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An Evaluation of Turfgrass Species and Varieties: Tall Fescue

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INTRODUCTION

Originating in Europe, **Tall fescue** (*Festuca anundinacea* **Schreb.**) is a coarse-textured grass, which is characterized by a bunch-type growth habit. The unimproved varieties of tall fescue usually form a turf, which is characterized by low shoot density and a leaf texture coarser than most of the other commonly used cool-season turf species. Because of its coarse leaf texture, tall fescue does not blend well in sod seeded with commonly used turf species, such as Kentucky bluegrass, creeping red fescue, or perennial ryegrass. In fact, it may be considered a weed when isolated clumps of tall fescue are found in a high-quality, fine-textured lawn. Although it has short rhizomes, it forms a turf with rather weak sod strength. Tall fescue possesses a deeper, coarser and more extensive root system than the other cool-season species giving this grass excellent drought tolerance. It is propagated by seed, with an establishment rate that is more rapid than Kentucky bluegrass, but slower than perennial ryegrass.

Adaptation and Use

Tall fescue is adapted to a wide range of soil conditions, but performs best when grown on moist, fine-textured soils that are high in organic matter. Although it tolerates soils of low fertility, tall fescue responds well to improved fertility. Soils with pH values of 5.5 to 6.5 are preferred by this grass, but it survives more extreme pH values from 4.7 to 8.5. Tall fescue also tolerates saturated soil conditions for extended periods and thus can be used to stabilize drainage ways.

Although considered a cool-season grass, it has been viewed as only slightly more tolerant of cold temperatures than perennial ryegrass; in Maine, it has historically been considered a short-lived perennial as well. It is because of these apparent misconceptions that this study is noteworthy.

Tall fescue is quite heat tolerant compared to most other cool-season grasses due to its deep, extensive root system. In the transition zone, it is grown as a long-lived perennial. Although leaf growth is restricted during transient periods of heat stress, tall fescue has the capability of retaining adequate color and appearance, making it the most drought- and wear-tolerant of the cool-season turfgrasses. Because of its tough leaves and extensive root system, tall fescue has been used extensively on athletic fields and other high-traffic locations. Despite its excellent wear tolerance, this grass should not be a first choice for athletic fields because it lacks recuperative potential related to an absence of vigorous rhizomes and stolons and is slow to recover following injury. Furthermore, since tall fescue does not achieve suitable wearability until its second growing season, damage incurred by athletic events during its establishment year may prove extensive and make recovery slow.

Cultural Requirements for Use as Turf

Tall fescue achieves its best leaf texture and overall turfgrass performance when maintained at a cutting height between 1.7 and 2.2 inches. When cut lower than 1.2 inches, tall fescue will not provide an adequate shoot density considered satisfactory for closely mowed turfs, such as fairways. The recommended fertilization rate should be 0.4 to 1.0 lb N/1000 ft^2/month of growing season. High nitrogen applications may lead to increased low-temperature injury in the colder regions of the country. Thatch has not been a problem in tall fescue turfs. Although drought tolerant, tall fescue does respond well to judicious irrigation.

MATERIALS AND METHODS

In May 1997, the National Turfgrass Evaluation Program (NTEP) tall fescue test was seeded at the Turfgrass Experimental Plots of the Littlefield Ornamentals Trial Garden on the University of Maine campus. The prepared soil was a well-drained Marlowe fine sandy loam, which had been amended with 60 lb of lime per 1000 ft^2 and 20 lb of 10-10-10 per 1000 ft^2 as per Maine Soil Testing Service recommendations. Seeding was accomplished by using a 5 x 3 ft plywood box to prevent drifting of seed into adjacent plots and then raking in to ensure soil-seed contact. Supplemental moisture was supplied through an in-ground irrigation system controlled by a Toro computer. The test consisted on 129 varieties, which were replicated three times.

This study was conducted in a shade-free area on a maintenance fertility program of 1.0 lb N per 1000 ft^2 per month of growing season using a commercial 20-5-15 slow-release fertilizer with 50% N as slow-release sulfur-coated urea source.

Mowing was initiated in July 1997 using a National Triplex 70-inch mower set at a mowing height of 2.0 inches. This height was increased to 3.0 inches during October and November of each year to increase photosynthetic area and thus increase carbohydrate storage in an attempt to reduce winter losses. Clippings were not removed and since little thatch or mat developed during the course of the study, these plots were neither aerified nor dethatched. There was no evidence of encroachment

into adjacent plots by any of the more aggressive varieties.

Visual turf quality and disease ratings were made on a monthly basis throughout the growing season. The ranking scale used was 1 = no living turf, and 9 = ideal turf. Yearly data were compiled and sent to the NTEP office in Beltsville, MD, for statistical analyses. These data have been combined for the four years of the study and the means separated and arrayed for each of the factors evaluated.

RESULTS AND DISCUSSION

1997

Ratings for the Tall Fescue varieties taken for the 1997 growing season are shown in Table 1. Although there were no significant differences in turf quality for the top 63 varieties, nevertheless, the first 25 varieties had quality scores above 7.0. Of these quality leaders, Millenium (7.8), Watchdog and Crossfire II (7.7), and MB 26, Apache II, Axiom, Coronado and PICK FA UT-93 (7.5) led the list. Of these eight top-rated varieties, all had genetic color ratings of 7.0 or above, with the exception of Axiom (6.3).

For the 1997 growing season, the first 65 varieties did not differ statistically in genetic color. Of these, however, Millennium, MB 26, Barlexas II, PICK FA–93, Coyote, Shenandoah II, Airlie, Velocity, and MB 29 had excellent color scores of 8.0.

