RUTGERS

New Jersey Agricultural
Experiment Station

2021
Turfgrass Proceedings

The New Jersey Turfgrass Association

In Cooperation with
Rutgers Center for Turfgrass Science
Rutgers Cooperative Extension

2021 RUTGERS TURFGRASS PROCEEDINGS

of the

GREEN EXPO Turf and Landscape Conference
December 7-9, 2021
Borgata Hotel
Atlantic City, New Jersey

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 2021 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.

Special thanks are given to those who have submitted papers for this proceedings, to the New Jersey Turfgrass Association for financial assistance, and to Anne Diglio and Barbara Fitzgerald for administrative support.

Deborah Spinella, Proceedings Layout Editor
Dr. James A. Murphy, Coordinator

TALL FESCUE PERFORMANCE AT RUTGERS HORT. FARM NO. 2 DURING 2021

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INTRODUCTION

A combination of the Rutgers Wear Simulator (RWS; Bonos et al., 2001) and Cady Traffic Simulator (CTS; Henderson et al., 2005) is being used to apply traffic stress to tall fescue (*Schedonorus arundinaceus* [Schreb.] Dumort. syn. *Festuca arundinacea* Schreb. syn. *Lolium arundinaceum* [Schreb.] Darbysh.) at Rutgers Hort. Farm No. 2. The traffic stress tolerance of entries comprising the 2018 NTEP Tall Fescue test was previously reported for autumn 2019 (Park and Murphy, 2020) and summer 2020 (Park and Murphy, 2021) evaluation periods.

This Proceedings article reports on the performance of cultivars and experimental selections in the 2018 NTEP Tall Fescue Test subjected to traffic stress during 2021; turfgrass quality evaluated in the absence of traffic is also reported.

MATERIALS AND METHODS

Evaluation Trial

The one-hundred-thirty-two (132) entries of the 2018 Tall Fescue Trial were seeded at 6.0 lb seed per 1000 ft^2 into 5- x 6-ft plots on a well-drained loam (sand=44%; silt=31%; clay=25%) at Rutgers Hort. Farm No. 2 in North Brunswick, NJ on 21 September 2018.

Soil test results (June 2020) from the 0- to 1-inch depth zone indicated that the soil pH was 5.2; soil phosphorus (P) and potassium (K) were 107 and 644 lb per acre (Mehlich 3), respectively. The soil pH was 5.5 at the 1- to 7-inch depth; soil P and K were 110 and 344 lb per acre, respectively. Calcitic lime (79 lb per 1000 ft^2) was applied during autumn 2020.

A total of 3.1 lb of N per 1000 ft^2 was applied during 2021 (0.6, 0.7, 0.7, 0.5, and 0.6 lb of N per 1000 ft^2 on 14 April, 20 May, 15 July, 21 September, and 22 October 2021, respectively).

The test was mowed a minimum of 2 times per week at a height of 1.5-inch. Evapotranspiration data were used to guide irrigation system programming with the primary goal to avoid excessive wetness or severe drought stress symptoms in the tall fescue.

Weed, disease, and insect pests were controlled during late autumn 2020 through 2021 to improve assessment of tall fescue entry responses to traffic. Herbicides were applied for postemergence suppression of annual bluegrass (*Poa annua* L.) during late autumn 2020 and winter 2021 (mesotrione and ethofumesate). Preemergence control of crabgrass (*Digitaria* spp.) and preventative control of white grubs (*Phyllophaga* spp.) were achieved using dithiopyr and imidacloprid, respectively. Turfgrass diseases including brown patch (caused by *Rhizoctonia solani*), gray leaf spot (caused by *Pyricularia grisea*), dollar spot (caused by *Clarireedia jacksonii*) and *Pythium* spp. were controlled preventatively by rotating the following fungicide active ingredients: cyazofamid+azoxystrobin, propamocarb, penthiopyrad, azoxystrobin+propiconazole, cyazofomid, thiophanate-methyl, propiconazole.

Application of Wear and Traffic Stresses

Traffic was first applied to this test in a strip across approximately ½ of each tall fescue plot during autumn 2019 (Park and Murphy, 2020) and continued during summer 2020 (Park and Murphy, 2021); the other approximate ½ of each plot has not received traffic (no traffic).

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Traffic consisted of two RWS and two CTS passes per week from 28 April to 15 September 2021 (21 weeks; 84 total machine passes). Machine passes were made across the same strip in which passes were made during traffic periods of previous years. The RWS maintained a forward speed of 2.5 miles per hour (mph); the paddles rotated at 250 rpm. The CTS was operated at a speed of 1.0 mph in the forward direction. Every other machine pass was made in the opposite direction.

Evaluation of the Effects of Traffic

Traffic plot strips and no traffic plots were visually assessed for uniformity of turf cover (1 to 9 scale; 9=most complete turf cover) and fullness of turfgrass canopy (0 to 100% scale; 100% = full canopy) after 7, 14, and 21 weeks of traffic on 10 June, 29 July, and 15 September 2022, respectively.

Images of traffic plot strips and no traffic plots were captured using a digital camera (Canon PowerShot G12; Canon USA, Inc., Lake Success, NY) positioned in an enclosed box equipped with artificial lighting. Individual digital image size was 1600 x 1200 pixels and camera settings included a shutter speed of 1/40 s, and aperture of F2.8, and ISO of 100 and a focal length of 7 mm.

Images were imported into SigmaScan Pro (v. 5.0, SPSS, Inc., Chicago, IL) to determine green cover (0 to 100% scale; 100%=complete green cover). 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.

Annual bluegrass encroachment into traffic plot strips and no traffic plots was visually evaluated on 13 October 2021; a 0 to 100% scale was used where 100% equaled complete annual bluegrass cover.

These data were analyzed using a 2 x 132 factorial of traffic and entries arranged in a strip-plot design with 3 replications. Horizontal plot strips were the two levels of traffic (no traffic and traffic). Vertical plots were the 132 tall fescue entries. Data were subjected to analysis of variance and means were separated using the Fisher's protected least significant difference (LSD) test at $p \leq 0.05$.

Evaluation of Tall Fescue in the Absence of Traffic

The no traffic section of each tall fescue plot was visually assessed for turfgrass quality each month during April through October 2021. A 1 to 9 rating was utilized for both parameters where 9 equaled the best turfgrass quality. 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

Response to traffic after 28 machine passes. Traffic reduced uniformity of turf cover, FTC, and green cover of tall fescue after 28 traffic passes on 10 June 2021; ANOVA detected a significant Entry effect for FTC and a Traffic x Entry interaction for uniformity of turf cover on this rating date (Table 1).

