

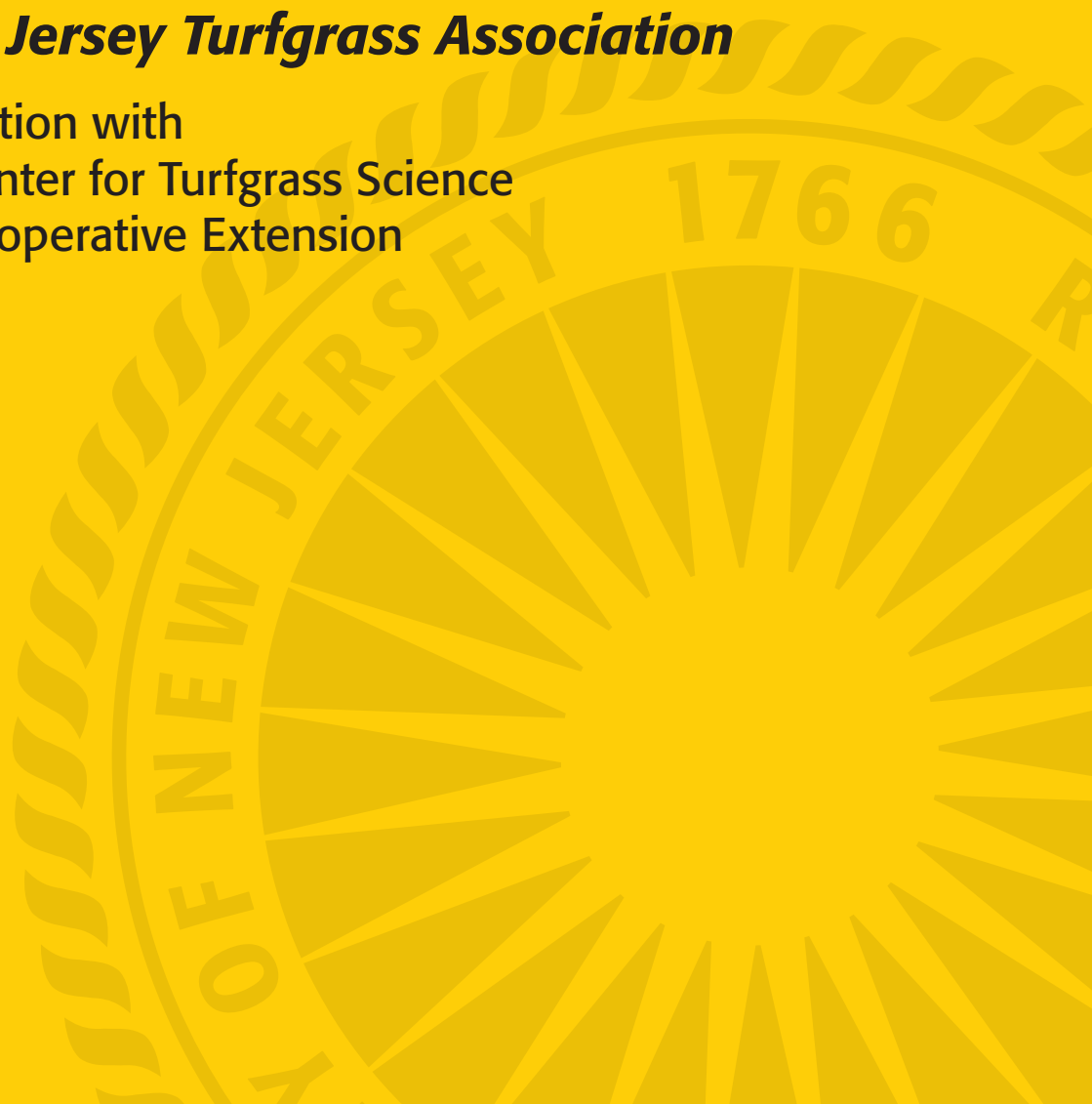
RUTGERS

New Jersey Agricultural
Experiment Station

2013 Turfgrass Proceedings

The New Jersey Turfgrass Association

In Cooperation with
Rutgers Center for Turfgrass Science
Rutgers Cooperative Extension



2013 RUTGERS TURFGRASS PROCEEDINGS

of the

GREEN EXPO Turf and Landscape Conference

December 10-12, 2013

Trump Taj Mahal

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 2013 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 Barbara Fitzgerald, Anne Diglio, and Ann Jenkins for administrative and secretarial support.

