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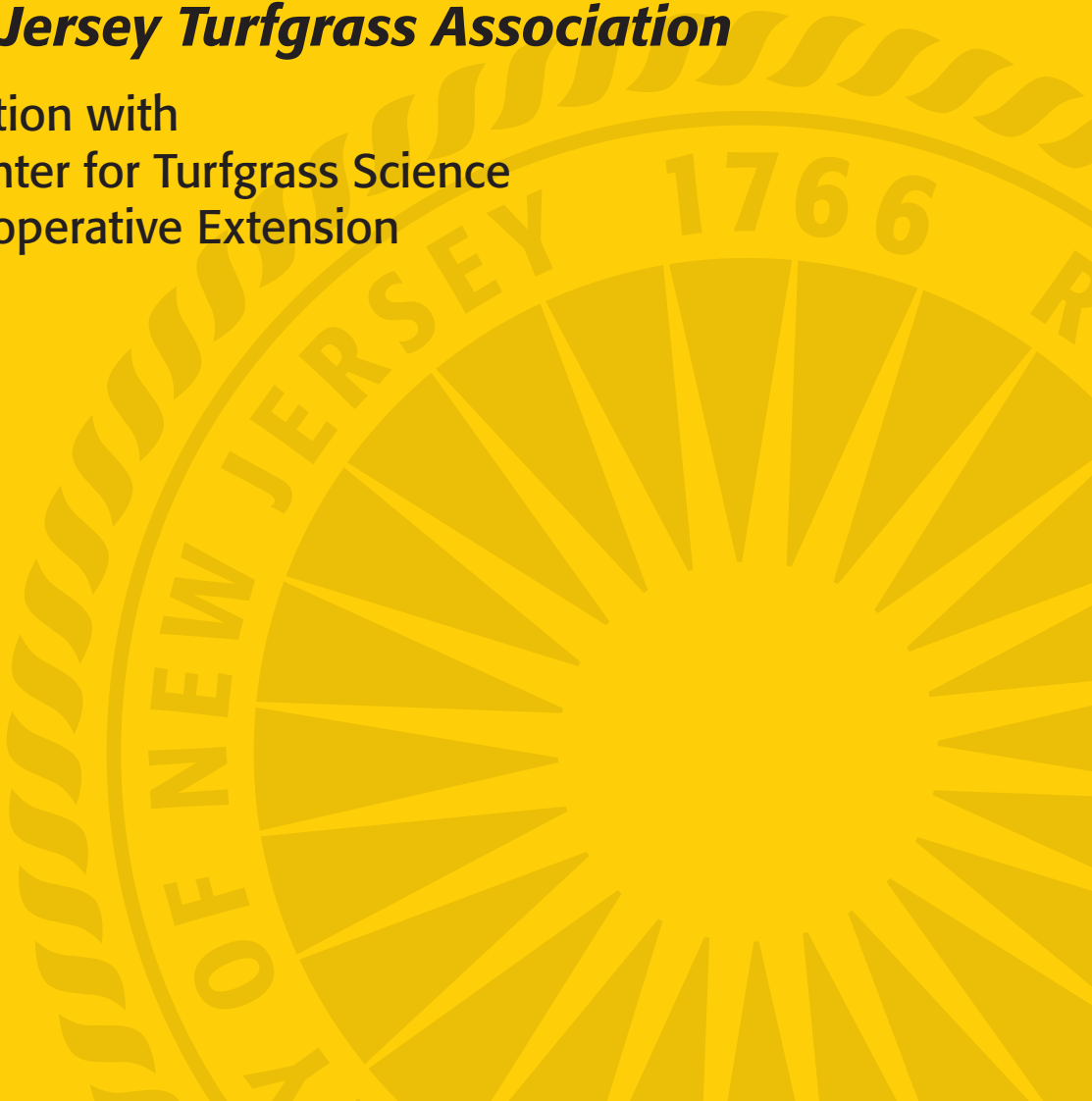

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The Rutgers Turfgrass Proceedings is published yearly by the Rutgers Center for Turfgrass Science, Rutgers Cooperative Extension, and the New Jersey Agricultural Experiment Station, School of Environmental and Biological Sciences, Rutgers, The State 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 2015 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

The 2012 NTEP TALL FESCUE TEST: RESULTS AT RUTGERS HORTICULTURAL RESEARCH FARM II DURING 2015

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Previously, tall fescue (*Festuca arundinacea* Schreb.) was described as a tall-growing, perennial bunchgrass with coarse leaves and an extensive fibrous root system; the cultivar 'Kentucky 31' was characterized as most satisfactory in the mid-Atlantic region because of factors including its ability to better persist under mowing and attractiveness (Juska et al., 1969). During the past 30 years, extensive tall fescue breeding efforts have resulted in cultivars with a lower vertical growth rate, darker-green color, finer leaf blades, higher shoot density, better disease resistance and greater seed yield (Bonos and Huff, 2013). Improved turf-type tall fescue cultivars are frequently established for sports fields and other recreational areas where improved traffic (wear and compaction) tolerance is very useful.

A modified version of the Rutgers Wear Simulator (RWS; Bonos et al., 2001) in combination with 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; 2012). More recently, Park et al. (2014; 2015) reported on the effectiveness of the combined use of both RWS and Cady Traffic Simulator (CTS; Henderson et al., 2005) to apply wear and trampling stresses to field trials at Rutgers.

The objective of this study was to continue 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 of 2015.

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 three-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 2015.

A total of 3.7 lb nitrogen (N) per 1000 ft^2 was applied in 2015 (0.7, 1.2, 0.8, and 1.0 lb N per 1000 ft^2 on 13 April, 12 June, 9 September, and 19 November 2014, respectively).

Turfgrass pests were controlled on a preventive basis to ensure the accurate assessment of entry response to traffic. Karcher and Richardson (2013) note that it is difficult to evaluate an individual turfgrass stress response when more than one stress is present on the turf. Park et al. (2012) reported that damage to tall fescue resulting from brown patch (caused by *Rhizoctonia solani*) interfered with the ability to positively correlate turf quality and wear

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tolerance, which has been previously reported. For this reason, brown patch was controlled with preventive applications of flutolanil on 3 and 20 July 2015 at 91 oz per acre (131 oz Prostar 70 WG per acre). Moreover, Pythium disease was preventively controlled with cyazofamid (19 June and 11 July 2015 at 0.72 and 1.0 lb per acre, respectively [Segway at 28 and 39 fl oz per acre, respectively]).

Crabgrass (*Digitaria* spp.) was controlled with preemergence applications of dithiopyr on 16 April and 11 June 2015 at 0.26 lb per acre (1.0 pt Dimension 2EW per acre). For preventive control of white grubs, imidacloprid was applied on 11 June 2015 at 6.0 oz per acre (Merit 75WP at 8.0 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 2015, one pass of the RWS and one pass of the CTS were made per week for 8 weeks (16 total passes) during spring (16 April to 1 June), summer (1 July to 18 August), and autumn (16 September to 1 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 (FTC) (0 to 100% scale where 100% = full canopy) at the conclusion of each traffic period on 4 June 2015 (spring), 18 August 2015 (summer), and 4 November 2015 (autumn).

Similarly, a Canon PowerShot G12 (Canon USA, Inc., Lake Success, NY) digital camera mounted in an enclosed box equipped with artificial lighting was used to capture images of trafficked and non-trafficked plots at the conclusion of each traffic period on 4 June, 19 August, and 2 November 2015. 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.

Images were imported into SigmaScan Pro (v. 5.0, SPSS, Inc., Chicago, IL) for digital image analysis (DIA) of green cover (0 to 100% scale where 100% = complete green cover) using methods described by Richardson et al. (2001) and 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 2015 as well as for spring green-up on 10 April 2015. A 1 to 9 rating was utilized for each parameter where 9 equaled the best turfgrass quality and earliest spring green-up.

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

Not unexpectedly, traffic reduced the uniformity of turf cover and FTC of tall fescue during spring, summer, and autumn 2015 (Table 1). Traffic reduced green cover during summer and autumn traffic; however, green cover was greater in trafficked plots compared to non-trafficked plots in spring 2015.

