

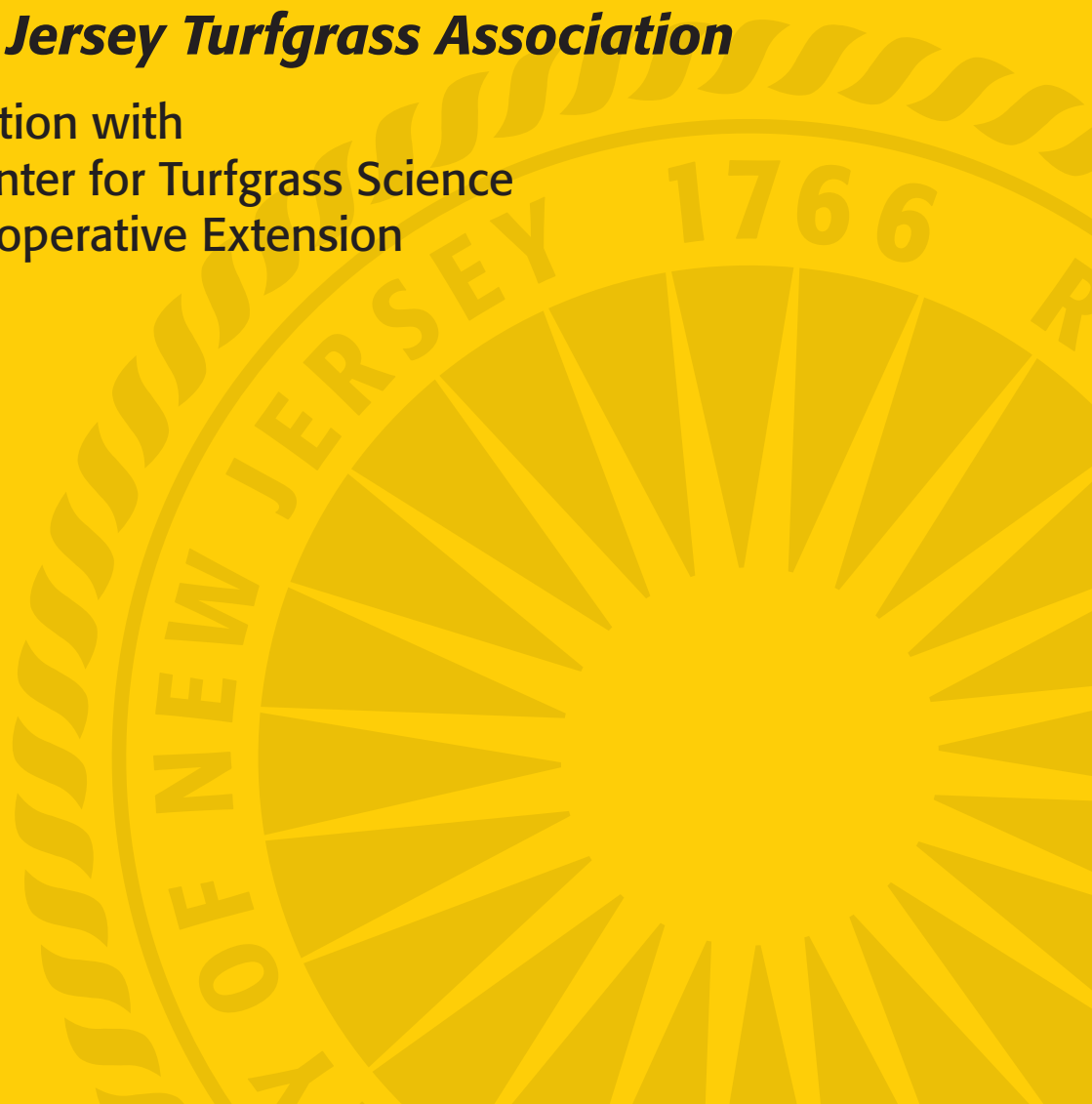
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Rutgers Center for Turfgrass Science
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The Rutgers Turfgrass Proceedings is published yearly by the Rutgers Center for Turfgrass Science, Rutgers Cooperative Extension, and the New Jersey Agricultural 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 2014 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

TALL FESCUE RESEARCH AT THE RUTGERS HORTICULTURAL RESEARCH FARM II DURING 2014

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Tall fescue (*Festuca arundinacea* Schreb.) is a cool-season turfgrass species that is adapted to a variety of soil and environmental conditions and is established as a turf for forage, sports and recreation, home lawn, and utility uses throughout the north, central, and transition areas of the United States (Meyer and Funk, 1989). Advances in turfgrass breeding have resulted in tall fescue cultivars with improved turf quality, better tolerance to disease, and greater seed yield (Bonos and Huff, 2013).

Increased use in establishing tall fescue for sports fields and other recreational areas has motivated the Rutgers Center for Turfgrass Science to assess the wear and traffic (wear and compaction) tolerance of existing tall fescue cultivars and new experimental selections. Previously, a combination of a modified version of the Rutgers Wear Simulator (RWS), described by Bonos et al. (2001) and a vibratory roller was used to apply traffic to the 2006 National Turfgrass Evaluation Program (NTEP) Tall Fescue test at Rutgers Horticultural Research Farm II (Park et al., 2008, 2009, 2010, 2011, and 2012).

Park et al. (2014) reported on using a combination of the RWS and Cady Traffic Simulator (CTS; Henderson et al., 2005) to apply traffic stress on the 2005 Cooperative Turfgrass Breeder's Test Tall Fescue Trial (<http://www.ctbt-us.info/>) during 2013. The combined use of the two machines (wear and trampling stresses caused by the RWS and CTS, respectively) was effective at assessing the traffic tolerance of tall fescue cultivars and experimental selections.

Traffic tolerance data for newer tall fescue experimental selections as well as existing, commercially-available cultivars is useful selection criteria

for turf managers. The objective of this study was to assess the traffic tolerance of tall fescue cultivars and experimental selections comprising the 2012 NTEP Tall Fescue Test using a combination of the RWS and CTS during spring, summer, and autumn.

MATERIALS AND METHODS

Evaluation Trial

The 116 entries of the 2012 NTEP Tall Fescue Trial were seeded into 5 x 6-ft plots in September 2012 on a well-drained loam (sand = 33%; silt = 41%; clay = 26%) at Rutgers Horticultural Research Farm II in North Brunswick, NJ. Also included in the trial were the cultivar Mustang 4 and 3-way blends of Mustang 4 + Faith + Bullseye; Rebel IV + Rebel Advance + Brockton; and Justice + Virtue II + Greystone.

Soil test results from March 2014 indicated that the soil pH was 6.4; soil phosphorous and potassium were 104 and 362 lb per acre (Mehlich 3), respectively. The test was mowed approximately two times per week at a height of 2.5 inches and was irrigated to prevent drought stress in 2014.

A total of 3.5 lb nitrogen (N) per 1000 ft² was applied in 2014 (0.7, 1.1, 0.7, and 1.0 lb N per 1000 ft² on 1 April, 9 June, 15 September, and 20 November 2014, respectively). Dithiopyr was applied to the trial on 14 April 2014 for preemergence control of crabgrass (*Digitaria* spp.) at 0.26 lb per acre (1.0 pt Dimension 2EW per acre).

For preventative control of dollar spot (caused by *Sclerotinia homoeocarpa*) and brown patch (caused by *Rhizoctonia solani*), a tank mixture of

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boscalid (0.34 lb per acre [7.8 oz Emerald per acre]) and pyraclostrobin (0.5 lb per acre [30.5 fl oz Insiguria SC per acre]) was applied 16 June, and 9 and 31 July 2014.

White clover (*Trifolium repens*) and other broad-leaf weeds were selectively controlled on 18 July 2014 using a tank mixture of triclopyr and dicamba at 0.5 and 0.25 lb [Turflon Ester and Banvel at 1.0 and 0.5 pt] per acre, respectively. For preventive control of white grubs, chlorantraniliprole was applied on 23 July 2014 at 2.2 fl oz per acre (Acelepryn at 12.0 fl oz per acre).

Application of Wear and Traffic Stresses

Traffic stress was applied to the one-half of each plot as a combination of wear using the RWS and trampling using the CTS. In 2014, one pass of the RWS and one pass of the CTS were made per week for 8 weeks (16 total passes) during spring (18 April to 2 June), summer (2 July to 18 August), and autumn (15 September to 8 November). The RWS was operated at ground speed of 2.5 miles per hour (mph) and 250 rpm for the paddles. The CTS, developed using a Toro Greens Aerifier, was operated in the forward direction at a speed of 1.0 mph. Every other pass of each machine was made in the opposite direction.

