9          | 6.7                                | 5.2                                      |
| 50 Turfway            | 5.2                                  | 5.5          | 5.6          | 4.9          | 5.0          | 7.0                                | 4.8                                      |

(Continued)

Table 2. Tall fescue turf trial, 2012 (NTEP) (continued).

| Cultivar or Selection | -----Turf Quality <sup>1</sup> ----- |              |              |              |              | Color <sup>2</sup><br>Oct.<br>2016 | Brown Patch <sup>3</sup><br>2016<br>Avg. |
|-----------------------|--------------------------------------|--------------|--------------|--------------|--------------|------------------------------------|------------------------------------------|
|                       | 2013-<br>2016<br>Avg.                | 2013<br>Avg. | 2014<br>Avg. | 2015<br>Avg. | 2016<br>Avg. |                                    |                                          |
| 51 RAD-TF-89          | 5.2                                  | 5.7          | 5.3          | 4.9          | 5.0          | 7.7                                | 5.0                                      |
| 52 Trinity            | 5.2                                  | 5.1          | 5.5          | 5.1          | 5.3          | 6.3                                | 5.0                                      |
| 53 Foxhound           | 5.2                                  | 5.6          | 5.3          | 4.9          | 5.1          | 8.0                                | 4.7                                      |
| 54 Grande 3           | 5.2                                  | 4.8          | 5.7          | 5.4          | 5.0          | 7.7                                | 5.2                                      |
| 55 PPG-TF-138         | 5.2                                  | 5.1          | 5.2          | 4.9          | 5.6          | 7.3                                | 5.0                                      |
| 56 RAD-TF-92          | 5.2                                  | 5.6          | 5.4          | 4.8          | 5.0          | 7.7                                | 3.7                                      |
| 57 Leonardo           | 5.2                                  | 5.2          | 5.5          | 5.0          | 5.0          | 6.7                                | 4.8                                      |
| 58 K12-05             | 5.2                                  | 5.7          | 5.3          | 4.9          | 4.9          | 7.3                                | 3.3                                      |
| 59 JS 916             | 5.2                                  | 5.2          | 5.2          | 5.0          | 5.4          | 6.7                                | 5.8                                      |
| 60 TF-287             | 5.2                                  | 5.4          | 5.0          | 4.8          | 5.5          | 7.7                                | 5.5                                      |
| 61 ATF 1754           | 5.2                                  | 5.0          | 5.2          | 5.5          | 4.9          | 6.3                                | 4.8                                      |
| 62 Michalangelo       | 5.1                                  | 5.3          | 5.0          | 5.1          | 5.1          | 7.3                                | 5.3                                      |
| 63 RAD-TF-83          | 5.1                                  | 5.5          | 5.3          | 4.8          | 4.8          | 8.7                                | 4.5                                      |
| 64 PPG-TF-169         | 5.1                                  | 4.9          | 5.7          | 5.1          | 4.8          | 5.3                                | 4.3                                      |
| 65 Unitus             | 5.1                                  | 6.0          | 4.6          | 4.7          | 5.1          | 7.3                                | 6.3                                      |
| 66 Hover              | 5.1                                  | 5.4          | 5.2          | 4.7          | 5.1          | 7.3                                | 5.0                                      |
| 67 Embrace            | 5.1                                  | 5.1          | 5.4          | 5.1          | 4.7          | 6.0                                | 5.2                                      |
| 68 Rhambler 2 SRP     | 5.0                                  | 6.1          | 4.4          | 4.9          | 4.8          | 7.3                                | 5.3                                      |
| 69 Falcon V           | 5.0                                  | 5.0          | 4.8          | 5.0          | 5.0          | 6.0                                | 6.2                                      |
| 70 ATF 1704           | 5.0                                  | 4.7          | 5.2          | 5.2          | 4.9          | 7.0                                | 5.5                                      |
| 71 Fesnova            | 5.0                                  | 5.7          | 5.0          | 4.5          | 4.7          | 6.7                                | 4.8                                      |
| 72 K12-MCD            | 4.9                                  | 4.9          | 4.9          | 4.9          | 4.8          | 6.0                                | 6.2                                      |
| 73 PPG-TF-115         | 4.9                                  | 5.3          | 4.8          | 4.5          | 4.9          | 6.0                                | 5.7                                      |
| 74 Hounddog 8         | 4.9                                  | 4.7          | 5.2          | 4.7          | 4.8          | 7.7                                | 4.7                                      |
| 75 Meridian           | 4.9                                  | 5.0          | 4.8          | 4.7          | 5.0          | 6.7                                | 4.2                                      |

(Continued)

Table 2. Tall fescue turf trial, 2012 (NTEP) (continued).

| Cultivar or Selection | -----Turf Quality <sup>1</sup> ----- |              |              |              |              | Color <sup>2</sup><br>Oct.<br>2016 | Brown Patch <sup>3</sup><br>2016<br>Avg. |
|-----------------------|--------------------------------------|--------------|--------------|--------------|--------------|------------------------------------|------------------------------------------|
|                       | 2013-<br>2016<br>Avg.                | 2013<br>Avg. | 2014<br>Avg. | 2015<br>Avg. | 2016<br>Avg. |                                    |                                          |
| 76 IS-TF 272          | 4.8                                  | 4.7          | 4.9          | 4.8          | 4.8          | 8.0                                | 3.7                                      |
| 77 Rhizing Moon       | 4.8                                  | 5.1          | 4.8          | 4.5          | 4.7          | 7.3                                | 6.5                                      |
| 78 Catalyst           | 4.8                                  | 4.6          | 4.7          | 4.7          | 5.0          | 6.0                                | 5.8                                      |
| 79 ATF 1736           | 4.8                                  | 4.9          | 4.6          | 4.7          | 4.9          | 6.0                                | 4.8                                      |
| 80 Terrano            | 4.7                                  | 5.5          | 4.6          | 4.6          | 4.1          | 5.3                                | 5.3                                      |
| 81 PST-5MVD           | 4.7                                  | 4.9          | 4.8          | 4.3          | 4.6          | 6.3                                | 5.5                                      |
| 82 JS 818             | 4.7                                  | 5.1          | 4.2          | 4.7          | 4.5          | 6.7                                | 4.0                                      |
| 83 IS-TF 276 M2       | 4.7                                  | 5.3          | 4.6          | 4.5          | 4.2          | 7.3                                | 5.0                                      |
| 84 BAR Fa 121095      | 4.6                                  | 4.6          | 4.6          | 4.6          | 4.8          | 6.7                                | 3.3                                      |
| 85 Saitillo           | 4.6                                  | 4.7          | 4.5          | 4.3          | 4.9          | 6.0                                | 5.3                                      |
| 86 PST-5BRK           | 4.6                                  | 5.1          | 4.6          | 4.4          | 4.3          | 5.3                                | 6.3                                      |
| 87 Ares               | 4.6                                  | 4.8          | 4.5          | 4.5          | 4.5          | 6.7                                | 3.8                                      |
| 88 PST-5DZP           | 4.5                                  | 4.9          | 4.2          | 4.6          | 4.4          | 6.0                                | 4.8                                      |
| 89 Ceasar             | 4.5                                  | 5.2          | 4.5          | 4.3          | 4.1          | 6.7                                | 4.7                                      |
| 90 Temptation         | 4.5                                  | 5.2          | 4.3          | 4.5          | 4.0          | 8.0                                | 4.7                                      |
| 91 Memphis            | 4.5                                  | 4.9          | 4.7          | 4.0          | 4.3          | 7.0                                | 3.7                                      |
| 92 PST-5BPO           | 4.5                                  | 4.0          | 4.5          | 4.5          | 4.7          | 7.7                                | 6.0                                      |
| 93 Comp. Res. SST     | 4.4                                  | 4.7          | 4.9          | 4.6          | 3.6          | 5.7                                | 2.2                                      |
| 94 Dynamite LS        | 4.3                                  | 4.8          | 4.0          | 4.1          | 4.4          | 7.3                                | 4.5                                      |
| 95 JS 819             | 4.3                                  | 5.0          | 4.2          | 3.9          | 4.2          | 6.7                                | 3.3                                      |
| 96 PSG-GSD            | 4.3                                  | 4.6          | 4.2          | 4.0          | 4.4          | 5.7                                | 5.7                                      |
| 97 Swagger            | 4.3                                  | 4.5          | 4.4          | 4.3          | 4.0          | 5.7                                | 5.5                                      |
| 98 PSG-8BP2           | 4.3                                  | 4.5          | 4.0          | 4.4          | 4.3          | 6.7                                | 3.7                                      |
| 99 BAR Fa 121089      | 4.2                                  | 4.2          | 4.3          | 4.1          | 4.3          | 7.0                                | 4.2                                      |
| 100 PSG-TT4           | 4.2                                  | 4.2          | 4.1          | 4.2          | 4.4          | 6.0                                | 4.3                                      |

(Continued)

Table 2. Tall fescue turf trial, 2012 (NTEP) (continued).