The entry factor had a significant effect on each parameter during each season in 2015 (Table 1). Moreover, the entry effect interacted with the traffic factor for uniformity of turf cover during spring, summer, and autumn, green cover during spring and autumn, and FTC during spring.

Response to Spring Traffic 4 June 2015

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 FTC and green cover were Raptor III (ZW 44), Technique (RZ2), Fayette (IS-TF 291), B23, Hemi, IS-TF 311, Meridian (PST-5GRB), 4th Millennium SRP (U43), Screamer LS (PPG-TF-148), PPG-TF-135, Catalyst, ATF 1612, Firewall (PSG-WE1), Xtender (PPG-TF-139), Hot Rod (Burl TF-136), Reflection (U45), Avenger (PPG-TF-156), IS-TF 269 SEL, Rowdy (SRX-TPC), F711, W41, IS-TF 289, Bizem, and RAD-TF-88. Kentucky 31 had poorest uniformity of turf cover and lowest FTC and green cover after spring 2015 traffic.

Response to Summer Traffic 18 and 19 August 2015

Cultivars and experimental selections with best uniformity of turf cover after summer 2015 traffic were B23, Fayette (IS-TF 291), Meridian (PST-5GRB), Regenerate, Avenger (PPG-TF-156), PPG-TF-135, TF-287, RAD-TF-92, ATF 1612, PPG-TF-172, ATF 1704, Reflection (U45), IS-TF 311, Technique (RZ2), F711, Rhambler 2 SRP (LSD), RAD-TF-89, Catalyst, 4th Millennium SRP (U43), Diablo (IS-TF 330), Raptor III (ZW 44), Temple (DZ1), Hemi, Saltillo (PST-5SALT), Bullseye, and PST-5EX2 (Table 3). Entries with the poorest uniformity of turf cover after summer traffic were Mustang 4, PST-5DZP, GO-DFR, Dynamite LS (PPG-TF-145), Ares (PPG-TF-142), JS 825, CCR2, ATF 1754, ATF 1736, RAD-TF-83, BAR Fa 120878, Mustang 4 + Faith + Bullseye, IS-TF 272, Faith, JS 819, Rebel IV + Rebel Advance + Brockton, PSG-PO1, Marauder, Warhawk, 204 Res. Blk4, BAR Fa 121089, Frontline (Exp TF-09), Thunderstruck (TD1), Justice + Virtue II + Greystone, Temptation (OR-21), and
Kentucky 31 (Table 3).

FTC and green cover varied among entries but were independent of the level of traffic after summer 2015 traffic (Table 3). Entries with the greatest green cover and FTC on 19 August 2015 were B23, Fayette (IS-TF 291), PPG-TF-135, ATF 1704, Reflection (U45), Rhambler 2 SRP (LSD), TF-287, 4th Millennium SRP (U43), IS-TF 269 SEL, Embrace (PST-5EV2), Rain Dance (PST-5SDT), Bizem, Firecracker SLS (PPG-TF-105), Traverse 2 SRP (W45), RAD-TF-88, and Leonardo (LTP-FSD).

Response to Autumn Traffic 2 to 4 November 2015

Uniformity of turf cover and green cover 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 the best uniformity of turf cover and greatest green cover were Temple (DZ1), Traverse 2 SRP (W45), PPG-TF-172, PSG-GSD, K12-13, 4th Millennium SRP (U43), PSG-8BP2, Diablo (IS-TF 330), Reflection (U45), Bizem, Pick-W43, F711, GO-DFR, RAD-TF-92, Xtender (PPG-TF-139), Raptor III (ZW 44), PST-5BPO, Comp. Res. SST, Embrace (PST-5EV2), RAD-TF-89, Rhambler 2 SRP (LSD), Fayette (IS-TF 291), Michelangelo (LTP-F5DPDR), IS-TF 308 SEL, Maestro (T31), JS 916, TF-287, Rockwell (LTP-TWUU), PST-5EX2, PPG-TF-170, Hemi, RAD-TF-88, IS-TF 311, B23, Technique (RZ2), Titanium 2LS (PPG-TF-152), Kingdom (DB1), Firebird 2, Firecracker SLS (PPG-TF-105), Saltillo (PST-5SALT), Hover (Burl TF-69), Rowdy (SRX-TPC), Caesar (TY 10), Regenerate, IS-TF 285, and Screamer LS (PPG-TF-148). Entries with the poorest uniformity of turf cover and least green cover were Annihilator, PST-5DZP, Thunderstruck (TD1), Falcon V, CCR2, Marauder, and Kentucky 31.

Although FTC varied among entries after autumn traffic, it was independent of the level of traffic (Table 4). Eighty-two entries had the greatest FTC in November 2015; only Kentucky 31 had the lowest FTC.

Performance of Tall Fescue without Traffic

Entries with the best multi-year average turf quality during 2013-15 were F711, Black Tail (PPG-TF-150), Traverse 2 SRP (W45), Regenerate, 5th Millennium SRP (U43), MET 1, Technique (RZ2), B23, CCR2, Rockwell (LTP-TWUU), Avenger II (PPG-TF-156), Raptor III (ZW 44), Titanium 2LS (PPG-TF-152), Hemi, Firecracker SLS (PPG-TF-105), Firebird 2, ATF 1612, Bizem, Rhambler 2 SRP (LSD), Bullseye, PPG-TF-172, Reflection (U45), IS-TF 307 SEL, Rowdy (SRX-TPC), Fayette (IS-TF 291), Meridian (PST-5GRB), Pick-W43, Cochise V (PPG-TF-135), PPG-TF-137, GTO (Burl TF-

2), Embrace (PST-5EV2), Hot Rod (Burl TF-136), Firewall (PSG-WE1), IS-TF 311, MET-3, Temple (DZ1), Thor (PPG-TF-157), RAD-TF-92, W41, PPG-TF-170, IS-TF 308 SEL, Diablo (IS-TF 330), ATF 1704, PPG-TF-151, JS 916, and MET 6 SEL, and IS-TF 289 (Table 5).

Entries with the poorest multi-year average turf quality in 2013-15 were BAR Fa 120878 and Kentucky 31 (Table 5). Other entries with lower multi-year average turf quality (< 5.0) during 2013-15 were Comp. Res. SST, K12-13, PSG-TT4, PST-5EX2, Rebel IV + Rebel Advance + Brockton, Inspiration, JS 819, Frontline (Exp TF-09), BAR Fa 121091, Marauder, Aquaduct, BAR Fa 121089, Annihilator, JS 825, Justice + Virtue II + Greystone, and Warhawk (Table 5).

Entries with the best spring green-up on 10 April 2015 were Kentucky 31, Grande 3, and Falcon V (Table 5). Additional cultivars and experimental selections with better spring green-up (> 6.0) were Regenerate, MET 1, ATF 1704, Rockwell (LTP-TWUU), PST-5EX2, Mustang 4, Pick-W43, PPG-TF-169, Screamer LS (PPG-TF-148), CCR2, 5th Millennium SRP (U43), Catalyst, GTO (Burl TF-2), MET 6 SEL, ATF 1754, Meridian (PST-5GRB), Faith, Avenger II (PPG-TF-156), PPG-TF-170, Bizem, MET-3, and PST-5MVD.

Entries with the poorest spring green-up on the same rating date in 2015 were Rhambler 2 SRP (LSD), JS 809, IS-TF 285, Thunderstruck (TD1), Ares (PPG-TF-142), BAR Fa 121095, JS 819, JS 818, IS-TF 289, Kingdom (DB1), JS 825, K12-13, and Dynamite LS (PPG-TF-145) (Table 5).

DISCUSSION

While combined operation of the RWS and CTS continued to be effective at applying traffic stress to tall fescue, digital image analysis provided confounding green cover results compared to visually-generated uniformity of turf cover and FTC data. Greater green cover in trafficked plots compared to non-trafficked tall fescue after spring traffic was due to the RWS removing senesced, non-green turfgrass leaves (winter senescence) in trafficked plots, not a more dense turf canopy. Moreover, among the 87 entries with the greatest green cover after autumn 2015 traffic, fourteen were among entries with the poorest uniformity of turf cover.