Evaluation of the Effects of Traffic

Trafficked and non-trafficked plots were visually assessed for uniformity of turf cover (1 to 9 scale where 9 = most complete turf cover) and fullness of turfgrass canopy (0 to 100% scale where 100% = full canopy) at the conclusion of each traffic period on 4 June 2014 (spring), 15 August 2014 (summer), and 11 November 2014 (autumn).

Similarly, a Canon PowerShot G12 (Canon USA, Inc., Lake Success, NY) digital camera, positioned to capture images of plots within an enclosed box equipped with artificial lighting, was used to capture digital images of trafficked and non-trafficked plots at the conclusion of each traffic period on 3 June, 18 August, and 13 November 2014. Individual digital image size was 1600 x 1200 pixels and camera settings included a shutter speed of 1/40 s, aperture of F2.8, ISO of 100, and a focal length of 7 mm. Digital images acquired on 13 November 2014 used a focal length of 8 mm.

Images were imported into SigmaScan Pro (v. 5.0, SPSS, Inc., Chicago, IL) for digital image analysis (DIA). Green cover (0 to 100% scale where 100% = complete green cover) was determined according to methods described by Richardson et al. (2001) using batch analysis programming developed by Karcher and Richardson (2005). A hue range of 50 to 107 and a saturation range of 0 to 100 were used in the software to identify green leaves in the images.

Trial data were analyzed as a 2 (traffic and no traffic) x 116 (entries) factorial arranged in a strip-plot design with three replications. Data were subjected to analysis of variance and means were separated using Fisher's protected least significant difference (LSD) test at $p \leq 0.05$.

Evaluation of Non-trafficked Plots

Plots were rated for turfgrass quality monthly during April through October during 2014 as well as spring green-up (14 April 2014), genetic color (2 October 2014), and leaf texture (2 October 2014). A 1 to 9 rating was utilized for each parameter where 9 equaled the best turfgrass quality, earliest spring green-up, darkest green color, and finest leaf texture.

Analysis of variance was performed on these data as a single factor randomized complete block design with three replications. Means were separated using Fisher's protected least significant difference (LSD) test at $p \leq 0.05$.

RESULTS

As expected, traffic reduced the uniformity of turf cover, percent green cover, and fullness of turfgrass canopy for tall fescue during spring, summer, and autumn 2014 (Table 1). The entry factor had a significant effect for each parameter during each season in 2014. Moreover, the entry effect interacted with the traffic factor for uniformity of turf cover and fullness of turf canopy during spring and autumn, and green cover during summer and autumn.

Response to Spring Traffic 3 June 2014

More differences were observed among entries receiving traffic compared to entries not receiving

traffic (Table 2). When subjected to traffic, entries with the best uniformity of turf cover and greatest fullness of turfgrass canopy were Hemi, RZ2, U45, B23, PPG-TF-152, PST-5EV2, Firebird 2, PPG-TF-139, CCR2, Hot Rod (Burl TF-136), LTP-TWUU, PST-5GRB, W45, JS 916, PPG-TF-156, ZW 44, ATF 1704, PSG-WE1, U43, PPG-TF-135, DZ1, PSG-GSD, IS-TF 311, and W41. Cultivars and experimental selections with the poorest uniformity of turf cover and lowest fullness of turfgrass canopy after spring 2014 traffic were PPG-TF-142, Temptation (OR-21), K12-05, BAR Fa 120878, BAR Fa 121091, JS 825, Justice + Virtue II + Greystone, Kentucky 31, and Marauder (Table 2).

Green cover varied among entries but was independent of the level of traffic (Table 2). Averaged across no traffic and traffic, green cover ranged from 71.3 to 82.5%. Forty-six entries and experimental selections had the greatest green cover on 3 June 2014; sixteen entries had the least green cover.

Response to Summer Traffic 18-19 August 2014

Uniformity of turf cover and fullness of turfgrass canopy varies among entries but was independent of the level of traffic in August 2014 (Table 3). Entries with the best uniformity of turf cover and greatest fullness turfgrass canopy on 19 August 2014 were Mustang 4, RZ2, PPG-TF-156, GTO (Burl TF-2), ATF 1704, Burl TF-69, B23, Hemi, PST-5GRB, U45, JS 916, PSG-WE1, BAR Fa 121095, IS-TF 310 SEL, PPG-TF-137, RAD-TF-92, Regenerate, PPG-TF-135, PST-5BPO, IS-TF 330, DZ1, IS-TF 311, RAD-TF-89, U43, ZW 44, PSG-GSD, MET 1, Firebird 2, PPG-TF-152, Falcon V, IS-TF 307 SEL, RAD-TF-88, PPG-TF-172, IS-TF 289, Rain Dance (PST-5SDT), ATF 1754, F711, TF-287, LTP-F5DPDR, Hot Rod (Burl TF-136), Inspiration (PST-R5NW), SRX-TPC, and MET 6 SEL. BAR Fa 120878, JS 825, and Kentucky 31 had the poorest uniformity of turf cover and fullness of turfgrass canopy on 15 August 2014.

Green cover of entries depended on the level of traffic with differences being observed under the level of summer traffic (Table 3). Cultivars and selections with the greatest green cover were PST-5EX2, Mustang 4, U45, PST-5BPO, Rebel IV + Rebel Advance + Brockton, Mustang 4 + Faith + Bullseye, Inspiration (PST-R5NW), Justice + Virtue II + Greystone, ATF 1736, RAD-TF-88, TF-287, Burl TF-69, B23, PST-5BRK, ZW 44, PST-5GRB, Grande 3, Falcon IV, PSG-GSD, JS 916, Pick-W43, IS-TF 269

SEL, BAR Fa 121095, RAD-TF-83, PPG-TF-152, Regenerate, Hemi, Falcon V, RAD-TF-92, IS-TF 308 SEL, PST-5RO5, Frontline (Exp TF-09), IS-TF 330, BAR Fa 121091, W45, Rain Dance (PST-5SDT), Fesnova, PPG-TF-135, Bullseye, RAD-TF-89, LTP-F5DPDR, Faith, Firebird 2, PPG-TF-139, IS-TF 276 M2, PPG-TF-156, BAR Fa 120878, LTP-TWUU, PSG-PO1, and U43. Entries with the least green cover after summer traffic were PST-5DZP, Temptation (OR-21), IS-TF 305 SEL, Terrano, PPG-TF-172, TD1, F711, Rhambler 2 SRP (LSD), PSG-WE1, Bizem, K12-13, W41, PPG-TF-145, MET 6 SEL, 204 Res. Blk4, DB1, PPG-TF-151, PPG-TF-105, RZ2, ATF 1612, Marauder, PPG-TF-142, JS 825, and Kentucky 31 (Table 3).

Response to Autumn Traffic 11-13 November 2014

Performance of entries depended on the level of autumn traffic with more differences among entries being observed when traffic stress was applied (Table 4). Cultivars and experimental selections with best uniformity of turf cover, greatest green cover, and greatest fullness of turfgrass canopy under traffic were Regenerate, RZ2, Hot Rod (Burl TF-136), U43, Comp. Res. SST, B23, U45, Hemi, ZW 44, IS-TF 311, RAD-TF-92, PPG-TF-156, RAD-TF-88, F711, Rhambler 2 SRP (LSD), RAD-TF-89, IS-TF 310 SEL, TF-287, JS 916, PPG-TF-152, IS-TF 330, IS-TF 308 SEL, PPG-TF-148, and T31. Kentucky 31 had the poorest uniformity of turf cover, least green cover, and lowest fullness of turfgrass canopy after autumn traffic.

Performance of Tall Fescue without Traffic

Entries with the best multi-year average turf quality during 2013-2014 were Regenerate, PPG-TF-150, W45, F711, MET 1, RZ2, PSG-WE1, Hemi, ZW 44, PPG-TF-152, Firebird 2, ATF 1612, B23, GTO (Burl TF-2), U43, PPG-TF-156, Pick-W43, CCR2, LTP-TWUU, Bullseye, Hot Rod (Burl TF-136), IS-TF 307 SEL, PPG-TF-137, Rhambler 2 SRP (LSD), Bizem, U45, IS-TF 289, IS-TF 311, PPG-TF-172, PPG-TF-105, MET-3, PST-5GRB, and IS-TF 291 (Table 5). Entries with the poorest multi-year average turf quality in 2013-2014 were BAR Fa 120878 and Kentucky 31. Other entries with poor multi-year average turf quality (< 4.0) during 2013-14 were Marauder, Aquaduct, BAR Fa 121091, JS 825, Annihilator, BAR Fa 121089, Justice + Virtue II + Greystone, and Warhawk (Table 5).