The uniformity of turf cover of GLX ACED (PST-5DART), PPG-TF-318, DLFPS-321/3696, PST-5TRN, PPG-TF-267, DLFPS-321/3702, Bullseye LTZ, PPG-TF-249, ProGold, Bravo 2, NAI-ROS4, Birmingham, Hemi, PPG-TF-306, PPG-TF-231, RH3, Tank (PPG-TF-338), Firenza II (PPG-TF 244), and PST-5MINK were not as responsive (not statistically different) to traffic after 28 machine passes (10 June 2021) than all other entries (Table 2). Thirty-six entries had the best uniformity of turf cover after being trafficked on this rating date; DLFPS-321/3696, PG-TF-267, PPG-TF-249, DLFPS-321/3702, GLX ACED (PST-5DART), Bullseye LTZ, PPG-TF-306, ProGold, PPG-TF-231, Bravo 2, RH3, PST-5TRN, Tank (PPG-TF-338), RHL2, DLFPS-TF/3552, PST-5MINK, Raptor LS (PPG-TF-336), DLFPS-321/3699, and JT 233 had uniformity of turf cover > 7.0. Tall fescue entries with the poorest uniformity of turf cover after 28 traffic passes were Dynamite G-LS (PPG-TF-254), BAR FA 8228, BAR-FA8230, OG-WALK, BAR 9FE MAS, NAI-ST5, and Kentucky-31.

Eighty-five (85) tall fescue entries were among the group of entries with the greatest FTC on 10 June 2021 (Table 2); Kentucky-31 had the lowest FTC on this rating date.

Response to traffic after 56 machine passes. Traffic reduced uniformity of turf cover, FTC, and green cover of tall fescue after 56 traffic passes on 29 July 2021; ANOVA detected a Traffic x Entry interaction for uniformity of turf cover and FTC on this rating date (Table 3).

Based on the uniformity of turf cover, PPG-TF-306 was the entry least sensitive to traffic on 29 July 2021 (Table 4). Tall fescue entries with the best uniformity of turf cover and greatest FTC after 56 traffic passes were PPG-TF-306, Firecracker G-LS (PPG-TF-315), PPG-TF-337, DLFPS-321/3699, PPG-TF-267, PPG-TF-231, K18-RS6, RH3, PPG-TF-318, Tank (PPG-TF-338), JT 233, ProGold, PST-5TRN, GLX ACED (PST-5DART), Estrena, 3N1, DLFPS-321/3707, Spyder 2LS (ZRC1), TD2, Raptor LS (PPG-TF-336), NAI-ROS4, Bravo 2, DLFPS-321/3703, PPG-TF-312, Bullseye LTZ, DLFPS-321/3702, Raptor III, PST-5GQ, Titan MAX (TF456), Moondance GLX, DLFPS-321/3708, PPG-TF-249, Firehawk SLT, Monument (PST-5SQB), Padre 2, Tango, AH2, Talladega II (NAI-3N2), and Hemi.

Entries with the poorest uniformity of turf cover and least FTC on 29 July 2021 were BAR-FA8230, RAD-TF 115 (Turbo SS), NAI-ST5, BAR FA 8228, OG-WALK, and Kentucky-31 (Table 4).

Response to traffic after 84 machine passes. Traffic reduced uniformity of turf cover, FTC, and green cover of tall fescue after 84 traffic passes on 15 September 2021 and greater annual bluegrass was observed in trafficked plots compared to no traffic plots on 13 October 2021 (Table 5). The effect of Entry was significant for uniformity of turf cover (15 September 2021) and annual bluegrass population (13 October 2021) while ANOVA detected significant a Traffic x Entry interaction for FTC (15 September 2021).

There were 45 entries with the best uniformity of turf cover on 15 September 2021 regardless of the level of traffic; entries with uniformity of turf cover greater than 7.0 were RH3, PPG-TF-267, GLX ACED (PST-5DART), Raptor III, TD2, Firecracker G-LS (PPG-TF-315), PPG-TF-231, PPG-TF-306, PPG-TF-338, Paramount, DLFPS-321/3696, and PPG-TF-249 (Table 6). Kentucky-31 had the poorest uniformity of turf cover on this rating date.

There were 30 entries among the group with the greatest FTC after 84 machine passes of traffic; cultivars and experimental selections with FTC greater than 50% were RH3, PPG-TF-267, Firecracker G-LS (PPG-TF-315), PPG-TF-231, GLX ACED (PST-5DART), PST-5TRN, PPG-TF-306, Paramount, Hemi, 3N1, Firenza II (PPG-TF 244), PPG-TF-318, Raptor III, TD2, PPG-TF-338, DLFPS-321/3696, JT 233, Bullseye LTZ, TF456, Bullseye, AST8118LM, PPG-TF-249, Spyder 2LS (ZRC1), and DLFPS-321/3699 (Table 6). Entries with the least FTC under the traffic condition on 15 September 2021 were Dragster, NT-3, AH1, OG-WALK, DLFPS-321/3701, DLFPS-321/3706, RAD-TF 115 (Turbo SS), ATF2116, DLFPS-321/3694, Zion (BAR-TF-134), BAR 9FE MAS, NAI-ST5, and Kentucky-31.

There were 89 cultivars and experimental selections that were among the group with the least annual bluegrass encroachment on 13 October 2021 (Table 6). The most severe annual bluegrass encroachment was observed in Kentucky-31. Other entries with severe annual bluegrass invasion (≥ 30% cover) were BAR 9FE MAS, PPG-TF-312, BAR-FA8230, Dragster, NAI-FQZ-17, NAI-ST5, K18-NSE, BY-TF-169, Zion (BAR-TF-134), NAI-TUE, PST-5MINK, DLFPS-321/3699, Tango, Firehawk SLT, and PST-5DZM.

Performance of Tall Fescue Without Traffic

There were 39 tall fescue entries among the group with the best average turf quality during 2021; cultivars and selections with turf quality > 7.0 were DLFPS-321/3702, K18-NSE, DLFPS-321/3703, Tank (PPG-TF-338), 5LSS, RC4, AH1, PPG-TF-267, PPG-TF-231, RH3, RHL2, PPG-TF-262, DLFPS-321/3701, DLFPS-TF/3553, O'Keefe (OLTP-TF-122), DLFPS-321/3696, Raptor LS (PPG-TF-336), DLFPS-TF/3552, Dynamite G-LS (PPG-TF-254), DLFPS-321/3707, and PPG-TF-306 (Table 7).

Kentucky-31, BAR 9FE MAS, and OG-WALK had the poorest average turf quality during 2021 (Table 7). Other entries with poor average turf quality (< 4.0) during 2021 were AST8218LM, Grand Prix (FC15-01P), PST-5THM, ATF2116, Escalade, BAR-FA8230, BAR FA 8228, and Palomar.

There were 44 entries among the group with the best multi-year average turf quality during 2019-2021; commercially named entries included Tank (PPG-TF-338), Stealth (PPG-TF-238), Teacher (PPG-TF-313), Xanadu (JT 268), Spyder 2LS (ZRC1), O'Keefe (OLTP-TF-122), Raptor LS (PPG-TF-336), Paramount, Estrena, Bullseye LTZ, Firecracker G-LS (PPG-TF-315), Dynamite G-LS (PPG-TF-254), Avenger III (PPG-TF-308), Talladega II (NAI-3N2), Titan MAX (TF456), and Triad (PPG-TF-323) (Table 7).

Kentucky-31 had the poorest multiyear average turf quality during 2019-2021; other entries with poor (< 4.0) multiyear average turf quality were AST8218LM, ATF2116, PST-5THM, ATF 1768, Grand

Prix (FC15-01P), RAD-TF 115 (Turbo SS), Naturally Green, Escalade, BAR-FA8230, BAR 9FE MAS, BAR FA 8228, Palomar, and OG-WALK (Table 7).