Uniformity of turf cover and FTC ratings tended to provide more differences among entries compared to green cover data. Across all three seasons during 2015, uniformity of turf cover in trafficked plots ranged from 3.3 to 8.3 and FTC ranged from 42 to 82%. Green cover in trafficked plots varied from 70 to 94%.

Park et al. (2015) previously questioned the capability of digital image analysis at capturing all turfgrass canopy characteristics compared to an experienced human evaluator. Karcher and Richardson (2013) described various limitations concerning the use of digital image analysis in turf research and the need for new techniques to evaluate leaf texture, turf density, and uniformity. These often subtle turf characteristics appear to be the source of discrepancies between our visual parameters and digital image analysis data.

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Table 1. Uniformity of turf cover, fullness of turf canopy, and green turf cover as affected by tall fescue entry and traffic level during 2015. (Includes all entries of the 2012 National Turfgrass Evaluation Program (NTEP) Tall Fescue Test.)

	Spring Traffic (4 June 2015)[1]			Summer Traffic (18 and 19 Aug. 2015)			Autumn Traffic (2 to 4 Nov. 2015)		
	Uniformity of Turf Cover[2]	Fullness of Turfgrass Canopy[3]	Green Cover (DIA)[4]	Uniformity of Turf Cover	Fullness of Turfgrass Canopy	Green Cover (DIA)	Uniformity of Turf Cover	Fullness of Turfgrass Canopy	Green Cover (DIA)
	--1 to 9 scale--	--------0 to 100% scale--------		--1 to 9 scale--	--------0 to 100% scale--------		--1 to 9 scale--	--------0 to 100% scale--------	
Level of Traffic									
No Traffic	8.7	93.4	89.6	8.7	91.3	85.9	8.5	89.4	89.4
Traffic	6.6	68.9	91.0	6.1	65.4	77.9	5.7	57.6	78.1
LSD at 5% =	0.1	3.5	0.6	0.3	3.9	3.3	0.2	3.1	2.1
Source of Variation									
Traffic	***	**	*	***	**	**	***	***	**
Entry	***	***	***	***	***	***	***	***	*
Traffic x Entry	***	***	***	*	NS	NS	*	NS	*
CV (%)	7.8	6.1	1.1	10.8	9.1	5.4	10.7	10.1	3.3

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

[2] 9 = most dense, uniform canopy

[3] 100% = full canopy

[4] 100% = complete green cover; measured by digital image analysis (DIA)

NS, *, **, *** = Nonsignifcant and signifcant at the 0.05, 0.01, and 0.001 probability level, respectively

Table 2. Green cover, uniformity of turf cover, and fullness of turfgrass canopy as affected by the interaction of tall fescue entry and traffic in spring 2015. (Includes all entries of the 2012 National Turfgrass Evaluation Program (NTEP) Tall Fescue Test.)

		Spring Traffic (4 June 2015)[1]					
		Uniformity of Turf Cover[2]		Fullness of Turfgrass Canopy[3]		Green Cover (%) (DIA)[4]	
	Selection	No Traffic	Traffic[4]	No Traffic	Traffic	No Traffic	Traffic
		1 to 9 scale		0 to 100% scale			
1	ATF 1704	9.0	8.0	96.7	76.7	88.5	91.1
2	Raptor III (ZW 44)	9.0	8.0	96.7	78.3	89.7	92.5
3	B23	9.0	7.7	100.0	78.3	91.5	93.1
4	Fayette (IS-TF 291)	9.0	7.7	96.7	81.7	88.7	92.0
5	Meridian (PST-5GRB)	9.0	7.7	96.7	76.7	92.4	92.8
6	IS-TF 311	9.0	7.7	96.7	78.3	89.5	92.0
7	Technique (RZ2)	9.0	7.7	100.0	81.7	88.8	93.5
8	4th Millennium SRP (U43)	9.0	7.7	98.3	73.3	90.3	92.7
9	RAD-TF-89	9.0	7.7	95.0	80.0	89.7	90.0
10	Hemi	9.0	7.7	98.3	78.3	90.5	92.8
11	JS 916	9.0	7.7	95.0	76.7	90.4	90.7
12	Screamer LS (PPG-TF-148)	9.0	7.7	96.7	73.3	90.9	91.8
13	Comp. Res. SST	8.3	7.7	93.3	76.7	88.1	91.5
14	RAD-TF-92	9.0	7.3	93.3	80.0	90.0	90.7
15	PPG-TF-135	9.0	7.3	98.3	78.3	91.2	92.8
16	ATF 1612	9.0	7.3	98.3	76.7	89.6	92.9
17	Avenger (PPG-TF-156)	9.0	7.3	98.3	75.0	90.7	92.9
18	PPG-TF-172	9.0	7.3	96.7	71.7	91.3	92.1
19	Reflection (U45)	9.0	7.3	95.0	76.7	90.5	92.0
20	PST-5EX2	8.3	7.3	88.3	73.3	87.4	89.7
21	Catalyst	8.7	7.3	95.0	78.3	88.1	92.1
22	Rowdy (SRX-TPC)	9.0	7.3	96.7	73.3	91.1	92.0
23	IS-TF 269 SEL	9.0	7.3	93.3	75.0	91.6	92.2
24	Hot Rod (Burl TF-136)	9.0	7.3	95.0	76.7	90.9	92.4
25	Xtender (PPG-TF-139)	9.0	7.3	95.0	76.7	90.3	92.6
26	Falcon V	9.0	7.3	93.3	75.0	89.8	90.9
27	PSG-8BP2	8.3	7.3	90.0	75.0	88.8	89.9
28	Michelangelo (LTP-F5DPDR)	8.7	7.3	95.0	73.3	90.0	90.6
29	Firewall (PSG-WE1)	8.7	7.3	96.7	76.7	89.8	92.7
30	TF-287	9.0	7.0	95.0	70.0	89.7	90.9

(Continued)

Table 2. Tall fescue traffic test, spring 2015, NTEP (continued).

		Spring Traffic (4 June 2015)[1]					
		Uniformity of Turf Cover[2]		Fullness of Turfgrass Canopy[3]		Green Cover (%) (DIA)[4]	
	Selection	No Traffic	Traffic[4]	No Traffic	Traffic	No Traffic	Traffic
		1 to 9 scale		0 to 100% scale			
31	F711	9.0	7.0	96.7	75.0	91.6	93.2
32	Bullseye	9.0	7.0	93.3	68.3	90.7	92.2
33	PST-5BPO	8.7	7.0	90.0	70.0	90.4	90.8
34	Swagger (PST-5RO5)	9.0	7.0	93.3	71.7	90.1	90.7
35	W41	9.0	7.0	96.7	75.0	90.5	92.5
36	Embrace (PST-5EV2)	9.0	7.0	93.3	70.0	90.3	92.0
37	Bizem	9.0	7.0	95.0	73.3	89.8	92.5
38	K12-MCD	8.7	7.0	96.7	73.3	89.3	91.0
39	IS-TF 310 SEL	9.0	7.0	96.7	71.7	89.3	90.9
40	PSG-GSD	8.3	7.0	91.7	75.0	90.3	91.7
41	RAD-TF-88	9.0	7.0	96.7	73.3	92.0	92.1
42	Leonardo (LTP-FSD)	9.0	7.0	96.7	75.0	90.8	91.7
43	Black Tail (PPG-TF-150)	9.0	7.0	95.0	71.7	91.4	92.0
44	IS-TF 289	9.0	7.0	95.0	75.0	89.1	92.1
45	JS 818	8.7	7.0	91.7	66.7	87.5	90.4
46	MET 6 SEL	9.0	7.0	96.7	70.0	89.4	91.8
47	Temple (DZ1)	9.0	6.7	96.7	71.7	90.4	92.0
48	Diablo (IS-TF 330)	9.0	6.7	95.0	70.0	89.9	92.2
49	PPG-TF-170	8.7	6.7	96.7	73.3	90.4	91.0
50	Rain Dance (PST-5SDT)	8.0	6.7	90.0	68.3	90.0	90.2
51	Foxhound (IS-TF 284 M2)	8.7	6.7	93.3	65.0	89.8	91.0
52	Firecracker SLS (PPG-TF-105)	9.0	6.7	95.0	75.0	91.2	91.6
53	IS-TF 285	8.3	6.7	90.0	66.7	88.6	91.4
54	IS-TF 276 M2	9.0	6.7	90.0	66.7	87.6	89.7
55	PPG-TF-138	9.0	6.7	95.0	68.3	89.8	90.8
56	Inspiration (PST-R5NW)	8.0	6.7	91.7	70.0	88.9	89.1
57	MET 1	9.0	6.7	96.7	66.7	89.3	91.2
58	Aquaduct	8.0	6.7	90.0	70.0	86.8	89.2
59	Hover (Burl TF-69)	9.0	6.7	96.7	70.0	90.6	91.3
60	PST-5BRK	8.7	6.7	91.7	66.7	90.8	91.8
61	IS-TF 305 SEL	9.0	6.7	91.7	65.0	90.8	91.7
62	Grande 3	8.7	6.7	98.3	71.7	88.9	91.2
63	PPG-TF-169	9.0	6.7	96.7	70.0	87.7	91.1
64	Terrano	9.0	6.7	91.7	65.0	89.9	90.7
65	Annihilator	8.3	6.7	88.3	66.7	89.0	89.2

(Continued)

Table 2. Tall fescue traffic test, spring 2015, NTEP (continued).