Entries with better green-up on 16 April 2014 were Kentucky 31, PST-5EX2, Grande 3, LPTWUU, RZ2, PPG-TF-148, Pick-W43, and GTO (Burl TF-2) (Table 5). Entries with delayed green-up were K12-05, IS-TF 284 M2, JS 825, and K12-13.

Entries with the darkest green color on 2 October 2014 were TD1, IS-TF 282 M2, IS-TF 291, RAD-TF-88, Frontline (Exp TF-09), DB1, IS-TF 330, K12-05, IS-TF 284 M2, IS-TF 272, RAD-TF-83, PPG-TF-142, Temptation (OR-21), RAD-TF-89, Caesar (TY 10), IS-TF 285, IS-TF 269 SEL, PPG-TF-145, JS 818, IS-TF 289, and JS 819 (Table 5). Entries with the lightest green color were BAR Fa 120878 and Kentucky 31.

Cultivars and selections with the finest leaf texture on 2 October 2014 were Regenerate, PST-5GRB, U43, W45, IS-TF 308 SEL, CCR2, F711, ATF 1704, IS-TF 291, Firebird 2, RAD-TF-92, PPG-TF-156, PPG-TF-137, RZ2, PPG-TF-150, PSG-WE1, Grande 3, and 204 Res. Blk4 (Table 5). Entries with the coarsest leaf texture were BAR Fa 120878 and Kentucky 31.

DISCUSSION

The combined operation of the RWS and CTS to the 2012 NTEP Tall Fescue Test was effective at imparting traffic stress to tall fescue. Differences among entries was often more apparent when traffic stress was applied.

Visual ratings of uniformity of turf cover and fullness of turfgrass canopy provided discernment among entries compared to green cover generated by digital image analysis. Uniformity of turf cover ranged from 1.3 to 6.7 and fullness of turfgrass canopy ranged from 20.0 to 61.7% in trafficked plots; whereas green cover varied from 81.3 to 94.0%. Digital image analysis was not capable of detecting all differences in turfgrass canopy density characteristics compared to an experienced human evaluator. Future research is being planned to quantify this discrepancy.

Although brown patch disease was preventively controlled in this test to ensure an accurate assessment of traffic stress tolerance, susceptibility to brown patch is a very important criteria for tall fescues established on sports fields and other recreational sites.

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Table 1. Uniformity of turf cover, green cover, and fullness of turf canopy as affected by tall fescue entry and traffic level during 2014. (Includes all entries of the 2012 National Turfgrass Evaluation Program (NTEP) Tall Fescue Test.)

Level of Traffic	Spring Traffic ¹				Summer Traffic			Autumn Traffic		
	Uniformity of Turf Cover ²	Green Cover ³	Fullness of Turfgrass Canopy ⁴	Uniformity of Turf Cover	Green Cover	Fullness of Turfgrass Canopy	Uniformity of Turf Cover	Green Cover	Fullness of Turfgrass Canopy	
	3 June 2014	3 June 2014	3 June 2014	19 Aug. 2014	18 Aug. 2014	19 Aug. 2014	11 Nov. 2014	13 Nov. 2014	11 Nov. 2014	
	--1 to 9 scale--	-----0 to 100% scale-----	-----0 to 100% scale-----	--1 to 9 scale--	-----0 to 100% scale-----	-----0 to 100% scale-----	--1 to 9 scale--	-----0 to 100% scale-----	-----0 to 100% scale-----	
Traffic	5.9	75.5	62.4	5.3	75.4	55.7	4.6	92.1	44.8	
No Traffic	8.5	79.8	87.8	8.7	82.6	90.2	8.7	95.9	88.6	
LSD at 5% =	0.2	3.4	3.4	0.2	1.5	2.3	0.4	0.5	5.6	
Source of Variation										
Traffic	***	*	**	***	**	***	***	***	***	
Entry	***	***	***	***	***	***	***	***	***	
Traffic x Entry	*	NS	*	NS	**	NS	*	***	*	
CV (%)	9.8	3.2	8.4	12.8	3.8	10.7	12.3	1.1	9.9	

¹ Forty-two total machine passes were applied using a combination of the Rutgers Wear Simulator and Cady Traffic Simulator during three eight-week periods: spring (16 passes): two passes per week from 18 April through 2 June 2014; summer (16 passes): two passes per week from 2 July to 18 August 2014; and autumn (16 passes): two passes per week from 15 September to 8 November 2015

² 9 = most dense, uniform canopy

³ 100% = complete green cover; measured by digital image analysis

NS, *, **, *** Nonsignificant and significant at the 0.05, 0.01, and 0.001 probability level, respectively

Table 2. Uniformity of turf cover and fullness of turfgrass canopy as affected by the interaction of tall fescue entry and traffic after spring 2014 traffic; and green cover as affected by tall fescue entry. (Includes all entries of the 2012 National Turfgrass Evaluation (NTEP) Tall Fescue Test.)

Tall Fescue Entry	Uniformity of Turf Cover ¹ 3 June 2014		Green Cover ² 3 June 2014	Fullness of Turfgrass Canopy ³ 3 June 2014	
	No Traffic	Traffic ⁴		No Traffic	Traffic
	-----1 to 9 scale -----		-----0 to 100% scale -----		
1 RZ2	9.0	8.0	76.4	93.3	78.3
2 Firebird 2	9.0	8.0	80.3	91.7	75.0
3 PST-5GRB	8.7	7.7	80.1	93.3	73.3
4 ZW 44	9.0	7.7	76.7	90.0	73.3
5 PPG-TF-156	8.7	7.3	77.3	91.7	73.3
6 Hemi	9.0	7.3	78.4	93.3	80.0
7 B23	9.0	7.3	80.4	93.3	76.7
8 U43	9.0	7.3	81.2	91.7	71.7
9 DZ1	9.0	7.3	78.9	88.3	71.7
10 PPG-TF-135	9.0	7.3	81.2	95.0	71.7
11 U45	9.0	7.0	80.7	91.7	76.7
12 JS 916	9.0	7.0	77.9	90.0	73.3
13 ATF 1704	8.7	7.0	74.8	90.0	73.3
14 IS-TF 311	9.0	7.0	77.8	93.3	70.0
15 Catalyst	9.0	7.0	75.5	88.3	66.7
16 PPG-TF-152	9.0	7.0	82.1	93.3	75.0
17 IS-TF 289	9.0	7.0	77.2	91.7	65.0
18 Rhambler 2 SRP (LSD)	8.7	7.0	80.3	88.3	66.7
19 W45	9.0	7.0	78.4	93.3	73.3
20 PPG-TF-139	8.7	7.0	79.3	95.0	75.0
21 LTP-TWJU	9.0	7.0	77.0	95.0	75.0
22 PST-5EV2	8.7	7.0	80.9	93.3	75.0
23 CCR2	9.0	7.0	77.2	93.3	75.0
24 Mustang 4	8.3	6.7	80.6	88.3	61.7
25 GTO (Burl TF-2)	8.7	6.7	73.4	90.0	63.3
26 PSG-WE1	9.0	6.7	73.4	93.3	73.3
27 RAD-TF-92	8.7	6.7	79.8	90.0	66.7
28 PPG-TF-137	8.7	6.7	79.1	88.3	65.0
29 IS-TF 330	9.0	6.7	80.6	93.3	65.0
30 PST-5BPO	8.3	6.7	81.0	88.3	66.7

(Continued)

Table 2. Tall fescue traffic test, 2014 (continued).

