

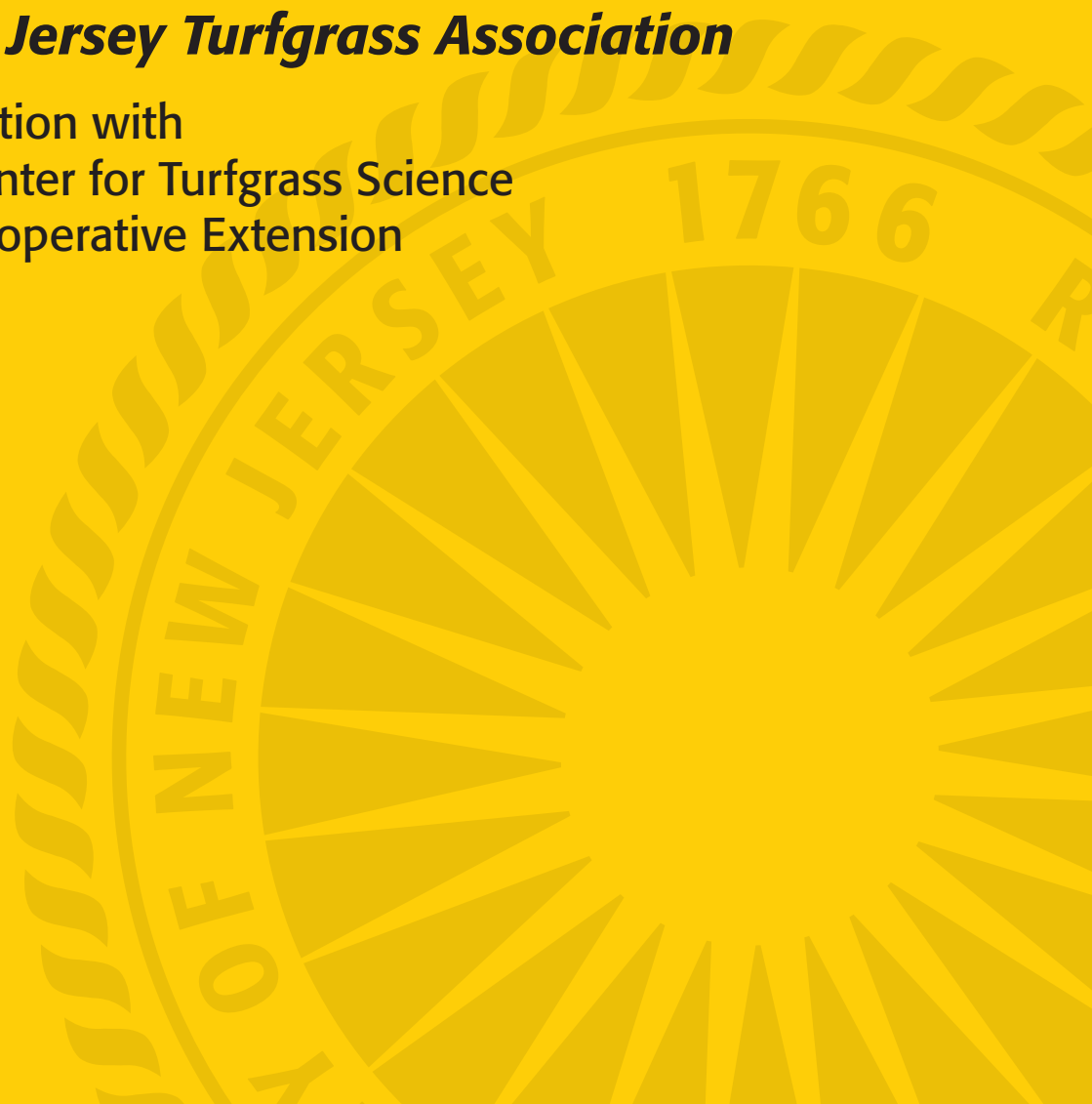
RUTGERS

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2013 Turfgrass Proceedings

The New Jersey Turfgrass Association

In Cooperation with
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Rutgers Cooperative Extension



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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 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

ASSESSING COOL-SEASON TURFGRASS BLENDS AND MIXTURES UNDER LOW MAINTENANCE

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There is increased interest in maintaining cool-season turfgrasses under limited nitrogen fertility, irrigation, and pesticide inputs for home lawns and other grounds. Seed mixtures are commonly recommended for the purpose of broadening the diversity and adaptation of the established turf; however, there is limited data available comparing the performance of seed mixtures. The objective of this trial was to evaluate the long-term performance of cool-season turfgrass blends and mixtures under minimal management inputs.

MATERIALS AND METHODS

One hundred five (105) entries were seeded in September 2011 in 6 x 5-ft plots at the Rutgers Horticultural Research Farm II, North Brunswick, NJ in a low-lying area of the research farm surrounded by woods on three sides and a row of trees on the fourth side, restricting air circulation across the trial.

Entries consisted of blends and mixtures of hard fescue [Hrd.Fescue] (*Festuca brevilipa* R. Tracey 'Beacon' and 'Firefly'), Chewings fescue [Chew.Fescue] (*F. rubra* L. subsp. *fallax* [Thuill.] Nyman 'Fairmont' and 'Intrigue II'), strong creeping red fescue [SCR.Fescue] (*F. rubra* L. subsp. *rubra* 'Celestial' and 'Wendy Jean'), tall fescue [Tll.Fescue] (*F. arundinacea* Schreb. 'Bullseye', 'Faith', and 'Mustang 4'), perennial ryegrass [P.Rye] (*Lolium perenne* L. 'Fiesta 4', 'Paragon GLR', and PPG-PR 164), "Light" Kentucky bluegrass [KBG-Light] (*Poa pratensis* L. 'Bluenote' and A05-361), and "Dark" Kentucky bluegrass [KBG-Dark] ('Midnight II' and 'Bewitched'). Each component of a seed blend or mixture was added in equivalent quantities based on seed count

(e.g., 50:50%; 33.3:33.3:33.3%; 25:25:25:25%; etc.); percentages by weight are reported in Tables 1 and 2. Each entry was seeded at a rate equivalent to 2,160 seeds per square foot (15 seeds per square inch). This trial also included 14 retail seed blends and mixtures (See Table 3 for cultivars and seeding rate). Entries were replicated three times and arranged in a randomized complete block design.

During 2013, the test was mowed approximately once per week with a rotary mower at 2.5 inches. Mowing was withheld from the test whenever the trial exhibited drought stress. Irrigation was applied once to the trial during 2013 on 19 July (1.0-inch of water). Nitrogen (N) (43-0-0) was applied as polymer coated urea at 0.8 and 0.9 lb N per 1000 ft² on 28 March and 30 August 2013, respectively. Fenoxaprop-p-ethyl (Acclaim Extra) was applied at 0.3 lb per acre on 2 Aug. 2013 for postemergence control of crabgrass (*Digitaria* spp.). Triclopyr (Turf-lon Ester Ultra) and 2,4-D were applied at 1.0 and 0.4 lb per acre, respectively, on 13 September 2013 for postemergence broadleaf weed control.