		Spring Traffic (4 June 2015)[1]					
		Uniformity of Turf Cover[2]		Fullness of Turfgrass Canopy[3]		Green Cover (%) (DIA)[4]	
	Selection	No Traffic	Traffic[4]	No Traffic	Traffic	No Traffic	Traffic
		1 to 9 scale		0 to 100% scale			
66	Falcon IV	8.3	6.7	91.7	60.0	88.0	89.2
67	ATF 1736	8.3	6.7	93.3	66.7	88.9	90.5
68	ATF 1754	9.0	6.7	93.3	66.7	88.0	89.7
69	Regenerate	9.0	6.3	96.7	73.3	90.1	92.5
70	Rhambler 2 SRP (LSD)	9.0	6.3	96.7	70.0	90.1	92.5
71	Rockwell (LTP-TWUU)	9.0	6.3	98.3	68.3	90.4	92.2
72	IS-TF 308 SEL	9.0	6.3	96.7	63.3	90.9	93.1
73	Maestro (T31)	9.0	6.3	96.7	68.3	89.4	91.7
74	Caesar (TY 10)	8.0	6.3	91.7	68.3	89.0	89.4
75	PST-5MVD	9.0	6.3	91.7	68.3	89.9	92.2
76	Firebird 2	9.0	6.3	98.3	70.0	91.4	92.3
77	Kingdom (DB1)	9.0	6.3	93.3	68.3	90.0	90.5
78	MET-3	8.7	6.3	91.7	68.3	89.9	91.8
79	Fesnova	8.7	6.3	91.7	65.0	90.5	91.6
80	PPG-TF-115	8.7	6.3	93.3	66.7	91.0	91.3
81	Thor (PPG-TF-157)	9.0	6.3	93.3	66.7	91.4	91.7
82	Titanium 2LS (PPG-TF-152)	9.0	6.3	96.7	70.0	91.1	92.9
83	PPG-TF-151	8.3	6.3	93.3	65.0	90.9	91.7
84	JS 825	8.0	6.3	83.3	61.7	86.0	87.6
85	RAD-TF-83	9.0	6.3	93.3	63.3	87.6	88.8
86	JS 819	8.3	6.3	91.7	68.3	87.5	89.1
87	Faith	8.7	6.3	95.0	70.0	88.4	91.6
88	Frontline (Exp TF-09)	8.0	6.3	86.7	61.7	89.6	88.7
89	Saltillo (PST-5SALT)	8.7	6.0	91.7	66.7	90.4	91.2
90	Traverse 2 SRP (W45)	8.7	6.0	95.0	68.3	90.5	93.6
91	GTO (Burl TF-2)	9.0	6.0	93.3	68.3	87.9	91.2
92	K12-05	8.7	6.0	95.0	60.0	88.9	89.6
93	PPG-TF-137	9.0	6.0	100.0	73.3	90.8	93.4
94	Pick-W43	8.7	6.0	96.7	65.0	90.2	93.0
95	IS-TF 307 SEL	9.0	6.0	95.0	70.0	90.1	92.2
96	PSG-TT4	8.0	6.0	88.3	66.7	89.5	89.6
97	GO-DFR	8.7	6.0	93.3	63.3	89.0	89.1
98	Dynamite LS (PPG-TF-145)	8.7	6.0	91.7	68.3	90.7	90.9
99	Mustang 4	8.0	6.0	91.7	63.3	88.5	90.2
100	PST-5DZP	9.0	6.0	91.7	66.7	90.6	90.8

(Continued)

Table 2. Tall fescue traffic test, spring 2015, NTEP (continued).

		Spring Traffic (4 June 2015)[1]					
		Uniformity of Turf Cover[2]		Fullness of Turfgrass Canopy[3]		Green Cover (%) (DIA)[4]	
	Selection	No Traffic	Traffic[4]	No Traffic	Traffic	No Traffic	Traffic
		1 to 9 scale		0 to 100% scale			
101	Rebel IV + Rebel Advance + Brockton	8.0	6.0	86.7	61.7	89.2	89.4
102	Mustang 4 + Faith + Bullseye	8.3	6.0	93.3	63.3	88.5	89.6
103	PSG-PO1	9.0	6.0	95.0	66.7	89.8	92.0
104	BAR Fa 121091	8.0	5.7	90.0	65.0	89.5	88.7
105	JS 809	8.3	5.7	91.7	61.7	85.6	88.5
106	Turfway (IS-TF 282 M2)	8.3	5.7	91.7	63.3	89.5	89.9
107	Warhawk	7.7	5.7	85.0	65.0	88.6	89.8
108	204 Res. Blk4	8.7	5.7	95.0	61.7	89.2	92.3
109	BAR Fa 121089	8.0	5.7	88.3	53.3	87.7	87.8
110	K12-13	8.3	5.3	95.0	60.0	87.4	89.4
111	BAR Fa 121095	8.0	5.3	93.3	56.7	89.5	90.2
112	Ares (PPG-TF-142)	9.0	5.3	91.7	55.0	89.5	90.7
113	CCR2	9.0	5.3	95.0	56.7	92.2	92.1
114	IS-TF 272	9.0	5.3	93.3	60.0	89.7	90.7
115	Marauder	8.0	5.3	90.0	60.0	90.4	89.1
116	Thunderstruck (TD1)	9.0	5.3	91.7	56.7	89.3	89.1
117	Justice + Virtue II + Greystone	7.7	5.3	83.3	55.0	88.7	88.9
118	BAR Fa 120878	6.7	5.0	71.7	51.7	86.2	85.2
119	Temptation (OR-21)	8.3	5.0	90.0	58.3	88.2	89.1
120	Kentucky 31	6.0	4.0	61.7	41.7	85.1	85.3
	Columns (down) LSD at 5% =	1.0		8.5		1.8	
	Rows (across) LSD at 5% =	1.0		8.4		1.7	

[1] Sixteen total machine passes were applied using a combination of the Rutgers Wear Simulator and Cady Traffic Simulator during spring 2015 (two passes per week from 16 April to 1 June 2015)
[2] 9 = most dense, uniform canopy
[3] 100% = full canopy
[4] 100% = complete green cover; measured by digital image analysis (DIA)

Table 3. Uniformity of turf cover as affected by the interaction of traffic and tall fescue entry and green cover and fullness of turfgrass canopy as affected by tall fescue entry in summer 2015. (Includes all entries of the 2012 National Turfgrass Evaluation (NTEP) Tall Fescue Test.)