Dr. Ann Brooks Gould, Editor
Dr. Bruce B. Clarke, Coordinator

TALL FESCUE RESEARCH AT THE RUTGERS HORTICULTURAL RESEARCH FARM No. 2 DURING 2013

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Joseph B. Clark, and William A. Meyer¹

Tall fescue (*Festuca arundinacea* Schreb.) is a cool-season turfgrass species that is adapted to variable soil pH, rainfall, and sunlight and is an important grass for forage, roadside stabilization, golf course roughs, home lawns, parks, and sports fields throughout the north, central, and transition areas of the United States (Meyer and Funk, 1989). Major advances in turfgrass breeding during the last 30 years have resulted in tall fescue cultivars with lower vertical growth rate, darker-green color, finer leaf blades, higher shoot density, better disease resistance, and greater seed yield (Bonos and Huff, 2013).

The interest in establishing tall fescue for sports fields has driven the Rutgers Center for Turfgrass Science to assess the wear and traffic (wear and compaction) tolerance of newer tall fescue cultivars. Park et al. (2009) identified entries with better wear and traffic tolerance within the 2005 Cooperative Turfgrass Breeder's Test (CTBT) Tall Fescue Trial (<http://www.ctbt-us.info/>) and the 2006 National Turfgrass Evaluation Program (NTEP) Tall Fescue Test.

In 2004, CTBT began sponsoring Kentucky bluegrass (*Poa pratensis* L.), perennial ryegrass (*Lolium perenne* L.), and tall fescue evaluations across numerous geographic and climatically diverse locations in the United States. A significant number of these are experimental selections, an indication of the effort turfgrass breeders are making to improve these species. Park and coworkers (2012, 2013) reported on the wear tolerance entries comprising the 2010 CTBT Tall Fescue test.

Turfgrass breeders would benefit from having access to traffic tolerance, turf quality, and brown patch susceptibility data for newer tall fescue experimental selections as well as existing, commercially-

available cultivars. The objective of this study was to assess the traffic tolerance of tall fescue cultivars and experimental selections comprising the 2010 CTBT tall fescue trial and the performance of entries comprising the 2012 NTEP Tall Fescue Test.

STUDY 1: 2010 CTBT TALL FESCUE TRIAL

MATERIALS AND METHODS

Evaluation Trial

The 104 entries of the 2010 CTBT tall fescue trial were seeded on 2 September 2010 as 5.5 ft x 3.5 ft plots on a loam at the Rutgers Horticultural Research Farm No. 2 in North Brunswick, NJ. The field was within a low-lying area of the research farm surrounded by woods on three sides and a row of trees on the fourth side, which decreased air circulation across the trial.

Soil test results from November 2011 indicated that the soil pH was 6.0; soil phosphorous (P) and potassium (K) were 259 and 435 lb per A, respectively. The test was mowed approximately 2 times a week with a reel mower at a height of 1.5 inches. The test was minimally irrigated in 2013 to prevent severe drought stress. A total of 2.8 lb nitrogen (N) per 1000 ft² was applied in 2013 (0.8, 0.9, and 1.1 lb N per 1000 ft² on 28 March, 7 May, and 9 September, respectively).

Application of Wear and Traffic Stresses

During 2013, traffic stress was applied to the one-half of each plot that did not receive wear during 2012. Traffic was applied as a combination of wear using the Rutgers Wear Simulator (RWS; Bonos et

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al., 2001) and trampling using the Cady Traffic Simulator (CTS; Henderson et al., 2005). A total of 48 passes (24 RWS passes and 24 CTS passes) were applied in 2013. One pass of the RWS and one pass of the CTS were made per week for 8 weeks (16 total passes) from 4 April to 20 May 2013. Traffic intensity was increased to 4 passes per week (2 RWS passes and 2 CTS passes) for 8 weeks from 29 May to 15 July 2013 (32 total passes).

Plot Evaluation

Uniformity of turf cover during traffic and recovery was visually assessed every 4 weeks using a 1 to 9 scale where 9 = most complete, non-bruised turf cover and 1 = least cover. Ratings were taken on 23 April, 21 May, 19 June, 16 July, 12 August, and 10 September 2013.

Analysis of variance was performed on data using a 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 STRESSES DURING 2013

Most entries maintained good uniformity of turf cover during a 2 pass per week traffic schedule during April through May 2013 (Table 1). After 8 traffic passes, 94 entries had acceptable uniformity of turf cover (≥ 6.0). Moreover, after 16 passes, 99 entries exhibited uniformity of turf cover (≥ 6.0).

Entries with the best uniformity of turf cover after 32 traffic passes (19 June 2013) were PST-5GRB and PST-5YMY (Table 1). Other entries exhibiting acceptable uniformity of turf cover (≥ 6.0) after 32 traffic passes were IS-TF 234C, ATF1618, PPG-TF 105, ATF1569, RainDance (PST-5SDT), ATF1611, PST-5SXR, IS-TF 223, PSG 709509, PPG-TF 117, ATF1549, PPG-TF 115, PSG 8308, PSG 82BPRH, Finelawn Xpress, ATF1551, PPG-TF 101, Cumberland (PST-5R20), ATF1614, PSG 07-5, IS-TF 233C, PST-5MVD, Bullseye, IS-TF 197, PST-5SDS, Gazelle II, and PPG-TF 106.