On the late summer evaluation date, August 18th, leaf spot symptoms were observed and ratings recorded using the NTEP system (9 = healthy to 1 = dead). Although ratings ranged from 8.7 (Milleninium) to 2.7 (Rebel Sentry & DLF-1), statistical analyses revealed that leaf spot ratings of 3.7 and higher were not significantly different. Subsequent evaluations taken later in the 1997 growing season indicated that leaf spot was no longer a problem on any of the varieties evaluated in this test.

Also on August 18th, percent cover ratings were taken and these indicated that the majority of the improved tall fescue varieties had produced covers in the 80% to 90% range. Considering the fact that tall fescue has a bunch growth habit and the seeding was done only three months previously, this degree of coverage should be considered very acceptable. The unimproved Kentucky-31 variety was associated with 68 % ground cover and differed statistically from all the others.

1998

Evaluations of grass quality and percent ground cover taken in the spring and fall are shown in Table 2. Statistical analysis revealed that there was no difference in quality for the first 42 varieties or expressed another way, all varieties with quality ratings of 6.2 or higher were not statistically different. The 13 highest ranked varieties had quality ratings of at least 6.5, with Coyote, Watchdog, Millennium and Tomahawk-E receiving quality ratings of 7.3, 7.1, 6.9, and 6.8, respectively.

Although the popular literature suggests that tall fescue is the least cold tolerant of the cool-season grasses, spring cover evaluations revealed that the 15 highest rated varieties all had covers of 60% or higher following the first winter. Then after the second full growing season following seeding, the 13 highest ranked varieties produced ground covers of 80% or higher. These results are considered excellent for a grass species such as tall fescue, which has a bunch growth habit. It should be noted, however, that all varieties that had produced fall cover of 72% or higher were not found to be significantly different.

1999

Varieties with quality ratings of 5.7 and above were not significantly different, Table 3. The top-rated varieties had quality rating of 6.0 and higher, with the 11 highest ranked varieties scoring above 6.0. The variety Dynasty ranked highest with a quality score of 6.4, followed by Coyote, Jaguar 3, PICK FA 20-92, and Watchdog, all with a rating of 6.2.

Of the five highest ranked varieties, PICK FA 20-92 and Watchdog had genetic color scores of 8.0, followed by Dynasty and Coyote and Jaguar 3 with color scores of 7.7 for the first and 7.3 for the last two. It should be noted, however, that those varieties with genetic color scores of 6.7 and higher were not significantly different.

2000

The quality ratings for the 2000 growing season are shown in Table 4. Those varieties with quality scores of 6.2 and higher were not significantly different. It should be noted that for this growing season, 14 varieties had quality scores of 7.0 and higher. Of these, six scored 7.5 and above. For example, Barlexas II led this group with a quality score of 7.7, followed by Coyote, Millennium and PICK FA 20-92 all scoring 7.6. Durana and Dynasty trailed this group of leaders with still exceptional quality scores of 7.5.

Table 1. Turfgrass quality, genetic color, percent cover, and leaf spot ratings for tall fescue varieties seeded in May 1997 at the University of Maine. Means are the average of monthly ratings made during the 1997 growing season.

Variety	Quality[1]	Genetic Color[2]	Leaf Spot[3]	% Cover
1. MILLENNIUM	7.8	8.0	8.7	95
2. WATCHDOG	7.7	7.3	5.0	95
3. CROSSFIRE II	7.7	7.0	6.3	80
4. MB 26	7.5	8.0	6.7	88
5. APACHE II	7.5	7.3	5.7	87
6. AXIOM	7.5	6.3	4.3	93
7. CORONADO	7.5	7.3	6.3	88
8. PICK FA UT-93	7.5	7.7	4.7	92
9. BAR FA 6D	7.3	7.3	6.3	87
10. BRANDY	7.3	7.7	5.3	90
11. R5AU	7.3	7.0	5.0	87
12. BARLEXAS II	7.3	8.0	6.0	92
13. SHORTSTOP II	7.3	7.7	5.7	85
14. PICK FA 20-92	7.3	8.0	5.3	95
15. PICK FA 15-92	7.3	7.7	5.3	83
16. PICK FA N-93	7.3	8.0	7.7	88
17. EMPRESS	7.2	7.3	4.7	88
18. COCHISE II	7.2	7.0	5.0	88
19. WILDFIRE	7.2	7.0	4.3	93
20. LEPRECHAUN	7.2	6.7	6.0	93
21. SR 8500	7.2	7.0	4.0	93
22. REMBRANDT	7.2	7.3	7.3	95
23. MB 216	7.2	7.7	7.0	93
24. SCORPIO	7.2	7.3	6.0	87
25. SUNPRO	7.2	6.7	5.7	92
26. ZANZIBAR	7.0	7.3	7.7	88
27. MUSTANG II	7.0	6.3	5.3	92
28. BRAVO	7.0	6.7	4.3	90
29. ARID 3	7.0	7.7	5.0	90
30. DURANA	7.0	7.7	5.3	87
31. FALCON III	7.0	7.3	6.0	88
32. COYOTE	7.0	8.0	8.7	88
33. ARIZONA	7.0	7.7	6.0	93
34. REBEL 2000	7.0	7.3	7.3	95
35. SHENANDOAH II	7.0	8.0	6.7	85
36. SRX 8084	7.0	7.0	7.0	88
37. CHAPEL HILL	7.0	7.7	7.0	90
38. PLANTATION	7.0	7.3	6.0	93
39. OFI-931	7.0	7.7	5.3	90
40. OFI-96-31	7.0	7.7	6.3	90
41. MARKSMAN	7.0	7.0	4.7	92
42. GENESIS	7.0	7.0	7.0	87
43. FINELAWN PETITE	7.0	7.7	5.3	82
44. ATF-020	6.8	7.3	5.7	85
45. ANTHEM II	6.8	7.0	4.0	93
46. WYATT	6.8	6.7	6.3	90
47. AIRLIE	6.8	8.0	7.3	88
48. ARID II	6.8	7.0	5.0	88
49. GAZELLE	6.8	7.3	7.7	92
50. BULLDAWG	6.8	7.7	6.7	87
51. DUSTER	6.8	7.3	3.7	82
52. AZTEC II	6.8	6.7	5.3	87
53. VELOCITY	6.8	8.0	7.0	90
54. MB 29	6.8	8.0	6.3	85
55. BARRINGTON	6.8	7.3	7.3	93
56. MB 215	6.8	7.7	6.7	87
57. OFI-96-32	6.8	6.7	4.3	87
58. TARHEEL	6.8	7.0	4.7	92
59. GOOD-EN	6.8	6.7	6.3	90
60. RESERVE	6.8	5.7	5.7	90
61. PSII-TF-9	6.8	6.3	6.3	88
62. TULSA	6.8	6.7	4.0	95
63. MASTERPIECE	6.8	7.7	6.3	85
64. PIXIE E+	6.7	6.3	5.7	92
65. RENEGADE	6.7	7.0	6.0	85