Tall Fescue Entry	Uniformity of Turf Cover ¹ 3 June 2014		Green Cover ² 3 June 2014	Fullness of Turfgrass Canopy ³ 3 June 2014	
	No Traffic	Traffic ⁴		No Traffic	Traffic
	-----1 to 9 scale -----		-----0 to 100% scale -----		
31 PSG-GSD	8.3	6.7	79.7	86.7	70.0
32 Falcon V	9.0	6.7	78.9	90.0	63.3
33 Hot Rod (Burl TF-136)	9.0	6.7	77.2	93.3	75.0
34 W41	8.7	6.7	79.7	91.7	68.3
35 Regenerate	9.0	6.3	76.5	93.3	68.3
36 IS-TF 284 M2	8.7	6.3	79.4	90.0	55.0
37 F711	9.0	6.3	76.9	93.3	68.3
38 TF-287	9.0	6.3	79.2	88.3	63.3
39 RAD-TF-88	8.7	6.3	78.0	93.3	65.0
40 PPG-TF-172	8.7	6.3	77.7	91.7	63.3
41 IS-TF 307 SEL	9.0	6.3	77.7	90.0	61.7
42 IS-TF 308 SEL	8.7	6.3	78.6	90.0	65.0
43 PPG-TF-148	9.0	6.3	78.0	88.3	70.0
44 ATF 1612	9.0	6.3	79.7	90.0	68.3
45 IS-TF 285	8.3	6.3	77.3	86.7	68.3
46 Fesnova	8.7	6.3	79.7	88.3	60.0
47 PST-5BRK	8.7	6.3	80.4	88.3	60.0
48 PST-5DZP	8.7	6.3	80.6	86.7	61.7
49 IS-TF 310 SEL	8.7	6.0	76.4	90.0	65.0
50 BAR Fa 121095	8.3	6.0	78.2	86.7	66.7
51 RAD-TF-89	8.7	6.0	74.4	91.7	65.0
52 MET 6 SEL	8.7	6.0	78.1	88.3	66.7
53 SRX-TPC	9.0	6.0	80.1	90.0	61.7
54 PST-5RO5	8.3	6.0	79.9	88.3	55.0
55 IS-TF 282 M2	8.7	6.0	78.0	88.3	60.0
56 Saltillo (PST-5SALT)	8.7	6.0	82.5	86.7	56.7
57 Pick-W43	9.0	6.0	77.1	95.0	68.3
58 PPG-TF-150	9.0	6.0	81.3	95.0	70.0
59 Bizem	9.0	6.0	78.3	90.0	70.0
60 PST-5EX2	8.0	6.0	77.8	75.0	58.3
61 Grande 3	8.3	6.0	76.2	93.3	76.7
62 Falcon IV	8.0	6.0	78.5	85.0	61.7
63 MET-3	8.7	6.0	77.5	93.3	71.7
64 DB1	9.0	6.0	78.1	93.3	61.7
65 IS-TF 305 SEL	8.7	6.0	80.2	88.3	66.7

(Continued)

Table 2. Tall fescue traffic test, 2014 (continued).

Tall Fescue Entry	Uniformity of Turf Cover ¹ 3 June 2014		Green Cover ² 3 June 2014	Fullness of Turfgrass Canopy ³ 3 June 2014	
	No Traffic	Traffic ⁴		No Traffic	Traffic
	-----1 to 9 scale -----		-----0 to 100% scale -----		
66 MET 1	9.0	5.7	76.2	95.0	71.7
67 PPG-TF-170	9.0	5.7	75.8	93.3	61.7
68 Rain Dance (PST-5SDT)	8.0	5.7	78.1	86.7	56.7
69 Aquaduct	8.0	5.7	74.2	80.0	56.7
70 Inspiration (PST-R5NW)	8.0	5.7	78.4	81.7	58.3
71 IS-TF 291	8.3	5.7	78.1	86.7	56.7
72 GO-DFR	9.0	5.7	78.1	90.0	63.3
73 TD1	8.3	5.7	75.7	88.3	58.3
74 T31	8.7	5.7	77.7	90.0	61.7
75 Bullseye	9.0	5.7	79.3	91.7	61.7
76 PSG-TT4	7.7	5.7	76.4	78.3	58.3
77 PPG-TF-105	8.7	5.7	77.7	93.3	55.0
78 PPG-TF-169	8.3	5.7	75.3	90.0	58.3
79 ATF 1736	8.3	5.7	75.1	88.3	66.7
80 Annihilator	8.3	5.7	75.7	85.0	56.7
81 PPG-TF-157	8.7	5.7	79.6	91.7	58.3
82 JS 819	8.0	5.7	75.6	81.7	61.7
83 PST-5MVD	8.3	5.7	78.4	88.3	58.3
84 PPG-TF-145	8.3	5.7	78.0	88.3	58.3
85 PSG-8BP2	7.7	5.7	75.8	81.7	60.0
86 PPG-TF-115	8.0	5.7	79.4	83.3	53.3
87 Burl TF-69	8.7	5.3	77.8	93.3	58.3
88 LTP-F5DPDR	8.3	5.3	76.5	88.3	65.0
89 ATF 1754	8.7	5.3	71.4	91.7	71.7
90 IS-TF 269 SEL	8.3	5.3	78.2	90.0	56.7
91 PPG-TF-138	8.7	5.3	76.5	90.0	61.7
92 Mustang 4 + Faith + Bullseye	— 8.0	5.3 5.3	78.3	85.0	50.0
93 Rebel IV + Rebel Advance + Brockton	— 7.7	5.3 5.3	78.8	81.7	58.3
94 Caesar (TY 10)	8.3	5.3	77.5	81.7	50.0
95 Faith	9.0	5.0	75.8	91.7	56.7

(Continued)

Table 2. Tall fescue traffic test, 2014 (continued).

Tall Fescue Entry	Uniformity of Turf Cover ¹ 3 June 2014		Green Cover ² 3 June 2014	Fullness of Turfgrass Canopy ³ 3 June 2014	
	No Traffic	Traffic ⁴		No Traffic	Traffic
	-----1 to 9 scale -----		-----0 to 100% scale -----		
96 PPG-TF-151	8.3	5.0	80.8	90.0	61.7
97 K12-13	8.7	5.0	71.3	85.0	53.3
98 RAD-TF-83	8.0	5.0	76.2	78.3	63.3
99 LTP-FSD	8.3	5.0	76.3	88.3	56.7
100 204 Res. Blk4	8.3	5.0	73.8	86.7	61.7
101 JS 818	8.0	5.0	76.6	85.0	53.3
102 Warhawk	7.0	5.0	77.3	78.3	48.3
103 PSG-PO1	8.7	5.0	78.2	85.0	63.3
104 IS-TF 276 M2	8.0	5.0	78.5	85.0	61.7
105 Frontline (Exp TF-09)	8.0	5.0	79.0	76.7	46.7
106 Comp. Res. SST	8.0	4.7	76.0	83.3	53.3
107 K12-MCD	8.3	4.7	77.4	83.3	53.3
108 BAR Fa 121089	7.7	4.7	79.2	76.7	55.0
109 PPG-TF-142	8.7	4.7	74.8	85.0	50.0
110 Terrano	7.7	4.7	76.9	81.7	55.0
111 Temptation (OR-21)	7.7	4.7	76.4	78.3	45.0
112 JS 809	7.7	4.3	73.0	85.0	51.7
113 K12-05	8.0	4.3	75.9	83.3	48.3
114 BAR Fa 120878	6.3	4.3	75.7	68.3	45.0
115 BAR Fa 121091	7.0	4.0	76.1	78.3	43.3
116 IS-TF 272	8.3	4.0	76.9	86.7	53.3
117 Justice + Virtue II + Greystone	7.0	3.7	78.1	75.0	38.3
118 JS 825	7.0	3.7	71.9	70.0	41.7
119 Kentucky 31	6.3	3.7	71.5	63.3	38.3
120 Marauder	7.7	3.3	74.9	81.7	43.3
Columns (down) LSD at 5% =	1.4		4.2	12.5	
Rows (across) LSD at 5% =	1.1		–	10.7	

¹9 = most dense, uniform canopy

²100% = complete green cover; measured by digital image analysis

³100% = full canopy

⁴Sixteen total machine passes were applied using a combination of the Rutgers Wear Simulator and Cady Traffic Simulator during spring (18 April through 2 June 2014)

Table 3. Uniformity of turf cover and fullness of turfgrass canopy as affected tall fescue entry; and green cover as affected by the interaction of tall fescue entry and traffic after summer 2014 traffic. (Includes all entries of the 2012 National Turfgrass Evaluation (NTEP) Tall Fescue Test.)