Kentucky 31 had the poorest uniformity of turf cover after 32 passes (Table 1). Other entries ex-

hibiting the poor uniformity of turf cover (< 5.0) after 32 passes were STR 86QRH, Corona, ATF1491, ATF1609, PSG3905, ATF1610, PSG 5908, Tarnation (PST-5T8E), ATF1547, Spyder LS, ATF1608, PSG 8GRTR, and Crossfire 3.

The uniformity of turf cover for all cultivars and experimental selections had significantly deteriorated when assessed after 48 passes; the only entries that exhibited a rating ≥ 5.0 were PST-5YMY, IS-TF 223, and PST-5DVD-07 (Table 1).

Entries with the best recovery on 10 September 2013 were PST-5YMY, PSG 709509, PST-5GRB, ATF1618, PST-5R05, RainDance (PST-5SDT), PPG-TF 105, Finelawn Xpress, ATF1619, Coronado TDH, PPG-TF 117, ATF1569, PST-5BGR, ATF1549, ATF1551, PPG-TF 101, and PSG 8308 (Table 1).

All entries that exhibited the poorest uniformity of turf cover after 48 traffic passes on 16 July 2013 also had the poorest uniformity of turf cover on 10 September 2013 except Falcon IV, IS-TF 231C, PST-5SXR, and PSG 5908 (Table 1).

STUDY 2: 2012 NTEP TALL FESCUE TEST

MATERIALS AND METHODS

Evaluation Trial

One-hundred-sixteen entries of the 2012 Tall Fescue Trial were seeded into 5 ft x 6 ft plots at Horticultural Research Farm No. 2 in North Brunswick, NJ on 13 September 2012. 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 + Grey-stone.

Traffic application was initially scheduled for fall 2013; however, intense brown patch damage during summer 2013 and slow recovery during early fall 2014 delayed traffic application until spring 2014.

Plot Evaluation

Plots were rated for turfgrass establishment (December 2012), spring green-up (April 2013), brown patch susceptibility (July 2013), and turfgrass quality (May through October 2013). A 1 to 9 rating

was utilized for each parameter where 9 equaled the best turfgrass establishment, least brown patch incidence, and best turfgrass quality.

Analysis of variance was performed on data using a 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

Seventy-five entries had the best turfgrass establishment by 17 December 2012; all entries except IS-TF 272, BAR Fa 121091, and K12-13 had exhibited acceptable turf establishment (≥ 6.0) (Table 2).

Entries exhibiting early spring green-up on 15 April 2013 were Kentucky 31, PST-5GRB, PPG-TF-170, Justice + Virtue II + Greystone, Rebel IV + Rebel Advance + Brockton, Mustang 4, PSG-GSD, PPG-TF-169, PPG-TF-156, PPG-TF-148, Rain Dance (PST-5SDT), LTP-TWUU, Mustang 4 + Faith + Bullseye, ATF 1754, Falcon IV, GTO (Burl TF-2), PPG-TF-135, CCR2, Bullseye, Falcon V, Aquaduct, Bizem, PSG-PO1, RAD-TF-83, ATF 1704, RZ2, U43, ZW 44, Pick-W43, Catalyst, Regenerate, Grande 3, T31, and MET-3 (Table 2). Cultivars and selections that exhibited slow spring green-up in 2013 were JS 809, Saltillo (PST-5SALT), PSG-8BP2, 204 Res. Blk4, PPG-TF-145, IS-TF 285, Comp. Res. SST, PPG-TF-142, Warhawk, IS-TF 269 SEL, BAR Fa 121095, BAR Fa 121091, JS 825, DB1, TD1, and K12-13.

Entries with the best average turf quality during 2013 were Regenerate, PPG-TF-150, ATF 1612, W45, U43, Hemi, ZW 44, Firebird 2, PPG-TF-152, Bullseye, RZ2, MET-3, MET 1, IS-TF 289, PSG-WE1, PPG-TF-105, CCR2, GTO (Burl TF-2), Rhambler 2 SRP (LSD), IS-TF 307 SEL, F711, PPG-TF-156, U45, B23, PPG-TF-137, LTP-TWUU, PPG-TF-172, Bizem, Pick-W43, and IS-TF 291 (Table 2). Other entries with acceptable turf quality (≥ 6.0) were SRX-TPC, RAD-TF-89, PPG-TF-170, LTP-F5DPDR, Faith, Fesnova, PPG-TF-135, PPG-TF-139, MET 6 SEL, IS-TF 311, W41, PPG-TF-151, Hot Rod (Burl TF-136), Burl TF-69, IS-TF 284 M2, PPG-TF-157, IS-TF 305 SEL, PST-5EV2, and IS-TF 330.