DISCUSSION

The 132 cultivars and experimental selections that comprise this trial represent a wide breadth of tall fescue germplasm and breeding efforts; the average turf quality for 2019-2021 ranged from 1.1 to 7.5. Among the 44 entries with the best average turf quality for 2019-2021, 33 were experimental selections. This suggests that sports field managers, golf course superintendents, landscapers, sod producers and other turfgrass practitioners can continue to anticipate the release of exceptional tall fescue cultivars beyond the current inventory of high quality cultivars.

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Table 1. Uniformity of cover, fullness of turf canopy, and green cover as affected by traffic and tall fescue entry after 28 traffic machine passes during 2021.

	After 28 machine passes (10 June 2021)[1]		
	Uniformity of Turf Cover[2]	Fullness of Turfgrass Canopy[3]	Green Cover[4]
	1 to 9 scale	0 to 100% scale	
Level of Traffic			
No Traffic	8.6	92	91
Traffic	5.9	62	75
Source of Variation			
Traffic	*	***	**
Entry	***	***	NS
Traffic x Entry	*	NS	NS
CV (%)	11.0	10.8	5.6

[1] Twenty-eight (28) machine passes were made using the Rutgers Wear Simulator (2 passes wk^{-1}) and Cady Traffic Simulator (2 passes wk^{-1}) during 28 April to 10 June 2021

[2] 9 = most dense, uniform turf cover

[3] 100% = full canopy

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

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

Table 2. Uniformity of turf cover as affected by the interaction of traffic and tall fescue entry and fullness of turfgrass canopy as affected by tall fescue entry after 28 traffic machine passes. (Includes all entries of the 2018 National Turfgrass Evaluation Program (NTEP) Tall Fescue Test.)

		After 28 machine passes (10 June 2021)[1]		
		Uniformity of Turf Cover[2]		Fullness of
	Tall fescue entry	No Traffic	Traffic	Turfgrass Canopy[3]
		1 to 9 scale		0 to 100% scale
1	PPG-TF-306	9.0	7.3	89
2	DLFPS-321/3699	9.0	7.0	83
3	Firecracker G-LS (PPG-TF-315)	9.0	6.0	82
4	PPG-TF-337	9.0	6.0	83
5	PST-5TRN	8.3	7.3	84
6	ProGold	8.7	7.3	87
7	GLX ACED (PST-5DART)	8.7	7.7	85
8	3N1	9.0	6.7	85
9	DLFPS-321/3707	9.0	6.0	78
10	PPG-TF-267	9.0	7.7	89
11	K18-RS6	8.3	6.3	80
12	RH3	9.0	7.3	85
13	JT 233	9.0	7.0	82
14	PPG-TF-231	9.0	7.3	87
15	PPG-TF-318	7.7	6.7	73
16	Tank (PPG-TF-338)	9.0	7.3	83
17	Estrena	8.7	6.3	74
18	Paramount	9.0	6.7	79
19	TD2	8.7	6.7	83
20	DLFPS-321/3702	9.0	7.7	86
21	DLFPS-321/3703	9.0	6.7	88
22	PST-5GQ	8.7	6.0	78
23	Bravo 2	8.7	7.3	86
24	RH1	9.0	6.7	83
25	PPG-TF-312	9.0	5.7	78
26	Raptor LS (PPG-TF-336)	9.0	7.0	83
27	Spyder 2LS (ZRC1)	8.3	6.0	78
28	Bullseye LTZ	9.0	7.7	82
29	NAI-ROS4	8.3	6.7	83
30	Raptor III	8.7	6.3	76
31	Titan MAX (TF456)	9.0	6.7	79
32	PST-5BYOB	8.7	6.0	82
33	Moondance GLX	8.0	5.7	76
34	Monument (PST-5SQB)	8.7	6.0	80
35	PST-5DC24	8.7	6.7	83

(Continued)

Table 2. Uniformity of turf cover as affected by the interaction of traffic and tall fescue entry and fullness of turfgrass canopy as affected by tall fescue entry after 28 traffic machine passes. (Includes all entries of the 2018 National Turfgrass Evaluation Program (NTEP) Tall Fescue Test.)

		After 28 machine passes (10 June 2021)[1]		
		Uniformity of Turf Cover[2]		Fullness of
	Tall fescue entry	No Traffic	Traffic	Turfgrass Canopy[3]
		1 to 9 scale		0 to 100% scale
36	DLFPS-321/3705	8.7	5.3	71
37	DLFPS-321/3708	9.0	6.3	83
38	PPG-TF-249	9.0	7.7	87
39	Firenza II (PPG-TF 244)	8.0	6.3	73
40	PPG-TF 316	8.7	6.0	78
41	PPG-TF-257	8.7	5.7	75
42	Bullseye	8.3	6.3	76
43	Firehawk SLT	9.0	5.0	78
44	Birmingham	8.3	6.7	81
45	DLFPS-TF/3552	9.0	7.0	85
46	DLFPS-321/3679	8.7	6.7	86
47	Fayette	9.0	6.3	82
48	O'Keefe (OLTP-TF-122)	9.0	6.7	83
49	Kizzle (K18-ROE)	9.0	6.3	83
50	PST-5THM	8.3	5.7	79
51	Lifeguard	9.0	6.3	82
52	PST-5MINK	8.7	7.0	84
53	Tango	8.7	6.7	78
54	Padre 2	9.0	6.7	81
55	AH2	8.7	6.3	78
56	K18-WB1	9.0	5.3	71
57	Xanadu (JT 268)	8.3	4.7	73
58	Symphony (PPG-TF 305)	9.0	5.7	77
59	Stealth (PPG-TF-238)	9.0	5.7	78
60	Hemi	8.3	6.7	78
61	Dragster	8.3	5.0	70
62	Talladega II (NAI-3N2)	9.0	6.0	81
63	Gro-Pro (SE5302)	8.3	5.7	72
64	RHL2	9.0	7.0	86
65	AST8118LM	8.7	6.3	72
66	TMT1	8.7	5.0	72
67	5LSS	9.0	5.3	78
68	DLFPS-TF/3550	9.0	6.3	83
69	DLFPS-TF/3553	9.0	6.3	82
70	DLFPS-321/3696	9.0	8.0	90

(Continued)

Table 2. Uniformity of turf cover as affected by the interaction of traffic and tall fescue entry and fullness of turfgrass canopy as affected by tall fescue entry after 28 traffic machine passes. (Includes all entries of the 2018 National Turfgrass Evaluation Program (NTEP) Tall Fescue Test.)