Turfgrass quality (1 to 9 scale; 9 = best quality) was visually rated monthly during April through October (seven ratings).

Damage from red thread disease (caused by *Laetisaria fuciformis* [McAlpine] Burdsall) was observed in the trial in late spring 2013 and was rated on 31 May and 24 June 2013. Damage from summer patch disease (caused by *Magnaporthe poae* Landschoot & Jackson) was observed in summer 2013 and was rated on 28 August 2013. Disease incidence was visually assessed using a 1 to 9 scale where 9 represented the least disease.

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Weed encroachment was visually evaluated on 26 July and 5 September 2013 using a 1 to 9 scale where 9 was equal to the fewest weeds. The predominant weeds in the trial were yellow woodsorrel (*Oxalis stricta* L.), white clover (*Trifolium repens* L.), and crabgrass.

Differences in turfgrass vigor were observed in early fall 2013. The test was rated for turf vigor on 4 October 2013 using a 1 to 9 scale where 9 equaled the most vigorous, upright growth.

The two Kentucky bluegrass blends (KBG-Light and KBG-Dark) did not establish during 2012 and were removed from data analysis. Data were subjected to analysis of variance and means were separated using Fisher's protected least significant difference (LSD) test at $p \leq 0.05$.

RESULTS

Fifty-six entries had the best multi-year average turf quality during 2012-13; 44 of those entries were comprised of hard fescue and/or tall fescue (Table 1). Pennington Smart Seed Northeast Mixture was the only retail mixture among top statistical performers. Sixteen entries had the lowest average turf quality during 2012-13; nine of these were retail entries and seven were non-retail entries. Each of these seven poorest performing non-retail entries contained strong creeping red fescue.

Turfgrass quality of many entries changed dramatically between June and October 2013. Among the 35 entries with the best turfgrass quality in October 2013 (all contained perennial ryegrass and/or tall fescue), 32 entries had less than acceptable turf quality (< 6.0) in June 2013 (Table 1). Eleven entries that were among the grouping with the best turfgrass quality in June 2013 were amongst the poorest for turfgrass quality in October 2013; each of these eleven entries contained Kentucky bluegrass, hard fescue, strong creeping red fescue, and/or Chewings fescue.

Twenty-nine entries exhibited the best spring green-up on 15 April 2013; all contained perennial ryegrass and/or tall fescue (Table 2). Thirty-one entries had the poorest spring green-up on 15 April 2013; 30 of these entries contained Kentucky bluegrass, hard fescue, and/or Chewings fescue.

Damage from red thread was sporadic throughout the test and was not severe on 31 May and 24 June 2013 (Table 2). Few differences were observed among entries.

Forty-six entries had the least weed encroachment on 26 July and 5 September 2013 (Table 2). Entries with the most severe weed encroachment typically had lower turf density (data not shown).

Twenty-one entries had the least summer patch on 28 August 2013; all contained perennial ryegrass and/or tall fescue (Table 2). Eighteen entries had the most summer patch on this rating date. These blends and mixtures that were damaged by summer patch contained Kentucky bluegrass, hard fescue, Chewings fescue and/or strong creeping red fescue; only one mixture contained tall fescue (47.2%) and none of the mixtures contained perennial ryegrass.

The nine entries exhibiting the most vigorous growth on 4 October 2013 each contained tall fescue (at minimum 50% by weight) (Table 2). In contrast, the twenty entries with the least turf vigor tended to be highly susceptible to summer patch and were comprised of Kentucky bluegrass, Chewings fescue, hard fescue, and/or strong creeping red fescue.

DISCUSSION

While hard fescue exhibited good turfgrass quality during 2012 and early 2013, summer patch susceptibility greatly reduced the turfgrass quality of hard fescue and mixtures containing hard fescue by fall 2013. The performance of the hard fescue and perennial ryegrass mixture did not exhibit damage from summer patch suggesting that mixing with perennial ryegrass may provide protection to hard fescue from this disease. Similarly, the inclusion of tall fescue with hard fescue, Chewings fescue, and Kentucky bluegrass also limited the damage caused by summer patch disease.

The performance of tall fescue during 2013 improved significantly compared to 2012 suggesting that establishment of this species was slow and may be due to the relatively low amount of N fertilization used in this trial. By the end of 2013, the best turf performance was observed in mixtures that contained perennial ryegrass and/or tall fescue.

Turfgrass diseases such as summer patch and gray leaf spot (caused by *Pyricularia grisea* [Cooke] Sacc.) may not be highly problematic in every growing season. However, the findings in this trial highlight the potential devastating nature of these turf diseases and the importance of tolerance in turfgrass blends and mixtures. The long-term assessment of cool-season turfgrass mixtures is critical for developing sound recommendations on turf mixtures.

Table 1. Performance of cool-season turfgrass blends and mixtures in a low maintenance trial established in North Brunswick, NJ in September 2011.

	Species Composition of Seed Blend or Mixture ¹							Turfgrass Quality ²									
	Hard Fescue	Tall Fescue	Kentucky Bluegrass Dark	Kentucky Bluegrass Light	Chewings Fescue	Strong Creeping Red Fescue	Perennial Ryegrass	2012-2013 Avg.	2012 Avg.	2013 Avg.	April 2013	May 2013	June 2013	July 2013	Aug. 2013	Sept. 2013	Oct. 2013
	(% by weight)							(1 to 9 scale)									
1	20.7	.	7.1	.	29.0	.	43.2	5.5	5.3	5.8	3.7	6.0	6.0	5.7	5.7	6.7	7.0
2	22.3	.	.	.	31.2	.	46.5	5.4	5.3	5.6	3.7	5.3	5.0	6.0	6.0	6.3	6.7
3	73.6	.	.	26.4	.	.	.	5.4	5.6	5.2	7.3	8.3	8.0	6.3	3.0	2.0	1.7
4	32.4	.	.	.	.	.	67.6	5.4	5.3	5.5	3.7	5.3	5.3	3.7	6.0	6.3	8.0
5	74.4	.	25.6	.	.	.	.	5.4	5.4	5.4	7.0	8.0	8.3	7.0	3.3	1.7	2.3
6	41.7	.	.	.	58.3	.	.	5.3	5.4	5.3	6.0	8.3	8.0	6.0	3.3	2.3	3.0
7	.	41.3	5.2	.	21.5	.	32.0	5.2	5.2	5.2	3.7	5.0	5.7	4.3	5.7	5.7	6.3
8	18.4	49.6	6.3	.	25.7	.	.	5.2	5.0	5.3	4.0	7.3	7.0	6.3	5.0	3.7	4.0
9	.	.	9.0	.	36.6	.	54.4	5.1	4.8	5.5	3.3	4.3	5.7	6.0	5.3	6.7	7.0
10	.	52.6	6.7	.	.	.	40.7	5.1	5.2	4.9	3.3	4.7	3.7	3.0	6.0	7.0	7.0
11	21.3	.	7.3	.	.	27.0	44.4	5.1	4.9	5.2	3.7	5.3	6.0	5.3	5.0	5.3	6.0
12	17.4	.	.	.	24.3	22.1	36.2	5.0	5.0	5.1	3.3	6.0	4.7	4.7	5.3	5.3	6.3
13	.	.	.	.	40.2	.	59.8	4.9	4.6	5.2	3.3	4.0	5.0	5.3	5.7	6.3	7.0
14	.	43.6	.	.	22.7	.	33.7	4.9	4.7	5.2	3.3	6.0	4.7	4.7	5.7	5.7	6.3
15	20.7	.	7.4	.	28.9	.	43.0	4.9	4.8	5.0	3.3	5.7	5.0	4.7	4.7	5.0	7.0
16	36.2	.	.	13.0	50.8	.	.	4.9	4.8	5.0	5.3	7.3	8.3	5.3	3.7	2.3	2.7
17	29.0	.	.	10.4	.	.	60.6	4.9	4.8	4.9	3.7	4.7	4.7	3.7	5.7	5.7	6.7
18	.	88.3	11.7	.	.	.	.	4.8	3.9	5.8	4.3	5.3	5.7	3.3	6.7	7.3	7.7
19	.	60.5	.	8.1	31.4	.	.	4.8	4.5	5.2	4.0	7.3	6.0	5.7	5.0	3.7	4.7
20	Pennington Northeast 03SMTNE00G ³							4.8	4.7	4.9	3.7	4.7	4.7	4.7	5.7	5.7	5.0