Selection	Uniformity of Turf Cover ¹ 19 Aug. 2014	Green Cover ² 18 Aug. 2014		Fullness of Turfgrass Canopy ³ 19 Aug. 2014
		No Traffic	Traffic ⁴	
	---1 to 9 scale---	-----0 to 100% scale-----		
1 RZ2	8.0	83.1	70.2	84.2
2 Firebird 2	7.3	82.8	76.6	80.0
3 PST-5GRB	7.8	82.8	78.9	80.8
4 ZW 44	7.5	84.0	79.1	75.0
5 PPG-TF-156	8.0	83.7	76.5	82.5
6 Hemi	7.8	81.9	77.9	81.7
7 B23	7.8	85.6	79.2	81.7
8 U43	7.5	82.7	76.4	75.7
9 DZ1	7.5	82.7	75.4	77.5
10 PPG-TF-135	7.5	87.3	77.1	79.2
11 U45	7.8	84.6	81.7	79.2
12 JS 916	7.8	82.6	78.8	79.2
13 ATF 1704	7.8	83.8	74.4	83.3
14 IS-TF 311	7.5	80.2	75.3	77.5
15 Catalyst	7.3	82.0	75.5	73.3
16 PPG-TF-152	7.3	85.6	78.2	78.3
17 IS-TF 289	7.3	79.8	72.5	76.7
18 Rhambler 2 SRP (LSD)	7.2	81.9	71.6	73.3
19 W45	7.2	85.2	77.2	72.5
20 PPG-TF-139	7.2	83.8	76.6	72.5
21 LTP-TWUU	7.2	84.9	76.4	72.5
22 PST-5EV2	7.0	82.0	75.2	77.5
23 CCR2	6.5	83.8	73.8	70.8
24 Mustang 4	8.2	83.9	81.7	82.5
25 GTO (Burl TF-2)	8.0	81.9	76.1	80.8
26 PSG-WE1	7.8	83.1	71.6	78.3
27 RAD-TF-92	7.7	83.6	77.5	75.0
28 PPG-TF-137	7.7	84.1	75.0	77.5
29 IS-TF 330	7.5	83.7	77.3	77.5
30 PST-5BPO	7.5	82.8	81.4	77.5

(Continued)

Table 3. Tall fescue traffic test, 2014 (continued).

Selection	Uniformity of Turf Cover ¹ 19 Aug. 2014	Green Cover ² 18 Aug. 2014		Fullness of Turfgrass Canopy ³ 19 Aug. 2014	
		No Traffic	Traffic ⁴		
	---1 to 9 scale---	-----0 to 100% scale-----			
31	PSG-GSD	7.5	83.7	78.8	75.0
32	Falcon V	7.3	81.4	77.9	78.3
33	Hot Rod (Burl TF-136)	7.2	84.3	75.8	77.5
34	W41	6.7	84.3	71.1	67.5
35	Regenerate	7.5	84.1	78.0	80.0
36	IS-TF 284 M2	7.5	81.9	72.8	72.5
37	F711	7.3	85.1	71.6	75.0
38	TF-287	7.3	83.5	79.7	74.2
39	RAD-TF-88	7.3	83.9	79.9	77.5
40	PPG-TF-172	7.3	83.9	71.9	77.5
41	IS-TF 307 SEL	7.3	81.8	74.5	78.3
42	IS-TF 308 SEL	7.0	84.0	77.4	73.3
43	PPG-TF-148	7.0	84.1	74.6	76.7
44	ATF 1612	6.8	82.9	70.0	70.0
45	IS-TF 285	6.8	84.6	76.1	71.7
46	Fesnova	6.8	83.6	77.1	71.7
47	PST-5BRK	6.8	86.1	79.2	67.5
48	PST-5DZP	6.7	79.5	72.2	70.0
49	IS-TF 310 SEL	7.7	81.9	76.2	78.3
50	BAR Fa 121095	7.7	80.4	78.3	79.2
51	RAD-TF-89	7.5	80.7	76.9	75.8
52	MET 6 SEL	7.2	84.0	70.9	75.0
53	SRX-TPC	7.2	82.9	76.0	75.0
54	PST-5RO5	7.2	84.2	77.4	70.0
55	IS-TF 282 M2	7.0	82.5	73.2	76.7
56	Saltillo (PST-5SALT)	7.0	84.6	75.7	75.0
57	Pick-W43	6.8	87.4	78.5	70.0
58	PPG-TF-150	6.8	85.5	74.3	71.7
59	Bizem	6.8	83.5	71.6	75.8
60	PST-5EX2	6.8	85.5	82.1	73.3
61	Grande 3	6.7	84.6	78.9	72.5
62	Falcon IV	6.7	82.6	78.9	70.0
63	MET-3	6.5	84.4	75.4	70.8
64	DB1	6.5	80.9	70.7	67.5
65	IS-TF 305 SEL	6.3	81.4	72.1	67.5

(Continued)

Table 3. Tall fescue traffic test, 2014 (continued).

Selection	Uniformity of Turf Cover ¹ 19 Aug. 2014	Green Cover ² 18 Aug. 2014		Fullness of Turfgrass Canopy ³ 19 Aug. 2014	
		No Traffic	Traffic ⁴		
	---1 to 9 scale---	-----0 to 100% scale-----			
66	MET 1	7.3	82.7	72.9	80.8
67	PPG-TF-170	7.3	83.6	75.9	73.3
68	Rain Dance (PST-5SDT)	7.3	82.2	77.1	75.0
69	Aquaduct	7.2	76.4	72.5	71.7
70	Inspiration (PST-R5NW)	7.2	83.6	80.3	75.8
71	IS-TF 291	7.0	83.6	74.4	71.7
72	GO-DFR	7.0	78.6	75.2	75.8
73	TD1	7.0	80.2	71.8	70.8
74	T31	6.8	82.1	74.7	74.2
75	Bullseye	6.8	85.9	77.1	68.3
76	PSG-TT4	6.8	81.9	76.2	70.0
77	PPG-TF-105	6.8	82.8	70.2	68.3
78	PPG-TF-169	6.7	85.7	73.4	71.7
79	ATF 1736	6.7	84.7	80.0	75.0
80	Annihilator	6.7	79.0	76.0	72.5
81	PPG-TF-157	6.7	84.9	75.8	71.7
82	JS 819	6.7	79.8	72.8	74.2
83	PST-5MVD	6.7	83.8	76.0	70.8
84	PPG-TF-145	6.7	83.2	71.0	67.5
85	PSG-8BP2	6.5	80.0	74.9	68.3
86	PPG-TF-115	6.3	81.7	73.2	71.7
87	Burl TF-69	7.8	82.3	79.3	82.5
88	LTP-F5DPDR	7.3	83.8	76.8	74.2
89	ATF 1754	7.3	82.2	72.9	75.0
90	IS-TF 269 SEL	7.0	82.7	78.4	75.0
91	PPG-TF-138	7.0	83.2	73.7	73.3
92	Mustang 4 + Faith + Bullseye	– 7.0	83.2	80.4	72.5
93	Rebel IV + Rebel Advance + Brockton	– 6.8	84.9	80.7	70.8
94	Caesar (TY 10)	6.3	80.4	74.0	66.7
95	Faith	7.3	85.4	76.8	69.2

(Continued)

Table 3. Tall fescue traffic test, 2014 (continued).

Selection	Uniformity of Turf Cover ¹ 19 Aug. 2014	Green Cover ² 18 Aug. 2014		Fullness of Turfgrass Canopy ³ 19 Aug. 2014	
		No Traffic	Traffic ⁴		
	---1 to 9 scale---	-----0 to 100% scale-----			
96	PPG-TF-151	7.0	82.6	70.3	71.7
97	K12-13	6.7	74.9	71.5	69.2
98	RAD-TF-83	6.7	83.5	78.3	66.7
99	LTP-FSD	6.7	81.1	76.1	71.7
100	204 Res. Blk4	6.5	83.9	70.8	68.3
101	JS 818	6.5	81.4	74.8	69.2
102	Warhawk	6.3	79.8	73.6	66.7
103	PSG-PO1	6.0	84.7	76.4	69.2
104	IS-TF 276 M2	6.0	82.2	76.6	66.7
105	Frontline (Exp TF-09)	6.0	82.3	77.4	64.2
106	Comp. Res. SST	7.2	78.0	74.5	71.7
107	K12-MCD	7.0	83.3	75.7	73.3
108	BAR Fa 121089	6.8	79.7	76.1	70.0
109	PPG-TF-142	6.7	82.4	68.9	68.3
110	Terrano	6.5	80.1	72.0	62.5
111	Temptation (OR-21)	6.2	81.2	72.2	65.8
112	JS 809	6.8	79.1	73.8	66.7
113	K12-05	6.5	81.3	72.7	66.7
114	BAR Fa 120878	6.2	79.5	76.5	59.2
115	BAR Fa 121091	6.7	80.5	77.3	68.3
116	IS-TF 272	6.2	82.8	72.7	72.5
117	Justice + Virtue II + Greystone	6.8	82.8	80.3	63.3
118	JS 825	5.7	76.5	67.2	58.3
119	Kentucky 31	5.2	77.6	66.6	50.8
120	Marauder	6.0	80.1	69.9	66.7
	Columns (down) LSD at 5% =	1.1	5.7	10.0	
	Rows (across) LSD at 5% =	–	5.0	–	

¹9 = most dense, uniform canopy

²100% = complete green cover; measured by digital image analysis

³100% = full canopy

⁴Sixteen total machine passes were applied using a combination of the Rutgers Wear Simulator and Cady Traffic Simulator during summer (2 July through 18 August 2014)

Table 4. Uniformity of turf cover, green cover, and fullness of turfgrass canopy as affected by the interaction of tall fescue entry and traffic after autumn 2014 traffic. (Includes all entries of the 2012 National Turfgrass Evaluation Program (NTEP) Tall Fescue Test.)