Entries with the poorest average turf quality in 2013 were Warhawk, BAR Fa 120878, and Kentucky 31 (Table 2). Other entries with poor average turf quality (< 4.0) in 2013 were K12-05, PST-5EX2, JS 809, 204 Res. Blk4, Inspiration (PST-R5NW), BAR Fa 121091, JS 819, Comp. Res. SST, JS 825, Aquaduct, K12-13, BAR Fa 121089, Marauder, Justice + Virtue II + Greystone, and Annihilator.

Entries exhibiting less brown patch symptoms (≥ 6.0) on 3 July and 25 July 2014 were Mustang 4, PPG-TF-150, PSG-WE1, MET 6 SEL, PPG-TF-105, PPG-TF-172, ATF 1612, Rhambler 2 SRP (LSD), PSG-GSD, Bullseye, RZ2, CCR2, MET-3, IS-TF 307 SEL, Bizem, Regenerate, Falcon V, MET 1, IS-TF 311, and PPG-TF-142 (Table 2). The following entries were severely damaged by brown patch (< 2.0) on 25 July 2014: BAR Fa 121091, TD1, IS-TF 276 M2, PPG-TF-138, RAD-TF-83, JS 819, IS-TF 272, Warhawk, K12-05, and K12-13.

DISCUSSION

Previously, the RWS and CTS have been operated independently to assess the tolerance of turfgrasses to wear and traffic stresses, respectively. The application of traffic to the 2010 CTBT Tall Fescue Trial during 2013 provided insight into the capability of tall fescue to tolerate traffic stresses caused by a combination of the two machines.

Tall fescue entries in the CTBT trial were capable of maintaining good turf cover during a two pass per week traffic schedule using both simulators during spring 2013. This traffic application schedule will be applied to the 2012 NTEP Tall Fescue Test during 2014. While a 4 pass per week traffic scenario would likely generate entry differences more quickly, it is anticipated that meaningful differences will develop using a 2 pass per week schedule over multiple seasons (spring, summer, and fall) while preventing severe disintegration of turf cover over the multi-year test.

The generation of turfgrass quality and brown patch susceptibility data from the 2012 NTEP Tall Fescue Test continues to be a very important cultivar selection criterion for tall fescues established on sports fields and other recreational sites.

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Table 1. Uniformity of turf cover during traffic and recovery in 2013 for cultivars and experimental selections comprising the 2010 CTBT Tall Fescue Test established in September 2010 at North Brunswick, NJ.

Cultivar or Selection	-----Uniformity of Turf Cover-----				Recovery	
	8 Passes ¹ 23 April 2013	16 Passes ¹ 21 May 2013	32 Passes ² 19 June 2013	48 Passes ² 16 July 2013	12 Aug. 2013	10 Sept. 2013
	-----1 to 9 scale ³ -----					
1 PST-5GRB	8.7	8.7	8.3	4.7	5.7	6.3
2 PST-5YMY	7.7	7.3	7.0	5.7	6.7	8.0
3 IS-TF 234C	6.0	8.0	6.7	4.0	4.0	4.7
4 ATF1618	8.0	7.7	6.3	4.7	5.7	6.3
5 PPG-TF 105	7.3	7.3	6.3	4.7	5.3	6.3
6 ATF1569	8.0	7.7	6.3	4.3	5.0	6.0
7 RainDance (PST-5SDT)	8.3	8.0	6.3	4.0	5.7	6.3
8 ATF1611	7.0	8.0	6.3	4.0	4.3	5.7
9 PST-5SXR	7.0	8.0	6.3	2.7	3.7	5.0
10 IS-TF 223	7.7	7.7	6.0	5.0	5.0	5.7
11 ATF1549	8.0	8.0	6.0	4.7	4.7	6.0
12 PSG 709509	6.3	7.7	6.0	4.7	6.0	6.3
13 PPG-TF 115	6.0	7.0	6.0	4.7	4.7	5.7
14 PPG-TF 117	5.7	6.7	6.0	4.7	5.3	6.0
15 PSG 8308	7.0	7.7	6.0	4.3	4.3	6.0
16 PSG 82BPRH	7.0	7.0	6.0	4.3	4.7	5.3
17 ATF1551	7.3	7.3	6.0	3.7	4.7	6.0
18 Finelawn Xpress	7.0	7.3	6.0	3.7	5.3	6.3
19 PPG-TF 101	7.0	6.7	6.0	3.7	4.7	6.0
20 IS-TF 233C	8.0	7.7	6.0	3.3	3.3	4.0
21 ATF1614	7.7	7.7	6.0	3.3	3.3	4.3
22 Cumberland (PST-5R20)	7.0	7.0	6.0	3.3	4.3	5.7
23 PSG 07-5	6.0	6.3	6.0	3.3	3.7	4.0
24 PST-5MVD	7.3	7.0	6.0	3.0	4.3	5.3
25 IS-TF 197	6.7	6.7	6.0	3.0	4.0	3.7
26 Bullseye	6.0	6.7	6.0	3.0	3.3	4.3
27 PPG-TF 106	8.3	7.0	6.0	2.7	3.7	4.0
28 Gazelle II	7.7	7.0	6.0	2.7	3.7	4.3
29 PST-5SDS	7.0	6.7	6.0	2.7	4.0	4.7
30 PST-5DVD-07	6.7	7.7	5.7	5.0	5.0	5.3
31 IS-TF 225	6.0	6.0	5.7	4.7	4.0	4.3
32 PST-5SIS	7.3	7.0	5.7	4.3	4.0	5.0
33 IS-TF 219	6.7	6.3	5.7	4.3	4.3	5.7
34 ATF1550	7.7	8.3	5.7	4.0	4.0	4.7
35 Rebel Exeda	8.0	7.7	5.7	4.0	5.7	5.7