(Continued)

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Table 1. Cool-season turfgrass blends and mixtures trial, 2011 (continued).

	Species Composition of Seed Blend or Mixture ¹							Turfgrass Quality ²									
	Hard Fescue	Tall Fescue	Kentucky Bluegrass Dark	Kentucky Bluegrass Light	Chewings Fescue	Strong Creeping Red Fescue	Perennial Ryegrass	2012-2013 Avg.	2012 Avg.	2013 Avg.	April 2013	May 2013	June 2013	July 2013	Aug. 2013	Sept. 2013	Oct. 2013
	(% by weight)							(1 to 9 scale)									
21	.	42.1	.	5.6	.	19.8	32.5	4.8	5.0	4.7	3.0	5.0	5.0	2.7	5.7	5.7	6.0
22	13.5	36.5	4.6	.	.	17.2	28.2	4.8	5.0	4.6	3.3	4.7	5.0	3.3	5.0	5.3	5.7
23	14.9	40.2	5.1	.	20.9	18.9	.	4.7	4.3	5.2	3.3	6.3	7.0	5.7	5.0	4.3	4.3
24	.	41.2	.	5.5	21.4	.	31.9	4.7	4.7	4.7	3.0	4.3	4.7	4.0	5.3	6.0	5.3
25	.	88.7	11.3	.	.	.	.	4.7	3.6	5.7	3.3	4.3	6.0	4.7	6.7	7.7	7.7
26	16.4	.	5.6	.	23.0	20.8	34.2	4.7	4.7	4.7	3.3	4.7	5.0	4.7	4.7	4.7	6.3
27	.	.	.	7.0	27.4	24.8	40.8	4.7	4.7	4.7	3.7	4.7	4.7	4.3	4.3	5.3	6.0
28	.	.	.	14.7	.	.	85.3	4.7	4.7	4.7	3.0	3.3	3.7	3.3	6.3	6.7	6.7
29	18.8	50.8	6.5	.	.	23.9	.	4.7	4.9	4.5	3.7	4.7	4.7	5.0	5.0	4.3	4.0
30	16.4	.	.	5.9	22.9	20.7	34.1	4.7	4.5	4.7	4.0	4.3	4.7	4.0	4.3	5.0	6.7
31	23.0	.	.	.	.	29.1	47.9	4.7	4.9	4.5	3.3	5.3	4.7	3.3	4.0	5.0	6.0
32	24.8	.	.	8.9	34.8	31.5	.	4.7	5.1	4.3	4.7	6.3	7.3	4.3	2.3	2.0	3.3
33	100.0	.	.	.	.	.	.	4.7	5.2	4.2	6.3	8.0	6.7	3.3	2.0	1.3	1.3
34	.	56.4	.	.	.	.	43.6	4.6	4.2	5.1	3.3	4.3	4.0	3.3	5.7	7.7	7.3
35	.	.	.	9.3	36.4	.	54.3	4.6	4.5	4.8	3.7	3.7	3.3	4.0	6.0	6.7	6.3
36	.	34.6	4.4	.	18.0	16.3	26.7	4.6	4.5	4.7	3.0	4.7	5.0	4.0	4.7	5.7	6.0
37	20.2	54.3	.	.	.	25.5	.	4.6	4.6	4.6	4.7	5.3	5.3	4.3	4.3	4.0	4.3
38	21.2	.	.	7.6	26.9	.	44.3	4.6	4.6	4.6	3.0	5.3	4.3	4.0	4.3	5.0	6.3
39	100.0	.	.	4.6	4.6	4.6	4.3	7.0	7.3	4.3	4.0	2.3	3.0
40	.	.	14.1	.	.	.	85.9	4.6	4.6	4.6	2.7	3.3	4.0	2.7	6.0	6.7	6.7

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(Continued)

Table 1. Cool-season turfgrass blends and mixtures trial, 2011 (continued).

	Species Composition of Seed Blend or Mixture ¹							Turfgrass Quality ²									
	Hard Fescue	Tall Fescue	Kentucky Bluegrass Dark	Kentucky Bluegrass Light	Chewings Fescue	Strong Creeping Red Fescue	Perennial Ryegrass	2012-2013 Avg.	2012 Avg.	2013 Avg.	April 2013	May 2013	June 2013	July 2013	Aug. 2013	Sept. 2013	Oct. 2013
	(% by weight)							(1 to 9 scale)									
41	.	36.2	.	.	18.8	17.0	28.0	4.6	4.9	4.3	3.7	4.3	4.7	3.3	5.0	4.3	4.7
42	18.3	49.4	.	6.6	25.7	.	.	4.6	4.1	4.9	4.3	6.7	7.0	6.0	4.0	3.0	3.7
43	.	50.3	.	.	26.1	23.6	.	4.6	4.4	4.8	3.0	6.3	6.7	5.0	4.0	3.7	5.0
44	16.3	43.9	.	5.8	.	.	34.0	4.6	4.3	4.8	2.7	4.3	4.3	4.3	6.3	6.3	5.0
45	.	.	.	.	.	37.8	62.2	4.6	4.6	4.5	3.3	3.7	4.3	2.3	5.3	5.7	7.0
46	13.3	35.8	4.6	.	.	18.6	27.7	4.5	3.9	5.2	3.0	5.3	5.3	4.0	5.7	6.3	6.7
47	24.8	66.7	8.5	.	.	.	.	4.5	4.2	4.8	4.0	5.3	5.3	4.0	4.7	4.7	5.7
48	13.5	36.4	.	4.8	.	17.1	28.2	4.5	4.4	4.7	3.7	6.0	5.0	3.0	5.0	4.3	5.7
49	.	100.0	.	.	.	.	.	4.5	3.6	5.5	4.0	4.3	4.7	4.3	6.7	7.3	7.0
50	29.2	.	10.0	.	.	.	60.8	4.5	4.0	4.9	2.7	4.3	3.7	4.7	6.7	6.0	6.3
51	.	60.7	7.7	.	31.6	.	.	4.5	4.1	4.9	3.7	5.7	5.7	5.0	5.0	4.7	4.7
52	36.5	.	12.5	.	51.0	.	.	4.5	4.5	4.5	4.3	7.0	7.0	6.0	3.3	1.7	2.3
53	.	.	.	.	.	.	100.0	4.5	4.5	4.5	3.3	3.7	3.0	3.0	6.3	7.0	5.7
54	.	.	19.7	.	80.3	.	.	4.5	4.5	4.5	5.0	6.3	7.0	5.3	3.3	2.3	2.3
55	11.3	30.6	.	4.1	15.9	14.4	23.7	4.5	4.4	4.5	3.3	5.3	4.7	3.7	4.7	4.3	5.7
56	38.1	.	.	13.6	.	48.3	.	4.5	4.8	4.1	4.3	5.3	6.3	3.7	2.3	2.7	3.7
57	.	65.8	.	.	34.2	.	.	4.4	3.9	5.0	4.0	6.0	6.7	5.0	4.7	4.0	4.7
58	27.3	.	.	.	38.2	34.5	.	4.4	4.5	4.4	3.3	6.0	7.3	5.0	3.3	2.7	3.0
59	Pennington Tall Fescue L144-10-3RBTF85 ³							4.4	3.4	5.4	3.7	5.0	5.3	4.3	6.3	7.0	6.0
60	27.1	72.9	4.4	4.0	4.9	3.7	5.7	5.3	4.0	5.0	5.0	5.3

