

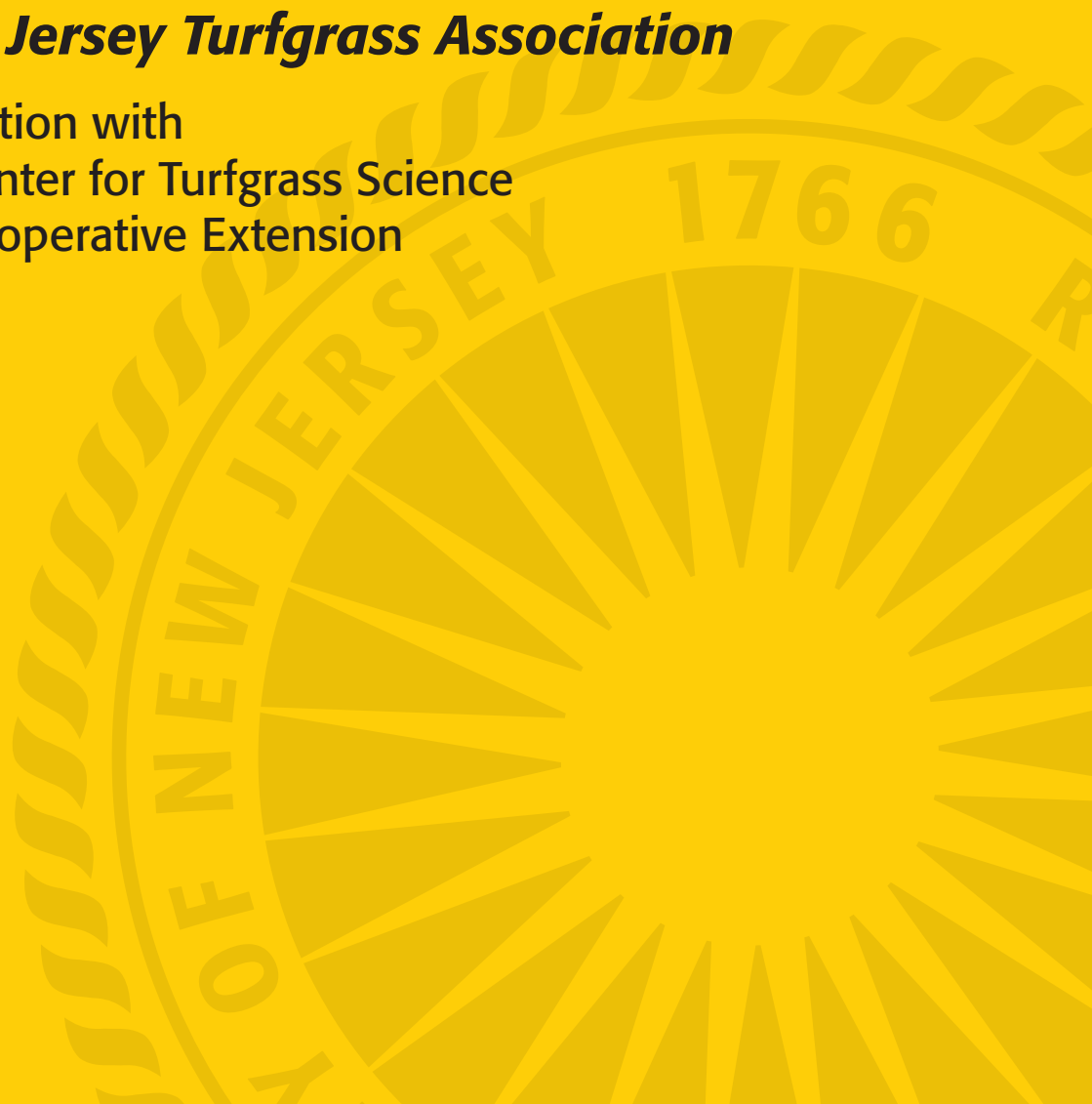
# RUTGERS

New Jersey Agricultural  
Experiment Station

## **2012 Turfgrass Proceedings**

***The New Jersey Turfgrass Association***

In Cooperation with  
Rutgers Center for Turfgrass Science  
Rutgers Cooperative Extension



# **2012 RUTGERS TURFGRASS PROCEEDINGS**

of the

## **GREEN EXPO Turf and Landscape Conference**

**December 4-6, 2012**

**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 2012 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 using fewer irrigation, fertility, and pesticide inputs for home lawns and grounds. 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%; etc.); percentages by weight are reported in Table 1. 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 2 for cultivars and seeding rate). The retail seed blends and mixtures were purchased in summer 2011; the species and variety

composition of these blends and mixtures may be different at the time of publication of this article. Entries were replicated three times and arranged in a randomized complete block design.