| Cultivar or Selection | -----Turf Quality <sup>1</sup> ----- |              |              |              |              | Color <sup>2</sup><br>Oct.<br>2016 | Brown Patch <sup>3</sup><br>2016<br>Avg. |
|-----------------------|--------------------------------------|--------------|--------------|--------------|--------------|------------------------------------|------------------------------------------|
|                       | 2013-<br>2016<br>Avg.                | 2013<br>Avg. | 2014<br>Avg. | 2015<br>Avg. | 2016<br>Avg. |                                    |                                          |
| 101 Frontline         | 4.2                                  | 5.0          | 4.2          | 3.8          | 3.7          | 6.7                                | 4.3                                      |
| 102 Rain Dance        | 4.1                                  | 4.1          | 4.1          | 4.2          | 4.1          | 6.0                                | 4.0                                      |
| 103 JS 809            | 4.1                                  | 4.7          | 4.1          | 3.9          | 3.7          | 6.3                                | 3.0                                      |
| 104 Annihilator       | 4.1                                  | 4.2          | 4.3          | 3.9          | 3.9          | 6.7                                | 2.2                                      |
| 105 Marauder          | 4.1                                  | 4.2          | 4.5          | 3.9          | 3.7          | 5.7                                | 1.8                                      |
| 106 204 Res. Blk 4    | 4.0                                  | 4.1          | 4.1          | 3.9          | 4.0          | 5.7                                | 1.5                                      |
| 107 K12-13            | 4.0                                  | 4.4          | 4.3          | 3.5          | 3.7          | 6.3                                | 2.8                                      |
| 108 Falcon IV         | 3.9                                  | 4.6          | 3.9          | 3.6          | 3.6          | 5.7                                | 4.7                                      |
| 109 Inspiration       | 3.7                                  | 4.1          | 3.3          | 3.4          | 3.9          | 6.7                                | 5.2                                      |
| 110 Warhawk           | 3.6                                  | 4.0          | 3.7          | 3.5          | 3.3          | 6.3                                | 2.0                                      |
| 111 BAR Fa 121091     | 3.6                                  | 3.0          | 3.5          | 3.7          | 4.1          | 7.0                                | 3.3                                      |
| 112 JS 825            | 3.6                                  | 4.3          | 3.4          | 3.1          | 3.4          | 6.3                                | 3.2                                      |
| 113 PST-5EX2          | 3.5                                  | 3.5          | 3.3          | 3.6          | 3.7          | 5.3                                | 6.8                                      |
| 114 Aquaduct          | 3.5                                  | 3.8          | 3.5          | 3.4          | 3.2          | 6.3                                | 3.3                                      |
| 115 BAR Fa 120878     | 2.1                                  | 2.6          | 2.1          | 2.0          | 1.9          | 4.0                                | 4.3                                      |
| 116 Ky-31             | 1.3                                  | 1.3          | 1.3          | 1.3          | 1.2          | 1.0                                | 5.7                                      |
| LSD at 5% =           | 0.5                                  | 0.8          | 0.7          | 0.7          | 0.7          | 1.6                                | 1.7                                      |

<sup>1</sup>9 = best turf quality  
<sup>2</sup>9 = best genetic color  
<sup>3</sup>9 = least disease



Table 3. Performance of tall fescue cultivars and selections in a turf trial established in September 2013 at Adelphia, NJ.

| Cultivar or Selection | -----Turf Quality <sup>1</sup> ----- |              |              |              | Brown Patch <sup>2</sup><br>Aug.<br>2016 |
|-----------------------|--------------------------------------|--------------|--------------|--------------|------------------------------------------|
|                       | 2014-<br>2016<br>Avg.                | 2014<br>Avg. | 2015<br>Avg. | 2016<br>Avg. |                                          |
| 1 Raptor III          | 6.8                                  | 6.5          | 6.4          | 7.4          | 6.3                                      |
| 2 305 Comp            | 6.6                                  | 6.3          | 6.4          | 7.1          | 5.7                                      |
| 3 TMT Comp            | 6.5                                  | 6.1          | 6.3          | 7.1          | 5.7                                      |
| 4 GTO                 | 6.2                                  | 5.6          | 5.9          | 7.0          | 7.3                                      |
| 5 Firewall            | 6.1                                  | 6.2          | 5.8          | 6.5          | 4.7                                      |
| 6 Avenger             | 6.0                                  | 5.8          | 6.0          | 6.3          | 4.0                                      |
| 7 Technique           | 6.0                                  | 5.8          | 5.9          | 6.4          | 4.3                                      |
| 8 Maestro             | 6.0                                  | 5.5          | 5.6          | 6.8          | 6.3                                      |
| 9 Supersonic          | 6.0                                  | 5.7          | 6.0          | 6.2          | 4.3                                      |
| 10 Screamer LS        | 5.8                                  | 5.8          | 5.7          | 5.9          | 4.0                                      |
| 11 1-11 TF-12         | 5.8                                  | 5.9          | 5.4          | 6.0          | 5.7                                      |
| 12 PPG-TF 177         | 5.8                                  | 5.6          | 5.7          | 6.0          | 4.3                                      |
| 13 8G1643-6           | 5.7                                  | 5.8          | 5.5          | 6.0          | 5.3                                      |
| 14 PPG-TF 195         | 5.7                                  | 5.8          | 5.3          | 6.1          | 4.7                                      |
| 15 1-11 TF-19         | 5.7                                  | 5.9          | 5.5          | 5.7          | 4.7                                      |
| 16 303 Comp           | 5.7                                  | 5.2          | 5.9          | 5.9          | 5.7                                      |
| 17 PST-5MINI          | 5.6                                  | 5.5          | 5.4          | 6.0          | 4.7                                      |
| 18 304 Comp           | 5.6                                  | 5.4          | 5.7          | 5.8          | 4.7                                      |
| 19 301 Comp           | 5.6                                  | 5.6          | 5.6          | 5.5          | 5.3                                      |
| 20 Reflection         | 5.6                                  | 5.3          | 5.4          | 6.0          | 5.0                                      |
| 21 PPG-TF 180         | 5.5                                  | 5.5          | 5.7          | 5.3          | 4.3                                      |
| 22 GO-AOTF            | 5.5                                  | 5.6          | 5.3          | 5.6          | 3.0                                      |
| 23 Saltillo           | 5.5                                  | 5.2          | 5.3          | 5.9          | 4.7                                      |
| 24 Selkirk            | 5.5                                  | 5.2          | 5.1          | 6.1          | 5.0                                      |
| 25 302 Comp           | 5.5                                  | 5.2          | 5.2          | 5.9          | 4.7                                      |
| 26 Firecracker SLS    | 5.5                                  | 5.4          | 5.5          | 5.5          | 3.7                                      |
| 27 1-11 TF-2          | 5.4                                  | 5.2          | 5.7          | 5.4          | 3.3                                      |
| 28 1-11 TF-5          | 5.4                                  | 5.5          | 5.2          | 5.5          | 4.7                                      |
| 29 Trinity            | 5.4                                  | 5.5          | 5.3          | 5.4          | 3.7                                      |
| 30 Persuasion         | 5.4                                  | 5.5          | 5.2          | 5.5          | 3.7                                      |
| 31 PPG-TF 154         | 5.4                                  | 5.7          | 5.2          | 5.3          | 3.7                                      |
| 32 PPG-TF 174         | 5.4                                  | 5.2          | 5.2          | 5.7          | 4.3                                      |
| 33 1-11 TF BULK       | 5.4                                  | 5.6          | 5.1          | 5.4          | 4.0                                      |
| 34 8G1643-10          | 5.3                                  | 5.2          | 5.5          | 5.3          | 6.0                                      |
| 35 Regenerate         | 5.3                                  | 4.9          | 5.2          | 5.9          | 4.7                                      |

(Continued)

Table 3. Tall fescue turf trial, 2013 (continued).