(Continued)

Table 1. Tall fescue traffic and recovery trial, 2010, CTBT (continued).

Cultivar or Selection	-----Uniformity of Turf Cover-----				Recovery	
	8 Passes ¹ 23 April 2013	16 Passes ¹ 21 May 2013	32 Passes ² 19 June 2013	48 Passes ² 16 July 2013	12 Aug. 2013	10 Sept. 2013
	-----1 to 9 scale ³ -----					
36 ATF1613	8.3	7.0	5.7	4.0	4.7	4.3
37 Rhambler	8.0	7.0	5.7	4.0	3.0	4.3
38 PST-5MCD	7.3	7.0	5.7	4.0	5.0	5.7
39 PST-5LIV	7.0	7.0	5.7	4.0	4.7	5.0
40 PST-5SLV	6.7	7.0	5.7	4.0	5.0	5.3
41 ATF1570	8.0	7.3	5.7	3.7	4.7	5.3
42 PST-5AWT	7.7	7.3	5.7	3.7	4.7	5.3
43 LW	7.0	7.3	5.7	3.7	3.7	4.3
44 3rd Millennium	7.7	7.0	5.7	3.7	3.7	4.7
45 IS-TF 226	7.3	6.7	5.7	3.7	5.0	5.7
46 6351	7.7	8.0	5.7	3.3	3.7	4.0
47 PST-5DRP	6.7	8.0	5.7	3.3	4.3	5.7
48 PPG-TF 102	8.0	7.7	5.7	3.3	2.3	4.3
49 PPG-TF 116	7.7	7.3	5.7	3.3	3.0	4.0
50 IS-TF 224	7.7	7.0	5.7	3.3	3.3	4.3
51 PST-5DKB	7.3	7.0	5.7	3.3	4.3	5.7
52 Wolfpack II	7.0	6.7	5.7	3.3	3.3	4.7
53 Firecracker LS	6.3	6.0	5.7	3.3	4.3	4.3
54 ATF1567	7.7	8.0	5.7	3.0	4.0	5.0
55 ATF1620	7.3	7.0	5.7	3.0	3.3	4.3
56 IS-TF 231C	7.3	7.0	5.7	2.7	4.0	5.0
57 IS-TF 230B	5.3	5.7	5.7	2.7	3.3	4.7
58 PST-5R05	6.0	6.3	5.3	4.7	5.7	6.3
59 ATF1571	8.0	7.7	5.3	4.3	4.7	5.3
60 Coronado TDH	6.0	7.3	5.3	4.0	4.3	6.3
61 Titanium LS	7.3	7.0	5.3	4.0	4.7	5.3
62 Inspiration (PST-R5NW)	7.0	7.0	5.3	4.0	4.7	5.0
63 PSG 07-9	6.0	7.3	5.3	3.7	3.7	4.7
64 PST-5V4	7.7	7.0	5.3	3.7	4.0	5.3
65 IS-TF 215	7.0	6.7	5.3	3.7	4.7	5.0
66 Mustang 4	6.7	7.7	5.3	3.3	2.3	4.0
67 ATF1566	7.3	7.3	5.3	3.3	4.0	5.3
68 PST-5BGR	7.3	7.0	5.3	3.3	5.0	6.0
69 ATF1612	7.3	7.0	5.3	3.3	3.3	4.7
70 Raptor II	6.3	7.0	5.3	3.3	3.7	3.7

(Continued)

Table 1. Tall fescue traffic and recovery trial, 2010, CTBT (continued).