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(Continued)

Table 1. Cool-season turfgrass blends and mixtures trial, 2011 (continued).

	Species Composition of Seed Blend or Mixture ¹							Turfgrass Quality ²									
	Hard Fescue	Tall Fescue	Kentucky Bluegrass Dark	Kentucky Bluegrass Light	Chewings Fescue	Strong Creeping Red Fescue	Perennial Ryegrass	2012-2013 Avg.	2012 Avg.	2013 Avg.	April 2013	May 2013	June 2013	July 2013	Aug. 2013	Sept. 2013	Oct. 2013
	(% by weight)							(1 to 9 scale)									
61	.	.	9.3	.	.	34.3	56.4	4.4	4.6	4.2	3.3	3.3	3.3	2.7	4.7	5.7	6.3
62	18.8	50.7	.	6.7	.	23.8	.	4.3	4.3	4.3	3.7	6.3	6.0	3.0	4.0	3.3	4.0
63	14.9	40.1	.	5.3	20.8	18.9	.	4.3	4.4	4.2	3.3	5.0	4.3	4.7	4.0	3.3	4.7
64	.	44.6	.	.	.	21.0	34.4	4.3	4.4	4.2	2.7	5.0	4.7	3.3	4.7	4.3	5.0
65	.	42.2	5.4	.	.	19.8	32.6	4.3	4.5	4.1	3.0	3.7	4.0	3.0	5.0	5.0	5.0
66	Pennington Tall Fescue L144-10-3SMTF56G ³							4.2	3.6	4.9	3.7	4.3	5.0	3.7	5.7	5.7	6.0
67	.	47.1	.	6.3	24.5	22.1	.	4.2	4.3	4.1	2.7	4.3	5.0	4.7	3.3	4.0	4.3
68	24.7	66.5	.	8.8	.	.	.	4.2	3.8	4.6	3.7	6.0	6.0	4.3	4.0	3.7	4.3
69	.	52.4	.	7.0	.	.	40.6	4.2	3.9	4.4	2.7	4.3	3.7	2.7	5.3	6.3	6.0
70	.	62.6	8.0	.	.	29.4	.	4.2	4.1	4.3	3.0	5.0	5.3	3.0	4.0	4.3	5.0
71	11.4	30.7	3.9	.	15.9	14.4	23.7	4.2	4.3	4.0	3.3	4.0	3.3	3.7	4.3	4.0	5.3
72	19.6	52.9	.	.	27.5	.	.	4.1	3.6	4.7	3.7	5.7	6.3	5.3	4.0	3.3	4.3
73	.	.	.	20.4	79.6	.	.	4.1	4.0	4.3	4.7	7.7	7.0	5.0	2.0	1.7	2.3
74	17.3	46.6	.	.	.	.	36.1	4.1	4.3	4.0	3.0	4.0	3.3	3.0	4.3	5.0	5.3
75	.	34.5	.	4.6	17.9	16.3	26.7	4.1	3.9	4.3	2.3	4.3	4.7	3.7	4.7	5.0	5.7
76	16.3	44.0	5.6	.	.	.	34.1	4.0	3.8	4.3	2.7	4.7	4.0	4.3	5.0	4.7	5.0
77	38.3	.	13.2	.	.	48.5	.	4.0	4.5	3.5	3.3	4.7	5.7	3.3	2.7	2.0	2.7
78	.	.	6.7	.	27.5	24.9	40.9	4.0	4.0	4.0	2.7	3.3	3.3	3.3	5.0	4.0	6.3
79	52.5	47.5	.	4.0	4.1	3.9	3.7	4.7	5.7	3.0	3.3	3.0	4.3
80	.	62.4	.	8.3	.	29.3	.	4.0	4.1	3.8	3.3	5.0	5.0	2.0	3.7	4.0	4.0

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(Continued)

Table 1. Cool-season turfgrass blends and mixtures trial, 2011 (continued).

	Species Composition of Seed Blend or Mixture ¹							Turfgrass Quality ²									
	Hard Fescue	Tall Fescue	Kentucky Bluegrass Dark	Kentucky Bluegrass Light	Chewings Fescue	Strong Creeping Red Fescue	Perennial Ryegrass	2012-2013 Avg.	2012 Avg.	2013 Avg.	April 2013	May 2013	June 2013	July 2013	Aug. 2013	Sept. 2013	Oct. 2013
	(% by weight)							(1 to 9 scale)									
81	.	47.2	6.0	.	24.6	22.2	.	3.9	4.0	4.0	3.7	5.7	5.3	4.3	3.0	2.3	3.3
82	.	.	.	.	29.4	26.7	43.9	3.9	3.9	3.9	2.7	3.0	3.0	3.0	4.3	5.7	6.0
83	.	.	.	11.8	46.3	41.9	.	3.9	4.2	3.7	3.7	4.3	5.3	3.0	3.0	3.0	4.0
84	Vigoro Tall Fescue 54917 ³							3.9	3.2	4.7	3.7	4.7	5.3	2.7	5.7	5.7	5.0
85	13.3	35.7	.	4.7	18.6	.	27.7	3.9	4.0	3.8	2.3	3.3	3.7	3.0	4.0	4.7	5.7
86	Scotts Sun & Shade 10020298 ³							3.9	3.8	3.9	3.0	4.3	4.7	3.7	4.0	4.0	4.0
87	24.9	.	8.6	.	34.9	31.6	.	3.8	4.0	3.6	4.3	4.7	4.7	3.7	2.7	2.3	3.0
88	Scotts Tall Fescue 11030345 ³							3.7	3.0	4.4	3.3	4.7	4.7	3.3	4.3	5.0	5.7
89	Jonathan Green Full Sun FS-11-B ³							3.7	3.8	3.6	3.3	4.3	3.3	3.0	3.0	4.7	3.7
90	.	.	.	9.6	.	34.2	56.2	3.7	4.1	3.2	3.3	3.3	2.7	2.7	2.7	3.3	4.3
91	Scotts Sunny Mix 11020570 ³							3.6	3.4	3.9	2.7	4.0	4.3	3.7	5.0	4.3	3.0
92	.	.	11.4	.	46.5	42.1	.	3.6	3.5	3.6	3.0	4.7	5.3	3.7	3.0	2.0	3.3
93	Pearl's Premium Sunny Mixture JG-38811-A ³							3.5	3.6	3.5	2.7	4.7	3.7	3.0	3.0	3.0	4.3
94	Diamond Sun Mix 21644 ³							3.5	3.9	3.2	3.3	4.0	4.3	3.0	3.0	3.0	1.7
95	Scotts Sun & Shade 10020280 ³							3.4	3.7	3.1	2.7	3.7	3.7	2.7	2.0	3.0	4.0
96	.	68.0	.	.	.	32.0	.	3.3	3.4	3.3	2.7	3.7	4.3	2.7	3.3	3.0	3.3
97	Jonathan Green Black Beauty BBU-10-2 ³							3.3	2.9	3.7	2.7	4.0	3.7	3.0	4.3	4.7	3.7
98	AmTurf Sun & Shade L152-11-650-3 ³							3.2	3.3	3.2	2.0	4.0	4.0	3.3	2.7	2.7	3.7
99	44.1	55.9	.	3.1	3.5	2.8	2.7	4.0	5.0	3.3	1.3	1.3	1.7
100	.	.	.	22.0	.	78.0	.	3.0	3.6	2.3	3.0	2.7	3.7	1.0	1.7	1.3	2.7