| Cultivar or Selection | -----Turf Quality <sup>1</sup> ----- |              |              |              | Brown Patch <sup>2</sup><br>Aug.<br>2016 |
|-----------------------|--------------------------------------|--------------|--------------|--------------|------------------------------------------|
|                       | 2014-<br>2016<br>Avg.                | 2014<br>Avg. | 2015<br>Avg. | 2016<br>Avg. |                                          |
| 36 PPG-TF 198         | 5.3                                  | 5.5          | 5.2          | 5.3          | 5.0                                      |
| 37 1-11 TF-7          | 5.3                                  | 5.3          | 5.3          | 5.3          | 4.7                                      |
| 38 PPG-TF 178         | 5.3                                  | 5.1          | 5.3          | 5.6          | 4.7                                      |
| 39 Annapolis          | 5.3                                  | 6.0          | 5.2          | 4.7          | 3.7                                      |
| 40 3rd Millennium     | 5.3                                  | 5.3          | 5.1          | 5.4          | 4.3                                      |
| 41 PPG-TF 182         | 5.3                                  | 5.6          | 5.1          | 5.2          | 2.7                                      |
| 42 Ventura            | 5.3                                  | 5.6          | 4.9          | 5.2          | 3.7                                      |
| 43 PPG-TF 173         | 5.2                                  | 5.4          | 5.2          | 5.1          | 3.0                                      |
| 44 PST-Syn-5DAW       | 5.2                                  | 5.5          | 5.0          | 5.1          | 4.0                                      |
| 45 PPG-TF 203         | 5.2                                  | 5.5          | 5.1          | 5.0          | 4.7                                      |
| 46 PPG-TF 189         | 5.2                                  | 5.1          | 5.1          | 5.4          | 4.7                                      |
| 47 1-11 TF-1          | 5.2                                  | 5.7          | 5.1          | 4.7          | 3.0                                      |
| 48 Valkyrie LS        | 5.2                                  | 5.3          | 5.1          | 5.1          | 5.0                                      |
| 49 PPG-TF 193         | 5.2                                  | 5.2          | 5.2          | 5.1          | 4.3                                      |
| 50 06-11 TF-15        | 5.2                                  | 5.2          | 4.7          | 5.6          | 4.7                                      |
| 51 Rowdy              | 5.2                                  | 5.9          | 5.0          | 4.6          | 4.0                                      |
| 52 PPG-TF 191         | 5.2                                  | 5.3          | 5.1          | 5.0          | 3.7                                      |
| 53 8G1643-1           | 5.1                                  | 5.2          | 5.0          | 5.2          | 5.3                                      |
| 54 Fesnova            | 5.1                                  | 5.6          | 5.0          | 4.8          | 3.3                                      |
| 55 BMT                | 5.1                                  | 5.0          | 5.1          | 5.3          | 4.0                                      |
| 56 Faith              | 5.1                                  | 5.3          | 4.9          | 5.2          | 4.0                                      |
| 57 1-11 TF-16         | 5.1                                  | 4.9          | 5.2          | 5.2          | 3.7                                      |
| 58 Titanium 2LS       | 5.1                                  | 5.7          | 4.7          | 5.0          | 3.7                                      |
| 59 8G1643-5           | 5.1                                  | 5.5          | 4.7          | 5.1          | 4.7                                      |
| 60 1-11 TF-13         | 5.1                                  | 5.6          | 5.2          | 4.5          | 3.3                                      |
| 61 PST-5BRK           | 5.1                                  | 5.3          | 4.9          | 5.0          | 4.3                                      |
| 62 Falcon IV          | 5.1                                  | 4.9          | 5.0          | 5.3          | 4.3                                      |
| 63 PST-5WAL           | 5.0                                  | 5.4          | 4.5          | 5.2          | 3.7                                      |
| 64 Xtender            | 5.0                                  | 4.8          | 4.9          | 5.2          | 3.7                                      |
| 65 Ares               | 5.0                                  | 5.5          | 4.9          | 4.6          | 2.7                                      |
| 66 PPG-TF 153         | 5.0                                  | 5.3          | 4.8          | 4.8          | 4.3                                      |
| 67 Mustang 4          | 5.0                                  | 5.4          | 4.7          | 4.8          | 3.7                                      |
| 68 Shortstop 3        | 5.0                                  | 5.6          | 4.8          | 4.4          | 3.7                                      |
| 69 PPG-TF 190         | 5.0                                  | 5.5          | 5.1          | 4.3          | 3.0                                      |
| 70 Terrano            | 5.0                                  | 5.7          | 4.7          | 4.5          | 2.7                                      |

(Continued)

Table 3. Tall fescue turf trial, 2013 (continued).

| Cultivar or Selection | -----Turf Quality <sup>1</sup> ----- |              |              |              | Brown Patch <sup>2</sup><br>Aug.<br>2016 |
|-----------------------|--------------------------------------|--------------|--------------|--------------|------------------------------------------|
|                       | 2014-<br>2016<br>Avg.                | 2014<br>Avg. | 2015<br>Avg. | 2016<br>Avg. |                                          |
| 71 Embrace            | 4.9                                  | 5.4          | 4.6          | 4.9          | 4.3                                      |
| 72 Rain Saver         | 4.9                                  | 5.2          | 4.6          | 5.1          | 4.3                                      |
| 73 8G1643 BULK        | 4.9                                  | 5.1          | 4.6          | 5.1          | 5.3                                      |
| 74 Dynamite LS        | 4.9                                  | 5.2          | 5.2          | 4.4          | 3.3                                      |
| 75 PST-5MCD           | 4.9                                  | 5.3          | 4.8          | 4.6          | 3.0                                      |
| 76 Meridian           | 4.9                                  | 5.5          | 4.5          | 4.8          | 2.7                                      |
| 77 8G1643-2           | 4.9                                  | 4.9          | 4.4          | 5.5          | 6.0                                      |
| 78 GO-MNKY            | 4.9                                  | 5.0          | 4.5          | 5.2          | 3.3                                      |
| 79 Monet              | 4.9                                  | 5.1          | 4.9          | 4.8          | 2.3                                      |
| 80 4-11 TF-6          | 4.9                                  | 5.2          | 4.8          | 4.7          | 4.3                                      |
| 81 4-11 TF-7          | 4.9                                  | 5.3          | 4.6          | 4.8          | 3.3                                      |
| 82 4-11 TF-5          | 4.9                                  | 5.2          | 4.6          | 4.9          | 3.7                                      |
| 83 Talladega          | 4.9                                  | 5.0          | 5.0          | 4.7          | 3.3                                      |
| 84 Rebounder          | 4.9                                  | 5.8          | 4.9          | 4.0          | 2.7                                      |
| 85 77-08TF            | 4.9                                  | 4.9          | 4.8          | 5.0          | 4.0                                      |
| 86 06-11 TF-4         | 4.9                                  | 5.4          | 4.9          | 4.4          | 3.7                                      |
| 87 PST-5T20           | 4.9                                  | 4.7          | 4.8          | 5.1          | 4.3                                      |
| 88 06-11 TF-3         | 4.9                                  | 5.1          | 4.6          | 4.9          | 4.0                                      |
| 89 Shenandoah Elite   | 4.9                                  | 5.3          | 5.0          | 4.3          | 3.3                                      |
| 90 4-11 TF-3          | 4.8                                  | 5.4          | 4.6          | 4.6          | 3.7                                      |
| 91 1-11 TF-11         | 4.8                                  | 5.6          | 4.9          | 4.0          | 2.3                                      |
| 92 PST-5BPO           | 4.8                                  | 5.2          | 4.7          | 4.6          | 4.3                                      |
| 93 8BP2 BULK          | 4.8                                  | 5.3          | 4.7          | 4.5          | 3.3                                      |
| 94 Shenandoah III     | 4.8                                  | 5.3          | 5.1          | 4.1          | 2.0                                      |
| 95 06-11 TF BULK      | 4.8                                  | 4.8          | 4.7          | 4.9          | 4.3                                      |
| 96 Speedway           | 4.8                                  | 5.2          | 4.7          | 4.5          | 3.0                                      |
| 97 4-11 TF-12         | 4.8                                  | 4.7          | 4.7          | 5.0          | 4.3                                      |
| 98 Quest              | 4.8                                  | 5.1          | 4.5          | 4.8          | 3.3                                      |
| 99 06-11 TF-14        | 4.8                                  | 5.0          | 4.3          | 5.1          | 4.7                                      |
| 100 Guardian 41       | 4.8                                  | 5.1          | 4.6          | 4.6          | 3.3                                      |
| 101 Inferno           | 4.8                                  | 5.1          | 4.7          | 4.5          | 3.0                                      |
| 102 PST-5DZP          | 4.8                                  | 5.4          | 4.8          | 4.1          | 2.7                                      |
| 103 PSM-6351          | 4.8                                  | 5.8          | 4.7          | 3.8          | 1.7                                      |
| 104 4-11 TF-4         | 4.7                                  | 4.7          | 4.6          | 5.0          | 4.7                                      |
| 105 PPG-TF 143        | 4.7                                  | 4.7          | 4.8          | 4.7          | 3.3                                      |

(Continued)

Table 3. Tall fescue turf trial, 2013 (continued).