		After 28 machine passes (10 June 2021)[1]		
		Uniformity of Turf Cover[2]		Fullness of
	Tall fescue entry	No Traffic	Traffic	Turfgrass Canopy[3]
		1 to 9 scale		0 to 100% scale
71	PST-5MCMO	8.3	6.0	77
72	PST-5DZM	9.0	6.7	78
73	PST-5GLBS	8.3	5.3	75
74	DLFPS-321/3706	8.7	5.7	77
75	Zion (BAR-TF-134)	8.7	5.7	77
76	SE5STAR	9.0	6.0	78
77	Galactic (SE5CR1)	8.7	4.7	72
78	Fairfield (SETF104)	9.0	6.3	80
79	Teacher (PPG-TF-313)	8.0	5.7	70
80	Titan GLX (TF445)	8.7	5.7	75
81	DLFPS-321/3693	8.3	6.0	76
82	RS1	9.0	6.0	81
83	Bonfire (JS-DTT)	9.0	5.3	78
84	RDC	9.0	6.7	80
85	BY-TF-169	9.0	6.0	77
86	DLFPS-321/3701	9.0	5.3	79
87	PST-5E6	8.7	5.3	76
88	Copious TF	9.0	5.7	80
89	PPG-TF-262	9.0	6.3	82
90	Avenger III (PPG-TF-308)	8.7	5.3	73
91	Titanium G-LS (PPG-TF-255)	9.0	5.3	78
92	GO-RH20	8.0	5.3	71
93	Tough (NAI-TUE)	8.7	6.0	81
94	Serenade (PPG-TF-320)	9.0	6.3	78
95	Triad (PPG-TF-323)	9.0	6.0	79
96	A-TF31	8.3	6.0	73
97	Escalade	7.7	5.0	65
98	BGR-TF3	9.0	5.7	75
99	Grande 3	8.0	5.3	64
100	COL-TF-148	9.0	5.0	78
101	Degas (LTP-TF-111)	8.7	6.3	78
102	K18-NSE	9.0	6.0	78
103	Bandit	8.0	5.7	74
104	NAI-FQZ-17	8.7	6.0	78
105	AH1	9.0	5.3	80

(Continued)

Table 2. Uniformity of turf cover as affected by the interaction of traffic and tall fescue entry and fullness of turfgrass canopy as affected by tall fescue entry after 28 traffic machine passes. (Includes all entries of the 2018 National Turfgrass Evaluation Program (NTEP) Tall Fescue Test.)

		After 28 machine passes (10 June 2021)[1]		
		Uniformity of Turf Cover[2]		Fullness of
	Tall fescue entry	No Traffic	Traffic	Turfgrass Canopy[3]
		1 to 9 scale		0 to 100% scale
106	RC4	9.0	5.3	77
107	Dynamite G-LS (PPG-TF-254)	9.0	4.3	75
108	GO-AOMK	8.7	5.7	76
109	RAD-TF0.0	8.3	4.7	72
110	RHF	8.3	4.7	67
111	DLFPS-321/3694	8.7	5.0	70
112	LBF	8.7	5.7	74
113	JT-517	8.0	5.7	73
114	SETFM2	8.3	5.3	73
115	SETFM3	8.3	5.3	73
116	3B2	8.7	6.0	73
117	AST8218LM	8.0	5.0	67
118	Palomar	8.3	5.3	70
119	Grand Prix (FC15-01P)	8.3	5.7	72
120	DLFPS-321/3695	9.0	5.0	72
121	BAR 9FE MAS	7.3	4.0	58
122	RAD--TF105	9.0	5.0	74
123	Naturally Green	8.0	4.7	67
124	ATF2116	8.0	5.0	68
125	NT-3	8.3	5.0	72
126	ATF 1768	8.3	5.3	68
127	BAR-FA8230	7.7	4.0	62
128	RAD-TF 115 (Turbo SS)	8.3	4.7	64
129	BAR FA 8228	7.7	4.3	63
130	NAI-ST5	7.7	3.7	67
131	OG-WALK	7.7	4.0	59
132	Kentucky-31	5.7	3.0	43
	LSD (down; columns) at 5% =		1.5	14
	LSD (across; rows) at 5% =		1.7	–

[1]Twenty-eight (28) machine passes were made using the Rutgers Wear Simulator (2 passes wk^{-1}) and Cady Traffic Simulator (2 passes wk^{-1}) during 28 April to 10 June 2021

[2]9 = most dense, uniform canopy

[3]100% = full canopy

Table 3. Uniformity of cover, fullness of turf canopy, and green cover as affected by traffic and tall fescue entry after 56 traffic machine passes during 2021.

	After 56 machine passes (29 July 2021)[1]		
	Uniformity of Turf Cover[2]	Fullness of Turfgrass Canopy[3]	Green Cover[4]
	----- 1 to 9 scale -----	---------- 0 to 100% scale ----------	
Level of Traffic			
No Traffic	8.8	95	92
Traffic	5.4	49	76
Source of Variation			
Traffic	**	**	**
Entry	***	***	NS
Traffic x Entry	*	**	NS
CV (%)	13.0	12.0	5.4

[1]Fifty-six machine (56) passes were made using the Rutgers Wear Simulator (2 passes wk^{-1}) and Cady Traffic Simulator (2 passes wk^{-1}) during 28 April to 29 July 2021

[2] 9 = most dense, uniform turf cover

[3]100% = full canopy

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

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

Table 4. Uniformity of turf cover and fullness of turfgrass canopy as affected by the interaction of traffic and tall fescue entry after 56 traffic machine passes (Includes all entries of the 2018 National Turfgrass Evaluation Program (NTEP) Tall Fescue Test.)

		After 56 machine passes (29 July 2021)[1]			
	Tall fescue entry	Uniformity of Turf Cover[2]		Fullness of Turfgrass Canopy[3]	
		1 to 9 scale		0 to 100% scale	
1	PPG-TF-306	9.0	7.3	100	68
2	DLFPS-321/3699	9.0	7.0	97	58
3	Firecracker G-LS (PPG-TF-315)	9.0	7.0	100	58
4	PPG-TF-337	9.0	7.0	98	58
5	PST-5TRN	8.7	6.7	95	63
6	ProGold	8.7	6.7	97	63
7	GLX ACED (PST-5DART)	8.7	6.7	95	63
8	3N1	9.0	6.7	98	58
9	DLFPS-321/3707	9.0	6.7	100	55
10	PPG-TF-267	9.0	6.7	100	70
11	K18-RS6	8.7	6.7	97	68
12	RH3	8.7	6.7	98	67
13	JT 233	9.0	6.7	97	63
14	PPG-TF-231	9.0	6.7	98	68
15	PPG-TF-318	8.7	6.7	93	67
16	Tank (PPG-TF-338)	9.0	6.7	100	65
17	Estrena	9.0	6.7	98	62
18	Paramount	9.0	6.3	97	53
19	TD2	9.0	6.3	98	63
20	DLFPS-321/3702	9.0	6.3	100	57
21	DLFPS-321/3703	9.0	6.3	100	58
22	PST-5GQ	9.0	6.3	97	57
23	Bravo 2	9.0	6.3	97	60
24	RH1	9.0	6.3	92	53
25	PPG-TF-312	9.0	6.3	100	58
26	Raptor LS (PPG-TF-336)	9.0	6.3	100	62
27	Spyder 2LS (ZRC1)	9.0	6.3	98	65
28	Bullseye LTZ	9.0	6.3	98	58
29	NAI-ROS4	9.0	6.3	95	62
30	Raptor III	9.0	6.3	98	57
31	Titan MAX (TF456)	9.0	6.3	97	57
32	PST-5BYOB	8.3	6.0	92	53
33	Moondance GLX	8.0	6.0	95	65
34	Monument (PST-5SQB)	8.7	6.0	88	55
35	PST-5DC24	8.3	6.0	90	50

(Continued)

Table 4. Uniformity of turf cover and fullness of turfgrass canopy as affected by the interaction of traffic and tall fescue entry after 56 traffic machine passes (Includes all entries of the 2018 National Turfgrass Evaluation Program (NTEP) Tall Fescue Test.)