Soil test results from June 2012 indicated that the soil pH was 5.7 and quantities of soil phosphorous (P) and potassium (K) were 268 and 270 lb per acre, respectively. The trial was fertilized with 0.5 lb nitrogen (N) per 1000 ft<sup>2</sup> at seeding. The trial received 0.4, 0.4, and 1.0 lb N per 1000 ft<sup>2</sup> on 22 March, 26 April, and 9 August 2012, respectively. Nitrogen (16-4-8) was applied as 14.4% ammoniacal N and 1.6% urea N on 22 March and 26 April 2012; N (43-0-0) was applied as 43% polymer coated urea on 9 August 2012. Per soil test recommendations, calcitic lime was applied at 47 lb per 1000 ft<sup>2</sup> on 7 August 2012.

The test was initially mowed at 2 inches with a reel mower; after a dry period in July 2012 mowing was changed to a 3-inch cutting height with a rotary mower. Irrigation was applied once to the trial on 2 July 2012 (1 inch of water).

Turfgrass establishment was rated on 26 October 2011 using a 1 to 9 scale where 9 represented the best establishment. Turfgrass quality was assessed monthly during April through October 2012 using a 1 to 9 scale where 9 was equal to the best quality. Weed encroachment was visually evaluated on 26 July 2012 using a 1 to 9 scale where 9 was equal to the fewest weeds. The predominant weed in the trial was yellow woodsorrel (*Oxalis stricta*). Gray leaf spot (caused by *Pyricularia grisea*) was observed in early fall 2012 and was rated on 2 October 2012 using a 1 to 9 scale where 9 represented the least disease.

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Turfgrass quality data (seven ratings) were averaged prior to statistical analysis. Data were subjected to analysis of variance and means were separated using Fisher's protected least significant difference (LSD) test at  $p < 0.05$ .

## RESULTS

The hard fescue blend and ten mixtures containing hard fescue were among the 14 entries that had an average turf quality  $\geq 5.0$  during 2012 (Table 1). Pennington Smart Seed Northeast Mixture was the only retail product among the top statistical ranking for average turfgrass quality during 2012. Other retail blends and mixtures generally had poor average turfgrass quality relative to the other blends and mixtures evaluated.

Entries with the poorest average turf quality during 2012 were KBG-Light, KBG-Dark, and Vigoro Sun-Shade Grass Seed Mixture (Table 1). The poor average turf quality of the Kentucky bluegrass blends can be attributed to the very slow establishment rate of this species relative to other species assessed in this trial, which was probably exacerbated by the low rate of N fertilization. The Vigoro Sun-Shade Grass Seed Mixture exhibited poor average turf quality due to the annual ryegrass (*L. multiflorum*) component in the mixture and gray leaf spot susceptibility during fall 2012.

Not surprisingly, entries with the most rapid establishment on 26 October 2011 were the perennial ryegrass blend and mixtures containing perennial ryegrass (Table 1). Entries with the poorest establishment were the two Kentucky bluegrass blends and three mixtures containing 50% Kentucky bluegrass (Hrd.Fescue + KBG-Light; Hrd.Fescue + KBG-Dark; and KBG-Light + Chew.Fescue).

Seventy-four blends and mixtures had the least weed encroachment on 12 July 2012 (Table 1). Fifty-nine of the entries had limited weed encroachment (rating  $\geq 7.0$ ) and 38 of these entries contained perennial ryegrass. Ten mixtures exhibited less than acceptable weed encroachment ( $< 6.0$ ); among these, Kentucky bluegrass was the most common component of nine mixtures.