| Cultivar or Selection | -----Turf Quality <sup>1</sup> ----- |              |              |              | Brown Patch <sup>2</sup><br>Aug.<br>2016 |
|-----------------------|--------------------------------------|--------------|--------------|--------------|------------------------------------------|
|                       | 2014-<br>2016<br>Avg.                | 2014<br>Avg. | 2015<br>Avg. | 2016<br>Avg. |                                          |
| 106 PST-5W03          | 4.7                                  | 5.0          | 4.7          | 4.5          | 3.7                                      |
| 107 06-11 TF-16       | 4.7                                  | 4.8          | 4.5          | 4.9          | 3.0                                      |
| 108 4-11 TF-9         | 4.7                                  | 5.1          | 4.5          | 4.6          | 3.0                                      |
| 109 Inspiration       | 4.7                                  | 5.3          | 4.7          | 4.1          | 3.3                                      |
| 110 TF-09-1-3         | 4.7                                  | 5.3          | 4.4          | 4.4          | 2.7                                      |
| 111 GSD               | 4.7                                  | 5.3          | 4.5          | 4.3          | 4.3                                      |
| 112 Padre             | 4.7                                  | 5.1          | 4.6          | 4.4          | 3.3                                      |
| 113 8BP2-1            | 4.7                                  | 4.9          | 4.4          | 4.7          | 3.7                                      |
| 114 Summer            | 4.7                                  | 4.9          | 4.8          | 4.4          | 3.0                                      |
| 115 PO1               | 4.7                                  | 5.5          | 4.4          | 4.2          | 2.7                                      |
| 116 FA-10-9-1         | 4.7                                  | 5.0          | 4.6          | 4.4          | 3.0                                      |
| 117 Gazelle II        | 4.7                                  | 5.3          | 4.4          | 4.3          | 2.7                                      |
| 118 LS 2000           | 4.7                                  | 5.2          | 4.3          | 4.5          | 2.7                                      |
| 119 PST-5MVD          | 4.7                                  | 4.8          | 4.7          | 4.5          | 3.7                                      |
| 120 Bladerunner 2     | 4.7                                  | 4.8          | 4.6          | 4.6          | 3.3                                      |
| 121 Tar Heel II       | 4.6                                  | 4.9          | 4.4          | 4.6          | 3.7                                      |
| 122 8BP2-7            | 4.6                                  | 5.2          | 4.4          | 4.3          | 2.7                                      |
| 123 TF-09-1-9         | 4.6                                  | 4.9          | 4.6          | 4.4          | 2.7                                      |
| 124 1-11 TF-14        | 4.6                                  | 5.4          | 4.4          | 4.1          | 2.7                                      |
| 125 8BP2-4            | 4.6                                  | 5.0          | 4.7          | 4.1          | 2.7                                      |
| 126 Cochise IV        | 4.6                                  | 5.4          | 4.2          | 4.2          | 2.3                                      |
| 127 Tarnation GT      | 4.6                                  | 5.0          | 4.4          | 4.4          | 3.0                                      |
| 128 PSG 08-6          | 4.6                                  | 5.0          | 4.5          | 4.3          | 4.3                                      |
| 129 TF-09-1-2         | 4.6                                  | 5.2          | 4.3          | 4.3          | 3.3                                      |
| 130 Spyder LS         | 4.6                                  | 4.8          | 4.7          | 4.2          | 2.3                                      |
| 131 TF 09-6           | 4.6                                  | 4.7          | 4.6          | 4.4          | 4.0                                      |
| 132 Bullseye          | 4.6                                  | 4.9          | 4.8          | 4.1          | 3.0                                      |
| 133 4-11 TF-1         | 4.6                                  | 4.3          | 4.3          | 5.1          | 4.7                                      |
| 134 TF-09-1-7         | 4.6                                  | 4.8          | 4.6          | 4.3          | 3.0                                      |
| 135 Justice           | 4.5                                  | 4.6          | 4.6          | 4.4          | 3.0                                      |
| 136 Renegade Supreme  | 4.5                                  | 4.9          | 4.6          | 4.2          | 1.7                                      |
| 137 FA-10-9-6         | 4.5                                  | 4.7          | 4.3          | 4.6          | 4.3                                      |
| 138 06-11 TF-12       | 4.5                                  | 4.8          | 4.3          | 4.4          | 3.3                                      |
| 139 PST-5BGR          | 4.5                                  | 5.0          | 4.5          | 4.1          | 3.3                                      |
| 140 Stingray          | 4.5                                  | 4.9          | 4.7          | 4.0          | 2.3                                      |

(Continued)

Table 3. Tall fescue turf trial, 2013 (continued).

| Cultivar or Selection | -----Turf Quality <sup>1</sup> ----- |              |              |              | Brown Patch <sup>2</sup><br>Aug.<br>2016 |
|-----------------------|--------------------------------------|--------------|--------------|--------------|------------------------------------------|
|                       | 2014-<br>2016<br>Avg.                | 2014<br>Avg. | 2015<br>Avg. | 2016<br>Avg. |                                          |
| 141 Crossfire 3       | 4.5                                  | 5.1          | 4.5          | 3.9          | 2.7                                      |
| 142 8G1643-4          | 4.5                                  | 5.3          | 4.1          | 4.1          | 2.3                                      |
| 143 Cumberland        | 4.5                                  | 5.2          | 4.1          | 4.2          | 3.0                                      |
| 144 TF 11-2 15        | 4.5                                  | 5.2          | 4.4          | 3.9          | 1.7                                      |
| 145 8BP2-6            | 4.5                                  | 5.0          | 4.3          | 4.1          | 3.0                                      |
| 146 8BP2-8            | 4.5                                  | 4.8          | 4.3          | 4.3          | 2.3                                      |
| 147 Grande 3          | 4.4                                  | 5.4          | 4.3          | 3.6          | 2.3                                      |
| 148 4-11 TF BULK      | 4.4                                  | 4.8          | 4.1          | 4.4          | 3.7                                      |
| 149 Jaguar 4G         | 4.4                                  | 4.7          | 4.3          | 4.3          | 2.7                                      |
| 150 TF-09-1-5         | 4.4                                  | 5.2          | 4.4          | 3.8          | 2.7                                      |
| 151 AT51              | 4.4                                  | 4.6          | 4.9          | 3.8          | 2.0                                      |
| 152 Hudson            | 4.4                                  | 5.3          | 4.1          | 3.8          | 3.0                                      |
| 153 Sequester         | 4.4                                  | 4.7          | 4.5          | 4.0          | 3.7                                      |
| 154 8ST10W-6          | 4.4                                  | 4.7          | 4.6          | 3.9          | 2.3                                      |
| 155 DaVinci           | 4.4                                  | 4.6          | 4.8          | 3.8          | 2.3                                      |
| 156 ATV 412           | 4.4                                  | 4.8          | 4.3          | 4.0          | 3.0                                      |
| 157 8BP2-5            | 4.4                                  | 4.8          | 4.1          | 4.2          | 2.3                                      |
| 158 FA-10-9 BULK      | 4.4                                  | 4.8          | 4.4          | 3.9          | 2.7                                      |
| 159 FA-10-9-12        | 4.4                                  | 4.8          | 4.2          | 4.1          | 3.3                                      |
| 160 TF 11-2 10        | 4.3                                  | 4.7          | 4.2          | 4.2          | 3.0                                      |
| 161 8G1643-9          | 4.3                                  | 5.0          | 4.3          | 3.8          | 2.7                                      |
| 162 TF 11-2 3         | 4.3                                  | 4.9          | 4.3          | 3.8          | 2.0                                      |
| 163 8BP2-3            | 4.3                                  | 4.9          | 4.3          | 3.7          | 2.7                                      |
| 164 ATF 1532          | 4.3                                  | 4.4          | 4.3          | 4.3          | 3.0                                      |
| 165 8G1643-8          | 4.3                                  | 4.6          | 4.7          | 3.7          | 2.3                                      |
| 166 Shenandoah II     | 4.3                                  | 4.4          | 4.3          | 4.2          | 2.0                                      |
| 167 06-11 TF-18       | 4.3                                  | 4.8          | 4.0          | 4.2          | 3.7                                      |
| 168 TF-09-1-8         | 4.3                                  | 4.8          | 4.0          | 4.1          | 2.7                                      |
| 169 Titan Rx          | 4.3                                  | 4.6          | 4.1          | 4.2          | 3.3                                      |
| 170 Blackwatch 2      | 4.3                                  | 4.5          | 4.6          | 3.8          | 2.0                                      |
| 171 Wolfpack II       | 4.3                                  | 4.6          | 4.2          | 4.1          | 2.0                                      |
| 172 8ST10W-8          | 4.3                                  | 4.2          | 4.4          | 4.2          | 3.3                                      |
| 173 FA-10-9-5         | 4.3                                  | 4.8          | 4.1          | 4.0          | 3.0                                      |
| 174 PST-5EX2          | 4.3                                  | 4.8          | 4.2          | 3.8          | 2.3                                      |
| 175 Rendition Rx      | 4.2                                  | 4.2          | 4.5          | 4.0          | 2.0                                      |

(Continued)

Table 3. Tall fescue turf trial, 2013 (continued).

| Cultivar or Selection | -----Turf Quality <sup>1</sup> ----- |              |              |              | Brown Patch <sup>2</sup><br>Aug.<br>2016 |
|-----------------------|--------------------------------------|--------------|--------------|--------------|------------------------------------------|
|                       | 2014-<br>2016<br>Avg.                | 2014<br>Avg. | 2015<br>Avg. | 2016<br>Avg. |                                          |
| 176 Titan Ultra       | 4.2                                  | 4.3          | 4.2          | 4.2          | 2.7                                      |
| 177 SR 8650           | 4.2                                  | 4.6          | 4.0          | 4.1          | 3.0                                      |
| 178 Crewcut II        | 4.2                                  | 4.7          | 4.2          | 3.8          | 2.3                                      |
| 179 Cezanne RZ        | 4.2                                  | 4.4          | 4.4          | 3.9          | 2.0                                      |
| 180 TF-09-1-11        | 4.2                                  | 4.6          | 3.9          | 4.1          | 4.0                                      |
| 181 8NJMT             | 4.2                                  | 4.8          | 4.0          | 3.7          | 2.3                                      |
| 182 TF 11-2 BULK      | 4.2                                  | 4.6          | 4.4          | 3.6          | 2.0                                      |
| 183 FA-10-9-7         | 4.2                                  | 4.7          | 4.1          | 3.7          | 3.0                                      |
| 184 Covenant II       | 4.2                                  | 4.7          | 4.0          | 3.8          | 3.0                                      |
| 185 8NJMD             | 4.1                                  | 4.6          | 4.0          | 3.8          | 2.7                                      |
| 186 TF 11-2 14        | 4.1                                  | 4.4          | 4.2          | 3.7          | 1.7                                      |
| 187 TF-09-1 BULK      | 4.1                                  | 4.3          | 4.2          | 3.8          | 2.3                                      |
| 188 Sungazer          | 4.1                                  | 4.7          | 3.8          | 3.7          | 3.0                                      |
| 189 TF 11-2 4         | 4.0                                  | 4.7          | 3.8          | 3.5          | 1.7                                      |
| 190 Masterpiece       | 3.9                                  | 4.0          | 4.1          | 3.7          | 2.7                                      |
| 191 Arid 3            | 3.9                                  | 4.2          | 3.8          | 3.9          | 2.3                                      |
| 192 8ST10W-1          | 3.9                                  | 4.1          | 4.0          | 3.5          | 2.0                                      |
| 193 Scorpion II       | 3.8                                  | 3.5          | 4.2          | 3.8          | 3.0                                      |
| 194 6-5-09TF          | 3.7                                  | 3.7          | 3.5          | 3.9          | 3.0                                      |
| 195 AGRFA-190         | 2.9                                  | 2.5          | 3.1          | 3.1          | 3.3                                      |
| LSD at 5% =           | 0.7                                  | 0.8          | 0.8          | 1.1          | 1.7                                      |