Table 1. Continued.

Variety	Quality[1]	Genetic Color[2]	Leaf Spot[3]	% Cover
66. EQUINOX	6.7	6.7	5.0	88
67. BARRERA	6.7	7.7	6.7	85
68. TF 66	6.7	8.0	5.0	88
69. BONSAI 2000	6.7	7.3	6.0	90
70. SOUTHERN CHOICE	6.7	7.0	3.7	93
71. MB 28	6.7	7.3	6.0	85
72. PSII-TF-10	6.7	6.0	3.7	92
73. MB 214	6.7	7.0	7.3	95
74. FALCON II	6.7	6.3	5.3	85
75. WPEZE	6.7	6.0	3.0	92
76. DYNASTY	6.7	7.7	5.7	92
77. REBEL SENTRY	6.7	7.3	2.7	88
78. ISI-TF10	6.7	7.0	4.0	77
79. SR 8210	6.7	7.0	5.3	90
80. EA 41	6.5	8.0	3.7	85
81. REGIMENT	6.5	6.0	4.0	87
82. BAR FA6 US2U	6.5	7.7	5.7	95
83. CU9501T	6.5	6.7	6.7	92
84. DOMINION	6.5	7.7	6.0	85
85. BANDANA	6.5	7.3	6.7	85
86. PICK FA XK-95	6.5	7.3	3.3	93
87. ISI-TF9	6.5	6.7	5.3	90
88. OLYMPIC GOLD	6.5	7.0	7.0	87
89. CU9502T	6.5	6.7	7.7	85
90. SAFARI	6.5	7.0	5.3	95
91. TRACER	6.5	7.7	5.3	87
92. ARABIA	6.3	7.0	6.7	88
93. ATF-022	6.3	6.7	4.3	87
94. OFI-FWY	6.3	6.7	3.7	92
95. ISI-TF11	6.3	7.3	6.0	80
96. ATF-253	6.3	6.3	4.7	90
97. LION	6.3	6.3	4.7	90
98. RED COAT	6.3	7.0	4.3	83
99. TOMAHAWK-E	6.3	6.7	4.3	87
100. GLEN EAGLE	6.3	7.7	5.0	90
101. PST-5TO	6.2	7.7	4.7	78
102. SHENANDOAH	6.2	6.0	5.3	92
103. JTTFA-96	6.2	5.0	5.3	85
104. WVPB-1B	6.2	6.7	6.7	88
105. JAGUAR 3	6.2	7.3	5.7	87
106. WX3-275	6.2	6.3	4.3	82
107. TITAN 2	6.2	6.0	4.7	87
108. DP 50-9011	6.2	5.7	5.0	88
109. PEDESTAL	6.2	7.3	4.3	88
110. MB 213	6.0	7.7	6.0	87
111. KITTY HAWK S.S.T.	6.0	6.7	5.0	80
112. TWILIGHT II	6.0	6.7	4.0	83
113. HELIX	6.0	6.3	5.0	80
114. WOLFPACK	6.0	6.7	7.3	85
115. ATF-257	6.0	5.7	4.0	87
116. COMSTOCK	6.0	6.7	3.3	88
117. OFI-951	6.0	7.7	6.0	85
118. CORONADO GOLD	6.0	7.3	5.7	85
119. PRO 8430	6.0	6.3	7.7	87
120. BONSAI	5.8	5.7	4.7	77
121. ALAMO E	5.8	7.0	3.3	88
122. JSC-1	5.8	6.7	3.3	88
123. JTTFC-96	5.8	5.3	5.0	87
124. DP 7952	5.7	4.0	3.7	85
125. ONCUE	5.7	6.3	4.0	87
126. ARID	5.5	4.7	3.3	85
127. DLF-1	5.5	5.7	2.7	80
128. AV-1	5.2	5.0	3.3	80
129. KENTUCKY-31 w/endo	3.7	3.0	3.0	68

[1] The first 63 varieties did not differ significantly in turf quality.
[2] The first 65 varieties did not differ significantly in genetic color.
[3] Leaf spot ratings of 3.7 and higher were not significantly different. Symptoms were only found to be a problem during the Aug. 18 evaluation.

Table 2. Turfgrass quality, spring and fall percent cover ratings for tall fescue varieties seeded in May 1997 at the University of Maine. Means are the average of monthly ratings made during the 1998 growing season.