Selection	Uniformity of Turf Cover ¹ 11 Nov. 2014		Green Cover ² 13 Nov. 2014		Fullness of Turfgrass Canopy ³ 11 Nov. 2014	
	No Traffic	Traffic ⁴	No Traffic	Traffic	No Traffic	Traffic
	---1 to 9 scale---		-----0 to 100% scale-----			
1 RZ2	9.0	6.3	96.4	92.4	93.3	61.7
2 Firebird 2	9.0	4.7	95.9	92.9	93.3	48.3
3 PST-5GRB	9.0	5.3	96.0	92.0	90.0	43.3
4 ZW 44	9.0	6.0	96.3	93.4	93.3	56.7
5 PPG-TF-156	9.0	5.7	96.7	92.9	93.3	55.0
6 Hemi	9.0	6.3	96.8	92.3	93.3	56.7
7 B23	9.0	5.7	95.2	92.2	93.3	58.3
8 U43	9.0	6.0	96.4	93.0	93.3	60.0
9 DZ1	9.0	5.0	96.3	92.3	91.7	45.0
10 PPG-TF-135	9.0	5.0	96.5	93.2	93.3	46.7
11 U45	9.0	6.7	96.1	93.5	93.3	56.7
12 JS 916	9.0	5.7	95.9	92.8	93.3	53.3
13 ATF 1704	9.0	5.0	96.0	92.1	95.0	53.3
14 IS-TF 311	9.0	5.7	95.6	92.8	93.3	56.7
15 Catalyst	9.0	6.3	95.4	92.0	93.3	60.0
16 PPG-TF-152	9.0	5.3	95.9	93.8	93.3	53.3
17 IS-TF 289	9.0	4.7	94.8	92.0	90.0	48.3
18 Rhambler 2 SRP (LSD)	9.0	6.3	95.7	93.0	88.3	53.3
19 W45	9.0	5.0	96.1	91.8	93.3	38.3
20 PPG-TF-139	8.7	4.7	96.1	93.2	90.0	48.3
21 LTP-TWUU	9.0	4.3	96.9	92.9	91.7	38.3
22 PST-5EV2	9.0	5.0	95.8	90.4	90.0	43.3
23 CCR2	8.7	4.0	96.5	91.8	93.3	46.7
24 Mustang 4	8.7	4.0	96.7	92.6	91.7	41.7
25 GTO (Burl TF-2)	9.0	4.7	95.3	91.4	91.7	48.3
26 PSG-WE1	9.0	5.7	95.7	91.7	95.0	53.3
27 RAD-TF-92	9.0	5.3	95.9	92.6	91.7	56.7
28 PPG-TF-137	9.0	4.3	96.3	92.4	93.3	41.7
29 IS-TF 330	9.0	5.3	95.4	93.0	95.0	53.3
30 PST-5BPO	8.7	4.7	95.1	91.3	81.7	46.7

(Continued)

Table 4. Tall fescue traffic test, 2014 (continued).

Selection	Uniformity of Turf Cover ¹ 11 Nov. 2014		Green Cover ² 13 Nov. 2014		Fullness of Turfgrass Canopy ³ 11 Nov. 2014	
	No Traffic	Traffic ⁴	No Traffic	Traffic	No Traffic	Traffic
	---1 to 9 scale---		-----0 to 100% scale-----			
31 PSG-GSD	8.0	4.0	96.5	93.2	85.0	43.3
32 Falcon V	9.0	4.7	96.4	92.1	93.3	50.0
33 Hot Rod (Burl TF-136)	9.0	5.7	96.2	93.0	93.3	61.7
34 W41	8.7	4.3	96.1	92.5	91.7	46.7
35 Regenerate	9.0	6.3	95.9	92.5	95.0	61.7
36 IS-TF 284 M2	9.0	4.7	95.6	91.3	90.0	46.7
37 F711	9.0	6.3	96.8	93.1	95.0	53.3
38 TF-287	9.0	5.7	96.0	92.9	91.7	53.3
39 RAD-TF-88	9.0	5.7	95.8	92.8	93.3	55.0
40 PPG-TF-172	9.0	5.0	96.6	91.9	95.0	53.3
41 IS-TF 307 SEL	9.0	4.7	95.5	91.8	93.3	45.0
42 IS-TF 308 SEL	9.0	5.3	95.5	93.2	93.3	51.7
43 PPG-TF-148	9.0	5.3	96.5	93.1	93.3	51.7
44 ATF 1612	9.0	4.3	95.6	92.3	90.0	41.7
45 IS-TF 285	9.0	4.3	95.8	91.9	88.3	43.3
46 Fesnova	8.7	3.3	97.1	91.8	85.0	31.7
47 PST-5BRK	8.7	3.3	96.1	92.1	83.3	33.3
48 PST-5DZP	8.7	3.7	95.1	92.1	81.7	41.7
49 IS-TF 310 SEL	9.0	6.0	95.6	92.9	90.0	53.3
50 BAR Fa 121095	8.7	5.0	96.0	92.6	85.0	50.0
51 RAD-TF-89	9.0	6.0	94.6	92.9	91.7	53.3
52 MET 6 SEL	8.7	5.0	95.2	91.5	91.7	46.7
53 SRX-TPC	8.7	4.0	97.0	93.0	88.3	43.3
54 PST-5RO5	8.7	3.7	96.1	90.6	85.0	40.0
55 IS-TF 282 M2	9.0	4.7	95.5	91.6	90.0	40.0
56 Saltillo (PST-5SALT)	8.7	4.0	96.6	92.9	81.7	35.0
57 Pick-W43	9.0	5.3	96.4	93.4	90.0	50.0
58 PPG-TF-150	8.7	5.0	96.4	93.1	91.7	48.3
59 Bizem	9.0	4.7	95.9	92.1	91.7	40.0
60 PST-5EX2	8.0	4.7	96.5	92.0	81.7	45.0
61 Grande 3	9.0	5.7	96.0	91.9	90.0	51.7
62 Falcon IV	7.7	3.3	96.6	91.9	85.0	33.3
63 MET-3	8.7	4.3	95.8	92.4	93.3	41.7
64 DB1	9.0	3.3	96.1	92.0	90.0	35.0
65 IS-TF 305 SEL	8.7	3.7	95.9	92.8	88.3	38.3

(Continued)

Table 4. Tall fescue traffic test, 2014 (continued).