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

<sup>2</sup>9 = least disease

Table 4. Performance of tall fescue cultivars and selections in a turf trial established in September 2014 at Adelphia, NJ.

| Cultivar or Selection | -----Turf Quality <sup>1</sup> ----- |           |           | Red Thread <sup>2</sup><br>May 2016 | Brown Patch <sup>2</sup><br>Aug. 2016 |
|-----------------------|--------------------------------------|-----------|-----------|-------------------------------------|---------------------------------------|
|                       | 2015-2016 Avg.                       | 2015 Avg. | 2016 Avg. |                                     |                                       |
| 1 NT-3                | 6.0                                  | 5.6       | 6.3       | 7.3                                 | 5.7                                   |
| 2 13TFC18             | 5.9                                  | 5.5       | 6.2       | 8.3                                 | 5.3                                   |
| 3 3B3 Comp            | 5.8                                  | 5.2       | 6.3       | 7.7                                 | 6.7                                   |
| 4 ROL Comp            | 5.8                                  | 5.5       | 6.1       | 6.3                                 | 5.0                                   |
| 5 3N2 Comp            | 5.6                                  | 5.1       | 6.1       | 5.7                                 | 5.0                                   |
| 6 PPG-TF 205          | 5.5                                  | 5.0       | 6.1       | 8.3                                 | 5.3                                   |
| 7 Traverse 2 SRP      | 5.5                                  | 5.3       | 5.7       | 6.7                                 | 4.7                                   |
| 8 3N1 Comp            | 5.5                                  | 5.4       | 5.6       | 5.3                                 | 4.7                                   |
| 9 PPG-TF 176          | 5.5                                  | 5.6       | 5.3       | 6.3                                 | 4.0                                   |
| 10 PPG-TF 191         | 5.5                                  | 5.2       | 5.7       | 7.3                                 | 5.7                                   |
| 11 3N3 Comp           | 5.5                                  | 5.0       | 6.0       | 6.0                                 | 5.3                                   |
| 12 4th Millennium     | 5.5                                  | 5.2       | 5.8       | 6.0                                 | 4.0                                   |
| 13 13TFC15            | 5.4                                  | 5.4       | 5.4       | 7.0                                 | 4.7                                   |
| 14 Reflection         | 5.4                                  | 4.9       | 5.9       | 6.7                                 | 5.7                                   |
| 15 ROM Comp           | 5.4                                  | 5.1       | 5.7       | 4.7                                 | 6.0                                   |
| 16 3B2 Comp           | 5.4                                  | 5.0       | 5.7       | 5.7                                 | 5.7                                   |
| 17 PPG-TF 189         | 5.4                                  | 5.3       | 5.4       | 4.7                                 | 5.3                                   |
| 18 PPG-TF 173         | 5.4                                  | 5.4       | 5.3       | 7.3                                 | 4.3                                   |
| 19 PPG-TF 210         | 5.4                                  | 5.1       | 5.6       | 6.7                                 | 5.7                                   |
| 20 TBT Comp           | 5.3                                  | 5.1       | 5.6       | 6.7                                 | 5.7                                   |
| 21 PPG-TF 182         | 5.3                                  | 5.4       | 5.2       | 6.3                                 | 4.3                                   |
| 22 NT-2               | 5.3                                  | 5.2       | 5.3       | 6.0                                 | 3.7                                   |
| 23 Trinity            | 5.2                                  | 5.1       | 5.4       | 6.3                                 | 4.7                                   |
| 24 PPG-TF 190         | 5.2                                  | 5.2       | 5.2       | 8.0                                 | 3.7                                   |
| 25 PPG-TF 178         | 5.2                                  | 5.1       | 5.3       | 6.3                                 | 3.3                                   |
| 26 PPG-TF 203         | 5.2                                  | 5.0       | 5.4       | 6.0                                 | 4.7                                   |
| 27 10-314             | 5.2                                  | 5.0       | 5.3       | 7.0                                 | 5.3                                   |
| 28 Technique          | 5.2                                  | 5.1       | 5.2       | 6.0                                 | 4.0                                   |
| 29 PPG-TF 174         | 5.2                                  | 5.1       | 5.2       | 6.7                                 | 4.3                                   |
| 30 CTF-2115           | 5.2                                  | 5.0       | 5.3       | 6.7                                 | 4.7                                   |
| 31 PPG-TF 211         | 5.1                                  | 4.9       | 5.4       | 6.7                                 | 6.0                                   |
| 32 PPG-TF 177         | 5.1                                  | 5.1       | 5.2       | 5.3                                 | 4.7                                   |
| 33 LS 1200            | 5.1                                  | 5.1       | 5.1       | 4.0                                 | 4.3                                   |
| 34 PPG-TF 195         | 5.1                                  | 5.3       | 4.9       | 5.3                                 | 4.3                                   |
| 35 PPG-TF 221         | 5.1                                  | 4.9       | 5.3       | 4.0                                 | 6.3                                   |

(Continued)

Table 4. Tall fescue turf trial, 2014 (continued).

| Cultivar or Selection | -----Turf Quality <sup>1</sup> ----- |              |              | Red Thread <sup>2</sup><br>May<br>2016 | Brown Patch <sup>2</sup><br>Aug.<br>2016 |
|-----------------------|--------------------------------------|--------------|--------------|----------------------------------------|------------------------------------------|
|                       | 2015-<br>2016<br>Avg.                | 2015<br>Avg. | 2016<br>Avg. |                                        |                                          |
| 36 Michelangelo       | 5.1                                  | 5.0          | 5.1          | 6.7                                    | 4.7                                      |
| 37 PPG-TF 198         | 5.1                                  | 4.9          | 5.3          | 6.3                                    | 4.7                                      |
| 38 PPG-TF 180         | 5.1                                  | 5.1          | 5.0          | 5.0                                    | 4.3                                      |
| 39 PST-Syn-5BYOB      | 5.0                                  | 4.6          | 5.5          | 7.3                                    | 5.0                                      |
| 40 Van Gogh           | 5.0                                  | 4.9          | 5.2          | 6.0                                    | 4.3                                      |
| 41 Blacktail          | 5.0                                  | 5.3          | 4.8          | 5.3                                    | 4.3                                      |
| 42 NT-1               | 5.0                                  | 4.9          | 5.1          | 6.7                                    | 4.7                                      |
| 43 Rambler 2          | 5.0                                  | 5.1          | 4.9          | 5.7                                    | 5.0                                      |
| 44 Thor               | 5.0                                  | 4.8          | 5.2          | 5.0                                    | 5.3                                      |
| 45 Thunderstruck      | 5.0                                  | 4.9          | 5.0          | 7.3                                    | 3.7                                      |
| 46 Leonardo           | 5.0                                  | 4.8          | 5.1          | 6.7                                    | 4.0                                      |
| 47 Selkirk            | 4.9                                  | 4.5          | 5.4          | 5.0                                    | 4.0                                      |
| 48 13TFC16            | 4.9                                  | 4.6          | 5.3          | 7.3                                    | 3.7                                      |
| 49 Diablo             | 4.9                                  | 4.9          | 5.0          | 5.3                                    | 4.7                                      |
| 50 13TFC10            | 4.9                                  | 4.7          | 5.1          | 7.0                                    | 4.7                                      |
| 51 Persuasion         | 4.9                                  | 4.6          | 5.1          | 6.3                                    | 4.3                                      |
| 52 Essential          | 4.9                                  | 4.8          | 4.9          | 7.0                                    | 4.3                                      |
| 53 Spyder LS          | 4.9                                  | 5.1          | 4.7          | 5.7                                    | 4.7                                      |
| 54 Regenerate         | 4.8                                  | 4.7          | 5.0          | 8.3                                    | 4.3                                      |
| 55 10-328             | 4.8                                  | 4.8          | 4.8          | 8.0                                    | 4.3                                      |
| 56 Meridian           | 4.8                                  | 4.7          | 5.0          | 7.0                                    | 4.3                                      |
| 57 ROE Comp           | 4.8                                  | 4.8          | 4.8          | 6.3                                    | 5.0                                      |
| 58 PST-Syn-5DRU       | 4.8                                  | 4.7          | 4.9          | 6.0                                    | 4.7                                      |
| 59 PST-Syn-5STAR      | 4.8                                  | 4.6          | 5.0          | 5.7                                    | 4.3                                      |
| 60 PST-5MCD           | 4.8                                  | 4.9          | 4.7          | 5.0                                    | 3.3                                      |
| 61 PST-5BRK           | 4.8                                  | 4.8          | 4.8          | 6.7                                    | 4.7                                      |
| 62 ATF 1521           | 4.8                                  | 4.8          | 4.8          | 6.3                                    | 4.3                                      |
| 63 13TFC2             | 4.8                                  | 4.9          | 4.7          | 6.0                                    | 4.7                                      |
| 64 Ares               | 4.8                                  | 4.8          | 4.8          | 4.7                                    | 5.0                                      |
| 65 Falcon IV          | 4.8                                  | 4.8          | 4.7          | 7.3                                    | 4.7                                      |
| 66 PST-Syn-5NO        | 4.8                                  | 4.6          | 4.9          | 5.7                                    | 5.0                                      |
| 67 PST-5MVD           | 4.8                                  | 4.6          | 4.9          | 5.7                                    | 4.3                                      |
| 68 MET 1              | 4.8                                  | 4.8          | 4.7          | 4.7                                    | 5.3                                      |
| 69 PST-525D           | 4.7                                  | 4.6          | 4.9          | 5.7                                    | 4.0                                      |
| 70 Fesnova            | 4.7                                  | 4.8          | 4.6          | 7.0                                    | 4.7                                      |