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(Continued)

Table 1. Cool-season turfgrass blends and mixtures trial, 2011 (continued).

	Species Composition of Seed Blend or Mixture ¹							Turfgrass Quality ²										
	Hard Fescue	Tall Fescue	Kentucky Bluegrass Dark	Kentucky Bluegrass Light	Chewings Fescue	Strong Creeping Red Fescue	Perennial Ryegrass	2012-2013 Avg.	2012 Avg.	2013 Avg.	April 2013	May 2013	June 2013	July 2013	Aug. 2013	Sept. 2013	Oct. 2013	
	(% by weight)							(1 to 9 scale)										
101	.	.	21.3	.	.	78.7	.	3.0	3.8	2.3	3.0	3.0	3.3	1.3	1.7	1.3	2.0	
102	.	.	.	.	.	100.0	.	2.9	3.3	2.5	2.0	2.7	4.0	2.0	1.7	2.3	3.0
103	Vigoro Sun-Shade 52548 ³								2.7	2.3	3.2	2.0	3.7	4.0	2.7	3.0	4.0	2.7
	LSD at 5% =								1.0	1.1	1.1	1.3	1.9	1.9	1.7	1.7	1.8	2.1

¹ Cultivars for each species were: 'Beacon' and 'Firefly' Hard fescue; 'Fairmont' and 'Intrigue II' Chewings fescue; 'Celestial' and 'Wendy Jean' Strong creeping red fescue; 'Bullseye', 'Faith', and 'Mustang 4' Tall fescue; 'Fiesta 4', 'Paragon GLR', and PPG-PR 164 Perennial ryegrass; 'Bluenote' and A05-361 "Light" Kentucky bluegrass; 'Midnight II' and 'Bewitched' "Dark" Kentucky bluegrass

² Average of seven observations during 2012 and seven observations during 2013 (April, May, June, July, August, September, and October); 9 = best turf quality

³ See Table 3 for species/cultivar composition of retail blends and mixtures

Table 2. Spring green-up, disease susceptibility, weed encroachment, and turfgrass vigor for cool-season turfgrass blends and mixtures in a low maintenance trial established in North Brunswick, NJ in September 2011.

	Species Composition of Seed Blend or Mixture ¹							Spring Green-up ²	Red Thread ³			Weeds ⁴		Summer Patch ⁵	Vigor ⁵
	Hard Fescue	Tall Fescue	Kentucky Bluegrass Dark	Kentucky Bluegrass Light	Chewings Fescue	Strong Creeping Red Fescue	Perennial Ryegrass	15 April 2013	31 May 2013	24 June 2013	26 July 2013	5 Sept. 2013	28 Aug. 2013	4 Oct. 2013	
	(% by weight)							(1 to 9 scale)							
1	20.7	.	7.1	.	29.0	.	43.2	4.7	8.3	8.0	8.3	7.7	6.7	5.3	
2	22.3	.	.	.	31.2	.	46.5	4.7	8.0	6.7	8.0	7.0	6.0	5.7	
3	73.6	.	.	26.4	.	.	.	3.0	9.0	9.0	9.0	9.0	2.3	2.0	
4	32.4	.	.	.	.	.	67.6	5.7	8.3	7.3	6.3	6.3	7.3	6.3
5	74.4	.	25.6	.	.	.	.	3.0	9.0	9.0	9.0	9.0	2.3	2.3
6	41.7	.	.	.	58.3	.	.	3.0	8.0	9.0	9.0	9.0	3.0	1.7	
7	.	41.3	5.2	.	21.5	.	32.0	4.7	9.0	9.0	7.3	8.0	7.0	6.0	
8	18.4	49.6	6.3	.	25.7	.	.	4.3	8.7	8.7	8.7	9.0	5.3	4.7	
9	.	.	9.0	.	36.6	.	54.4	4.3	8.7	8.3	7.7	7.0	6.0	5.3	
10	.	52.6	6.7	.	.	.	40.7	5.0	8.3	8.0	6.7	7.7	8.3	7.7	
11	21.3	.	7.3	.	.	27.0	44.4	4.7	8.7	8.0	7.3	6.0	5.3	5.3	
12	17.4	.	.	.	24.3	22.1	36.2	4.0	9.0	8.7	7.0	8.0	4.7	5.0	
13	.	.	.	.	40.2	.	59.8	5.3	8.7	7.7	8.0	7.0	7.3	5.3
14	.	43.6	.	.	22.7	.	33.7	5.3	8.7	8.3	7.7	7.0	6.7	5.7	
15	20.7	.	7.4	.	28.9	.	43.0	4.7	7.7	7.0	6.7	7.3	6.0	5.3	
16	36.2	.	.	13.0	50.8	.	.	3.3	8.3	8.7	8.3	8.3	2.7	2.3	
17	29.0	.	.	10.4	.	.	60.6	4.7	8.7	8.0	7.0	7.0	6.3	6.3	
18	.	88.3	11.7	.	.	.	.	6.0	9.0	9.0	8.7	8.3	9.0	8.3
19	.	60.5	.	8.1	31.4	.	.	3.0	7.7	8.0	7.7	8.7	4.3	4.7	
20	Pennington Northeast 03SMTNE00G ⁶							5.3	8.7	7.7	7.0	7.3	5.7	3.3	

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(Continued)

Table 2. Cool-season turfgrass blends and mixtures trial, 2011 (continued).