Sixty-four entries had the least gray leaf spot susceptibility on 2 October 2012 (Table 1). The perennial ryegrass blend ('Fiesta 4', 'Paragon GLR', and PPG-PR 164) and thirteen mixtures containing these perennial ryegrasses were among those 64 entries with the least gray leaf spot. No retail mixture containing perennial ryegrass was among entries with the least gray leaf spot susceptibility. In fact, of the fifteen entries that had the greatest susceptibility to gray leaf spot, nine were retail containing perennial ryegrass.

## DISCUSSION

Data from the first year of this study suggest that hard fescue should receive strong consideration for inclusion in cool-season turfgrass mixtures that will be grown under low maintenance (minimal irrigation and nitrogen fertilization inputs). Under minimal irrigation and nitrogen fertilization, slow turfgrass establishment and subsequently poor turfgrass quality should be expected in year one where Kentucky bluegrass blends are established from seed.

Including perennial ryegrass in seed mixtures will provide more rapid turf establishment and likely minimize weed encroachment; however, reduced turfgrass quality should be expected longer term if perennial ryegrass cultivars do not have improved tolerance to gray leaf spot disease.

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 <sup>1</sup>	Turf Quality <sup>2</sup> Avg. 2012	Establishment <sup>3</sup> 26 Oct. 2012	Weeds <sup>4</sup> 26 July 2012	Gray Leaf Spot <sup>5</sup> 2 Oct. 2012
1 Hrd.Fescue 73.6% + KBG-Light 26.4%	5.6	2.3	6.0	9.0
2 Hrd.Fescue 41.7% + Chew.Fescue 58.3%	5.4	4.0	7.0	9.0
3 Hrd.Fescue 74.4% + KBG-Dark 25.6%	5.4	2.3	6.0	9.0
4 Hrd.Fescue 20.7% + KBG-Dark 7.1% + Chew.Fescue 29.0% + P.Rye 43.2%	5.3	7.0	7.3	8.0
5 Hrd.Fescue 32.4% + P.Rye 67.6%	5.3	8.7	7.7	7.3
6 Hrd.Fescue 22.3% + Chew.Fescue 31.2% + P.Rye 46.5%	5.3	7.0	7.0	6.7
7 TII.Fescue 52.6% + KBG-Dark 6.7% + P.Rye 40.7%	5.2	7.3	7.3	7.7
8 TII.Fescue 41.3% + KBG-Dark 5.2% + Chew.Fescue 21.5% + P.Rye 32.0%	5.2	7.7	7.3	9.0
9 Hard Fescue 100% (Hrd.Fescue)	5.2	3.3	7.0	9.0
10 Hrd.Fescue 24.8% + KBG-Light 8.9% + Chew.Fescue 34.8% + SCR.Fescue 31.5%	5.1	3.0	7.0	8.0
11 Hrd.Fescue 17.4% + Chew.Fescue 24.3% + SCR.Fescue 22.1% + P.Rye 36.2%	5.0	6.3	7.7	6.3
12 Hrd.Fescue 18.4% + TII.Fescue 49.6% + KBG-Dark 6.3% + Chew.Fescue 25.7%	5.0	5.3	7.3	8.7
13 Hrd.Fescue 13.5% + TII.Fescue 36.5% + KBG-Dark 4.6% + SCR.Fescue 17.2% + P.Rye 28.2%	5.0	6.3	6.7	8.0
14 TII.Fescue 42.1% + KBG-Light 5.6% + SCR.Fescue 19.8% + P.Rye 32.5%	5.0	7.0	7.3	7.0
15 TII.Fescue 36.2% + Chew.Fescue 18.8% + SCR.Fescue 17.0% + P.Rye 28.0%	4.9	7.7	7.0	6.0
16 Hrd.Fescue 18.8% + TII.Fescue 50.8% + KBG-Dark 6.5% + SCR.Fescue 23.9%	4.9	5.0	8.0	9.0
17 Hrd.Fescue 23.0% + SCR.Fescue 29.1% + P.Rye 47.9%	4.9	8.0	8.0	7.0
18 Hrd.Fescue 21.3% + KBG-Dark 7.3% + SCR.Fescue 27.0% + P.Rye 44.4%	4.9	6.7	7.0	6.0
19 Hrd.Fescue 36.2% + KBG-Light 13.0% + Chew.Fescue 50.8%	4.8	3.0	6.3	9.0
20 KBG-Dark 9.0% + Chew.Fescue 36.6% + P.Rye 54.4	4.8	8.3	6.7	7.0
21 Hrd.Fescue 29.0% + KBG-Light 10.4% + P.Rye 60.6%	4.8	7.7	7.0	6.3
22 Hrd.Fescue 20.7% + KBG-Light 7.4% + Chew.Fescue 28.9% + P.Rye 43.0%	4.8	7.0	7.0	6.7
23 Hrd.Fescue 38.1% + KBG-Light 13.6% + SCR.Fescue 48.3%	4.8	4.3	7.3	6.7
24 Pennington Northeast 03SMTNE00G	4.7	7.0	7.0	5.0
25 TII.Fescue 41.2% + KBG-Light 5.5% + Chew.Fescue 21.4% + P.Rye 31.9%	4.7	7.3	6.7	6.3