Variety	Quality[1]	Spring Cover (%)	Fall Cover (%)[2]
1. COYOTE	7.3	75	93
2. WATCHDOG	7.1	67	90
3. MILLENNIUM	6.9	65	90
4. TOMAHAWK-E	6.8	80	93
5. MB 216	6.7	78	92
6. OFI-931	6.7	70	90
7. REBEL 2000	6.7	65	88
8. AIRLIE	6.6	70	92
9. MB 215	6.6	73	80
10. BRANDY	6.5	60	85
11. FALCON III	6.5	63	88
12. MB 213	6.5	68	80
13. PLANTATION	6.5	60	85
14. DURANA	6.4	63	77
15. DOMINION	6.4	67	78
16. VELOCITY	6.3	57	77
17. BARLEXAS	6.3	57	78
18. BARRINGTON	6.3	60	80
19. CU9501T	6.3	65	82
20. KICKOFF	6.3	70	82
21. MARKSMAN	6.3	67	87
22. MB 26	6.3	57	85
23. MB 29	6.3	67	87
24. SOUTHERN CHOICE	6.3	65	80
25. APACHE II	6.2	70	88
26. ARID 3	6.2	77	77
27. ATF-020	6.2	63	82
28. TRACER	6.2	52	83
29. CU9502T	6.2	62	83
30. GOOD-EN	6.2	57	80
31. MB 28	6.2	62	83
32. MUSTANG II	6.2	70	80
33. PICK FA 20-92	6.2	57	80
34. BULLDAWG	6.2	62	78
35. DYNASTY	6.2	53	70
36. R5AU	6.2	60	80
37. REMBRANDT	6.2	60	82
38. RENEGADE	6.2	68	92
39. SAFARI	6.2	58	83
40. SUNPRO	6.2	53	78
41. CHAPEL HILL	6.2	67	85
42. ZANZIBAR	6.2	67	92
43. ATF-022	6.1	67	87
44. ATF-257	6.1	67	88
45. BAR FA 6D	6.1	53	70
46. BAR FA6 US2U	6.1	53	80
47. COMSTOCK	6.1	67	85
48. CROSSFIRE II	6.1	68	83
49. MB 214	6.1	75	82
50. PIXIE E+	6.1	70	85
51. RESERVE	6.1	60	78
52. FALCON II	6.0	60	77
53. ISI-TF9	6.0	60	80
54. WX3-275	6.0	63	77
55. ATF-253	5.9	55	80
56. BARRERA	5.9	57	75
57. BRAVO	5.9	58	78
58. CORONADO GOLD	5.9	55	77
59. DUSTER	5.9	68	83
60. FINELAWN PETITE	5.9	68	87
61. GENESIS	5.9	62	85
62. ISI-TF10	5.9	65	87
63. LEPRECHAUN	5.9	57	67
64. LION	5.9	62	67
65. SR 8500	5.9	53	80
66. ARID II	5.8	50	73

Table 2. Continued.

Variety	Quality[1]	Spring Cover (%)	Fall Cover (%)[2]
67. CORONADO	5.8	53	75
68. GAZELLE	5.8	62	72
69. JAGUAR 3	5.8	63	78
70. OFI-96-31	5.8	60	85
71. PRO 8430	5.8	63	75
72. TITAN 2	5.8	72	88
73. WVPB-1B	5.8	63	75
74. ARABIA	5.7	52	72
75. RED COAT	5.7	50	75
76. TF 66	5.7	55	77
77. BONSAI	5.7	52	72
78. EQUINOX	5.7	50	82
79. MASTERPIECE	5.7	48	67
80. OFI-FWY	5.7	65	78
81. ARIZONA	5.7	47	77
82. ONCUE	5.7	58	82
83. REBEL SENTRY	5.7	55	72
84. REGIMENT	5.7	53	75
85. TAR HEEL	5.7	53	68
86. SCORPIO	5.7	43	68
87. ANTHEM II	5.6	52	73
88. WYATT	5.6	50	72
89. GLEN EAGLE	5.6	65	78
90. SHENANDOAH	5.6	57	80
91. SHENANDOAH II	5.6	53	72
92. EA 41	5.5	50	70
93. ISI-TF11	5.5	48	87
94. JTTFC-96	5.5	67	78
95. AXIOM	5.4	47	77
96. AZTEC II	5.4	52	68
97. EMPRESS	5.4	52	63
98. KITTY HAWK S.S.T.	5.4	57	87
99. SRX 8084	5.4	57	78
100. ALAMO E	5.3	42	68
101. PEDESTAL	5.3	43	67
102. PICK FA N-93	5.3	38	70
103. SR 8210	5.3	45	65
104. TULSA	5.3	53	72
105. JSC-1	5.2	63	78
106. WPEZE	5.2	47	83
107. AV-1	5.1	57	57
108. BONSAI	5.1	53	70
109. COCHISE II	5.1	35	77
110. DP 50-9011	5.1	47	73
111. JTTFA-96	5.1	50	75
112. PSII-TF-10	5.1	47	70
113. PSII-TF-9	5.1	47	75
114. PST-5TO	5.1	42	67
115. TWILIGHT II	5.1	40	62
116. WOLFPACK	5.1	45	60
117. BANDANA	5.0	42	53
118. OFI-96-32	5.0	45	68
119. DLF-1	4.9	60	82
120. DP 7952	4.9	38	75
121. OFI-951	4.9	42	57
122. PICK FA 15-92	4.9	40	62
123. PICK FA XK-95	4.9	30	58
124. HELIX	4.9	47	67
125. WILDFIRE	4.8	32	57
126. PICK FA UT-93	4.8	25	57
127. ARID	4.2	55	77
128. SHORTSTOP II	4.2	23	52
129. KENTUCKY- 31 w/endo	3.4	57	78

[1] Varieties with quality ratings of 6.2 or higher were not significantly different.
[2] Varieties with fall ground covers of 72% or higher were not significantly different.

Table 3. Turfgrass quality and genetic color for tall fescue varieties seeded in May 1997 at the University of Maine. Means are the average of monthly ratings made during the 1999 growing season.