	Species Composition of Seed Blend or Mixture ¹							Spring Green- up ²	Red Thread ³			Weeds ⁴		Summer Patch ³	Vigor ⁵		
	Hard Fescue	Tall Fescue	Kentucky Bluegrass Dark	Kentucky Bluegrass Light	Chewings Fescue	Strong Creep- ing Red Fescue	Perennial Ryegrass		15 April	31 May	24 June	26 July	5 Sept.			28 Aug.	4 Oct.
									2013	2013	2013	2013	2013			2013	2013
	(% by weight)							(1 to 9 scale)									
21	.	42.1	.	5.6	.	19.8	32.5	4.7	9.0	8.3	7.7	7.7	7.3	7.0			
22	13.5	36.5	4.6	.	.	17.2	28.2	4.7	7.3	6.7	8.0	7.0	6.0	4.7			
23	14.9	40.2	5.1	.	20.9	18.9	.	4.3	8.0	8.0	8.7	8.7	4.7	5.0			
24	.	41.2	.	5.5	21.4	.	31.9	5.0	7.7	7.0	8.0	7.3	6.3	5.7			
25	.	88.7	11.3	.	.	.	.	5.3	9.0	9.0	8.7	8.3	9.0	8.3
26	16.4	.	5.6	.	23.0	20.8	34.2	4.0	7.7	7.3	8.0	7.3	4.3	4.3			
27	.	.	.	7.0	27.4	24.8	40.8	4.3	8.3	7.3	7.3	6.3	5.0	4.3			
28	.	.	.	14.7	.	.	85.3	5.7	7.7	6.3	5.7	6.0	8.7	6.7			
29	18.8	50.8	6.5	.	.	23.9	.	3.3	6.3	6.3	8.3	8.3	5.3	4.7			
30	16.4	.	.	5.9	22.9	20.7	34.1	3.7	7.3	6.7	6.7	7.0	4.7	3.7			
31	23.0	.	.	.	.	29.1	47.9	4.7	7.3	6.0	7.0	7.0	5.7	4.3
32	24.8	.	.	8.9	34.8	31.5	.	3.3	9.0	8.7	8.3	8.3	1.7	2.0			
33	100.0	.	.	.	.	.	.	3.0	9.0	9.0	8.3	7.7	1.3	1.3
34	.	56.4	.	.	.	.	43.6	5.7	7.7	7.3	7.3	7.0	9.0	7.3
35	.	.	.	9.3	36.4	.	54.3	5.3	7.7	6.0	7.3	6.3	6.3	5.3			
36	.	34.6	4.4	.	18.0	16.3	26.7	4.3	8.7	8.0	7.7	7.3	5.3	5.3			
37	20.2	54.3	.	.	.	25.5	.	4.3	7.7	7.7	8.7	8.3	5.0	4.0			
38	21.2	.	.	7.6	26.9	.	44.3	4.0	8.0	8.3	6.0	6.0	6.0	5.0			
39	100.0	.	.	3.3	9.0	9.0	9.0	8.3	3.0	2.0			
40	.	.	14.1	.	.	.	85.9	5.3	8.0	7.0	5.0	5.0	8.7	7.0			

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(Continued)

Table 2. Cool-season turfgrass blends and mixtures trial, 2011 (continued).

	Species Composition of Seed Blend or Mixture ¹							Spring Green-up ²	Red Thread ³			Weeds ⁴		Summer Patch ³	Vigor ⁵		
	Hard Fescue	Tall Fescue	Kentucky Bluegrass Dark	Kentucky Bluegrass Light	Chewings Fescue	Strong Creeping Red Fescue	Perennial Ryegrass		15 April	31 May	24 June	26 July	5 Sept.			28 Aug.	4 Oct.
									2013	2013	2013	2013	2013			2013	2013
	(% by weight)							(1 to 9 scale)									
41	.	36.2	.	.	18.8	17.0	28.0	5.3	7.7	7.0	5.3	6.7	5.3	5.3			
42	18.3	49.4	.	6.6	25.7	.	.	3.7	8.0	8.0	8.7	8.7	3.3	4.0			
43	.	50.3	.	.	26.1	23.6	.	3.3	8.7	8.7	8.3	8.0	3.7	3.7			
44	16.3	43.9	.	5.8	.	.	34.0	5.3	7.7	7.0	7.0	6.7	7.7	6.3			
45	.	.	.	.	.	37.8	62.2	5.3	7.7	6.3	6.7	7.0	6.7	5.3
46	13.3	35.8	4.6	.	.	18.6	27.7	4.3	7.7	7.3	7.0	7.7	6.3	5.7			
47	24.8	66.7	8.5	.	.	.	.	4.3	8.3	8.3	9.0	8.7	6.3	5.7
48	13.5	36.4	.	4.8	.	17.1	28.2	4.7	8.7	8.0	8.0	7.3	5.0	5.3			
49	.	100.0	.	.	.	.	.	5.0	8.3	8.7	8.7	8.7	9.0	8.7
50	29.2	.	10.0	.	.	.	60.8	5.0	7.0	7.0	7.0	6.7	7.3	5.7			
51	.	60.7	7.7	.	31.6	.	.	3.0	7.3	7.3	7.7	8.7	5.3	5.3			
52	36.5	.	12.5	.	51.0	.	.	3.7	7.3	7.7	8.0	8.0	2.3	1.7			
53	.	.	.	.	.	.	100.0	6.0	8.7	7.7	6.7	6.0	9.0	6.7
54	.	.	19.7	.	80.3	.	.	3.3	7.7	7.7	8.7	8.7	2.0	2.0			
55	11.3	30.6	.	4.1	15.9	14.4	23.7	4.3	7.3	6.3	7.3	8.0	4.7	4.3			
56	38.1	.	.	13.6	.	48.3	.	3.0	8.3	8.0	8.3	7.7	2.7	3.0			
57	.	65.8	.	.	34.2	.	.	3.3	8.7	8.3	8.3	8.3	4.0	4.0			
58	27.3	.	.	.	38.2	34.5	.	4.0	8.7	8.7	8.0	8.3	2.0	1.7			
59	Pennington Tall Fescue L144-10-3RBTF85 ⁵							5.7	9.0	9.0	7.7	7.3	9.0	8.7			
60	27.1	72.9	4.7	9.0	9.0	8.3	8.0	7.3	7.0			

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(Continued)

Table 2. Cool-season turfgrass blends and mixtures trial, 2011 (continued).