		Summer Traffic (18 and 19 August 2015)[1]			
		Uniformity of Turf Cover[2]		Fullness of Turfgrass Canopy[3]	Green Cover (%) (DIA)[4]
	Selection	No Traffic	Traffic		
		1 to 9 scale		0 to 100% scale	
1	ATF 1704	9.0	7.3	87.5	83.5
2	Raptor III (ZW 44)	8.7	7.0	85.0	81.2
3	B23	9.0	8.3	90.0	83.7
4	Fayette (IS-TF 291)	8.7	8.0	89.2	83.2
5	Meridian (PST-5GRB)	9.0	8.0	89.2	82.0
6	IS-TF 311	8.7	7.3	86.7	80.4
7	Technique (RZ2)	9.0	7.3	84.2	80.4
8	4th Millennium SRP (U43)	9.0	7.0	85.0	85.0
9	RAD-TF-89	9.0	7.0	85.8	82.5
10	Hemi	8.7	7.0	82.5	79.9
11	JS 916	8.7	6.7	84.2	82.5
12	Screamer LS (PPG-TF-148)	8.7	6.7	82.5	80.0
13	Comp. Res. SST	8.3	6.0	78.3	81.6
14	RAD-TF-92	9.0	7.7	85.0	83.0
15	PPG-TF-135	9.0	7.7	87.5	84.3
16	ATF 1612	9.0	7.7	85.0	80.5
17	Avenger (PPG-TF-156)	9.0	7.7	91.7	82.2
18	PPG-TF-172	9.0	7.3	89.2	82.5
19	Reflection (U45)	9.0	7.3	86.7	85.8
20	PST-5EX2	8.3	7.0	78.3	87.8
21	Catalyst	9.0	7.0	85.8	82.2
22	Rowdy (SRX-TPC)	9.0	6.7	82.5	82.7
23	IS-TF 269 SEL	9.0	6.7	85.0	83.9
24	Hot Rod (Burl TF-136)	9.0	6.7	79.2	80.1
25	Xtender (PPG-TF-139)	8.7	6.3	80.0	86.1
26	Falcon V	9.0	6.3	80.0	81.7
27	PSG-8BP2	8.3	6.0	73.3	82.6
28	Michelangelo (LTP-F5DPDR)	8.7	6.0	78.3	84.8
29	Firewall (PSG-WE1)	8.3	6.0	79.2	70.3
30	TF-287	9.0	7.7	85.0	85.3

(Continued)

Table 3. Tall fescue traffic test, summer 2015, NTEP (continued).

		Summer Traffic (18 and 19 August 2015)[1]			
		Uniformity of Turf Cover[2]		Fullness of Turfgrass Canopy[3]	Green Cover (%) (DIA)[4]
	Selection	No Traffic	Traffic		
		1 to 9 scale		0 to 100% scale	
31	F711	9.0	7.0	87.5	81.5
32	Bullseye	9.0	7.0	80.0	84.8
33	PST-5BPO	8.7	6.7	80.8	85.5
34	Swagger (PST-5RO5)	8.7	6.7	80.8	84.6
35	W41	9.0	6.7	82.5	78.7
36	Embrace (PST-5EV2)	9.0	6.3	84.2	84.3
37	Bizem	9.0	6.3	82.5	85.2
38	K12-MCD	9.0	6.3	80.0	83.7
39	IS-TF 310 SEL	9.0	6.3	80.0	83.2
40	PSG-GSD	8.7	6.0	77.5	84.5
41	RAD-TF-88	9.0	6.0	81.7	83.8
42	Leonardo (LTP-FSD)	9.0	6.0	81.7	83.6
43	Black Tail (PPG-TF-150)	9.0	6.0	75.8	81.6
44	IS-TF 289	8.7	6.0	78.3	77.1
45	JS 818	9.0	5.7	76.7	79.0
46	MET 6 SEL	9.0	5.7	80.8	77.6
47	Temple (DZ1)	9.0	7.0	84.2	82.5
48	Diablo (IS-TF 330)	9.0	7.0	85.0	82.2
49	PPG-TF-170	9.0	6.7	83.3	83.0
50	Rain Dance (PST-5SDT)	9.0	6.7	82.5	86.0
51	Foxhound (IS-TF 284 M2)	8.7	6.3	77.5	84.0
52	Firecracker SLS (PPG-TF-105)	8.7	6.3	82.5	83.3
53	IS-TF 285	8.7	6.3	77.5	79.7
54	IS-TF 276 M2	8.7	6.3	75.8	84.0
55	PPG-TF-138	8.7	6.3	77.5	80.2
56	Inspiration (PST-R5NW)	8.0	6.3	80.8	85.7
57	MET 1	9.0	6.0	80.0	82.7
58	Aquaduct	7.7	6.0	71.7	82.7
59	Hover (Burl TF-69)	8.7	6.0	80.8	84.4
60	PST-5BRK	8.7	6.0	78.3	85.5
61	IS-TF 305 SEL	8.7	5.7	77.5	77.8
62	Grande 3	8.3	5.7	75.8	78.7
63	PPG-TF-169	8.7	5.7	78.3	78.5
64	Terrano	9.0	5.7	75.8	82.2
65	Annihilator	8.3	5.7	70.0	84.2

(Continued)

Table 3. Tall fescue traffic test, summer 2015, NTEP (continued).

		Summer Traffic (18 and 19 August 2015)[1]			
		Uniformity of Turf Cover[2]		Fullness of Turfgrass Canopy[3]	Green Cover (%) (DIA)[4]
	Selection	No Traffic	Traffic		
		1 to 9 scale		0 to 100% scale	
66	Falcon IV	8.3	5.7	72.5	86.2
67	ATF 1736	9.0	5.3	72.5	81.6
68	ATF 1754	9.0	5.3	73.3	76.7
69	Regenerate	9.0	8.0	86.7	81.6
70	Rhambler 2 SRP (LSD)	9.0	7.0	85.8	84.4
71	Rockwell (LTP-TWUU)	9.0	6.7	79.2	82.8
72	IS-TF 308 SEL	9.0	6.7	80.0	81.6
73	Maestro (T31)	8.7	6.7	84.2	77.6
74	Caesar (TY 10)	9.0	6.3	75.8	81.6
75	PST-5MVD	9.0	6.3	79.2	84.5
76	Firebird 2	9.0	6.0	80.0	79.8
77	Kingdom (DB1)	8.3	6.0	79.2	79.7
78	MET-3	9.0	6.0	77.5	82.0
79	Fesnova	9.0	6.0	75.0	84.1
80	PPG-TF-115	8.3	6.0	77.5	83.6
81	Thor (PPG-TF-157)	9.0	6.0	80.0	84.0
82	Titanium 2LS (PPG-TF-152)	9.0	5.7	81.7	83.0
83	PPG-TF-151	9.0	5.7	79.2	83.9
84	JS 825	7.7	5.3	73.3	79.3
85	RAD-TF-83	8.3	5.3	69.2	81.9
86	JS 819	7.7	5.0	70.0	80.2
87	Faith	8.0	5.0	72.5	70.8
88	Frontline (Exp TF-09)	7.3	4.3	62.5	81.6
89	Saltillo (PST-5SALT)	9.0	7.0	80.8	86.2
90	Traverse 2 SRP (W45)	9.0	6.3	81.7	83.9
91	GTO (Burl TF-2)	8.3	6.3	80.8	77.4
92	K12-05	9.0	6.3	82.5	76.3
93	PPG-TF-137	8.7	6.0	78.3	76.5
94	Pick-W43	8.7	5.7	77.5	84.1
95	IS-TF 307 SEL	9.0	5.7	82.5	82.2
96	PSG-TT4	8.3	5.7	74.2	86.2
97	GO-DFR	8.3	5.3	74.2	80.6
98	Dynamite LS (PPG-TF-145)	8.3	5.3	73.3	83.9
99	Mustang 4	8.3	5.3	77.5	85.3
100	PST-5DZP	9.0	5.3	75.8	77.6

(Continued)

Table 3. Tall fescue traffic test, summer 2015, NTEP (continued).