Variety	Quality[1]	Color[2]
1. DYNASTY	6.4	7.7
2. COYOTE	6.2	7.3
3. JAGUAR 3	6.2	7.3
4. PICK FA 20-92	6.2	8.0
5. WATCHDOG	6.2	8.0
6. BARLEXAS II	6.1	7.7
7. BARRINGTON	6.1	7.3
8. CU9502T	6.1	7.3
9. MILLENNIUM	6.1	7.7
10. OLYMPIC GOLD	6.1	7.3
11. PLANTATION	6.1	7.3
12. BAR FA6 US2U	6.0	7.3
13. CHAPEL HILL	6.0	6.3
14. GAZELLE	6.0	7.7
15. AIRLIE	6.0	7.3
16. DURANA	6.0	7.3
17. MB 26	6.0	8.0
18. DOMINION	6.0	7.3
19. REBEL 2000	6.0	8.0
20. REMBRANDT	6.0	7.3
21. SR 8210	6.0	6.7
22. APACHE II	5.9	7.0
23. BRAVO	5.9	6.7
24. CU9501T	5.9	7.3
25. FALCON III	5.9	7.3
26. MB 216	5.9	7.3
27. MUSTANG II	5.9	6.7
28. SOUTHERN CHOICE	5.9	6.7
29. SR 8500	5.9	7.0
30. SUNPRO	5.9	7.0
31. VELOCITY	5.9	7.7
32. ARID II	5.8	7.0
33. BONSAI 2000	5.8	6.7
34. COMSTOCK	5.8	7.0
35. CORONADO	5.8	7.3
36. CROSSFIRE II	5.8	7.0
37. DP 50-9011	5.8	6.3
38. MARKSMAN	5.8	7.0
39. MB 213	5.8	8.0
40. MB 214	5.8	8.0
41. MB 29	5.8	7.0
42. OFI-96-31	5.8	7.3
43. R5AU	5.8	7.0
44. REBEL SENTRY	5.8	7.0
45. RESERVE	5.8	7.0
46. WX3-275	5.8	7.7
47. ARID 3	5.7	7.0
48. ATF-022	5.7	7.0
49. WYATT	5.7	7.3
50. ATF-257	5.7	6.7
51. TF 66	5.7	7.7
52. EA 41	5.7	7.0
53. ISI-TF10	5.7	8.0
54. OFI-931	5.7	7.0
55. ARIZONA	5.7	7.0
56. PIXIE E+	5.7	6.7
57. SHENANDOAH II	5.7	7.7
58. TOMAHAWK-E	5.7	7.3
59. SCORPIO	5.7	7.3
60. ANTHEM II	5.6	7.7
61. ATF-020	5.6	7.0
62. BAR FA 6D	5.6	7.3
63. BULLDAWG	5.6	6.7
64. MASTERPIECE	5.6	7.7
65. MB 215	5.6	7.7
66. MB 28	5.6	7.0
67. PICK FA UT-93	5.6	7.0
68. RED COAT	5.6	7.7
69. RENEGADE	5.6	7.3
70. WOLFPACK	5.6	7.0
71. TRACER	5.5	7.7
72. BRANDY	5.5	7.3
73. CORONADO GOLD	5.5	8.0
74. GLEN EAGLE	5.5	7.3
75. LION	5.5	7.0
76. ONCUE	5.5	6.7
77. TAR HEEL	5.5	7.0
78. TULSA	5.5	6.3
79. ARABIA	5.4	7.7
80. WILDFIRE	5.4	7.0
81. ATF-253	5.4	6.7
82. COCHISE II	5.4	6.7
83. DUSTER	5.4	7.0
84. EMPRESS	5.4	6.3
85. EQUINOX	5.4	7.3
86. ISI-TF11	5.4	7.0
87. ISI-TF9	5.4	6.3
88. LEPRECHAUN	5.4	6.7
89. OFI-FWY	5.4	7.3
90. PICK FA N-93	5.4	7.3
91. PRO 8430	5.4	6.3
92. PST-5TO	5.4	7.3
93. REGIMENT	5.4	6.7
94. SAFARI	5.4	7.3
95. WVPB-1B	5.4	6.7
96. AZTEC II	5.3	6.7
97. BARRERA	5.3	7.7
98. JSC-1	5.3	6.7
99. OFI-951	5.3	6.3
100. OFI-96-32	5.3	7.0
101. PSII-TF-10	5.3	6.3
102. FALCON II	5.2	6.7
103. FINELAWN PETITE	5.2	7.7
104. GENESIS	5.2	6.7
105. GOOD-EN	5.2	6.7
106. KITTY HAWK S.S.T.	5.2	7.0
107. SHENANDOAH	5.2	6.3
108. SRX 8084	5.2	6.7
109. AXIOM	5.1	6.7
110. PICK FA XK-95	5.1	7.0
111. TITAN 2	5.1	5.3
112. WPEZE	5.1	7.0
113. BONSAI	5.0	6.3
114. PEDESTAL	5.0	7.0
115. PSII-TF-9	5.0	6.0
116. TWILIGHT II	5.0	7.3
117. ALAMO E	4.9	6.3
118. BANDANA	4.9	7.0
119. DP 7952	4.9	4.7
120. JTTFC-96	4.9	6.7
121. PICK FA 15-92	4.8	6.7
122. HELIX	4.8	6.3
123. ZANZIBAR	4.8	6.7
124. DLF-1	4.6	6.0
125. JTTFA-96	4.6	5.3
126. SHORTSTOP II	4.6	6.0
127. AV-1	4.5	6.0
128. ARID	4.4	5.7
129. KENTUCKY-31 w/endo.	3.3	3.3

Table 3. Continued.

[1] Varieties with quality ratings of 6.2 or higher were not significantly different.

[2] Varieties with genetic color ratings of 6.7 and higher were not

significantly different.

Table 4. Turfgrass quality for tall fescue varieties seeded in May 1997 at the University of Maine. Means are the average of monthly ratings made during the 2000 growing season.