	Species Composition of Seed Blend or Mixture ¹							Spring Green-up ²	Red Thread ³			Weeds ⁴		Summer Patch ³	Vigor ⁵		
	Hard Fescue	Tall Fescue	Kentucky Bluegrass Dark	Kentucky Bluegrass Light	Chewings Fescue	Strong Creeping Red Fescue	Perennial Ryegrass		15 April	31 May	24 June	26 July	5 Sept.			28 Aug.	4 Oct.
									2013	2013	2013	2013	2013			2013	2013
	(% by weight)								(1 to 9 scale)								
61	.	.	9.3	.	.	34.3	56.4	4.7	6.7	6.0	3.7	6.3	6.7	5.3			
62	18.8	50.7	.	6.7	.	23.8	.	3.3	7.7	7.7	8.7	8.7	4.7	3.7			
63	14.9	40.1	.	5.3	20.8	18.9	.	3.3	6.0	6.0	8.7	8.0	3.7	3.7			
64	.	44.6	.	.	.	21.0	34.4	5.3	8.0	7.7	7.0	6.3	5.7	5.3			
65	.	42.2	5.4	.	.	19.8	32.6	5.3	8.0	7.3	5.7	6.3	6.0	5.7			
66	Pennington Tall Fescue L144-10-3SMTF56G ⁶								5.7	9.0	9.0	6.7	8.3	9.0	8.3		
67	.	47.1	.	6.3	24.5	22.1	.	3.3	7.0	6.3	8.3	9.0	4.7	3.3			
68	24.7	66.5	.	8.8	.	.	.	3.3	8.3	8.7	8.0	8.0	5.7	5.3			
69	.	52.4	.	7.0	.	.	40.6	5.7	9.0	7.7	6.3	4.7	8.3	6.7			
70	.	62.6	8.0	.	.	29.4	.	3.7	8.3	7.7	8.3	8.3	5.0	4.0			
71	11.4	30.7	3.9	.	15.9	14.4	23.7	3.7	7.0	6.3	7.7	6.7	4.7	4.7			
72	19.6	52.9	.	.	27.5	.	.	3.3	8.3	8.0	8.0	8.3	4.7	4.7			
73	.	.	.	20.4	79.6	.	.	3.3	8.3	8.7	6.7	7.7	2.0	2.0			
74	17.3	46.6	.	.	.	.	36.1	5.3	7.3	5.3	6.7	6.7	8.0	6.0
75	.	34.5	.	4.6	17.9	16.3	26.7	5.3	8.7	8.0	6.7	6.7	4.7	5.7			
76	16.3	44.0	5.6	.	.	.	34.1	4.7	8.0	7.7	7.0	7.7	5.7	6.0			
77	38.3	.	13.2	.	.	48.5	.	3.3	6.7	6.0	6.7	5.7	2.3	1.7			
78	.	.	6.7	.	27.5	24.9	40.9	4.3	8.0	6.3	7.7	6.0	5.7	4.0			
79	52.5	47.5	.	3.0	7.7	6.7	8.3	7.3	3.3	1.7			
80	.	62.4	.	8.3	.	29.3	.	3.0	8.7	9.0	6.0	8.0	4.3	4.3			

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(Continued)

Table 2. Cool-season turfgrass blends and mixtures trial, 2011 (continued).

	Species Composition of Seed Blend or Mixture ¹							Spring Green-up ²	Red Thread ³			Weeds ⁴		Summer Patch ³	Vigor ⁵		
	Hard Fescue	Tall Fescue	Kentucky Bluegrass Dark	Kentucky Bluegrass Light	Chewings Fescue	Strong Creeping Red Fescue	Perennial Ryegrass		15 April	31 May	24 June	26 July	5 Sept.			28 Aug.	4 Oct.
									2013	2013	2013	2013	2013			2013	2013
	(% by weight)								(1 to 9 scale)								
81	.	47.2	6.0	.	24.6	22.2	.	3.0	7.7	7.0	7.7	8.0	2.7	3.0			
82	.	.	.	.	29.4	26.7	43.9	4.7	9.0	8.3	5.3	7.0	4.3	5.0
83	.	.	.	11.8	46.3	41.9	.	3.0	7.7	6.7	8.0	7.0	3.0	2.0			
84	Vigoro Tall Fescue 54917 ⁶							6.0	8.7	8.7	8.7	8.0	9.0	8.7			
85	13.3	35.7	.	4.7	18.6	.	27.7	4.0	5.7	6.3	4.3	7.0	5.3	5.0			
86	Scotts Sun & Shade 10020298 ⁶							5.3	8.3	8.7	6.7	5.7	4.7	3.7			
87	24.9	.	8.6	.	34.9	31.6	.	3.0	6.7	6.3	7.3	7.3	1.3	1.7			
88	Scotts Tall Fescue 11030345 ⁶							5.7	9.0	9.0	7.7	7.0	9.0	8.0			
89	Jonathan Green Full Sun FS-11-B ⁶							5.0	7.7	6.7	7.3	6.0	4.0	5.7			
90	.	.	.	9.6	.	34.2	56.2	5.7	7.7	5.0	5.3	5.7	6.0	3.7			
91	Scotts Sunny Mix 11020570 ⁶							5.3	9.0	8.3	5.7	5.3	7.3	3.7			
92	.	.	11.4	.	46.5	42.1	.	3.0	8.3	8.3	8.3	7.7	2.3	2.0			
93	Pearl's Premium Sunny Mixture JG-38811-A ⁶							6.0	8.7	8.0	7.0	6.3	4.3	4.0			
94	Diamond Sun Mix 21644 ⁶							6.3	8.0	7.7	5.3	5.0	5.7	3.7			
95	Scotts Sun & Shade 10020280 ⁶							5.0	9.0	7.7	6.3	6.0	4.3	3.3			
96	.	68.0	.	.	.	32.0	.	3.3	7.0	6.7	6.3	6.3	4.7	5.3			
97	Jonathan Green Black Beauty BBU-10-2 ⁶							4.3	8.0	7.0	8.0	7.7	6.7	5.3			
98	AmTurf Sun & Shade L152-11-650-3 ⁶							4.3	8.3	7.3	6.7	6.3	3.3	3.0			
99	44.1	55.9	.	2.3	8.3	6.3	7.3	6.0	1.0	1.3			
100	.	.	.	22.0	.	78.0	.	3.0	8.3	8.3	6.3	6.7	2.0	1.0			

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(Continued)

Table 2. Cool-season turfgrass blends and mixtures trial, 2011 (continued).

Species Composition of Seed Blend or Mixture ¹							Spring Green-up ²	Red Thread ³			Weeds ⁴	Summer Patch ³	Vigor ⁵
Hard Fescue	Tall Fescue	Kentucky Bluegrass Dark	Kentucky Bluegrass Light	Chewings Fescue	Strong Creeping Red Fescue	Perennial Ryegrass	15 April 2013	31 May 2013	24 June 2013	26 July 2013	5 Sept. 2013	28 Aug. 2013	4 Oct. 2013
(% by weight)							(1 to 9 scale)						
101	.	21.3	.	.	78.7	.	2.7	7.0	6.0	8.0	7.0	1.3	1.3
102	.	.	.	.	100.0	.	3.7	8.7	8.7	6.7	5.0	1.7	1.7
103	Vigoro Sun-Shade 52548 ⁶						5.3	7.7	7.0	6.0	5.3	4.0	4.0
LSD at 5% =							1.2	1.9	2.3	1.8	1.7	1.7	1.6

¹ Cultivars for each species were: 'Beacon' and 'Firefly' Hard fescue; 'Fairmont' and 'Intrigue II' Chewings fescue; 'Celestial' and 'Wendy Jean' Strong creeping red fescue; 'Bullseye', 'Faith', and 'Mustang 4' Tall fescue; 'Fiesta 4', 'Paragon GLR', and PPG-PR 164 Perennial ryegrass; 'Bluenote' and A05-361 "Light" Kentucky bluegrass; 'Midnight II' and 'Bewitched' "Dark" Kentucky bluegrass

² 9 = best spring green-up

³ 9 = least disease

⁴ 9 = least weed encroachment

⁵ 9 = most vigorous turfgrass growth

⁶ See Table 3 for species/cultivar composition of retail blends and mixtures

Table 3. Cultivars and recommended seeding rates of 14 retail seed blends and mixtures evaluated in a cool-season species mixture trial established in September 2011 at North Brunswick, NJ.

