

Shade Adaptation Studies

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The first shade adaptation study was established in the fall of 1987 to evaluate the performance of 35 species and cultivars of grasses. The species include chewings fescue (C.F.), creeping red fescue (C.R.F.), hard fescue (H.F.), tall fescue (T.F.), Kentucky bluegrass (K.B.), and rough bluegrass (*Poa trivialis*).

The area is located under the canopy of a mature stand of Siberian elm trees (*Ulmus pumila*) at the Iowa State University Horticulture Research Station north of Ames, Iowa. Grasses are mowed at a 2-inch height and receive 2 lb N/1000 ft²/year. No weed control has been required on the area, but the grass was irrigated during extended drought periods.

Monthly quality data are collected from May through October (Table 1). Visual quality was based on a 9 to 1 scale: 9 = best quality, 6 = lowest acceptable quality, and 1 = poorest quality. This trial has been observed through the extremes of the drought year 1988 and the very wet conditions of 1993. Turf quality among species varied greatly with moisture conditions. In dry weather, the fine fescues, especially the hard fescues, do well, whereas rough bluegrass quickly deteriorates. In extended wet periods, rough bluegrass does very well. Some of the tall fescues and chewings fescues also tend to perform better in wet conditions.

A new shade trial was added in the fall of 1994 to evaluate the performance of cultivars of chewings fescue (C.F.), creeping red fescue (C.R.F.), hard fescue (H.F.), tall fescue (T.F.), Kentucky bluegrass (K.B.), and rough bluegrass (*Poa trivialis*), and *Poa supina*. The results from this trial appear in Table 2.

Table 3 contains a summary of data from the last eight years for this project.

Table 1. 1996 quality¹ ratings for turfgrass culitvars in the 1987 Shade Trial.

	Cultivar	May	June	July	Aug	Sept	Oct	Mean
1	Atlanta (C.F.)	7.0	6.3	6.0	6.0	7.3	7.7	6.7
2	Victor (C.F.)	7.3	5.3	5.7	5.7	7.3	8.0	6.6
3	Mary (C.F.)	7.3	5.7	5.7	5.7	6.7	7.0	6.3
4	Banner (C.F.)	7.3	5.3	5.3	5.0	7.0	7.3	6.2
5	Waldorf (C.F.)	6.0	6.0	5.3	5.0	6.7	7.7	6.1
6	Wintergreen (C.F.)	5.7	6.0	5.7	5.3	6.3	7.0	6.0
7	Jamestown (C.F.)	7.7	5.0	5.0	4.7	6.3	7.0	5.9
8	Pennlawn (C.R.F.)	6.7	5.0	4.7	5.3	6.3	7.3	5.9
9	Shadow (C.F.)	7.0	4.7	4.3	5.0	6.7	7.7	5.9
10	Bar Fo 81-225 (H.F.)	4.7	5.3	5.3	5.7	6.3	7.0	5.7
11	Agram (C.F.)	6.7	4.7	4.3	4.7	6.0	6.7	5.5
12	St-2 (SR3000) (H.F.)	5.3	4.7	5.0	4.7	6.3	7.0	5.5
13	Ensykva (C.R.F.)	5.7	4.0	3.7	4.7	6.3	7.3	5.3
14	Waldina (H.F.)	5.0	4.3	4.0	4.7	6.0	6.3	5.1
15	Spartan (H.F.)	4.7	4.7	4.3	4.7	5.3	6.3	5.0
16	Highlight (C.F.)	6.0	4.7	4.0	4.3	5.0	5.7	4.9
17	Sabre (<i>Poa trivialis</i>)	3.3	6.3	5.0	4.3	5.3	5.3	4.9
18	Reliant (H.F.)	4.3	4.3	4.3	4.7	5.7	6.3	4.9
19	Biljart (H.F.)	4.7	4.3	3.7	4.3	5.7	6.3	4.8
20	Koket (C.F.)	6.0	4.0	3.0	3.3	4.7	6.3	4.6
21	Rebel (T.F.)	4.0	4.0	4.3	4.3	5.0	5.7	4.6
22	Estica (C.R.F.)	4.0	3.3	3.0	3.3	5.7	6.7	4.3
23	Rebell II (T.F.)	4.3	3.7	3.3	4.3	5.0	5.3	4.3
24	Bonanza (T.F.)	3.7	3.7	3.7	4.0	4.7	5.3	4.2