Variety		Quality[1]
1.	BARLEXAS II	7.7
2.	COYOTE	7.6
3.	MILLENNIUM	7.6
4.	PICK FA 20-92	7.6
5.	DURANA	7.5
6.	DYNASTY	7.5
7.	FALCON III	7.4
8.	MB 213	7.3
9.	REMBRANDT	7.3
10.	R5AU	7.2
11.	WATCHDOG	7.1
12.	CU9502T	7.0
13.	DOMINION	7.0
14.	TOMAHAWK-E	7.0
15.	MB 215	6.9
16.	OLYMPIC GOLD	6.9
17.	PLANTATION	6.9
18.	AIRLIE	6.8
19.	ATF-253	6.8
20.	VELOCITY	6.8
21.	ATF-257	6.8
22.	BAR FA6 US2U	6.7
23.	GAZELLE	6.7
24.	LEPRECHAUN	6.7
25.	MARKSMAN	6.7
26.	MUSTANG II	6.7
27.	SHENANDOAH II	6.7
28.	SOUTHERN CHOICE	6.7
29.	SR 8500	6.7
30.	APACHE II	6.6
31.	ARIZONA	6.6
32.	ATF-022	6.6
33.	BONSAI 2000	6.6
34.	JAGUAR 3	6.6
35.	MB 26	6.6
36.	CHAPEL HILL	6.5
37.	MASTERPIECE	6.5
38.	MB 29	6.5
39.	REBEL SENTRY	6.5
40.	CROSSFIRE II	6.4
41.	EMPRESS	6.4
42.	OFI-96-31	6.4
43.	REBEL 2000	6.4
44.	RESERVE	6.4
45.	SAFARI	6.4
46.	WYATT	6.4
47.	BARRERA	6.3
48.	BARRINGTON	6.3
49.	BRAVO	6.3
50.	BULLDAWG	6.3
51.	COMSTOCK	6.3
52.	OFI-931	6.3
53.	PRO 8430	6.3
54.	RENEGADE	6.3
55.	SCORPIO	6.3
56.	SR 8210	6.3
57.	SUNPRO	6.3
58.	TAR HEEL	6.3
59.	WX3-275	6.3
60.	CORONADO	6.2
61.	CORONADO GOLD	6.2
62.	CU9501T	6.2
63.	DP 50-9011	6.2
64.	GOOD-EN	6.2

Table 4. Continued.

Variety		Quality[1]
65.	MB 214	6.2
66.	MB 28	6.2
67.	PICK FA N-93	6.2
68.	PICK FA UT-93	6.2
69.	WOLFPACK	6.2
70.	COCHISE II	6.1
71.	EA 41	6.1
72.	ISI-TF9	6.1
73.	OFI-951	6.1
74.	RED COAT	6.1
75.	GENESIS	6.0
76.	TF66	6.0
77.	AXIOM	5.9
78.	ISI-TF10	5.9
79.	MB 216	5.9
80.	ONCUE	5.9
81.	PICK FA XK-95	5.9
82.	REGIMENT	5.9
84.	SHENANDOAH	5.9
85.	TRACER	5.9
86.	WVPB-1B	5.9
87.	ATF-020	5.8
88.	BRANDY	5.8
89.	PIXIE E+	5.8
90.	PST-5TO	5.8
91.	TULSA	5.8
92.	ARABIA	5.7
93.	EQUINOX	5.7
94.	GLEN EAGLE	5.7
95.	LION	5.7
96.	OFI-96-32	5.7
97.	OFI-FWY	5.7
98.	TWILIGHT II	5.7
99.	FALCON II	5.6
100.	FINELAWN PETITE	5.6
101.	HELIX	5.6
102.	ISI-TF11	5.6
103.	KITTY HAWK	5.6
104.	SRX 8084	5.6
105.	TITAN 2	5.6
106.	BAR FA 6D	5.5
107.	PSII-TF-9	5.5
108.	ARID 3	5.4
109.	JTTFA-96	5.4
110.	JTTFC-96	5.4
111.	ANTHEM II	5.3
112.	DUSTER	5.3
113.	JSC-1	5.3
114.	WILDFIRE	5.3
115.	BANDANA	5.2
116.	WPEZE	5.2
117.	AV-1	5.1
118.	AZTEC II	5.1
119.	DLF-1	5.1
120.	PEDESTAL	5.1
121.	PICK FA 15-92	5.1
122.	PSII-TF-10	5.1
123.	ARID II	5.0
124.	DP 7952	5.0
125.	BONSAI	4.9
126.	SHORTSTOP II	4.8
127.	ALAMO E	4.7
128.	ARID	4.6
129.	KENTUCKY-31 w/endo.	3.5

[1] Varieties with a quality rating of 6.2 or higher were not significantly different.

Four-Year Average

Based upon the four-year average, the final rankings for all tall fescue varieties entered in this test are shown in Table 5. Statistical analyses for turf quality revealed that the first 22 varieties with quality scores of 6.5 and higher did not differ significantly. However, of those varieties that led this list, Millennium was rated as having the highest quality rating of the group, with a score of 7.1. This was followed by Coyote and Watchdog with scores of 7.0. Barlexas had a score of 6.9 and PICK FA 20-92, 6.8. Durana, Dynasty, Falcon III, and Rembrandt were all rated at 6.7. Of these nine forgoing varieties, all had genetic color ratings of 7.3 and above. PICK FA 20-92 had a color rating of 8.0, while Millennium and Barlexas were scored at 7.8. Coyote, Watchdog and Dynasty had genetic color ratings of 7.7.

As mentioned earlier, there were 13 varieties with quality ratings of 6.6 or 6.5, which did not differ from the aforementioned group. These included Airlie, MB 26, Plantation, R5AU, Apache II, Crossfire II, Dominion, Marksman, MB 215, Olympic Gold, Rebel 2000, Tomahawk-E, and Velocity. All members of this latter group had genetic color ratings over 7.0, with MB 26 scoring 8.0. Velocity had a color rating of 7.8, while Airlie, MB 215, and Rebel 2000 each scored 7.7.