(Continued)



Table 4. Tall fescue turf trial, 2014 (continued).

| Cultivar or Selection | -----Turf Quality <sup>1</sup> ----- |              |              | Red Thread <sup>2</sup><br>May<br>2016 | Brown Patch <sup>2</sup><br>Aug.<br>2016 |
|-----------------------|--------------------------------------|--------------|--------------|----------------------------------------|------------------------------------------|
|                       | 2015-<br>2016<br>Avg.                | 2015<br>Avg. | 2016<br>Avg. |                                        |                                          |
| 71 Penn RK4           | 4.7                                  | 4.5          | 4.9          | 7.3                                    | 4.3                                      |
| 72 13TFC8             | 4.7                                  | 4.4          | 4.9          | 5.7                                    | 4.3                                      |
| 73 Selkirk            | 4.7                                  | 4.8          | 4.6          | 6.0                                    | 4.3                                      |
| 74 TO8G2-R14          | 4.7                                  | 4.7          | 4.6          | 5.7                                    | 3.0                                      |
| 75 Wolfpack II        | 4.7                                  | 4.8          | 4.6          | 4.7                                    | 4.0                                      |
| 76 Rockwell           | 4.7                                  | 4.7          | 4.6          | 7.7                                    | 4.7                                      |
| 77 Penn ATF 1254      | 4.7                                  | 4.5          | 4.8          | 6.0                                    | 4.3                                      |
| 78 Mustang 4          | 4.7                                  | 4.8          | 4.5          | 4.7                                    | 4.7                                      |
| 79 13TFC14            | 4.6                                  | 4.4          | 4.9          | 6.3                                    | 3.7                                      |
| 80 Firecracker SLS    | 4.6                                  | 4.7          | 4.6          | 5.7                                    | 4.3                                      |
| 81 13TFC4             | 4.6                                  | 4.4          | 4.8          | 6.0                                    | 5.0                                      |
| 82 Swagger            | 4.6                                  | 4.6          | 4.6          | 6.3                                    | 4.7                                      |
| 83 PSM-6351           | 4.6                                  | 4.7          | 4.5          | 6.3                                    | 4.3                                      |
| 84 Talladega          | 4.6                                  | 4.5          | 4.7          | 5.7                                    | 4.3                                      |
| 85 10-345             | 4.6                                  | 4.7          | 4.5          | 4.7                                    | 3.7                                      |
| 86 Terrano            | 4.6                                  | 5.0          | 4.2          | 6.7                                    | 4.7                                      |
| 87 3rd Millennium     | 4.6                                  | 4.6          | 4.6          | 6.7                                    | 3.7                                      |
| 88 Rhambler           | 4.6                                  | 4.6          | 4.6          | 4.7                                    | 3.3                                      |
| 89 13TFC7             | 4.6                                  | 4.4          | 4.7          | 6.3                                    | 4.7                                      |
| 90 Blacktie           | 4.6                                  | 4.8          | 4.3          | 6.0                                    | 5.3                                      |
| 91 Rebel Xtreme       | 4.6                                  | 4.7          | 4.4          | 4.7                                    | 5.3                                      |
| 92 PST-5FDR           | 4.6                                  | 4.6          | 4.5          | 4.7                                    | 4.7                                      |
| 93 BMT                | 4.5                                  | 4.4          | 4.6          | 5.7                                    | 4.7                                      |
| 94 3B1 Comp           | 4.5                                  | 4.7          | 4.4          | 5.7                                    | 4.0                                      |
| 95 Restore            | 4.5                                  | 4.4          | 4.6          | 7.3                                    | 4.7                                      |
| 96 ATV                | 4.5                                  | 5.0          | 4.0          | 5.3                                    | 3.3                                      |
| 97 PPG-TF169          | 4.5                                  | 4.5          | 4.5          | 5.3                                    | 3.7                                      |
| 98 Penn ATF 1376      | 4.5                                  | 4.6          | 4.3          | 7.3                                    | 4.0                                      |
| 99 TO8G2-R12          | 4.5                                  | 4.4          | 4.5          | 5.3                                    | 2.3                                      |
| 100 10-315            | 4.5                                  | 4.6          | 4.3          | 6.0                                    | 4.3                                      |
| 101 Screamer LS       | 4.5                                  | 4.5          | 4.5          | 5.0                                    | 4.0                                      |
| 102 Rebel XLR         | 4.5                                  | 4.3          | 4.6          | 4.7                                    | 4.3                                      |
| 103 Traverse          | 4.5                                  | 4.5          | 4.4          | 6.3                                    | 4.0                                      |
| 104 Inferno           | 4.4                                  | 4.6          | 4.3          | 6.7                                    | 4.0                                      |
| 105 PST-5WAL          | 4.4                                  | 4.4          | 4.4          | 5.7                                    | 5.0                                      |

(Continued)

Table 4. Tall fescue turf trial, 2014 (continued).

| Cultivar or Selection | -----Turf Quality <sup>1</sup> ----- |              |              | Red Thread <sup>2</sup><br>May<br>2016 | Brown Patch <sup>2</sup><br>Aug.<br>2016 |
|-----------------------|--------------------------------------|--------------|--------------|----------------------------------------|------------------------------------------|
|                       | 2015-<br>2016<br>Avg.                | 2015<br>Avg. | 2016<br>Avg. |                                        |                                          |
| 106 Titanium LS       | 4.4                                  | 4.4          | 4.5          | 5.3                                    | 4.0                                      |
| 107 PST-5BPO          | 4.4                                  | 4.3          | 4.5          | 8.3                                    | 5.3                                      |
| 108 Rebel Advance     | 4.4                                  | 4.4          | 4.4          | 6.0                                    | 3.7                                      |
| 109 Padre             | 4.4                                  | 4.5          | 4.3          | 4.7                                    | 3.7                                      |
| 110 Dynamite LS       | 4.4                                  | 4.4          | 4.3          | 5.0                                    | 5.0                                      |
| 111 NA-TDDM-VC        | 4.4                                  | 4.6          | 4.2          | 5.7                                    | 2.3                                      |
| 112 Temple            | 4.4                                  | 4.6          | 4.1          | 3.7                                    | 3.7                                      |
| 113 Falcon H2O        | 4.4                                  | 4.3          | 4.4          | 6.3                                    | 4.0                                      |
| 114 DaVinci           | 4.4                                  | 4.2          | 4.5          | 4.3                                    | 4.7                                      |
| 115 10-339            | 4.3                                  | 4.2          | 4.4          | 6.7                                    | 3.3                                      |
| 116 Cezanne RZ        | 4.3                                  | 4.5          | 4.2          | 6.7                                    | 3.3                                      |
| 117 PST-5MINI         | 4.3                                  | 4.0          | 4.6          | 6.3                                    | 4.3                                      |
| 118 Shenandoah Elite  | 4.3                                  | 4.4          | 4.2          | 7.0                                    | 4.0                                      |
| 119 Tribute II        | 4.3                                  | 4.5          | 4.1          | 7.0                                    | 3.7                                      |
| 120 PF5-18            | 4.3                                  | 4.4          | 4.2          | 6.0                                    | 3.7                                      |
| 121 Raptor II         | 4.3                                  | 4.5          | 4.1          | 5.3                                    | 3.0                                      |
| 122 Summer            | 4.3                                  | 4.6          | 4.0          | 8.0                                    | 3.0                                      |
| 123 PST-5T20          | 4.3                                  | 4.1          | 4.5          | 5.0                                    | 3.7                                      |
| 124 PST-5W03          | 4.3                                  | 4.6          | 4.0          | 4.0                                    | 4.3                                      |
| 125 Sungazer          | 4.3                                  | 4.4          | 4.1          | 6.7                                    | 4.3                                      |
| 126 Cumberland        | 4.2                                  | 4.1          | 4.3          | 6.0                                    | 3.7                                      |
| 127 PST-5SIS          | 4.2                                  | 4.1          | 4.3          | 5.3                                    | 4.3                                      |
| 128 Stingray          | 4.2                                  | 4.3          | 4.1          | 5.3                                    | 3.7                                      |
| 129 Rain Saver        | 4.2                                  | 4.0          | 4.3          | 5.7                                    | 4.0                                      |
| 130 Rembrandt         | 4.2                                  | 4.2          | 4.1          | 6.7                                    | 3.7                                      |
| 131 GO-14-MNR4        | 4.1                                  | 4.3          | 3.9          | 6.7                                    | 4.3                                      |
| 132 Penn ATF 1258     | 4.1                                  | 4.1          | 4.2          | 6.3                                    | 3.7                                      |
| 133 JT-783            | 4.1                                  | 4.3          | 4.0          | 5.3                                    | 3.0                                      |
| 134 Rain Dance        | 4.1                                  | 4.0          | 4.2          | 6.3                                    | 5.0                                      |
| 135 Monet             | 4.1                                  | 3.9          | 4.2          | 6.7                                    | 4.3                                      |
| 136 PST-5BGR          | 4.1                                  | 4.1          | 4.0          | 5.7                                    | 4.3                                      |
| 137 Jaguar 4G         | 4.0                                  | 4.1          | 4.0          | 7.0                                    | 2.7                                      |
| 138 Avenger           | 4.0                                  | 4.1          | 4.0          | 6.0                                    | 3.0                                      |
| 139 Quest             | 4.0                                  | 4.0          | 4.0          | 5.7                                    | 4.0                                      |
| 140 Sequester         | 4.0                                  | 4.2          | 3.8          | 7.0                                    | 4.0                                      |