		After 56 machine passes (29 July 2021)[1]			
	Tall fescue entry	Uniformity of Turf Cover[2]		Fullness of Turfgrass Canopy[3]	
		1 to 9 scale		0 to 100% scale	
36	DLFPS-321/3705	9.0	6.0	100	52
37	DLFPS-321/3708	9.0	6.0	100	63
38	PPG-TF-249	9.0	6.0	100	63
39	Firenza II (PPG-TF 244)	9.0	6.0	98	52
40	PPG-TF 316	9.0	6.0	98	52
41	PPG-TF-257	9.0	6.0	98	43
42	Bullseye	9.0	6.0	92	52
43	Firehawk SLT	9.0	6.0	98	60
44	Birmingham	9.0	6.0	95	48
45	DLFPS-TF/3552	9.0	5.7	97	48
46	DLFPS-321/3679	9.0	5.7	95	50
47	Fayette	9.0	5.7	97	48
48	O'Keefe (OLTP-TF-122)	9.0	5.7	100	50
49	Kizzle (K18-ROE)	8.7	5.7	95	52
50	PST-5THM	8.0	5.7	93	50
51	Lifeguard	8.7	5.7	95	50
52	PST-5MINK	8.7	5.7	90	47
53	Tango	8.7	5.7	93	58
54	Padre 2	9.0	5.7	98	60
55	AH2	9.0	5.7	100	57
56	K18-WB1	9.0	5.7	100	52
57	Xanadu (JT 268)	9.0	5.7	98	52
58	Symphony (PPG-TF 305)	9.0	5.7	100	52
59	Stealth (PPG-TF-238)	9.0	5.7	100	42
60	Hemi	9.0	5.7	92	55
61	Dragster	9.0	5.7	98	43
62	Talladega II (NAI-3N2)	9.0	5.7	98	55
63	Gro-Pro (SE5302)	8.0	5.7	90	42
64	RHL2	9.0	5.7	98	52
65	AST8118LM	8.7	5.7	93	47
66	TMT1	8.7	5.3	98	38
67	5LSS	9.0	5.3	98	43
68	DLFPS-TF/3550	9.0	5.3	98	50
69	DLFPS-TF/3553	9.0	5.3	97	42
70	DLFPS-321/3696	9.0	5.3	98	60

(Continued)

Table 4. Uniformity of turf cover and fullness of turfgrass canopy as affected by the interaction of traffic and tall fescue entry after 56 traffic machine passes (Includes all entries of the 2018 National Turfgrass Evaluation Program (NTEP) Tall Fescue Test.)

		After 56 machine passes (29 July 2021)[1]			
	Tall fescue entry	Uniformity of Turf Cover[2]		Fullness of Turfgrass Canopy[3]	
		1 to 9 scale		0 to 100% scale	
71	PST-5MCMO	8.7	5.3	95	53
72	PST-5DZM	8.7	5.3	93	53
73	PST-5GLBS	8.3	5.3	93	47
74	DLFPS-321/3706	9.0	5.3	100	45
75	Zion (BAR-TF-134)	9.0	5.3	100	45
76	SE5STAR	9.0	5.3	95	48
77	Galactic (SE5CR1)	9.0	5.3	95	47
78	Fairfield (SETF104)	9.0	5.3	98	45
79	Teacher (PPG-TF-313)	9.0	5.3	98	47
80	Titan GLX (TF445)	9.0	5.3	97	42
81	DLFPS-321/3693	8.7	5.0	97	48
82	RS1	9.0	5.0	98	42
83	Bonfire (JS-DTT)	8.7	5.0	97	50
84	RDC	9.0	5.0	98	40
85	BY-TF-169	9.0	5.0	100	45
86	DLFPS-321/3701	9.0	5.0	100	42
87	PST-5E6	8.7	5.0	93	43
88	Copious TF	9.0	5.0	97	48
89	PPG-TF-262	9.0	5.0	100	52
90	Avenger III (PPG-TF-308)	8.7	5.0	98	48
91	Titanium G-LS (PPG-TF-255)	9.0	5.0	98	43
92	GO-RH20	8.7	5.0	97	53
93	Tough (NAI-TUE)	9.0	5.0	92	52
94	Serenade (PPG-TF-320)	9.0	5.0	100	45
95	Triad (PPG-TF-323)	9.0	5.0	100	37
96	A-TF31	8.7	5.0	93	48
97	Escalade	7.7	5.0	85	43
98	BGR-TF3	8.7	4.7	88	38
99	Grande 3	9.0	4.7	92	48
100	COL-TF-148	9.0	4.7	97	42
101	Degas (LTP-TF-111)	9.0	4.7	98	55
102	K18-NSE	9.0	4.7	100	40
103	Bandit	8.0	4.7	95	45
104	NAI-FQZ-17	9.0	4.7	97	52
105	AH1	9.0	4.7	100	40

(Continued)

Table 4. Uniformity of turf cover and fullness of turfgrass canopy as affected by the interaction of traffic and tall fescue entry after 56 traffic machine passes (Includes all entries of the 2018 National Turfgrass Evaluation Program (NTEP) Tall Fescue Test.)

		After 56 machine passes (29 July 2021)[1]			
	Tall fescue entry	Uniformity of Turf Cover[2]		Fullness of Turfgrass Canopy[3]	
		1 to 9 scale		0 to 100% scale	
106	RC4	9.0	4.7	100	43
107	Dynamite G-LS (PPG-TF-254)	9.0	4.7	100	43
108	GO-AOMK	9.0	4.7	97	48
109	RAD-TF0.0	8.7	4.7	93	47
110	RHF	8.7	4.7	98	37
111	DLFPS-321/3694	9.0	4.3	98	42
112	LBF	8.0	4.3	90	37
113	JT-517	8.3	4.3	93	38
114	SETFM2	8.7	4.3	92	37
115	SETFM3	8.7	4.3	93	32
116	3B2	8.7	4.3	97	45
117	AST8218LM	8.3	4.3	85	37
118	Palomar	7.7	4.3	87	37
119	Grand Prix (FC15-01P)	8.0	4.3	90	47
120	DLFPS-321/3695	9.0	4.0	97	38
121	BAR 9FE MAS	8.0	4.0	75	28
122	RAD--TF105	9.0	4.0	95	37
123	Naturally Green	8.3	3.7	88	43
124	ATF2116	8.0	3.7	83	37
125	NT-3	9.0	3.7	95	35
126	ATF 1768	8.0	3.7	90	32
127	BAR-FA8230	8.0	3.3	82	32
128	RAD-TF 115 (Turbo SS)	9.0	3.3	90	28
129	BAR FA 8228	7.7	3.0	80	30
130	NAI-ST5	9.0	3.0	97	32
131	OG-WALK	7.7	3.0	80	27
132	Kentucky-31	5.3	2.0	48	23
	LSD (down; columns) at 5% =		1.6		15
	LSD (across; rows) at 5% =		1.8		18

[1]Fifty-six machine (56) passes were made using the Rutgers Wear Simulator (2 passes wk^{-1}) and Cady Traffic Simulator (2 passes wk^{-1}) during 28 April to 29 July 2021.