Although leaf spot disease symptoms were observed and rated in the test during the establishment year, they were never again sufficiently problematic to be considered for rating in subsequent years. Furthermore, despite its reputation as having poor cold tolerance, none of the varieties entered in this test was lost during the four years it was conducted.

CONCLUSIONS

The improved tall fescue varieties evaluated in this NTEP trial established well, provided good-quality turf, and by the end of the initial growing season gave excellent ground cover. In fact, almost 40 % of the varieties tested had attained 90% cover in the first five months of growth, with only three of the improved varieties providing less than 80% cover. The unimproved Kentucky-31 variety gave 68% cover during the same period.

Although tall fescue was not expected to provide turf of the quality of Kentucky bluegrass, nevertheless, the turf observed during the first season was of surprisingly good quality, with the first 43 top-rated varieties scoring 7.0 and above. Although some evidence of leaf spot symptoms were noted during the establishment year, the damage was not extensive and no further evidence of serious disease problems was noted for the remainder of the test.

Historically, tall fescue has been considered the least winter hardy of the cool-season grasses. Given this reputation, it was expected that plant losses after the first winter would be significant and possibly as devastating as had been observed at the same site for the NTEP perennial ryegrass trial during the winter of 1995-1996. Therefore, it was a pleasant surprise to note that in the spring of 1998, almost 45% of the varieties had retained at least 60 % ground cover. Of the forty-two statistically non-differing quality leaders, only Dynasty and Sunpro and Tracer, had spring covers of 53 % and 52%, respectively.

By the end of the second growing season, approximately half the varieties had produced covers of at least 80 %, considered very good for a grass with a bunch-type growth habit. Only 17 % of the varieties had ground covers of less than 70% when evaluated at the same time. It should be noted that no winter losses in plant cover were observed for the remainder of the study, calling into question the species' purported lack of cold hardiness.

Although the quality scores were somewhat lower for the 1999 growing season; nevertheless, the ultimate leaders tended to provide the best turf quality scores for that year. In 2000, the quality scores rebounded, so that the 14 top-rated varieties had quality scores of 7.0 or higher. In fact, there were only five varieties that had quality scores of less than 5.0 for that year.

The results of this study clearly indicate that improved tall fescue varieties do possess sufficient turf quality, disease resistance, and especially cold tolerance to be considered as a species choice for certain lawn and athletic areas in the Northeast region of the United States. The varieties that were evaluated have a sufficiently fine leaf texture and ability to fill in to be considered for situations where high fertility and irrigation inputs would not be an option. Certainly, tall fescue would not provide a turf of the quality provided by Kentucky bluegrass, but then it would not have the same high requirements for water and nitrogen as bluegrass.

Certain homeowners might welcome a deeply rooted grass that would not require the frequent watering needed to maintain a bluegrass lawn and could readily accept the less dense, less lush turf associated with this *Festuca* species. There could also be situations on the golf course where the superintendent might be willing to sacrifice the quality associated with a Kentucky bluegrass turf

Table 5. Turfgrass quality, genetic color and disease ratings for tall fescue varieties evaluated at the Littlefield Ornamentals Trial Garden at the University of Maine. Means are the average of monthly ratings made over the four-year duration of the study (1997–2000).

Rank	Variety	Quality[1]	Genetic Color[2]	Leaf Spot[3]
1.	MILLENNIUM	7.1	7.8	8.7
2.	COYOTE	7.0	7.7	8.7
3.	WATCHDOG	7.0	7.7	5.0
4.	BARLEXAS	6.9	7.8	6.0
5.	PICK FA 20-92	6.8	8.0	5.3
6.	DURANA	6.7	7.5	5.3
7.	DYNASTY	6.7	7.7	5.7
8.	FALCON III	6.7	7.3	6.0
9.	REMBRANDT	6.7	7.3	7.3
10.	AIRLIE	6.6	7.7	7.3
11.	MB 26	6.6	8.0	6.7
12.	PLANTATION	6.6	7.3	6.0
13.	R5AU	6.6	7.0	5.0
14.	APACHE II	6.5	7.2	5.7
15.	CROSSFIRE II	6.5	7.0	6.3
16.	DOMINION	6.5	7.5	6.0
17.	MARKSMAN	6.5	7.0	4.7
18.	MB 215	6.5	7.7	6.7
19.	OLYMPIC GOLD	6.5	7.2	7.0
20.	REBEL 2000	6.5	7.7	7.3
21.	TOMAHAWK-E	6.5	7.0	4.3
22.	VELOCITY	6.5	7.8	7.0
23.	BARRINGTON	6.4	7.3	7.3
24.	CHAPEL HILL	6.4	7.0	7.0
25.	CU9502T	6.4	7.0	7.7
26.	MB 213	6.4	7.8	6.0
27.	MB 216	6.4	7.5	7.0
28.	MB 29	6.4	7.5	6.3
29.	MUSTANG II	6.4	6.5	5.3
30.	OFI-931	6.4	7.3	5.3
31.	SOUTHERN CHOICE	6.4	6.8	3.7
32.	SR 8500	6.4	7.0	4.0
33.	SUNPRO	6.4	6.8	5.7
34.	BAR FA6 US2U	6.3	7.5	5.7
35.	BRANDY	6.3	7.5	5.3
36.	BRAVO	6.3	6.7	4.3
37.	CORONADO	6.3	7.3	6.3
38.	GAZELLE	6.3	7.5	7.7
39.	LEPRECHAUN	6.3	6.7	6.0
40.	RESERVE	6.3	6.3	5.7
41.	SHENANDOAH II	6.3	7.8	6.7
42.	ARIZONA	6.2	7.3	6.0
43.	ATF-022	6.2	6.8	4.3
44.	BONSAI 2000	6.2	7.0	6.0
45.	BULLDAWG	6.2	7.2	6.7
46.	CU9501T	6.2	7.0	6.7
47.	JAGUAR 3	6.2	7.3	5.7
48.	MASTERPIECE	6.2	7.7	6.3
49.	MB 214	6.2	7.5	7.3
50.	MB 28	6.2	7.2	6.0
51.	OFI-96-31	6.2	7.5	6.3
52.	REBEL SENTRY	6.2	7.2	2.7
53.	RENEGADE	6.2	7.2	6.0
54.	SCORPIO	6.2	7.3	6.0
55.	ARID 3	6.1	7.3	5.0
56.	ATF-020	6.1	7.2	5.7
57.	ATF-253	6.1	6.5	4.7
58.	ATF-257	6.1	6.2	4.0
59.	BAR FA 6D	6.1	7.3	6.3
60.	BARRERA	6.1	7.7	6.7
61.	EMPRESS	6.1	6.8	4.7
62.	GOOD-EN	6.1	6.7	6.3
63.	ISI-TF10	6.1	7.5	4.0
64.	PICK FA N–93	6.1	7.7	7.7
65.	PIXIEE+	6.1	6.5	5.7