(Continued)

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

Species Composition of Seed Blend or Mixture <sup>1</sup>	Turf Quality <sup>2</sup> Avg. 2012	Establishment <sup>3</sup> 26 Oct. 2012	Weeds <sup>4</sup> 26 July 2012	Gray Leaf Spot <sup>5</sup> 2 Oct. 2012
26 TII.Fescue 43.6% + Chew.Fescue 22.7% + P.Rye 33.7%	4.7	7.0	7.3	6.0
27 Hrd.Fescue 16.4% + KBG-Dark 5.6% + Chew.Fescue 23.0% + SCR.Fescue 20.8% + P.Rye 34.2%	4.7	6.0	7.3	6.0
28 KBG-Light 7.0% + Chew.Fescue 27.4% + SCR.Fescue 24.8% + P.Rye 40.8%	4.7	7.0	7.3	6.3
29 KBG-Light 14.7% + P.Rye 85.3%	4.7	7.3	6.7	6.0
30 Hrd.Fescue 20.2% + TII.Fescue 54.3% + SCR.Fescue 25.5%	4.6	5.3	6.7	9.0
31 Chewings Fescue 100% (Chew.Fescue)	4.6	3.7	7.7	9.0
32 Chew.Fescue 40.2% + P.Rye 59.8%	4.6	8.3	7.7	6.7
33 SCR.Fescue 37.8% + P.Rye 62.2%	4.6	8.0	7.3	5.3
34 KBG-Dark 9.3% + SCR.Fescue 34.3% + P.Rye 56.4%	4.6	6.7	7.7	5.0
35 KBG-Dark 14.1% + P.Rye 85.9%	4.6	7.7	6.7	6.3
36 Hrd.Fescue 21.2% + KBG-Light 7.6% + SCR.Fescue 26.9% + P.Rye 44.3%	4.6	6.7	7.0	5.7
37 Hrd.Fescue 36.5% + KBG-Dark 12.5% + Chew.Fescue 51.0%	4.5	3.7	6.7	9.0
38 KBG-Dark 19.7% + Chew.Fescue 80.3%	4.5	2.7	6.7	9.0
39 Hrd.Fescue 38.3% + KBG-Dark 13.2% + SCR.Fescue 48.5%	4.5	3.0	6.0	8.7
40 Hrd.Fescue 16.4% + KBG-Light 5.9% + Chew.Fescue 22.9% + SCR.Fescue 20.7% + P.Rye 34.1%	4.5	6.7	7.3	5.7
41 TII.Fescue 34.6% + KBG-Dark 4.4% + Chew.Fescue 18.0% + SCR.Fescue 16.3% + P.Rye 26.7%	4.5	6.3	7.3	5.7
42 TII.Fescue 60.5% + KBG-Light 8.1% + Chew.Fescue 31.4%	4.5	5.7	6.7	9.0
43 Hrd.Fescue 27.3% + Chew.Fescue 38.2% + SCR.Fescue 34.5%	4.5	4.0	7.3	9.0
44 TII.Fescue 42.2% + KBG-Dark 5.4% + SCR.Fescue 19.8% + P.Rye 32.6%	4.5	7.7	7.0	6.3
45 Perennial Ryegrass 100% (P.Rye)	4.5	7.7	7.3	7.0
46 KBG-Light 9.3% + Chew.Fescue 36.4% + P.Rye 54.3%	4.5	6.3	7.0	5.7
47 TII.Fescue 50.3% + Chew.Fescue 26.1% + SCR.Fescue 23.6%	4.4	5.3	7.0	9.0
48 Hrd.Fescue 13.5% + TII.Fescue 36.4% + KBG-Light 4.8% + SCR.Fescue 17.1% + P.Rye 28.2%	4.4	6.3	7.0	6.0
49 Hrd.Fescue 14.9% + TII.Fescue 40.1% + KBG-Light 5.3% + Chew.Fescue 20.8% + SCR.Fescue 18.9%	4.4	4.3	5.7	8.3
50 TII.Fescue 44.6% + SCR.Fescue 21.0% + P.Rye 34.4%	4.4	7.7	7.3	6.0