[2]9 = most dense, uniform canopy

[3]100% = full canopy

Table 5. Uniformity of cover, fullness of turf canopy, and green cover as affected by traffic and tall fescue entry after 84 traffic machine passes during 2021.

	After 84 machine passes (15 Sep. 2021)[1]			
	Uniformity of Turf Cover[2]	Fullness of Turfgrass Canopy[3]	Green Cover[4]	Annual Bluegrass[5] 13 Oct. 2021
	-- 1 to 9 scale --	0 to 100% scale		
Level of Traffic				
No Traffic	8.6	96	92	13
Traffic	3.8	41	71	34
Source of Variation				
Traffic	**	**	*	**
Entry	***	***	NS	***
Traffic x Entry	NS	*	NS	NS
CV (%)	15.2	13.3	10.5	29.4

[1]Eighty-four (84) machine passes were made using the Rutgers Wear Simulator (2 passes wk-1) and Cady Traffic Simulator (2 passes wk-1) during 28 April to 15 September 2021

[2]9 = most dense, uniform canopy

[3] 100% = full canopy

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

[5] 100% = complete annual bluegrass cover

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

Table 6. Uniformity of turf cover and annual bluegrass cover as affected by tall fescue entry and fullness of turfgrass canopy as affected by the interaction of tall fescue entry and traffic after 84 traffic machine passes during 2021. (Includes all entries of the 2018 National Turfgrass Evaluation Program (NTEP) Tall Fescue Test.)

		--- After 84 machine passes (15 Sep. 2021)[1] ---			
	Tall fescue entry	Uniformity of Turf Cover[2]	--- Fullness of Turf Canopy[3] --- No Traffic	Traffic	Annual bluegrass[4] 13 Oct. 2021
		1 to 9 scale	---------- 0 to 100% scale ----------		
1	PPG-TF-306	7.2	100	53	16
2	DLFPS-321/3699	6.5	88	50	30
3	Firecracker G-LS (PPG-TF-315)	7.2	100	58	23
4	PPG-TF-337	6.8	100	47	22
5	PST-5TRN	6.8	92	55	20
6	ProGold	6.8	95	48	17
7	GLX ACED (PST-5DART)	7.3	95	55	13
8	3N1	6.7	98	53	16
9	DLFPS-321/3707	6.3	100	42	22
10	PPG-TF-267	7.5	98	62	12
11	K18-RS6	6.8	100	48	16
12	RH3	7.7	97	63	11
13	JT 233	6.8	98	52	16
14	PPG-TF-231	7.2	100	58	18
15	PPG-TF-318	6.7	98	53	23
16	Tank (PPG-TF-338)	7.2	100	52	17
17	Estrena	6.5	100	45	18
18	Paramount	7.0	100	53	17
19	TD2	7.2	100	52	21
20	DLFPS-321/3702	6.7	98	47	21
21	DLFPS-321/3703	6.5	100	42	13
22	PST-5GQ	6.3	97	43	28
23	Bravo 2	5.8	92	40	26
24	RH1	6.3	98	43	18
25	PPG-TF-312	6.2	100	35	38
26	Raptor LS (PPG-TF-336)	6.7	100	48	20
27	Spyder 2LS (ZRC1)	6.7	100	50	16
28	Bullseye LTZ	6.8	100	52	15
29	NAI-ROS4	6.5	97	45	20
30	Raptor III	7.3	97	52	21
31	Titan MAX (TF456)	6.8	100	52	19
32	PST-5BYOB	6.3	92	45	24
33	Moondance GLX	6.0	90	40	18
34	Monument (PST-5SQB)	6.5	93	35	14
35	PST-5DC24	6.3	92	43	27

(Continued)

Table 6. Uniformity of turf cover and annual bluegrass cover as affected by tall fescue entry and fullness of turfgrass canopy as affected by the interaction of tall fescue entry and traffic after 84 traffic machine passes during 2021. (Includes all entries of the 2018 National Turfgrass Evaluation Program (NTEP) Tall Fescue Test.)

		--- After 84 machine passes (15 Sep. 2021)[1] ---			
	Tall fescue entry	Uniformity of Turf Cover[2]	--- Fullness of Turf Canopy[3] --- No Traffic	Traffic	Annual bluegrass[4] 13 Oct. 2021
		1 to 9 scale	---------- 0 to 100% scale ----------		
36	DLFPS-321/3705	6.2	98	38	28
37	DLFPS-321/3708	6.3	100	47	26
38	PPG-TF-249	7.0	98	50	15
39	Firenza II (PPG-TF 244)	6.7	100	53	18
40	PPG-TF 316	6.3	100	35	24
41	PPG-TF-257	6.3	100	35	23
42	Bullseye	6.5	97	52	21
43	Firehawk SLT	6.3	100	38	30
44	Birmingham	6.5	92	47	22
45	DLFPS-TF/3552	6.5	98	43	18
46	DLFPS-321/3679	6.0	97	35	24
47	Fayette	6.3	97	38	15
48	O'Keefe (OLTP-TF-122)	6.0	100	33	22
49	Kizzle (K18-ROE)	6.5	97	42	19
50	PST-5THM	6.5	92	47	21
51	Lifeguard	6.2	95	37	18
52	PST-5MINK	5.7	95	32	32
53	Tango	6.3	95	40	30
54	Padre 2	6.5	97	47	20
55	AH2	6.5	98	35	23
56	K18-WB1	6.5	100	47	19
57	Xanadu (JT 268)	5.8	100	37	23
58	Symphony (PPG-TF 305)	6.0	97	35	29
59	Stealth (PPG-TF-238)	6.2	100	35	17
60	Hemi	6.8	98	53	19
61	Dragster	6.0	100	30	37
62	Talladega II (NAI-3N2)	6.0	100	33	23
63	Gro-Pro (SE5302)	5.8	93	37	29
64	RHL2	6.5	100	45	15
65	AST8118LM	6.3	95	52	14
66	TMT1	6.0	98	32	28
67	5LSS	6.2	100	38	18
68	DLFPS-TF/3550	6.5	100	38	11
69	DLFPS-TF/3553	6.0	98	35	23
70	DLFPS-321/3696	7.0	98	52	23

(Continued)

Table 6. Uniformity of turf cover and annual bluegrass cover as affected by tall fescue entry and fullness of turfgrass canopy as affected by the interaction of tall fescue entry and traffic after 84 traffic machine passes during 2021. (Includes all entries of the 2018 National Turfgrass Evaluation Program (NTEP) Tall Fescue Test.)