Cultivar or Selection	-----Uniformity of Turf Cover-----				Recovery	
	8 Passes ¹ 23 April 2013	16 Passes ¹ 21 May 2013	32 Passes ² 19 June 2013	48 Passes ² 16 July 2013	12 Aug. 2013	10 Sept. 2013
	-----1 to 9 scale ³ -----					
71 Shenandoah Elite	7.7	8.3	5.3	3.0	3.0	3.7
72 Shenandoah III	7.7	8.0	5.3	3.0	3.0	4.0
73 IS-TF 217	7.0	7.7	5.3	3.0	4.0	5.3
74 ATF1568	6.0	6.3	5.3	3.0	3.3	4.7
75 Traverse	8.0	7.7	5.3	2.7	3.0	3.7
76 ATF1548	7.0	7.0	5.3	2.7	3.7	4.7
77 IS-TF 227	7.0	7.0	5.3	2.7	3.7	3.7
78 Essential	7.7	7.7	5.3	2.3	2.3	3.3
79 PSG 08-6	6.0	6.7	5.3	2.3	3.7	4.7
80 PSG 6008	5.7	6.0	5.3	2.3	3.0	3.3
81 ATF1621	8.0	7.3	5.3	2.0	3.0	4.3
82 ATF1619	6.7	6.7	5.0	3.3	4.7	6.3
83 PSG 8SP1	7.3	7.0	5.0	3.0	3.0	4.3
84 Catalyst	6.7	6.7	5.0	3.0	2.3	3.7
85 PST-5FDR	7.0	6.3	5.0	3.0	3.3	4.3
86 Penn 1901	6.0	6.3	5.0	2.7	3.7	4.0
87 Falcon IV	8.0	8.0	5.0	2.3	3.7	5.0
88 Falcon V	7.3	7.3	5.0	2.3	2.7	3.7
89 FCE3	6.3	6.3	5.0	2.3	3.0	4.3
90 PST-5SXD	6.7	7.0	5.0	1.3	2.3	3.0
91 STR 86QRH	5.7	6.3	4.7	3.0	3.3	4.7
92 Corona	5.7	6.3	4.7	2.7	4.0	4.7
93 ATF1491	6.3	6.0	4.7	2.7	3.0	4.0
94 ATF1609	7.0	7.0	4.7	2.3	2.7	3.3
95 PSG3905	5.7	6.3	4.7	2.0	2.7	3.3
96 ATF1610	7.0	6.7	4.7	1.7	3.3	4.3
97 PSG 5908	5.3	6.3	4.3	2.7	3.7	5.0
98 Tarnation (PST-5T8E)	5.3	5.3	4.3	2.7	3.3	3.7
99 ATF1547	6.3	6.7	4.3	2.3	2.7	4.3
100 Spyder LS	5.0	6.7	4.3	2.3	2.7	3.7
101 ATF1608	7.3	5.3	4.3	2.3	2.3	3.7
102 PSG 8GRTR	6.7	6.7	4.0	2.0	3.0	4.7
103 Crossfire 3	6.3	5.7	4.0	1.3	2.3	3.7
104 Kentucky 31	4.0	3.3	2.3	1.0	2.3	2.7

(Continued)

Table 1. Tall fescue traffic and recovery trial, 2010, CTBT (continued).

Cultivar or Selection	-----Uniformity of Turf Cover-----				Recovery	
	8 Passes ¹ 23 April 2013	16 Passes ¹ 21 May 2013	32 Passes ² 19 June 2013	48 Passes ² 16 July 2013	12 Aug. 2013	10 Sept. 2013
LSD at 5% =	1.7	1.8	1.5	1.9	2.2	2.2

¹ Traffic was applied 2 passes per week with a combination of the Rutgers Wear Simulator and Cady Traffic Simulator

² Traffic was applied 4 passes per week with a combination of the Rutgers Wear Simulator and Cady Traffic Simulator

³ 9 = most complete, non-bruised turf canopy

Table 2. Performance of tall fescue cultivars and experimental selections in a turf trial seeded in September 2012 at North Brunswick, NJ. (Includes all entries of the 2012 National Turfgrass Evaluation (NTEP) Tall Fescue Trial.)