Selection	Uniformity of Turf Cover ¹ 11 Nov. 2014		Green Cover ² 13 Nov. 2014		Fullness of Turfgrass Canopy ³ 11 Nov. 2014	
	No Traffic	Traffic ⁴	No Traffic	Traffic	No Traffic	Traffic
	---1 to 9 scale---		-----0 to 100% scale-----			
66 MET 1	9.0	5.0	95.4	91.7	95.0	48.3
67 PPG-TF-170	9.0	4.3	96.3	91.4	91.7	45.0
68 Rain Dance (PST-5SDT)	8.3	3.3	95.8	90.8	81.7	36.7
69 Aquaduct	8.7	4.3	95.8	91.5	86.7	40.0
70 Inspiration (PST-R5NW)	8.0	3.3	96.1	90.6	80.0	35.0
71 IS-TF 291	9.0	5.7	95.4	91.9	93.3	51.7
72 GO-DFR	8.3	4.3	95.6	92.5	90.0	50.0
73 TD1	8.7	3.7	94.3	91.8	86.7	35.0
74 T31	9.0	5.3	95.9	92.2	91.7	51.7
75 Bullseye	9.0	4.3	96.2	92.2	91.7	43.3
76 PSG-TT4	8.0	4.3	96.7	92.8	76.7	38.3
77 PPG-TF-105	9.0	4.3	96.0	93.0	91.7	45.0
78 PPG-TF-169	9.0	5.3	95.8	93.5	90.0	45.0
79 ATF 1736	9.0	5.0	96.3	93.2	91.7	43.3
80 Annihilator	8.3	4.7	96.5	92.8	90.0	41.7
81 PPG-TF-157	9.0	4.7	96.8	93.5	90.0	36.7
82 JS 819	8.7	4.3	95.4	92.7	78.3	43.3
83 PST-5MVD	8.3	3.7	96.3	92.4	90.0	40.0
84 PPG-TF-145	8.0	3.0	95.9	92.4	85.0	36.7
85 PSG-8BP2	7.7	5.0	95.2	91.3	81.7	50.0
86 PPG-TF-115	8.7	4.0	95.8	91.9	86.7	36.7
87 Burl TF-69	9.0	5.3	96.0	93.0	90.0	43.3
88 LTP-F5DPDR	9.0	5.3	96.6	93.9	90.0	40.0
89 ATF 1754	9.0	4.7	95.6	91.9	91.7	48.3
90 IS-TF 269 SEL	9.0	5.0	96.1	92.3	91.7	48.3
91 PPG-TF-138	9.0	4.7	95.8	92.5	88.3	51.7
92 Mustang 4 + Faith + Bullseye	— 8.7	— 3.7	— 96.9	— 92.3	— 91.7	— 36.7
93 Rebel IV + Rebel Advance + Brockton	— 8.0	— 3.3	— 95.8	— 92.2	— 80.0	— 33.3
94 Caesar (TY 10)	8.3	4.3	95.5	90.9	86.7	41.7
95 Faith	8.7	4.7	95.3	91.8	90.0	38.3

(Continued)

Table 4. Tall fescue traffic test, 2014 (continued).

Selection	Uniformity of Turf Cover ¹ 11 Nov. 2014		Green Cover ² 13 Nov. 2014		Fullness of Turfgrass Canopy ³ 11 Nov. 2014	
	No Traffic	Traffic ⁴	No Traffic	Traffic	No Traffic	Traffic
	---1 to 9 scale---		-----0 to 100% scale-----			
96 PPG-TF-151	9.0	4.0	96.5	91.9	90.0	36.7
97 K12-13	8.7	4.7	94.5	90.5	88.3	45.0
98 RAD-TF-83	8.3	4.0	96.1	92.4	88.3	43.3
99 LTP-FSD	9.0	3.7	96.7	92.2	91.7	36.7
100 204 Res. Blk4	9.0	5.3	97.0	93.8	93.3	50.0
101 JS 818	8.3	4.3	95.4	91.7	85.0	38.3
102 Warhawk	8.0	3.7	96.7	93.2	80.0	41.7
103 PSG-PO1	9.0	4.3	96.1	92.5	90.0	45.0
104 IS-TF 276 M2	8.7	4.0	95.7	91.6	85.0	41.7
105 Frontline (Exp TF-09)	7.7	3.3	96.0	92.2	73.3	31.7
106 Comp. Res. SST	9.0	6.0	96.2	94.0	91.7	58.3
107 K12-MCD	9.0	4.0	95.9	91.9	90.0	41.7
108 BAR Fa 121089	8.0	4.3	95.6	92.0	78.3	41.7
109 PPG-TF-142	8.7	3.7	95.0	90.4	90.0	38.3
110 Terrano	8.0	2.7	95.2	89.9	85.0	33.3
111 Temptation (OR-21)	8.0	2.7	95.9	91.5	83.3	31.7
112 JS 809	8.7	4.3	94.2	90.3	83.3	38.3
113 K12-05	9.0	4.0	94.9	89.8	90.0	46.7
114 BAR Fa 120878	7.0	4.3	96.3	91.3	63.3	40.0
115 BAR Fa 121091	8.0	2.3	95.6	91.1	83.3	33.3
116 IS-TF 272	9.0	4.3	95.1	91.9	91.7	41.7
117 Justice + Virtue II + Greystone	– 7.7	– 2.0	– 95.5	– 90.5	– 73.3	– 25.0
118 JS 825	7.3	1.7	93.8	88.4	73.3	26.7
119 Kentucky 31	6.0	1.3	95.7	81.3	61.7	20.0
120 Marauder	8.7	4.3	96.9	92.3	88.3	40.0
Columns (down) LSD at 5% =		1.4		1.8		11.6
Rows (across) LSD at 5% =		1.1		1.7		11.6

¹9 = most dense, uniform canopy

²100% = complete green cover; measured by digital image analysis

³100% = full canopy

⁴Sixteen total machine passes were applied using a combination of the Rutgers Wear Simulator and Cady Traffic Simulator during autumn (15 September to 8 November 2014)

Table 5. Performance of tall fescue entries without traffic in a turf trial seeded in September 2012 at North Brunswick, NJ. (Includes all entries of the 2012 National Turfgrass Evaluation Program (NTEP) Tall Fescue Test.)

Selection	Turfgrass Quality ¹			Spring	Color ³	Texture ⁴
	2013-2014 Avg.	2013 Avg.	2014 Avg.	Green-up ² 16 April 2014	2 Oct. 2014	2 Oct. 2014
-----1 to 9 scale-----						
1 RZ2	7.5	6.9	8.1	7.3	6.3	7.7
2 Firebird 2	7.3	7.0	7.6	6.3	7.0	7.7
3 PST-5GRB	6.9	5.7	8.0	7.0	5.0	8.7
4 ZW 44	7.4	7.1	7.7	6.0	7.3	7.3
5 PPG-TF-156	7.2	6.7	7.7	6.7	6.7	7.7
6 Hemi	7.4	7.1	7.8	6.0	7.3	7.3
7 B23	7.2	6.7	7.7	5.7	7.3	7.3
8 U43	7.2	7.2	7.2	7.0	7.0	8.3
9 DZ1	6.4	5.9	6.9	5.3	7.0	7.3
10 PPG-TF-135	6.8	6.3	7.4	6.7	6.7	6.7
11 U45	6.9	6.7	7.1	4.3	7.0	6.7
12 JS 916	6.5	5.8	7.2	4.3	6.7	7.3
13 ATF 1704	6.2	5.4	7.0	6.7	4.7	8.0
14 IS-TF 311	6.9	6.2	7.6	6.3	7.0	7.3
15 Catalyst	5.7	5.1	6.4	6.3	6.0	6.3
16 PPG-TF-152	7.4	7.0	7.7	5.3	6.7	7.3
17 IS-TF 289	6.9	6.9	6.9	3.3	7.7	6.3
18 Rhambler 2 SRP (LSD)	7.0	6.7	7.3	4.0	6.0	7.0
19 W45	7.7	7.3	8.1	5.3	7.0	8.3
20 PPG-TF-139	6.5	6.3	6.6	5.7	6.7	6.7
21 LTP-TWUU	7.1	6.6	7.7	7.7	6.3	7.3
22 PST-5EV2	6.7	6.0	7.4	5.7	6.0	7.0
23 CCR2	7.2	6.8	7.6	7.0	7.0	8.0
24 Mustang 4	5.8	5.7	5.9	6.3	6.3	5.7
25 GTO (Burl TF-2)	7.2	6.8	7.7	7.3	6.7	6.3
26 PSG-WE1	7.4	6.8	8.0	6.3	6.0	7.7
27 RAD-TF-92	6.3	5.8	6.8	5.0	7.0	7.7
28 PPG-TF-137	7.0	6.7	7.3	5.3	6.7	7.7
29 IS-TF 330	6.7	6.0	7.3	4.0	8.7	7.3
30 PST-5BPO	5.3	4.6	6.0	5.7	4.3	5.0

(Continued)

Table 5. Tall fescue test without traffic, 2014 (continued).