		--- After 84 machine passes (15 Sep. 2021)[1] ---			
	Tall fescue entry	Uniformity of Turf Cover[2]	--- Fullness of Turf Canopy[3] --- No Traffic	Traffic	Annual bluegrass[4] 13 Oct. 2021
		1 to 9 scale	---------- 0 to 100% scale ----------		
71	PST-5MCMO	5.7	92	33	28
72	PST-5DZM	5.7	95	35	30
73	PST-5GLBS	5.7	92	33	24
74	DLFPS-321/3706	5.8	98	28	28
75	Zion (BAR-TF-134)	5.7	97	25	33
76	SE5STAR	6.0	95	35	26
77	Galactic (SE5CR1)	6.3	98	42	29
78	Fairfield (SETF104)	6.5	97	48	23
79	Teacher (PPG-TF-313)	6.5	97	47	20
80	Titan GLX (TF445)	6.3	100	38	20
81	DLFPS-321/3693	6.2	98	35	18
82	RS1	6.5	98	43	22
83	Bonfire (JS-DTT)	5.8	97	35	24
84	RDC	6.3	100	40	16
85	BY-TF-169	6.3	98	38	33
86	DLFPS-321/3701	6.2	100	28	19
87	PST-5E6	6.3	97	37	25
88	Copious TF	6.0	87	43	28
89	PPG-TF-262	6.0	100	33	24
90	Avenger III (PPG-TF-308)	6.3	100	43	24
91	Titanium G-LS (PPG-TF-255)	6.0	98	33	21
92	GO-RH20	6.3	100	43	17
93	Tough (NAI-TUE)	5.5	88	33	33
94	Serenade (PPG-TF-320)	5.8	98	37	17
95	Triad (PPG-TF-323)	6.0	100	42	28
96	A-TF31	6.3	95	45	23
97	Escalade	5.7	87	40	23
98	BGR-TF3	5.8	90	43	21
99	Grande 3	6.0	95	33	26
100	COL-TF-148	6.0	98	32	23
101	Degas (LTP-TF-111)	6.5	98	42	29
102	K18-NSE	6.2	98	33	33
103	Bandit	5.5	90	38	26
104	NAI-FQZ-17	5.5	87	35	36
105	AH1	5.8	98	30	23

(Continued)

Table 6. Uniformity of turf cover and annual bluegrass cover as affected by tall fescue entry and fullness of turfgrass canopy as affected by the interaction of tall fescue entry and traffic after 84 traffic machine passes during 2021. (Includes all entries of the 2018 National Turfgrass Evaluation Program (NTEP) Tall Fescue Test.)

		--- After 84 machine passes (15 Sep. 2021)[1] ---			
	Tall fescue entry	Uniformity of Turf Cover[2]	--- Fullness of Turf Canopy[3] --- No Traffic	Traffic	Annual bluegrass[4] 13 Oct. 2021
		1 to 9 scale	---------- 0 to 100% scale ----------		
106	RC4	6.2	100	38	23
107	Dynamite G-LS (PPG-TF-254)	5.8	98	33	29
108	GO-AOMK	6.2	100	37	23
109	RAD-TF0.0	6.3	97	48	23
110	RHF	5.8	98	37	26
111	DLFPS-321/3694	5.7	100	27	23
112	LBF	5.8	92	33	25
113	JT-517	5.7	90	37	27
114	SETFM2	5.8	97	38	24
115	SETFM3	5.7	92	38	28
116	3B2	6.3	97	40	17
117	AST8218LM	5.8	90	40	24
118	Palomar	5.3	87	40	25
119	Grand Prix (FC15-01P)	6.3	92	48	21
120	DLFPS-321/3695	6.2	98	33	26
121	BAR 9FE MAS	4.8	73	25	46
122	RAD--TF105	6.0	95	37	26
123	Naturally Green	5.5	90	35	20
124	ATF2116	5.2	87	28	28
125	NT-3	5.8	98	30	18
126	ATF 1768	5.5	90	32	21
127	BAR-FA8230	5.0	83	33	38
128	RAD-TF 115 (Turbo SS)	5.7	95	28	28
129	BAR FA 8228	5.2	88	32	28
130	NAI-ST5	5.2	98	23	35
131	OG-WALK	4.5	87	30	28
132	Kentucky-31	3.0	45	15	65
	LSD (columns; down) at 5% =	1.2	15		14
	LSD (rows; across) at 5% =	–	18		–

[1]Eighty-four (84) machine passes were made using the Rutgers Wear Simulator (2 passes wk^{-1}) and Cady Traffic Simulator (2 passes wk^{-1}) during 28 April to 15 September 2021

[2]9 = most dense, uniform canopy

[3]100% = full canopy

[4]100% = complete annual bluegrass cover

Table 7. Performance of tall fescue entries without traffic in a turf trial seeded in September 2018 at North Brunswick, NJ (Includes all entries of the 2018 National Turfgrass Evaluation Program (NTEP) Tall Fescue Test.)

	Tall fescue entry	Average Turfgrass Quality[1] 2019-2021	2019	2020	2021
		1 to 9 scale			
1	K18-RS6	7.5	8.3	7.9	6.2
2	K18-NSE	7.4	7.1	7.5	7.7
3	PPG-TF-338	7.3	7.1	7.4	7.4
4	Stealth (PPG-TF-238)	7.3	7.5	7.7	6.7
5	PPG-TF-313	7.2	7.3	7.9	6.5
6	Xanadu (JT 268)	7.2	8.0	7.9	5.9
7	PPG-TF-267	7.2	6.8	7.6	7.3
8	PPG-TF-231	7.2	6.8	7.6	7.2
9	PPG-TF-262	7.2	6.9	7.6	7.1
10	RH3	7.2	7.1	7.2	7.2
11	5LSS	7.2	7.1	7.1	7.3
12	Spyder 2LS (ZRC1)	7.1	7.1	7.5	6.8
13	RC4	7.1	7.0	7.0	7.3
14	O'Keefe (OLTP-TF-122)	7.1	7.3	7.0	7.0
15	PPG-TF-312	7.1	7.2	7.2	6.9
16	DLFPS-321/3703	7.1	6.3	7.3	7.6
17	K18-WB1	7.1	7.2	7.1	6.9
18	TD2	7.1	7.3	7.6	6.2
19	DLFPS-TF/3552	7.0	6.9	7.3	7.0
20	Raptor LS (PPG-TF-336)	7.0	7.0	7.0	7.0
21	AH1	7.0	7.1	6.5	7.3
22	Paramount	7.0	6.7	7.7	6.6
23	Estrena	6.9	6.9	7.1	6.8
24	Bullseye LTZ	6.9	6.5	7.5	6.8
25	RHL2	6.9	7.1	6.3	7.2
26	DLFPS-321/3707	6.8	6.2	7.3	7.0
27	DLFPS-321/3701	6.8	6.3	7.0	7.1
28	DLFPS-TF/3553	6.8	6.6	6.8	7.1
29	RDC	6.8	6.2	7.4	6.9
30	DLFPS-321/3696	6.8	5.8	7.5	7.0
31	DLFPS-321/3693	6.7	6.5	7.1	6.6
32	DLFPS-TF/3550	6.7	6.4	6.9	6.9
33	Firecracker G-LS (PPG-TF-315)	6.7	6.4	6.9	6.9
34	COL-TF-148	6.7	7.1	6.3	6.8
35	AH2	6.7	7.7	6.4	6.0

(Continued)

Table 7. Performance of tall fescue entries without traffic in a turf trial seeded in September 2018 at North Brunswick, NJ (Includes all entries of the 2018 National Turfgrass Evaluation Program (NTEP) Tall Fescue Test.)