		Summer Traffic (18 and 19 August 2015)[1]			
		Uniformity of Turf Cover[2]		Fullness of Turfgrass Canopy[3]	Green Cover (%) (DIA)[4]
	Selection	No Traffic	Traffic		
		1 to 9 scale		0 to 100% scale	
101	Rebel IV + Rebel Advance + Brockton	8.3	5.0	69.2	84.0
102	Mustang 4 + Faith + Bullseye	9.0	5.0	76.7	83.0
103	PSG-PO1	8.3	4.7	71.7	77.9
104	BAR Fa 121091	8.0	6.3	74.2	84.5
105	JS 809	8.7	5.7	76.7	79.5
106	Turfway (IS-TF 282 M2)	9.0	5.7	77.5	80.3
107	Warhawk	7.7	4.7	64.2	82.3
108	204 Res. Blk4	8.7	4.3	70.0	79.3
109	BAR Fa 121089	8.3	4.3	67.5	82.4
110	K12-13	8.3	5.7	72.5	78.2
111	BAR Fa 121095	8.7	5.7	76.7	82.4
112	Ares (PPG-TF-142)	8.7	5.3	73.3	80.7
113	CCR2	9.0	5.3	73.3	78.3
114	IS-TF 272	7.7	5.0	72.5	78.4
115	Marauder	8.0	4.7	67.5	81.8
116	Thunderstruck (TD1)	9.0	4.0	70.8	75.6
117	Justice + Virtue II + Greystone	8.0	4.0	67.5	83.6
118	BAR Fa 120878	7.0	5.3	57.5	89.6
119	Temptation (OR-21)	8.0	4.0	65.0	73.6
120	Kentucky 31	6.0	4.0	47.5	85.7
	Columns (down) LSD at 5% =		1.4	10.8	6.5
	Rows (across) LSD at 5% =		1.3	NA[5]	NA

[1]Sixteen total machine passes were applied using a combination of the Rutgers Wear Simulator and Cady Traffic Simulator during summer 2015 (two passes per week from 1 July to 18 August 2015)
[2]9 = most dense, uniform canopy
[3]100% = full canopy
[4]100% = complete green cover; measured by digital image analysis (DIA)
[5]Not applicable

Table 4. Uniformity of turf cover and green cover as affected by the interaction of tall fescue entry and traffic and fullness of turfgrass canopy as affected by tall fescue entry after traffic in autumn 2015. (Includes all entries of the 2012 National Turfgrass Evaluation (NTEP) Tall Fescue Test.)

		Autumn Traffic (2 to 4 November 2015)[1]				
		Uniformity of Turf Cover[2]		Fullness of Turfgrass	Green Cover (%) (DIA)[4]	
	Tall Fescue Entry	No Traffic	Traffic	Canopy[3]	No Traffic	Traffic
		1 to 9 scale		0 to 100% scale		
1	ATF 1704	8.3	6.0	78.3	90.0	76.8
2	Raptor III (ZW 44)	8.7	6.7	80.0	90.8	79.1
3	B23	9.0	6.3	77.5	91.1	79.1
4	Fayette (IS-TF 291)	9.0	6.7	73.3	89.6	77.8
5	Meridian (PST-5GRB)	8.3	6.0	74.2	86.0	76.3
6	IS-TF 311	7.7	6.3	74.2	85.4	79.2
7	Technique (RZ2)	8.7	6.3	76.7	90.3	79.1
8	4th Millennium SRP (U43)	9.0	7.0	79.2	91.3	79.5
9	RAD-TF-89	8.7	6.7	78.3	88.2	77.9
10	Hemi	8.7	6.3	78.3	89.5	80.3
11	JS 916	8.3	6.3	77.5	93.2	81.9
12	Screamer LS (PPG-TF-148)	9.0	6.0	79.2	92.1	77.2
13	Comp. Res. SST	8.7	6.7	78.3	84.9	78.8
14	RAD-TF-92	8.7	6.7	77.5	90.4	79.5
15	PPG-TF-135	8.7	5.7	78.3	90.8	75.6
16	ATF 1612	8.7	5.3	72.5	89.8	76.3
17	Avenger (PPG-TF-156)	8.7	5.3	72.5	89.8	77.8
18	PPG-TF-172	9.0	7.0	80.8	91.7	80.8
19	Reflection (U45)	9.0	6.7	83.3	92.0	82.2
20	PST-5EX2	8.3	6.3	72.5	91.5	80.5
21	Catalyst	9.0	6.0	76.7	87.6	77.1
22	Rowdy (SRX-TPC)	9.0	6.0	76.7	92.9	79.2
23	IS-TF 269 SEL	8.3	5.7	71.7	90.3	76.8
24	Hot Rod (Burl TF-136)	8.0	5.7	72.5	86.9	77.8
25	Xtender (PPG-TF-139)	8.7	6.7	77.5	88.5	79.4
26	Falcon V	8.3	4.7	67.5	92.0	70.1
27	PSG-8BP2	8.3	7.0	79.2	86.9	79.5
28	Michelangelo (LTP-F5DPDR)	8.7	6.3	76.7	92.1	83.0
29	Firewall (PSG-WE1)	7.0	5.0	64.2	78.3	74.8
30	TF-287	8.7	6.3	80.8	89.1	81.5

(Continued)

Table 4. Tall fescue traffic test, autumn 2015, NTEP (continued).

		Autumn Traffic (2 to 4 November 2015)[1]				
		Uniformity of Turf Cover[2]		Fullness of Turfgrass	Green Cover (%) (DIA)[4]	
	Tall Fescue Entry	No Traffic	Traffic	Canopy[3]	No Traffic	Traffic
		1 to 9 scale		0 to 100% scale		
31	F711	9.0	6.7	79.2	90.7	80.8
32	Bullseye	8.3	5.3	78.3	88.9	79.9
33	PST-5BPO	8.0	6.7	78.3	89.5	79.0
34	Swagger (PST-5RO5)	8.7	5.0	73.3	88.2	76.3
35	W41	8.7	5.0	71.7	91.5	78.2
36	Embrace (PST-5EV2)	8.7	6.7	81.7	88.0	78.1
37	Bizem	9.0	6.7	81.7	92.1	81.9
38	K12-MCD	9.0	6.7	78.3	89.1	77.0
39	IS-TF 310 SEL	8.7	5.7	77.5	89.2	78.3
40	PSG-GSD	8.3	7.0	79.2	89.3	80.5
41	RAD-TF-88	8.7	6.3	80.0	89.8	79.9
42	Leonardo (LTP-FSD)	8.7	5.7	72.5	92.5	80.7
43	Black Tail (PPG-TF-150)	9.0	5.3	78.3	92.7	81.5
44	IS-TF 289	8.0	5.0	67.5	83.7	72.2
45	JS 818	8.7	5.3	72.5	88.7	77.5
46	MET 6 SEL	9.0	5.0	72.5	88.3	79.2
47	Temple (DZ1)	9.0	7.3	83.3	92.2	80.5
48	Diablo (IS-TF 330)	8.7	7.0	75.0	90.2	78.6
49	PPG-TF-170	8.7	6.3	75.0	91.8	80.4
50	Rain Dance (PST-5SDT)	8.0	5.7	72.5	89.4	76.5
51	Foxhound (IS-TF 284 M2)	9.0	6.3	72.5	89.8	76.5
52	Firecracker SLS (PPG-TF-105)	9.0	6.3	79.2	90.3	77.4
53	IS-TF 285	9.0	6.0	76.7	90.2	78.0
54	IS-TF 276 M2	8.3	5.7	73.3	89.5	79.9
55	PPG-TF-138	8.3	5.7	71.7	88.2	74.0
56	Inspiration (PST-R5NW)	8.0	5.0	71.7	91.1	79.8
57	MET 1	8.7	6.3	75.0	88.4	76.8
58	Aquaduct	8.3	6.0	69.2	85.8	77.3
59	Hover (Burl TF-69)	8.7	6.0	80.0	90.4	80.1
60	PST-5BRK	8.0	5.3	75.8	88.5	79.3
61	IS-TF 305 SEL	8.3	6.0	67.5	87.0	78.3
62	Grande 3	8.7	5.3	77.5	91.6	80.5
63	PPG-TF-169	8.3	5.3	75.8	87.0	79.1
64	Terrano	9.0	5.0	72.5	85.6	74.8
65	Annihilator	8.0	4.7	69.2	87.7	74.8

(Continued)

Table 4. Tall fescue traffic test, autumn 2015, NTEP (continued).