Cultivar or Selection	Turf Quality ¹	Turf Establishment ²	Spring Green-up ³	Brown Patch ⁴	
	2013 Avg.	17 Dec. 2012	15 April 2013	3 July 2013	25 July 2013
-----1 to 9 scale-----					
1 Regenerate	7.8	8.0	7.3	8.3	6.0
2 PPG-TF-150	7.4	7.3	6.3	8.0	7.3
3 ATF 1612	7.4	6.3	6.7	8.0	6.7
4 W45	7.3	8.0	6.7	7.3	5.0
5 U43	7.2	8.3	7.3	7.7	4.3
6 Hemi	7.1	7.3	5.3	8.0	5.7
7 ZW 44	7.1	8.3	7.3	7.7	4.3
8 Firebird 2	7.0	6.7	6.3	8.3	4.7
9 PPG-TF-152	7.0	7.7	6.0	8.0	4.3
10 Bullseye	6.9	8.0	7.7	8.7	6.3
11 RZ2	6.9	8.3	7.3	8.3	6.3
12 MET-3	6.9	7.0	7.3	8.0	6.3
13 MET 1	6.9	7.0	6.3	8.0	6.0
14 IS-TF 289	6.9	7.7	4.7	8.7	5.7
15 PSG-WE1	6.8	8.3	6.7	8.3	7.0
16 PPG-TF-105	6.8	7.7	7.0	7.7	7.0
17 CCR2	6.8	7.3	8.0	8.3	6.3
18 GTO (Burl TF-2)	6.8	7.7	8.0	8.0	5.0
19 Rhambler 2 SRP (LSD)	6.7	7.7	5.7	8.0	6.7
20 IS-TF 307 SEL	6.7	6.3	5.7	8.7	6.0
21 F711	6.7	8.7	6.3	8.0	5.3
22 PPG-TF-156	6.7	7.7	8.3	8.3	5.0
23 U45	6.7	7.3	6.0	8.3	5.0
24 B23	6.7	7.7	6.0	7.7	4.7
25 PPG-TF-137	6.7	7.3	7.0	7.7	4.3
26 LTP-TWUU	6.6	8.0	8.0	8.3	5.7
27 PPG-TF-172	6.5	8.0	6.3	8.7	6.7
28 Bizem	6.5	7.7	7.7	8.7	6.0
29 Pick-W43	6.5	8.3	7.3	8.7	4.0
30 IS-TF 291	6.5	7.3	5.7	8.0	4.0
31 SRX-TPC	6.4	8.3	5.7	8.3	5.7
32 RAD-TF-89	6.4	7.7	5.0	7.7	5.3
33 PPG-TF-170	6.4	8.7	8.7	8.0	3.3
34 LTP-F5DPDR	6.3	7.0	6.3	7.7	5.7
35 Faith	6.3	8.3	7.0	7.0	5.3

(Continued)

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

Cultivar or Selection	Turf Quality ¹	Turf Establishment ²	Spring Green-up ³	Brown Patch ⁴	
	2013 Avg.	17 Dec. 2012	15 April 2013	3 July 2013	25 July 2013
-----1 to 9 scale-----					
36 Fesnova	6.3	8.3	6.7	7.3	5.0
37 PPG-TF-135	6.3	7.7	8.0	7.0	4.3
38 PPG-TF-139	6.3	7.7	6.3	8.0	4.0
39 MET 6 SEL	6.2	7.3	6.3	8.3	7.0
40 IS-TF 311	6.2	6.0	5.7	8.0	6.0
41 W41	6.2	8.0	7.0	8.3	4.7
42 PPG-TF-151	6.2	8.7	6.7	7.0	4.7
43 Hot Rod (Burl TF-136)	6.2	7.3	5.3	8.0	4.0
44 Burl TF-69	6.2	8.7	6.7	7.3	3.0
45 IS-TF 284 M2	6.1	7.3	5.0	7.3	4.3
46 PPG-TF-157	6.1	7.3	6.7	8.0	4.0
47 IS-TF 305 SEL	6.1	7.3	4.7	7.7	4.0
48 PST-5EV2	6.0	7.0	7.0	8.7	5.3
49 IS-TF 330	6.0	7.3	5.0	7.3	2.3
50 PPG-TF-142	5.9	6.0	4.3	7.3	6.0
51 DZ1	5.9	8.0	5.3	7.0	3.0
52 IS-TF 308 SEL	5.9	7.0	5.0	7.3	2.7
53 Falcon V	5.8	8.0	7.7	8.3	6.0
54 JS 916	5.8	7.7	5.0	7.7	3.7
55 RAD-TF-92	5.8	7.3	5.0	7.7	3.0
56 Mustang 4	5.7	8.3	8.3	8.7	7.3
57 PST-5GRB	5.7	9.0	8.7	5.7	3.3
58 Grande 3	5.6	8.0	7.3	7.3	4.0
59 IS-TF 282 M2	5.6	7.7	6.0	7.0	3.7
60 IS-TF 269 SEL	5.6	6.7	4.0	6.7	3.0
61 T31	5.6	8.0	7.3	6.3	3.0
62 LTP-FSD	5.5	8.7	7.0	7.3	4.0
63 ATF 1754	5.5	8.0	8.0	7.0	3.7
64 IS-TF 310 SEL	5.5	7.0	5.0	6.3	2.7
65 ATF 1704	5.4	8.7	7.3	7.3	4.0
66 PPG-TF-148	5.4	7.7	8.3	7.3	3.3
67 GO-DFR	5.4	7.0	5.0	6.7	3.3
68 IS-TF 285	5.4	7.0	4.3	7.3	2.7
69 ATF 1736	5.3	8.0	6.3	7.7	3.3
70 RAD-TF-88	5.3	8.7	6.7	6.3	2.0