Selection	Turfgrass Quality ¹			Spring Green-up ² 16 April 2014	Color ³ 2 Oct. 2014	Texture ⁴ 2 Oct. 2014
	2013-2014 Avg.	2013 Avg.	2014 Avg.			
-----1 to 9 scale-----						
31 PSG-GSD	5.6	5.1	6.0	7.0	5.3	4.7
32 Falcon V	6.2	5.8	6.6	6.3	5.0	6.0
33 Hot Rod (Burl TF-136)	7.1	6.2	7.9	6.7	6.7	7.3
34 W41	6.6	6.2	6.9	5.3	6.3	7.0
35 Regenerate	7.8	7.8	7.8	6.7	7.3	8.7
36 IS-TF 284 M2	6.5	6.1	6.9	2.7	8.7	6.0
37 F711	7.5	6.7	8.3	7.0	6.3	8.0
38 TF-287	5.9	5.0	6.8	6.0	6.3	6.3
39 RAD-TF-88	6.2	5.3	7.1	5.0	8.7	7.3
40 PPG-TF-172	6.9	6.5	7.4	4.7	5.7	7.0
41 IS-TF 307 SEL	7.0	6.7	7.4	3.7	7.3	7.3
42 IS-TF 308 SEL	6.7	5.9	7.6	5.3	6.3	8.3
43 PPG-TF-148	6.3	5.4	7.2	7.3	6.0	7.3
44 ATF 1612	7.3	7.4	7.2	6.7	6.3	7.0
45 IS-TF 285	5.6	5.4	5.8	5.0	7.7	6.3
46 Fesnova	6.6	6.3	6.8	6.7	5.7	6.3
47 PST-5BRK	5.1	4.5	5.7	6.3	4.0	4.0
48 PST-5DZP	5.7	4.9	6.4	3.7	6.3	6.3
49 IS-TF 310 SEL	6.0	5.5	6.5	5.3	7.3	7.0
50 BAR Fa 121095	5.2	4.9	5.5	3.0	7.0	5.3
51 RAD-TF-89	6.6	6.4	6.7	5.0	8.0	7.0
52 MET 6 SEL	6.7	6.2	7.1	6.3	5.7	7.3
53 SRX-TPC	6.8	6.4	7.3	4.3	6.7	6.7
54 PST-5RO5	5.2	4.7	5.7	6.7	5.0	5.7
55 IS-TF 282 M2	6.2	5.6	6.9	5.7	8.7	7.0
56 Saltillo (PST-5SALT)	5.6	4.8	6.4	4.3	4.3	5.7
57 Pick-W43	7.2	6.5	7.8	7.3	6.7	7.0
58 PPG-TF-150	7.7	7.4	8.1	6.3	6.3	7.7
59 Bizem	6.9	6.5	7.4	7.0	6.7	6.7
60 PST-5EX2	4.3	3.8	4.9	8.3	3.0	4.3
61 Grande 3	6.3	5.6	7.1	7.7	5.7	7.7
62 Falcon IV	4.9	4.7	5.0	6.3	6.3	4.7
63 MET-3	6.9	6.9	6.9	6.0	6.3	7.0
64 DB1	5.7	5.2	6.1	4.3	8.7	6.0
65 IS-TF 305 SEL	6.4	6.1	6.6	5.0	7.0	7.3

(Continued)

Table 5. Tall fescue test without traffic, 2014 (continued).

Selection	Turfgrass Quality ¹			Spring Green-up ² 16 April 2014	Color ³ 2 Oct. 2014	Texture ⁴ 2 Oct. 2014
	2013-2014 Avg.	2013 Avg.	2014 Avg.			
-----1 to 9 scale-----						
66 MET 1	7.5	6.9	8.1	7.0	6.0	7.3
67 PPG-TF-170	6.7	6.4	7.0	6.7	6.7	7.0
68 Rain Dance (PST-5SDT)	4.9	4.3	5.5	6.7	4.7	5.3
69 Aquaduct	3.9	3.4	4.3	4.3	5.0	4.3
70 Inspiration (PST-R5NW)	4.2	3.7	4.8	6.0	5.0	3.3
71 IS-TF 291	6.9	6.5	7.3	5.3	8.7	7.7
72 GO-DFR	5.8	5.4	6.1	5.0	7.0	6.0
73 TD1	5.6	5.1	6.1	3.0	9.0	5.3
74 T31	6.3	5.6	7.1	6.3	6.3	6.7
75 Bullseye	7.1	6.9	7.3	6.7	7.0	6.7
76 PSG-TT4	4.6	4.3	5.0	6.3	4.7	4.7
77 PPG-TF-105	6.9	6.8	7.0	5.7	7.0	6.0
78 PPG-TF-169	6.0	5.1	6.9	6.7	5.7	7.0
79 ATF 1736	5.9	5.3	6.5	6.3	5.3	6.0
80 Annihilator	3.7	2.6	4.8	4.3	6.0	5.7
81 PPG-TF-157	6.7	6.1	7.3	5.7	7.3	7.0
82 JS 819	4.1	3.7	4.6	3.3	7.7	4.3
83 PST-5MVD	5.4	4.7	6.0	7.0	5.7	5.0
84 PPG-TF-145	5.3	4.8	5.8	4.0	7.7	5.7
85 PSG-8BP2	4.9	4.5	5.3	6.0	6.0	4.7
86 PPG-TF-115	5.1	4.3	5.9	5.0	7.0	5.0
87 Burl TF-69	6.3	6.2	6.5	6.3	7.3	6.3
88 LTP-F5DPDR	6.5	6.3	6.6	5.7	5.7	6.3
89 ATF 1754	6.1	5.5	6.8	7.0	6.0	6.3
90 IS-TF 269 SEL	6.2	5.6	6.7	4.3	7.7	6.7
91 PPG-TF-138	5.7	4.8	6.5	5.3	6.7	6.3
92 Mustang 4 + Faith + Bullseye	– 5.1	4.7	5.5	6.3	4.3	5.3
93 Rebel IV + Rebel Advance + Brockton	– 4.4	4.1	4.6	6.7	6.0	4.3
94 Caesar (TY 10)	5.3	5.1	5.6	6.3	7.7	5.7
95 Faith	6.3	6.3	6.4	6.7	7.0	6.0

(Continued)

Table 5. Tall fescue test without traffic, 2014 (continued).

Selection	Turfgrass Quality ¹			Spring Green-up ² 16 April 2014	Color ³ 2 Oct. 2014	Texture ⁴ 2 Oct. 2014
	2013-2014 Avg.	2013 Avg.	2014 Avg.			
-----1 to 9 scale-----						
96 PPG-TF-151	6.4	6.2	6.6	5.3	5.7	6.0
97 K12-13	4.3	3.3	5.2	1.0	6.7	5.7
98 RAD-TF-83	4.9	4.5	5.4	4.3	8.3	5.7
99 LTP-FSD	6.3	5.5	7.0	6.7	5.0	5.7
100 204 Res. Blk4	5.0	3.8	6.2	6.0	4.7	7.7
101 JS 818	5.2	5.0	5.4	4.0	7.7	5.0
102 Warhawk	3.1	2.2	3.9	3.0	6.0	5.7
103 PSG-PO1	5.7	5.2	6.2	6.3	6.3	7.0
104 IS-TF 276 M2	5.0	4.3	5.8	3.7	7.0	5.0
105 Frontline (Exp TF-09)	4.4	4.2	4.6	4.7	8.7	4.7
106 Comp. Res. SST	4.4	3.5	5.3	3.7	6.3	7.0
107 K12-MCD	5.2	4.6	5.9	5.7	5.7	5.7
108 BAR Fa 121089	3.7	3.2	4.2	4.3	6.3	4.0
109 PPG-TF-142	5.8	5.9	5.7	3.7	8.3	5.7
110 Terrano	5.2	4.9	5.4	4.7	6.3	5.7
111 Temptation (OR-21)	5.0	4.6	5.4	5.3	8.0	5.7
112 JS 809	4.5	3.8	5.3	3.0	7.3	5.3
113 K12-05	4.8	3.9	5.7	2.7	8.7	6.3
114 BAR Fa 120878	1.9	1.9	1.9	5.7	2.3	2.3
115 BAR Fa 121091	3.8	3.7	4.0	3.3	6.0	3.7
116 IS-TF 272	5.5	4.9	6.1	4.7	8.3	5.7
117 Justice + Virtue II + Greystone	— 3.2	2.7	3.7	5.7	3.3	4.0
118 JS 825	3.7	3.4	4.0	2.0	6.7	3.7
119 Kentucky 31	1.2	1.1	1.4	9.0	1.0	1.3
120 Marauder	3.9	2.9	5.0	3.0	5.3	5.7
LSD at 5% =	0.9	1.3	0.9	1.7	1.3	1.2

¹9 = best turfgrass quality

²9 = best spring green-up

³9 = darkest green color

⁴9 = finest leaf texture