		Autumn Traffic (2 to 4 November 2015)[1]				
		Uniformity of Turf Cover[2]		Fullness of Turfgrass	Green Cover (%) (DIA)[4]	
	Tall Fescue Entry	No Traffic	Traffic	Canopy[3]	No Traffic	Traffic
		1 to 9 scale		0 to 100% scale		
66	Falcon IV	8.3	4.3	66.7	88.4	77.2
67	ATF 1736	8.3	5.3	71.7	90.3	79.1
68	ATF 1754	8.7	5.3	73.3	86.6	73.8
69	Regenerate	9.0	6.0	74.2	90.9	78.5
70	Rhambler 2 SRP (LSD)	9.0	6.7	80.0	90.4	77.9
71	Rockwell (LTP-TWUU)	9.0	6.3	79.2	92.4	81.4
72	IS-TF 308 SEL	8.3	6.3	74.2	88.2	82.4
73	Maestro (T31)	8.7	6.3	74.2	88.5	82.4
74	Caesar (TY 10)	8.7	6.0	74.2	88.1	78.5
75	PST-5MVD	8.3	5.3	73.3	89.7	77.7
76	Firebird 2	8.7	6.3	74.2	90.8	78.4
77	Kingdom (DB1)	8.7	6.3	77.5	91.1	78.7
78	MET-3	8.7	6.0	74.2	90.6	76.1
79	Fesnova	8.3	5.7	72.5	93.4	78.7
80	PPG-TF-115	8.0	5.3	66.7	89.4	76.9
81	Thor (PPG-TF-157)	9.0	4.7	72.5	91.1	77.8
82	Titanium 2LS (PPG-TF-152)	9.0	6.3	79.2	90.1	79.1
83	PPG-TF-151	9.0	4.7	71.7	91.5	77.5
84	JS 825	8.0	5.0	65.8	84.3	73.8
85	RAD-TF-83	8.3	5.0	74.2	89.8	77.5
86	JS 819	8.0	5.3	66.7	88.2	77.9
87	Faith	7.7	4.7	63.3	88.4	78.0
88	Frontline (Exp TF-09)	7.7	4.7	70.8	87.4	78.3
89	Saltillo (PST-5SALT)	8.3	6.0	74.2	90.1	80.2
90	Traverse 2 SRP (W45)	9.0	7.0	79.2	89.7	82.0
91	GTO (Burl TF-2)	8.3	6.0	73.3	85.7	75.0
92	K12-05	9.0	5.3	70.8	88.6	74.9
93	PPG-TF-137	8.3	4.3	66.7	92.8	78.0
94	Pick-W43	9.0	6.7	79.2	91.7	81.9
95	IS-TF 307 SEL	9.0	5.3	73.3	90.1	77.9
96	PSG-TT4	7.7	4.7	69.2	90.6	79.7
97	GO-DFR	8.7	6.7	77.5	87.8	80.6
98	Dynamite LS (PPG-TF-145)	9.0	5.7	68.3	91.0	78.4
99	Mustang 4	8.3	5.3	71.7	92.3	81.8
100	PST-5DZP	8.0	4.7	67.5	87.4	72.6

(Continued)

Table 4. Tall fescue traffic test, autumn 2015, NTEP (continued).

		Autumn Traffic (2 to 4 November 2015)[1]				
		Uniformity of Turf Cover[2]		Fullness of Turfgrass	Green Cover (%) (DIA)[4]	
	Tall Fescue Entry	No Traffic	Traffic	Canopy[3]	No Traffic	Traffic
		1 to 9 scale		0 to 100% scale		
101	Rebel IV + Rebel Advance + Brockton	8.0	4.7	70.0	90.1	80.9
102	Mustang 4 + Faith + Bullseye	8.3	4.3	68.3	92.2	77.8
103	PSG-PO1	8.7	4.7	76.7	89.8	78.2
104	BAR Fa 121091	8.3	5.3	67.5	88.4	79.0
105	JS 809	8.7	6.7	72.5	86.6	76.5
106	Turfway (IS-TF 282 M2)	9.0	6.3	75.0	89.4	75.6
107	Warhawk	8.3	3.7	61.7	90.4	77.3
108	204 Res. Blk4	9.0	5.0	72.5	90.3	76.6
109	BAR Fa 121089	8.3	4.3	69.2	89.5	78.8
110	K12-13	9.0	7.0	79.2	86.8	79.7
111	BAR Fa 121095	8.7	5.0	70.0	90.0	79.2
112	Ares (PPG-TF-142)	8.7	5.3	68.3	87.9	75.2
113	CCR2	8.7	4.0	64.2	92.6	73.0
114	IS-TF 272	8.0	5.3	73.3	89.5	77.8
115	Marauder	8.3	4.0	68.3	88.7	70.7
116	Thunderstruck (TD1)	8.0	4.7	65.0	86.2	71.8
117	Justice + Virtue II + Greystone	8.0	4.3	66.7	87.4	77.5
118	BAR Fa 120878	7.0	4.7	59.2	91.4	79.9
119	Temptation (OR-21)	8.0	4.3	65.0	90.9	76.8
120	Kentucky 31	6.0	3.3	46.7	86.8	72.4
	Columns (down) LSD at 5% =	1.5		11.5	5.8	
	Rows (across) LSD at 5% =	1.2		NA[5]	4.8	

[1]Sixteen total machine passes were applied using a combination of the Rutgers Wear Simulator and Cady Traffic Simulator during autumn 2015 (two passes per week from 15 September to 1 November 2015)
[2]9 = most dense, uniform canopy
[3]100% = full canopy
[4]100% = complete green cover; measured by digital image analysis (DIA)
[5]Not applicable

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 (NTEP) Tall Fescue Test.)

	Tall Fescue Entry	Turfgrass Quality[1] 2013-2015 Avg.	Turfgrass Quality[1] 2013 Avg.	Turfgrass Quality[1] 2014 Avg.	Turfgrass Quality[1] 2015 Avg.	Spring Green-up[2] 10 April 2015
1	F711	7.6	6.7	8.3	7.9	5.7
2	Black Tail (PPG-TF-150)	7.6	7.4	8.1	7.3	5.3
3	Traverse 2 SRP (W45)	7.6	7.3	8.1	7.2	4.7
4	Regenerate	7.5	7.8	7.8	7.1	6.7
5	5th Millennium SRP (U43)	7.5	7.2	7.2	7.9	6.0
6	MET 1	7.5	6.9	8.1	7.4	6.7
7	Technique (RZ2)	7.5	6.9	8.1	7.4	5.7
8	B23	7.3	6.7	7.7	7.6	5.0
9	CCR2	7.3	6.8	7.6	7.6	6.3
10	Rockwell (LTP-TWUU)	7.3	6.6	7.7	7.6	6.7
11	Avenger II (PPG-TF-156)	7.3	6.7	7.7	7.4	6.0
12	Raptor III (ZW 44)	7.3	7.1	7.7	7.1	4.7
13	Titanium 2LS (PPG-TF-152)	7.3	7.0	7.7	7.1	3.3
14	Hemi	7.3	7.1	7.8	6.9	4.3
15	Firecracker SLS (PPG-TF-105)	7.2	6.8	7.0	7.9	3.0
16	Firebird 2	7.2	7.0	7.6	7.2	5.0
17	ATF 1612	7.2	7.4	7.2	7.1	5.7
18	Bizem	7.2	6.5	7.4	7.8	6.0
19	Rhambler 2 SRP (LSD)	7.2	6.7	7.3	7.6	2.0
20	Bullseye	7.2	6.9	7.3	7.2	4.7
21	PPG-TF-172	7.1	6.5	7.4	7.5	4.7
22	Reflection (U45)	7.1	6.7	7.1	7.4	4.7
23	IS-TF 307 SEL	7.1	6.7	7.4	7.3	4.0
24	Rowdy (SRX-TPC)	7.1	6.4	7.3	7.5	4.3
25	Fayette (IS-TF 291)	7.1	6.5	7.3	7.4	5.7
26	Meridian (PST-5GRB)	7.0	5.7	8.0	7.4	6.0
27	Pick-W43	7.0	6.5	7.8	6.9	6.3
28	Cochise V (PPG-TF-135)	7.0	6.3	7.4	7.3	5.7
29	PPG-TF-137	7.0	6.7	7.3	7.0	5.7
30	GTO (Burl TF-2)	7.0	6.8	7.7	6.6	6.0
31	Embrace (PST-5EV2)	7.0	6.0	7.4	7.5	5.7
32	Hot Rod (Burl TF-136)	7.0	6.2	7.9	6.8	5.3
33	Firewall (PSG-WE1)	7.0	6.8	8.0	6.1	5.0
34	IS-TF 311	6.9	6.2	7.6	7.0	4.7
35	MET-3	6.9	6.9	6.9	6.9	6.0

(Continued)

Table 5. Tall fescue turf trial, 2012, NTEP (continued).