(Continued)

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

Species Composition of Seed Blend or Mixture <sup>1</sup>	Turf Quality <sup>2</sup> Avg. 2012	Establishment <sup>3</sup> 26 Oct. 2012	Weeds <sup>4</sup> 26 July 2012	Gray Leaf Spot <sup>5</sup> 2 Oct. 2012
51 Hrd.Fescue 11.3% + TII.Fescue 30.6% + KBG-Light 4.1% + Chew.Fescue 15.9% + SCR.Fescue 14.4% + P.Rye 23.7%	4.4	6.7	7.0	6.0
52 TII.Fescue 47.1% + KBG-Light 6.3% + Chew.Fescue 24.5%+ SCR.Fescue 22.1%	4.3	5.3	7.3	8.3
53 Hrd.Fescue 16.3% + TII.Fescue 43.9% + KBG-Light 5.8% + P.Rye 34.0%	4.3	7.0	7.0	6.0
54 Hrd.Fescue 18.8% + TII.Fescue 50.7% + KBG-Light 6.7% + SCR.Fescue 23.8%	4.3	5.3	6.0	8.7
55 Hrd.Fescue 11.4% + TII.Fescue 30.7% + KBG-Dark 3.9% + Chew.Fescue 15.9% + SCR.Fescue 14.4% + P.Rye 23.7%	4.3	6.3	6.3	5.7
56 Hrd.Fescue 14.9% + TII.Fescue 40.2% + KBG-Dark 5.1% + Chew.Fescue 20.9% + SCR.Fescue 18.9%	4.3	4.7	6.0	9.0
57 Hrd.Fescue 17.3% + TII.Fescue 46.6% + P.Rye 36.1%	4.3	7.7	7.0	5.3
58 TII.Fescue 56.4% + P. Rye 43.6%	4.2	8.3	7.7	6.3
59 Hrd.Fescue 24.8% + TII.Fescue 66.7% + KBG-Dark 8.5%	4.2	6.0	5.7	9.0
60 KBG-Light 11.8% + Chew.Fescue 46.3% + SCR.Fescue 41.9%	4.2	3.7	7.0	8.3
61 Hrd.Fescue 18.3% + TII.Fescue 49.4% + KBG-Light 6.6% + Chew.Fescue 25.7%	4.1	5.0	7.3	9.0
62 KBG-Light 9.6% + SCR.Fescue 34.2% + P.Rye 56.2%	4.1	6.7	7.7	5.0
63 TII.Fescue 62.4% + KBG-Light 8.3% + SCR.Fescue 29.3%	4.1	5.0	6.7	8.0
64 TII.Fescue 60.7% + KBG-Dark 7.7% + Chew.Fescue 31.6%	4.1	4.7	7.0	9.0
65 TII.Fescue 62.6% + KBG-Dark 8.0% + SCR.Fescue 29.4%	4.1	4.7	5.3	9.0
66 Chew.Fescue 52.5% + SCR.Fescue 47.5%	4.1	3.7	7.0	8.3
67 Hrd.Fescue 29.2% + KBG-Dark 10.0% + P.Rye 60.8%	4.0	7.3	6.7	5.0
68 Hrd.Fescue 24.9% + KBG-Dark 8.6% + Chew.Fescue 34.9% + SCR.Fescue 31.6%	4.0	3.3	7.7	8.7
69 TII.Fescue 47.2% + KBG-Dark 6.0% + Chew.Fescue 24.6% + SCR.Fescue 22.2%	4.0	4.3	6.3	8.0
70 KBG-Dark 6.7% + Chew.Fescue 27.5% + SCR.Fescue 24.9% + P.Rye 40.9%	4.0	6.3	7.0	4.0