(Continued)

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

Cultivar or Selection	Turf Quality ¹	Turf Establishment ²	Spring Green-up ³	Brown Patch ⁴	
	2013 Avg.	17 Dec. 2012	15 April 2013	3 July 2013	25 July 2013
-----1 to 9 scale-----					
71 PSG-PO1	5.2	7.3	7.7	6.3	2.3
72 DB1	5.2	6.3	3.3	6.0	2.0
73 PSG-GSD	5.1	8.3	8.3	8.0	6.7
74 PPG-TF-169	5.1	8.0	8.3	7.0	4.0
75 Caesar (TY 10)	5.1	8.0	6.7	6.7	4.0
76 Catalyst	5.1	8.3	7.3	6.7	3.7
77 TD1	5.1	6.7	3.0	5.7	1.7
78 JS 818	5.0	8.3	5.3	5.3	3.0
79 TF-287	5.0	8.3	6.0	7.0	2.0
80 Terrano	4.9	7.3	6.3	8.0	3.7
81 PST-5DZP	4.9	7.0	5.3	7.7	3.3
82 BAR Fa 121095	4.9	6.0	4.0	6.7	3.0
83 IS-TF 272	4.9	5.7	4.7	5.3	1.0
84 Saltillo (PST-5SALT)	4.8	8.0	4.3	7.7	4.3
85 PPG-TF-145	4.8	7.3	4.3	7.0	2.0
86 PPG-TF-138	4.8	7.3	6.7	6.0	1.3
87 Mustang 4+Faith+Bullseye	4.7	8.0	8.0	7.3	4.3
88 PST-5MVD	4.7	8.0	6.7	6.7	4.0
89 Falcon IV	4.7	8.0	8.0	8.0	3.0
90 PST-5RO5	4.7	8.7	6.3	6.7	3.0
91 PST-5BPO	4.6	8.0	6.3	6.0	3.7
92 Temptation (OR-21)	4.6	8.3	4.7	5.3	3.7
93 K12-MCD	4.6	8.0	6.3	6.0	2.7
94 PST-5BRK	4.5	8.3	6.3	6.7	3.3
95 PSG-8BP2	4.5	8.0	4.3	6.3	2.0
96 RAD-TF-83	4.5	7.0	7.7	5.3	1.3
97 Rain Dance (PST-5SDT)	4.3	8.7	8.0	7.3	3.7
98 PSG-TT4	4.3	8.7	4.7	6.7	3.7
99 PPG-TF-115	4.3	7.0	6.7	6.3	2.0
100 IS-TF 276 M2	4.3	7.7	6.7	6.3	1.3
101 Frontline (Exp TF-09)	4.2	7.7	6.3	6.0	3.3
102 Rebel IV+Rebel Advance+ Brockton	4.1	8.7	8.3	7.3	4.7
103 K12-05	3.9	6.7	5.7	3.3	1.0
104 PST-5EX2	3.8	9.0	7.0	7.3	4.7
105 JS 809	3.8	8.3	4.3	5.7	2.7

(Continued)

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

Cultivar or Selection	Turf Quality ¹	Turf Establishment ²	Spring Green-up ³	Brown Patch ⁴		
	2013 Avg.	17 Dec. 2012	15 April 2013	3 July 2013	25 July 2013	
-----1 to 9 scale-----						
106	204 Res. Blk4	3.8	7.7	4.3	5.0	2.0
107	Inspiration (PST-R5NW)	3.7	7.3	6.7	5.7	3.0
108	BAR Fa 121091	3.7	4.7	4.0	6.3	1.7
109	JS 819	3.7	8.0	5.0	5.3	1.3
110	Comp. Res. SST	3.5	6.3	4.3	5.3	2.0
111	JS 825	3.4	7.3	3.3	6.3	3.3
112	Aquaduct	3.4	8.0	7.7	5.3	3.3
113	K12-13	3.3	3.3	2.7	3.0	1.0
114	BAR Fa 121089	3.2	6.3	5.7	6.3	3.0
115	Marauder	2.9	8.0	5.3	6.3	2.3
116	Justice+Virtue II+Greystone	2.7	9.0	8.3	5.3	3.3
117	Annihilator	2.6	8.3	4.7	7.0	2.7
118	Warhawk	2.2	8.0	4.0	5.3	1.0
119	BAR Fa 120878	1.9	7.7	6.7	5.7	2.7
120	Kentucky 31	1.1	9.0	9.0	6.0	5.0
LSD at 5% =		1.3	1.4	1.7	2.3	3.5

¹9 = best turf quality

²9 = best turf establishment

³9 = earliest spring green-up

⁴9 = least disease