Table 5. Continued.

Rank	Variety	Quality[1]	Genetic Color[2]	Leaf Spot[3]
66.	SAFARI	6.1	7.2	5.3
67.	SR 8210	6.1	6.8	5.3
68.	TAR HEEL	6.1	7.0	4.7
69.	WX3-275	6.1	7.0	4.3
70.	WYATT	6.1	7.0	6.3
71.	AXIOM	6.0	6.5	4.3
72.	COMSTOCK	6.0	6.8	3.3
73.	GENESIS	6.0	6.8	7.0
74.	ISI-TF9	6.0	6.5	5.3
75.	PICK FA UT-93	6.0	7.3	4.7
76.	TF 66	6.0	7.8	5.0
77.	TRACER	6.0	7.7	5.3
78.	ZANZIBAR	6.0	7.0	7.7
79.	COCHISE II	5.9	6.8	5.0
80.	CORONADO GOLD	5.9	7.7	5.7
81.	DUSTER	5.9	7.2	3.7
82.	EA 41	5.9	7.5	3.7
83.	FALCON II	5.9	6.5	5.3
84.	FINELAWN PETITE	5.9	7.7	5.3
85.	LION	5.9	6.7	4.7
86.	PRO 8430	5.9	6.3	7.7
87.	RED COAT	5.9	7.3	4.3
88.	REGIMENT	5.9	6.3	4.0
89.	TULSA	5.9	6.5	4.0
90.	ANTHEM II	5.8	7.3	4.0
91.	ARABIA	5.8	7.3	6.7
92.	ARID II	5.8	7.0	5.0
93.	DP 50-9011	5.8	6.0	5.0
94.	EQINOX	5.8	7.0	5.0
95.	GLEN EAGLE	5.8	7.5	5.0
96.	OFI-FWY	5.8	7.0	3.7
97.	SRX 8084	5.8	6.8	7.0
98.	WVPB-1B	5.8	6.7	6.7
99.	AZTEC II	5.7	6.7	5.3
100.	ISI-TF11	5.7	7.2	6.0
101.	OFI-96-32	5.7	6.8	4.3
102.	ONCUE	5.7	6.5	4.0
103.	SHENANDOAH	5.7	6.2	5.3
104.	WILDFIRE	5.7	7.0	4.3
105.	WOLFPACK	5.7	6.8	7.3
106.	KITTY HAWK	5.6	6.8	5.0
107.	OFI-951	5.6	7.0	6.0
108.	PICK FA XK-95	5.6	7.2	3.3
109.	PSII-TF-9	5.6	6.2	6.3
110.	PST-5TO	5.6	7.5	4.7
111.	TITAN 2	5.6	5.7	4.7
112.	WPEZE	5.6	6.5	3.0
113.	PICK FA 115-92	5.5	7.2	5.3
114.	PSII-TF-10	5.5	6.2	3.7
115.	TWILIGHT II	5.5	7.0	4.0
116.	BANDANA	5.4	7.2	6.7
117.	JSC-1	5.4	6.7	3.3
118.	JTTFC-96	5.4	6.0	5.0
119.	PEDESTAL	5.4	7.2	4.3
120.	HELIX	5.3	6.3	5.0
121.	JTTFA-96	5.3	5.2	5.3
122.	ALAMO E	5.2	6.7	3.3
123.	BONSAI	5.2	6.0	4.7
124.	SHORTSTOP II	5.2	6.8	5.7
125.	DP 7952	5.1	4.3	3.7
126.	AV-1	5.0	5.5	3.3
127.	DLF-1	5.0	5.8	2.7
128.	ARID	4.7	5.2	3.3
129.	KENTUCKY-31 w/endo	3.5	3.2	3.0

[1] Varieties with turf quality ratings of 6.5 or higher were not significantly different.
[2] Varieties with genetic colors ratings of 7.2 or higher were not significantly different.
[3] Leaf spot symptoms were only found to be a problem during the August evaluation of the establishment year.

for the convenience of an acceptable tall fescue turf that requires fewer inputs. The athletic director or individual in charge of the high school or college athletic fields could be tempted to seed tall fescue because of its excellent wear tolerance. They should be aware, however, that this species does not have particularly good recuperative potential and so would suffer from slow recovery if severely damaged, especially during the establishment year. If overseeding with perennial ryegrass to ensure good ground cover is part of that athletic program's maintenance schedule, then tall fescue would again become the dominant species in the field, given sufficient recovery time.

In conclusion, the improved tall fescue varieties performed surprisingly well at the Littlefield Garden at the University of Maine. Based upon this performance, this species should be given consideration as a cool-season turf species in those situations where its demonstrated attributes are consistent with the turf needs of that location and/or situation.

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