(Continued)

Table 4. Tall fescue turf trial, 2014 (continued).

| Cultivar or Selection | -----Turf Quality <sup>1</sup> ----- |              |              | Red Thread <sup>2</sup><br>May<br>2016 | Brown Patch <sup>2</sup><br>Aug.<br>2016 |
|-----------------------|--------------------------------------|--------------|--------------|----------------------------------------|------------------------------------------|
|                       | 2015-<br>2016<br>Avg.                | 2015<br>Avg. | 2016<br>Avg. |                                        |                                          |
| 141 Masterpiece       | 4.0                                  | 3.7          | 4.3          | 6.0                                    | 4.0                                      |
| 142 Renegade Supreme  | 4.0                                  | 3.9          | 4.1          | 6.0                                    | 4.0                                      |
| 143 PST-5YA           | 4.0                                  | 3.5          | 4.4          | 4.7                                    | 4.3                                      |
| 144 ATF 1255          | 3.9                                  | 4.2          | 3.6          | 6.0                                    | 3.3                                      |
| 145 Greystone         | 3.9                                  | 3.7          | 4.1          | 5.7                                    | 4.3                                      |
| 146 PST-5BGR          | 3.7                                  | 3.6          | 3.8          | 4.3                                    | 4.3                                      |
| LSD at 5% =           | 0.6                                  | 0.7          | 0.8          | 2.9                                    | 1.7                                      |

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

<sup>2</sup>9 = least disease

Table 5. Performance of tall fescue cultivars and selections in a turf trial established in September 2015 at Adelphia, NJ.

| Cultivar or Selection | Turf Quality <sup>1</sup><br>2016<br>Avg. | Establishment <sup>2</sup><br>Sept.<br>2015 | Brown Patch <sup>3</sup><br>Aug.<br>2016 |
|-----------------------|-------------------------------------------|---------------------------------------------|------------------------------------------|
| 1 SCR2 Comp           | 6.9                                       | 6.7                                         | 6.7                                      |
| 2 RS3 Comp            | 6.9                                       | 6.3                                         | 7.3                                      |
| 3 RS4 Comp            | 6.8                                       | 6.0                                         | 7.7                                      |
| 4 WN2 Comp            | 6.8                                       | 6.0                                         | 8.3                                      |
| 5 PPG-TF-239          | 6.8                                       | 4.3                                         | 7.7                                      |
| 6 Amity               | 6.7                                       | 6.0                                         | 8.7                                      |
| 7 HFBC2 Comp          | 6.7                                       | 6.7                                         | 8.0                                      |
| 8 PPG-TF-232          | 6.7                                       | 6.3                                         | 5.3                                      |
| 9 WB2 Comp            | 6.7                                       | 6.7                                         | 7.3                                      |
| 10 PPG-TF-235         | 6.6                                       | 5.3                                         | 7.3                                      |
| 11 PPG-TF-231         | 6.6                                       | 5.7                                         | 6.3                                      |
| 12 RAD-TF-98          | 6.6                                       | 6.0                                         | 5.0                                      |
| 13 NT-3 Comp          | 6.6                                       | 6.3                                         | 8.3                                      |
| 14 LRT Comp           | 6.6                                       | 6.7                                         | 7.0                                      |
| 15 NAI-15-3N2         | 6.5                                       | 5.3                                         | 8.7                                      |
| 16 HFBC1 Comp         | 6.5                                       | 6.7                                         | 8.3                                      |
| 17 PPG-TF-242         | 6.5                                       | 5.7                                         | 8.0                                      |
| 18 SCR1 Comp          | 6.5                                       | 6.3                                         | 8.0                                      |
| 19 WN1 Comp           | 6.5                                       | 6.7                                         | 8.0                                      |
| 20 SCR3 Comp          | 6.5                                       | 6.0                                         | 7.3                                      |
| 21 Xtender            | 6.5                                       | 5.7                                         | 5.7                                      |
| 22 Reflection         | 6.4                                       | 7.0                                         | 8.7                                      |
| 23 RS2 Comp           | 6.4                                       | 6.7                                         | 8.0                                      |
| 24 PPG-TF-234         | 6.4                                       | 5.7                                         | 7.0                                      |
| 25 PPG-TF-238         | 6.4                                       | 5.3                                         | 6.3                                      |
| 26 Raptor III         | 6.4                                       | 5.3                                         | 8.0                                      |
| 27 URT Comp           | 6.4                                       | 6.7                                         | 7.7                                      |
| 28 Supersonic         | 6.4                                       | 6.3                                         | 6.7                                      |
| 29 RAD-TF-99          | 6.4                                       | 6.3                                         | 5.7                                      |
| 30 NAI-15-CTR         | 6.3                                       | 5.7                                         | 8.0                                      |
| 31 Ares               | 6.3                                       | 5.7                                         | 5.3                                      |
| 32 PPG-TF-236         | 6.3                                       | 4.0                                         | 8.0                                      |
| 33 BPS Comp           | 6.3                                       | 7.0                                         | 7.3                                      |
| 34 RAD-TF-104         | 6.3                                       | 5.0                                         | 6.7                                      |
| 35 PPG-TF-176         | 6.2                                       | 6.7                                         | 7.7                                      |

(Continued)

Table 5. Tall fescue turf trial, 2015 (continued).

| Cultivar or Selection | Turf Quality <sup>1</sup><br>2016<br>Avg. | Establishment <sup>2</sup><br>Sept.<br>2015 | Brown Patch <sup>3</sup><br>Aug.<br>2016 |
|-----------------------|-------------------------------------------|---------------------------------------------|------------------------------------------|
| 36 NAI-15-3N1         | 6.2                                       | 6.0                                         | 7.7                                      |
| 37 NT-1 Comp          | 6.2                                       | 6.7                                         | 7.7                                      |
| 38 HFBC3 Comp         | 6.2                                       | 6.3                                         | 7.3                                      |
| 39 304 BS 2015        | 6.2                                       | 5.7                                         | 6.7                                      |
| 40 RAD-TF-105         | 6.2                                       | 5.3                                         | 6.3                                      |
| 41 Valkyrie LS        | 6.1                                       | 5.7                                         | 8.3                                      |
| 42 Diablo             | 6.1                                       | 5.0                                         | 6.7                                      |
| 43 PPG-TF-240         | 6.1                                       | 4.0                                         | 8.3                                      |
| 44 Avenger II         | 6.1                                       | 7.0                                         | 7.0                                      |
| 45 Thor               | 6.1                                       | 6.0                                         | 6.7                                      |
| 46 RAD-TF-96          | 6.1                                       | 6.3                                         | 4.7                                      |
| 47 RAD-TF-103         | 6.1                                       | 5.0                                         | 4.3                                      |
| 48 WB1 Comp           | 6.1                                       | 6.3                                         | 8.0                                      |
| 49 NAI-15-PAD2        | 6.1                                       | 5.7                                         | 7.7                                      |
| 50 JT-388             | 6.1                                       | 5.7                                         | 7.0                                      |
| 51 RS5 Comp           | 6.1                                       | 6.3                                         | 7.0                                      |
| 52 Faith              | 6.1                                       | 6.0                                         | 6.0                                      |
| 53 PST-5MIN4          | 6.1                                       | 5.3                                         | 5.7                                      |
| 54 WB3 Comp           | 6.0                                       | 6.3                                         | 7.7                                      |
| 55 PRT Comp           | 6.0                                       | 7.3                                         | 7.3                                      |
| 56 PPG-TF-241         | 6.0                                       | 5.0                                         | 6.3                                      |
| 57 Dynamite LS        | 6.0                                       | 5.7                                         | 5.3                                      |
| 58 PST-5DAW-15        | 6.0                                       | 6.0                                         | 8.0                                      |
| 59 Spyder LS          | 6.0                                       | 5.7                                         | 7.0                                      |
| 60 ATF 1521           | 6.0                                       | 6.0                                         | 6.3                                      |
| 61 PPG-TF-229         | 6.0                                       | 6.0                                         | 5.7                                      |
| 62 Firecracker SLS    | 5.9                                       | 7.3                                         | 8.3                                      |
| 63 Firecracker LS     | 5.9                                       | 7.0                                         | 6.7                                      |
| 64 NAI-15-3B2         | 5.9                                       | 5.7                                         | 7.7                                      |
| 65 RS1 Comp           | 5.9                                       | 7.3                                         | 7.3                                      |
| 66 PST-5MCD           | 5.9                                       | 6.0                                         | 6.7                                      |
| 67 Temple             | 5.9                                       | 6.0                                         | 6.7                                      |
| 68 Titanium 2LS       | 5.9                                       | 6.0                                         | 7.3                                      |
| 69 Cochise IV         | 5.9                                       | 6.7                                         | 7.0                                      |
| 70 RAD-TF-102         | 5.9                                       | 5.3                                         | 4.0                                      |