	Tall fescue entry	Average Turfgrass Quality[1] 2019-2021	2019	2020	2021
		1 to 9 scale			
36	Dynamite G-LS (PPG-TF-254)	6.7	6.4	6.7	7.0
37	RH1	6.7	6.6	6.8	6.7
38	PPG-TF-306	6.7	6.3	6.7	7.0
39	Avenger III (PPG-TF-308)	6.6	7.0	6.3	6.6
40	NAI-ROS4	6.6	6.7	6.7	6.5
41	NAI-3N2	6.6	6.5	6.7	6.7
42	TF456	6.6	7.0	6.7	6.1
43	DLFPS-321/3702	6.6	5.7	6.0	8.0
44	PPG-TF-323	6.6	6.4	6.7	6.6
45	JT 233	6.5	6.7	6.1	6.8
46	RHF	6.5	7.4	6.4	5.8
47	Firenza II (PPG-TF 244)	6.5	6.4	6.9	6.3
48	Serenade (PPG-TF-320)	6.5	7.0	6.1	6.4
49	GO-RH20	6.5	6.4	6.6	6.4
50	PPG-TF-257	6.5	6.5	6.3	6.5
51	DLFPS-321/3695	6.4	6.7	5.9	6.7
52	PPG-TF-337	6.4	6.5	6.7	6.1
53	Padre 2	6.4	6.2	6.4	6.5
54	Zion (BAR-TF-134)	6.3	6.4	5.9	6.7
55	PPG-TF 316	6.3	6.0	6.2	6.8
56	Titanium G-LS (PPG-TF-255)	6.3	6.1	6.5	6.3
57	Degas (LTP-TF-111)	6.3	6.2	6.5	6.1
58	DLFPS-321/3699	6.3	6.5	6.3	6.0
59	BY-TF-169	6.3	6.6	6.0	6.3
60	Raptor III	6.3	6.9	6.2	5.7
61	RS1	6.3	5.9	6.5	6.4
62	DLFPS-321/3694	6.3	6.3	6.6	5.9
63	TF445	6.3	6.2	6.1	6.4
64	PPG-TF-318	6.3	7.2	6.9	4.7
65	PPG-TF-249	6.2	6.0	6.0	6.7
66	Kizzle (K18-ROE)	6.1	6.2	6.0	6.1
67	TMT1	6.1	6.5	6.4	5.5
68	NT-3	6.1	6.6	5.7	6.0
69	DLFPS-321/3708	6.1	5.7	6.0	6.7
70	DLFPS-321/3705	6.1	5.8	6.3	6.1

(Continued)

Table 7. Performance of tall fescue entries without traffic in a turf trial seeded in September 2018 at North Brunswick, NJ (Includes all entries of the 2018 National Turfgrass Evaluation Program (NTEP) Tall Fescue Test.)

	Tall fescue entry	Average Turfgrass Quality[1] 2019-2021	2019	2020	2021
		1 to 9 scale			
71	DLFPS-321/3706	6.1	5.9	6.1	6.2
72	Bonfire (JS-DTT)	6.0	6.3	6.0	5.9
73	Firehawk SLT	6.0	6.3	6.0	5.8
74	3N1	6.0	5.6	6.5	6.0
75	Symphony (PPG-TF 305)	6.0	5.9	6.0	6.0
76	Dragster	6.0	6.6	6.0	5.4
77	DLFPS-321/3679	5.9	5.1	6.3	6.3
78	Fayette	5.9	5.2	6.2	6.2
79	SE5CR1	5.8	6.0	5.6	6.0
80	NAI-ST5	5.7	5.8	5.3	6.0
81	GLX ACED (PST-5DART)	5.7	5.7	5.8	5.5
82	SETF104	5.6	5.7	5.7	5.6
83	Hemi	5.6	6.1	5.2	5.5
84	3B2	5.6	5.3	6.0	5.4
85	GO-AOMK	5.5	5.2	5.1	6.2
86	PST-5TRN	5.2	5.4	5.2	5.0
87	RAD--TF105	5.2	5.1	4.8	5.6
88	Monument (PST-5SQB)	5.1	5.7	4.9	4.7
89	A-TF31	5.1	5.4	4.9	5.0
90	ProGold	5.1	5.2	5.0	5.0
91	PST-5BYOB	5.0	5.2	5.0	4.9
92	PST-5GQ	5.0	4.8	4.9	5.3
93	NAI-TUE	5.0	5.4	4.8	4.7
94	PST-5MCMO	5.0	5.0	4.9	5.0
95	Bravo 2	4.9	4.3	4.7	5.8
96	Burmingham	4.9	4.8	4.5	5.6
97	RAD-TF0.0	4.9	4.6	5.0	5.1
98	Lifeguard	4.8	4.6	5.0	4.8
99	Tango	4.7	4.2	4.8	5.3
100	SE5STAR	4.7	4.6	4.4	5.3
101	PST-5DZM	4.7	4.7	4.6	5.0
102	Grande 3	4.7	5.2	4.8	4.2
103	AST8118LM	4.7	4.9	4.1	5.0
104	PST-5E6	4.6	4.2	4.3	5.2
105	SETFM3	4.6	4.5	4.5	4.8

(Continued)

Table 7. Performance of tall fescue entries without traffic in a turf trial seeded in September 2018 at North Brunswick, NJ (Includes all entries of the 2018 National Turfgrass Evaluation Program (NTEP) Tall Fescue Test.)

	Tall fescue entry	Average Turfgrass Quality[1] 2019-2021	2019	2020	2021
		1 to 9 scale			
106	SE5302	4.6	5.2	4.0	4.5
107	NAI-FQZ-17	4.5	3.7	4.6	5.3
108	PST-5GLBS	4.5	4.5	4.7	4.4
109	PST-5DC24	4.5	4.4	4.7	4.5
110	Moondance GLX	4.5	4.6	4.9	4.0
111	Copious TF	4.5	4.1	4.3	5.0
112	Bullseye	4.5	5.0	4.3	4.2
113	LBF	4.5	4.7	4.2	4.5
114	BGR-TF3	4.4	4.5	4.1	4.6
115	JT-517	4.3	4.0	4.3	4.5
116	PST-5MINK	4.2	4.0	3.9	4.6
117	SETFM2	4.1	3.6	4.0	4.7
118	Bandit	4.0	3.9	3.7	4.3
119	AST8218LM	3.9	4.3	3.5	3.9
120	ATF2116	3.9	4.3	4.0	3.4
121	PST-5THM	3.9	4.1	3.9	3.7
122	ATF 1768	3.8	3.9	3.5	4.0
123	Grand Prix (FC15-01P)	3.7	3.7	3.5	3.8
124	RAD-TF 115 (Turbo SS)	3.6	3.3	3.4	4.1
125	Naturally Green	3.5	3.4	3.1	4.0
126	Escalade	3.4	4.0	3.2	3.2
127	BAR-FA8230	3.2	3.9	2.8	2.9
128	BAR 9FE MAS	2.9	3.8	2.4	2.4
129	BAR FA 8228	2.7	2.8	2.4	2.8
130	Palomar	2.6	2.6	2.4	2.7
131	OG-WALK	2.4	2.8	2.3	2.2
132	Kentucky-31	1.1	1.1	1.0	1.1
	LSD at 5% =	0.9	1.3	1.3	1.3
	CV%	10.1	13.6	14.3	13.6

[1]9 = best turfgrass quality