	Tall Fescue Entry	Turfgrass Quality[1] 2013-2015 Avg.	Turfgrass Quality[1] 2013 Avg.	Turfgrass Quality[1] 2014 Avg.	Turfgrass Quality[1] 2015 Avg.	Spring Green-up[2] 10 April 2015
36	Temple (DZ1)	6.9	5.9	6.9	7.7	5.3
37	Thor (PPG-TF-157)	6.9	6.1	7.3	7.2	4.7
38	RAD-TF-92	6.8	5.8	6.8	7.8	4.7
39	W41	6.8	6.2	6.9	7.4	4.7
40	PPG-TF-170	6.8	6.4	7.0	7.1	6.0
41	IS-TF 308 SEL	6.8	5.9	7.6	7.1	4.7
42	Diablo (IS-TF 330)	6.8	6.0	7.3	7.0	2.7
43	ATF 1704	6.8	5.4	7.0	7.9	6.7
44	PPG-TF-151	6.8	6.2	6.6	7.6	4.0
45	JS 916	6.7	5.8	7.2	7.3	4.0
46	MET 6 SEL	6.7	6.2	7.1	7.0	6.0
47	IS-TF 289	6.7	6.9	6.9	6.2	1.7
48	Maestro (T31)	6.6	5.6	7.1	7.3	5.0
49	RAD-TF-89	6.6	6.4	6.7	6.7	4.7
50	Fesnova	6.6	6.3	6.8	6.6	5.0
51	Screamer LS (PPG-TF-148)	6.5	5.4	7.2	7.0	6.3
52	Xtender (PPG-TF-139)	6.5	6.3	6.6	6.6	3.3
53	Foxhound (IS-TF 284 M2)	6.5	6.1	6.9	6.6	3.0
54	RAD-TF-88	6.5	5.3	7.1	7.1	4.7
55	Michelangelo (LTP-F5DPDR)	6.5	6.3	6.6	6.6	4.7
56	Falcon V	6.5	5.8	6.6	7.0	7.0
57	Leonardo (LTP-FSD)	6.5	5.5	7.0	6.9	5.3
58	Turfway (IS-TF 282 M2)	6.5	5.6	6.9	6.9	4.7
59	TF-287	6.4	5.0	6.8	7.4	4.0
60	Hover (Burl TF-69)	6.4	6.2	6.5	6.6	5.0
61	IS-TF 310 SEL	6.3	5.5	6.5	6.8	3.7
62	Grande 3	6.3	5.6	7.1	6.4	7.0
63	IS-TF 305 SEL	6.3	6.1	6.6	6.2	3.7
64	PPG-TF-169	6.3	5.1	6.9	6.9	6.3
65	IS-TF 269 SEL	6.2	5.6	6.7	6.5	3.3
66	ATF 1754	6.2	5.5	6.8	6.4	6.0
67	Faith	6.2	6.3	6.4	6.0	6.0
68	Catalyst	6.2	5.1	6.4	7.2	6.0
69	PSG-PO1	6.1	5.2	6.2	6.7	5.3
70	Kingdom (DB1)	6.0	5.2	6.1	6.7	1.7

(Continued)

Table 5. Tall fescue turf trial, 2012, NTEP (continued).

	Tall Fescue Entry	Turfgrass Quality[1] 2013-2015 Avg.	Turfgrass Quality[1] 2013 Avg.	Turfgrass Quality[1] 2014 Avg.	Turfgrass Quality[1] 2015 Avg.	Spring Green-up[2] 10 April 2015
71	Mustang 4	6.0	5.7	5.9	6.3	6.7
72	ATF 1736	6.0	5.3	6.5	6.2	5.3
73	IS-TF 285	5.9	5.4	5.8	6.6	2.0
74	Saltillo (PST-5SALT)	5.9	4.8	6.4	6.5	4.3
75	PST-5DZP	5.9	4.9	6.4	6.4	4.3
76	K12-MCD	5.9	4.6	5.9	7.2	4.7
77	PPG-TF-138	5.9	4.8	6.5	6.3	4.7
78	PST-5MVD	5.8	4.7	6.0	6.8	6.0
79	GO-DFR	5.8	5.4	6.1	5.9	2.7
80	Ares (PPG-TF-142)	5.8	5.9	5.7	5.7	2.0
81	Thunderstruck (TD1)	5.7	5.1	6.1	5.9	2.0
82	Terrano	5.7	4.9	5.4	6.8	2.7
83	JS 818	5.7	5.0	5.4	6.7	1.7
84	PSG-GSD	5.7	5.1	6.0	5.9	4.3
85	Swagger (PST-5RO5)	5.6	4.7	5.7	6.4	4.7
86	PST-5BPO	5.6	4.6	6.0	6.2	5.0
87	Caesar (TY 10)	5.6	5.1	5.6	6.1	4.7
88	Mustang 4 + Faith + Bullseye	5.6	4.7	5.5	6.5	5.7
89	Dynamite LS (PPG-TF-145)	5.6	4.8	5.8	6.1	1.0
90	IS-TF 272	5.6	4.9	6.1	5.7	3.0
91	K12-05	5.5	3.9	5.7	6.9	2.7
92	PST-5BRK	5.5	4.5	5.7	6.2	4.3
93	BAR Fa 121095	5.5	4.9	5.5	6.0	2.0
94	204 Res. Blk4	5.4	3.8	6.2	6.1	5.3
95	RAD-TF-83	5.4	4.5	5.4	6.1	3.7
96	PPG-TF-115	5.3	4.3	5.9	5.9	3.3
97	IS-TF 276 M2	5.3	4.3	5.8	5.9	4.0
98	Temptation (OR-21)	5.2	4.6	5.4	5.7	3.7
99	Rain Dance (PST-5SDT)	5.2	4.3	5.5	5.8	5.7
100	PSG-8BP2	5.1	4.5	5.3	5.6	3.0
101	Falcon IV	5.1	4.7	5.0	5.5	5.3
102	JS 809	5.1	3.8	5.3	6.1	2.0
103	Comp. Res. SST	4.8	3.5	5.3	5.5	4.0
104	K12-13	4.8	3.3	5.2	5.7	1.0
105	PSG-TT4	4.7	4.3	5.0	4.9	3.7

(Continued)

Table 5. Tall fescue turf trial, 2012, NTEP (continued).

	Tall Fescue Entry	Turfgrass Quality[1] 2013-2015 Avg.	Turfgrass Quality[1] 2013 Avg.	Turfgrass Quality[1] 2014 Avg.	Turfgrass Quality[1] 2015 Avg.	Spring Green-up[2] 10 April 2015
106	PST-5EX2	4.7	3.8	4.9	5.3	6.7
107	Rebel IV + Rebel Advance + Brockton	4.7	4.1	4.6	5.3	4.3
108	Inspiration (PST-R5NW)	4.5	3.7	4.8	5.2	2.7
109	JS 819	4.5	3.7	4.6	5.1	1.7
110	Frontline (Exp TF-09)	4.4	4.2	4.6	4.5	3.7
111	BAR Fa 121091	4.3	3.7	4.0	5.3	2.7
112	Marauder	4.3	2.9	5.0	5.0	4.0
113	Aquaduct	4.2	3.4	4.3	4.8	3.3
114	BAR Fa 121089	4.1	3.2	4.2	5.0	3.7
115	Annihilator	4.1	2.6	4.8	4.8	3.7
116	JS 825	4.0	3.4	4.0	4.5	1.0
117	Justice + Virtue II + Greystone	3.6	2.7	3.7	4.5	3.7
118	Warhawk	3.4	2.2	3.9	4.1	3.0
119	BAR Fa 120878	1.9	1.9	1.9	1.9	5.7
120	Kentucky 31	1.2	1.1	1.4	1.2	8.3
	LSD at 5% =	0.9	1.3	0.9	1.2	1.3

[1]9 = best turfgrass quality
[2]9 = best spring green-up