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(Continued)

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

Species Composition of Seed Blend or Mixture <sup>1</sup>	Turf Quality <sup>2</sup> Avg. 2012	Establishment <sup>3</sup> 26 Oct. 2012	Weeds <sup>4</sup> 26 July 2012	Gray Leaf Spot <sup>5</sup> 2 Oct. 2012
71 Hrd.Fescue 27.1% + TII.Fescue 72.9%	4.0	6.7	6.7	9.0
72 KBG-Light 20.4% + Chew.Fescue 79.6%	4.0	2.3	6.3	9.0
73 Hrd.Fescue 13.3% + TII.Fescue 35.7% + KBG-Light 4.7% + Chew.Fescue 18.6% + P.Rye 27.7%	4.0	7.0	7.3	6.7
74 TII.Fescue 52.4% + KBG-Light 7.0% + P.Rye 40.6%	3.9	6.7	6.3	6.7
75 TII.Fescue 34.5% + KBG-Light 4.6% + Chew.Fescue 17.9% + SCR.Fescue 16.3% + P.Rye 26.7%	3.9	7.0	6.0	5.0
76 TII.Fescue 65.8% + Chew.Fescue 34.2%	3.9	5.7	7.3	9.0
77 TII.Fescue 88.3% + KBG-Light 11.7%	3.9	5.7	6.0	9.0
78 Hrd.Fescue 13.3% + TII.Fescue 35.8% + KBG-Dark 4.6% + Chew.Fescue 18.6% + P.Rye 27.7%	3.9	6.3	7.3	5.7
79 Chew.Fescue 29.4% + SCR.Fescue 26.7% + P.Rye 43.9%	3.9	7.0	7.7	4.0
80 Diamond Sun Mix 21644	3.9	8.7	6.7	2.7
81 Hrd.Fescue 24.7% + TII.Fescue 66.5% + KBG-Light 8.8%	3.8	5.7	6.3	7.7
82 Scotts Sun & Shade 10020298	3.8	4.7	5.0	4.3
83 KBG-Dark 21.3% + SCR.Fescue 78.7%	3.8	3.0	5.7	6.7
84 Hrd.Fescue 16.3% + TII.Fescue 44.0% + KBG-Dark 5.6% + P.Rye 34.1%	3.8	7.0	7.7	5.3
85 Jonathan Green Full Sun FS-11-B	3.8	5.3	6.0	4.7
86 Scotts Sun & Shade 10020280	3.7	5.0	6.3	3.3
87 TII.Fescue 88.7% + KBG-Dark 11.3%	3.6	5.7	6.0	9.0
88 Pennington Tall Fescue L144-10-3SMTF56G	3.6	6.3	7.0	9.0
89 Hrd.Fescue 19.6% + TII.Fescue 52.9% + Chew.Fescue 27.5%	3.6	5.7	7.3	9.0
90 KBG-Light 22.0% + SCR.Fescue 78.0%	3.6	3.3	7.0	6.7
91 Tall Fescue 100% (TII.Fescue)	3.6	6.7	6.3	9.0
92 Pearl's Premium Sunny Mixture JG-38811-A	3.6	6.3	7.0	4.3
93 Hrd.Fescue 44.1% + SCR.Fescue 55.9%	3.5	4.3	7.0	9.0
94 KBG-Dark 11.4% + Chew.Fescue 46.5% + SCR.Fescue 42.1%	3.5	3.7	5.7	8.0
95 Pennington Tall Fescue L144-10-3RBTF85	3.4	6.7	7.0	9.0

(Continued)