Amturf Ultra Lawn Sun & Shade Grass Seed Mixture Lot: L152-11-650-3; Seeding rate: 2.5 lb per 1000 ft ²	
% by weight	Cultivar/Species
29.67	'Pennant II' Perennial Ryegrass
21.84	'Kenblue' Kentucky Bluegrass
19.95	'Culumbra II' Chewings Fescue
19.92	'Epic' Creeping Red Fescue
4.95	'Nordic' Hard Fescue

Diamond Grass Seed Sunny Lawn Mixture Lot: 21644; Seeding rate: 6.0 lb per 1000 ft ²	
% by weight	Cultivar/Species
19.60	'Brooklawn' Kentucky Bluegrass
19.60	'Guinness' Kentucky Bluegrass
19.60	'Top Gun' Perennial Ryegrass
19.60	'Extreme' Perennial Ryegrass
19.60	Red Fescue Creeping Type

Jonathan Green Black Beauty Ultra Grass Seed Mixture Lot: BBU-10-2; seeding rate: 5.0 lb per 1000 ft ²	
% by weight	Cultivar/Species
29.70	'Dakota' Tall Fescue
29.65	'Taos' Tall Fescue
19.75	'Tombstone' Tall Fescue
9.85	'Blue-tastic' Kentucky Bluegrass
9.83	'Frontier' Perennial Ryegrass

Jonathan Green Full Sun Grass Seed Mixture Lot: FS-11-B; Seeding rate: 2.4 lb per 1000 ft ²	
% by weight	Cultivar/Species
19.70	'Deepblue' Kentucky Bluegrass
19.70	'Frontier' Perennial Ryegrass
19.65	'Stanton' Perennial Ryegrass
19.95	'Taos' Tall Fescue
9.81	'Eugene' Creeping Red Fescue
9.80	'Hood' Chewings Fescue

(Continued)

Table 3. Cultivars and recommended seeding rates of retail seed blends and mixtures (continued).

Pearl's Premium Ultra Low Maintenance Lawn Seed Mixture – Sunny Mixture
 Lot: JG-3811-A; seeding rate: 6.3 lb per 1000 ft²

% by weight	Cultivar/Species
19.75	'Dakota' Tall Fescue
19.75	'Frontier' Perennial Ryegrass
19.65	'Deepblue' Kentucky Bluegrass
19.65	'Harpoon' Hard Fescue
19.65	'Carmen' Chewings Fescue

Pennington Smart Seed Northeast Mixture
 Lot: 03SMTNE00G; seeding rate: 6.0 lb per 1000 ft²

% by weight	Cultivar/Species
24.63	'Integra II' Perennial Ryegrass
24.52	'1G Squared' Perennial Ryegrass
19.77	'Ridgeline' Kentucky Bluegrass
14.68	'7 Seas' Chewings Fescue
14.57	'Razor' Red Fescue

Pennington Smart Seed Tall fescue Blend
 Lot: L144-10-3SMTF56G; seeding rate: 8.0 lb per 1000 sq ft²

% by weight	Cultivar/Species
34.35	'Justice' Tall Fescue
34.35	'Virtue II' Tall Fescue
29.50	'Greystone' Tall fescue

Pennington Premium Grass Seed Tall Fescue Blend
 Lot: L144-10-3RBTF85; seeding rate: 8.0 lb seed per 1000 ft²

% by weight	Cultivar/Species
39.10	'Rebel IV' Tall Fescue
39.10	'Rebel Advance' Tall Fescue
19.50	'Brockton' Tall Fescue

(Continued)

Table 3. Cultivars and recommended seeding rates of retail seed blends and mixtures (continued).

Scotts Turf Builder Grass Seed Sun & Shade Mix – Water Smart
Lot: 10020280; seeding rate: 5.0 lb per 1000 ft²

% by weight	Cultivar/Species
9.56	'Fenway' Creeping Red Fescue
9.54	'Trapeze' Creeping Red Fescue
9.52	'Nexus XD' Perennial Ryegrass
9.48	'Silver Dollar' Perennial Ryegrass
6.81	'Envicta' Kentucky Bluegrass
2.83	'Thermal' Kentucky Bluegrass
50.00	Water Smart™ Coating

Scotts Turf Builder Grass Seed Sun & Shade Mix – Water Smart
Lot: 11020298; seeding rate: 5.0 lb per 1000 ft²

% by weight	Cultivar/Species
9.52	'Wendy Jean' Creeping Red Fescue
8.68	'Uno' Perennial Ryegrass
8.56	'Silver Dollar' Perennial Ryegrass
8.52	'Wildhorse' Kentucky Bluegrass
6.82	'Abbey' Kentucky Bluegrass
5.64	'Fenway' Creeping Red Fescue
50.00	Water Smart™ Coating

Scotts Turf Builder Grass Seed Tall Fescue Mix – Water Smart
Lot: 11030345; seeding rate: 9.1 lb per 1000 ft²

% by weight	Cultivar/Species
19.01	'Matador GT' Tall Fescue
14.43	'Innovator' Tall Fescue
14.30	'Tar Heel II' Tall Fescue
50.00	Water Smart™ Coating

(Continued)

Table 3. Cultivars and recommended seeding rates of retail seed blends and mixtures (continued).

Scotts Turf Builder Grass Sunny Mix – Water Smart Lot: 11020570; seeding rate: 4.4 lb per 1000 ft ²	
% by weight	Cultivar/Species
17.55	'Abbey' Kentucky Bluegrass
11.46	'Appalachian' Kentucky Bluegrass
6.63	'Silver Dollar' Perennial Ryegrass
6.56	'Inspire' Perennial Ryegrass
5.54	'Uno' Perennial Ryegrass
50.00	Water Smart™ Coating

Vigoro Sun-Shade Grass Seed Mixture Lot: 52548; seeding rate: 3.0 lb per 1000 ft ²	
% by weight	Cultivar/Species
19.47	'Bargena III' Creeping Red Fescue
18.45	'Brooklawn' Kentucky Bluegrass
14.80	'Longfellow II' Chewings Fescue
14.57	'Peak' Perennial Ryegrass
9.89	'Panterra' Italian Ryegrass
9.79	'Pirouette II' Perennial Ryegrass
9.25	'Barbeta (RPR)' Perennial Ryegrass

Vigoro Tall Fescue Grass Seed Blend Lot: 54917; seeding rate: 6.0 lb per 1000 ft ²	
% by weight	Cultivar/Species
29.64	'Barrington' Tall Fescue
24.48	'Barrera' Tall Fescue
19.69	Bar FA 7676 (RTF) Tall Fescue
14.55	'Barlexus II (RTF)' Tall Fescue
9.88	LS1100 Tall Fescue