(Continued)

Table 5. Tall fescue turf trial, 2015 (continued).

| Cultivar or Selection | Turf Quality <sup>1</sup><br>2016<br>Avg. | Establishment <sup>2</sup><br>Sept.<br>2015 | Brown Patch <sup>3</sup><br>Aug.<br>2016 |
|-----------------------|-------------------------------------------|---------------------------------------------|------------------------------------------|
| 71 RS6 Comp           | 5.8                                       | 6.7                                         | 8.3                                      |
| 72 PST-5DZP           | 5.8                                       | 5.7                                         | 5.7                                      |
| 73 PPG-TF-230         | 5.8                                       | 5.7                                         | 6.7                                      |
| 74 Shenandoah III     | 5.8                                       | 4.3                                         | 6.7                                      |
| 75 PST-5T24           | 5.8                                       | 4.7                                         | 6.0                                      |
| 76 Maestro            | 5.7                                       | 7.0                                         | 7.3                                      |
| 77 Hemi               | 5.7                                       | 6.3                                         | 7.0                                      |
| 78 Black Tail         | 5.7                                       | 6.7                                         | 7.7                                      |
| 79 Screamer LS        | 5.7                                       | 7.0                                         | 7.7                                      |
| 80 Rowdy              | 5.7                                       | 5.3                                         | 7.3                                      |
| 81 Terrano            | 5.7                                       | 6.0                                         | 7.0                                      |
| 82 Shenandoah Elite   | 5.7                                       | 6.7                                         | 6.7                                      |
| 83 PST-53D2           | 5.7                                       | 4.7                                         | 5.3                                      |
| 84 Meridian           | 5.7                                       | 6.0                                         | 4.7                                      |
| 85 BMT-13             | 5.7                                       | 5.3                                         | 6.3                                      |
| 86 Firaces            | 5.7                                       | 6.0                                         | 6.3                                      |
| 87 Wolfpack II        | 5.6                                       | 5.0                                         | 7.7                                      |
| 88 Dallas             | 5.6                                       | 6.0                                         | 6.7                                      |
| 89 GO-MNKY-RF         | 5.6                                       | 5.0                                         | 5.3                                      |
| 90 PST-5MINI-14       | 5.6                                       | 6.0                                         | 7.3                                      |
| 91 PST-5NOR           | 5.6                                       | 5.3                                         | 7.0                                      |
| 92 Gazelle II         | 5.6                                       | 4.7                                         | 5.7                                      |
| 93 Thunderstruck      | 5.6                                       | 5.3                                         | 4.0                                      |
| 94 NT-2 Comp          | 5.5                                       | 6.7                                         | 8.3                                      |
| 95 GO-AO              | 5.5                                       | 6.3                                         | 4.7                                      |
| 96 Sundial            | 5.5                                       | 6.3                                         | 4.0                                      |
| 97 Inferno            | 5.5                                       | 6.3                                         | 7.0                                      |
| 98 Falcon IV          | 5.5                                       | 6.3                                         | 6.3                                      |
| 99 PST-Syn-5MIZ       | 5.5                                       | 4.7                                         | 6.0                                      |
| 100 Raptor II         | 5.5                                       | 6.3                                         | 5.3                                      |
| 101 Tribute II        | 5.5                                       | 6.7                                         | 4.7                                      |
| 102 Saltillo          | 5.4                                       | 5.7                                         | 7.0                                      |
| 103 Covenant II       | 5.4                                       | 5.7                                         | 5.0                                      |
| 104 PST-5STAR         | 5.4                                       | 5.7                                         | 5.3                                      |
| 105 Sequester         | 5.4                                       | 5.7                                         | 4.3                                      |

(Continued)

Table 5. Tall fescue turf trial, 2015 (continued).

| Cultivar or Selection | Turf Quality <sup>1</sup><br>2016<br>Avg. | Establishment <sup>2</sup><br>Sept.<br>2015 | Brown Patch <sup>3</sup><br>Aug.<br>2016 |
|-----------------------|-------------------------------------------|---------------------------------------------|------------------------------------------|
| 106 Stingray          | 5.4                                       | 5.3                                         | 5.7                                      |
| 107 Regenerate        | 5.4                                       | 7.0                                         | 5.3                                      |
| 108 Persuasion        | 5.4                                       | 5.7                                         | 5.0                                      |
| 109 PST-5BRK          | 5.3                                       | 6.0                                         | 8.0                                      |
| 110 Titanium          | 5.3                                       | 7.0                                         | 7.0                                      |
| 111 JT-107            | 5.3                                       | 5.7                                         | 5.0                                      |
| 112 ATF 1255          | 5.3                                       | 5.7                                         | 7.0                                      |
| 113 PST-5BPO          | 5.2                                       | 5.7                                         | 7.7                                      |
| 114 Summer            | 5.2                                       | 5.3                                         | 4.7                                      |
| 115 ATV               | 5.2                                       | 6.0                                         | 4.0                                      |
| 116 PST-5DR-15        | 5.2                                       | 4.7                                         | 7.7                                      |
| 117 FCE3              | 5.2                                       | 6.0                                         | 7.3                                      |
| 118 Rain Saver        | 5.2                                       | 5.3                                         | 5.3                                      |
| 119 Falcon V          | 5.2                                       | 7.0                                         | 8.0                                      |
| 120 NAI-15-RXR        | 5.2                                       | 4.3                                         | 6.7                                      |
| 121 Sungazer          | 5.1                                       | 4.3                                         | 4.7                                      |
| 122 Avenger           | 5.1                                       | 6.3                                         | 5.0                                      |
| 123 Hudson            | 5.1                                       | 6.7                                         | 5.3                                      |
| 124 Jaguar 4G         | 5.1                                       | 5.7                                         | 4.7                                      |
| 125 GO-MNKY           | 5.1                                       | 3.7                                         | 3.3                                      |
| 126 PST-5LYM          | 5.0                                       | 5.3                                         | 7.0                                      |
| 127 Titanium LS       | 5.0                                       | 6.7                                         | 6.0                                      |
| 128 GO-MINI           | 5.0                                       | 4.0                                         | 2.7                                      |
| 129 PPG-TF-237        | 5.0                                       | 5.7                                         | 4.3                                      |
| 130 NAI-15-TXR        | 4.9                                       | 6.0                                         | 5.7                                      |
| 131 NoNet             | 4.9                                       | 5.0                                         | 4.3                                      |
| 132 Scorpion II       | 4.8                                       | 6.3                                         | 4.7                                      |
| 133 GO-MNKY-H         | 4.8                                       | 3.3                                         | 3.0                                      |
| 134 Rain Dance        | 4.7                                       | 6.0                                         | 7.7                                      |
| 135 Merida            | 4.7                                       | 5.7                                         | 5.0                                      |
| 136 Picabu            | 4.7                                       | 5.3                                         | 6.0                                      |
| 137 Titan Ultra       | 4.5                                       | 6.3                                         | 4.7                                      |
| 138 Rendition RX      | 4.4                                       | 6.0                                         | 4.0                                      |
| 139 Titan Rx          | 4.3                                       | 6.7                                         | 3.7                                      |
| LSD at 5%=            | 0.6                                       | 1.2                                         | 2.0                                      |

(Continued)

Table 5. Tall fescue turf trial, 2015 (continued).

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

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

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



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

|                          | 2012           |                 | 2013 |     | 2014 |     | 2015 |     | 2016 |     |
|--------------------------|----------------|-----------------|------|-----|------|-----|------|-----|------|-----|
|                          | N <sup>1</sup> | Ht <sup>2</sup> | N    | Ht  | N    | Ht  | N    | Ht  | N    | Ht  |
| Table 1 (2012).....      | 3.75           | 1.5             | 3.75 | 1.5 | 3.65 | 1.5 | 3.75 | 1.5 | 3.40 | 1.5 |
| Table 2 (2012 NTEP)..... | 3.75           | 1.5             | 3.75 | 1.5 | 3.65 | 1.5 | 3.75 | 1.5 | 3.40 | 1.5 |
| Table 3 (2013).....      |                |                 |      |     | 4.30 | 1.5 | 4.50 | 1.5 | 3.65 | 1.5 |
| Table 4 (2014).....      |                |                 |      |     |      |     | 4.50 | 1.5 | 3.40 | 1.5 |
| Table 5 (2015).....      |                |                 |      |     |      |     |      |     | 2.90 | 1.5 |

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

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