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

Species Composition of Seed Blend or Mixture <sup>1</sup>	Turf Quality <sup>2</sup> Avg. 2012	Establishment <sup>3</sup> 26 Oct. 2012	Weeds <sup>4</sup> 26 July 2012	Gray Leaf Spot <sup>5</sup> 2 Oct. 2012
96 Scotts Sunny Mix 11020570	3.4	4.7	4.7	4.7
97 Tll.Fescue 68.0% + SCR.Fescue 32.0%	3.4	5.3	6.0	8.3
98 Strong Creeping Red Fescue 100% (SCR.Fescue)	3.3	4.7	6.7	7.3
99 AmTurf Sun & Shade L152-11-650-3	3.3	5.7	6.7	2.7
100 Vigoro Tall Fescue 54917	3.2	5.7	6.0	9.0
101 Scotts Tall Fescue 11030345	3.0	4.3	5.7	9.0
102 Jonathan Green Black Beauty BBU-10-2	2.9	5.3	6.3	6.0
103 Vigoro Sun-Shade 52548	2.3	9.0	6.0	2.7
104 Kentucky bluegrass - Light 100% (KBG-Light)	1.6	1.0	5.3	8.0
105 Kentucky bluegrass-Dark 100% (KBG-Dark)	1.4	1.0	5.0	8.3
LSD at 5% =	1.1	1.5	1.6	2.3

<sup>1</sup>Hrd.Fescue = hard fescue 'Beacon' and 'Firefly'; Chew.Fescue = chewings fescue 'Fairmont' and 'Intrigue II'; SCR.Fescue = strong creeping red fescue 'Celestial' and 'Wendy Jean'; Tll.Fescue = tall fescue 'Bullseye', 'Faith', and 'Mustang 4'; P.Rye = perennial ryegrass 'Fiesta 4', 'Paragon GLR', and PPG-PR 164; KBG-Light = "Light" Kentucky bluegrass 'Bluenote' and A05-361; KBG-Dark = "Dark" Kentucky bluegrass 'Midnight II' and 'Bewitched'

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

<sup>3</sup>9 = best establishment

<sup>4</sup>9 = least weed encroachment

<sup>5</sup>9 = least disease

Table 2. 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. Retail seed blends and mixtures were purchased in summer 2011; the species and variety composition of these blends and mixtures may be different at the time of publication of this article.

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Amturf Ultra Lawn Sun & Shade Grass Seed Mixture Lot: L152-11-650-3; seeding rate: 2.5 lb per 1000 ft <sup>2</sup>	
% 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

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Diamond Grass Seed Sunny Lawn Mixture Lot: 21644; seeding rate: 6.0 lb per 1000 ft <sup>2</sup>	
% 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

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Jonathan Green Black Beauty Ultra Grass Seed Mixture Lot: BBU-10-2; seeding rate: 5.0 lb per 1000 ft <sup>2</sup>	
% 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

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Amturf Ultra Lawn Sun & Shade Grass Seed Mixture Lot: L152-11-650-3; Seeding rate: 2.5 lb per 1000 ft <sup>2</sup>	
% 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

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(Continued)

Table 2. 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 ft<sup>2</sup>

% 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 ft<sup>2</sup>

% 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 ft<sup>2</sup>

% 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 ft<sup>2</sup>

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

(Continued)

Table 2. Cultivars and recommended seeding rates of retail seed blends and mixtures (continued).

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Scotts Turf Builder Grass Seed Sun & Shade Mix – Water Smart  
Lot: 10020280; seeding rate: 5.0 lb per 1000 ft<sup>2</sup>

% 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

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Scotts Turf Builder Grass Seed Sun & Shade Mix – Water Smart  
Lot: 11020298; seeding rate: 5.0 lb per 1000 ft<sup>2</sup>

% 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

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Scotts Turf Builder Grass Seed Tall Fescue Mix – Water Smart  
Lot: 11030345; seeding rate: 9.1 lb per 1000 ft<sup>2</sup>

% 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

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(Continued)

Table 2. Cultivars and recommended seeding rates of retail seed blends and mixtures (continued).

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Scotts Turf Builder Grass Sunny Mix – Water Smart Lot: 11020570; seeding rate: 4.4 lb per 1000 ft <sup>2</sup>	
% 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

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Vigoro Sun-Shade Grass Seed Mixture Lot: 52548; seeding rate: 3.0 lb per 1000 ft <sup>2</sup>	
% 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

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Vigoro Tall Fescue Grass Seed Blend Lot: 54917; seeding rate: 6.0 lb per 1000 ft <sup>2</sup>	
% 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

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