	Cultivar	May	June	July	Aug	Sept	Oct	Mean
25	Falcon (T.F.)	3.7	4.0	3.3	3.3	4.7	6.0	4.2
26	Scaldis (H.F.)	4.0	3.7	3.3	3.3	4.3	5.7	4.1
27	Midnight (K.B.)	2.7	4.3	3.7	4.7	4.0	4.7	4.0
28	Coventry (K.B.)	4.3	4.3	3.7	3.7	3.3	4.0	3.9
29	Apache (T.F.)	3.3	3.0	3.0	3.3	4.7	4.7	3.7
30	Arid (T.F.)	3.3	3.0	2.3	2.3	3.0	3.7	2.9
31	Bristol (K.B.)	2.3	2.7	2.0	3.0	3.0	3.7	2.8
32	Ram I (K.B.)	2.3	2.7	2.7	3.0	2.7	3.7	2.8
33	Glade (K.B.)	2.7	3.3	2.3	2.3	2.7	3.3	2.8
34	Chateau (K.B.)	2.0	2.0	2.3	2.0	2.0	2.7	2.2
35	Nassau (K.B.)	2.7	2.3	1.3	1.7	2.0	2.7	2.1
	LSD _{0.05}	1.7	2.1	1.9	1.9	2.3	2.0	1.7

¹Visual quality was assessed using a 9 to 1 scale: 9 = best quality, 6 = lowest acceptable quality, and 1 = poorest quality.

Table 2. 1996 Visual quality¹ data for turfgrass cultivars in the 1994 Shade Trial.

	Cultivar	May	June	July	Aug	Sept	Oct	Mean
1	Saber	7.0	6.3	5.7	5.3	6.7	7.3	6.4
2	Cypress	6.7	6.7	5.3	5.0	7.0	6.7	6.2
3	Polder	6.7	6.3	5.3	5.7	6.7	6.7	6.2
4	SR 5100	6.3	5.3	4.7	5.0	6.3	6.7	5.7
5	Southport	5.0	4.0	4.3	3.7	5.7	6.0	4.8
6	Bridgeport	5.3	4.0	4.0	3.3	5.3	6.0	4.7
7	Banner	5.7	4.0	3.3	4.3	5.3	5.7	4.7
8	Silvana	4.3	4.0	4.0	4.0	5.0	6.3	4.6
9	Waldina	4.3	4.0	4.3	3.7	4.0	5.7	4.3
10	Midnight	4.7	4.7	4.0	4.0	3.7	4.3	4.2
11	Molinda	4.3	3.0	3.7	3.0	4.7	6.3	4.2
12	Ascot	3.0	4.3	3.7	3.7	4.3	5.3	4.1
13	Banner II	4.7	3.7	3.7	3.7	4.0	4.7	4.1
14	Nordic	4.0	3.0	3.0	4.0	4.3	5.3	3.9
15	Shadow	4.0	3.7	3.0	3.0	4.0	5.7	3.9
16	Bonanza	4.7	3.3	3.7	3.0	3.7	5.0	3.9
17	Spartan	3.3	3.0	3.7	3.3	4.0	5.3	3.8
18	Shenandoah	3.7	3.0	3.3	3.7	4.0	5.0	3.8
19	Victory	4.7	2.7	2.7	2.7	3.7	5.0	3.6
20	Flyer	4.0	3.3	3.3	2.7	3.7	4.7	3.6
21	Bonanza II	3.0	3.7	3.3	3.0	4.0	4.7	3.6
22	Coventry	5.0	3.3	2.7	3.0	3.0	3.3	3.4
23	Arid	3.3	3.3	3.7	2.7	3.7	3.7	3.4
24	Glade	4.3	3.0	2.7	3.0	3.0	4.0	3.3
25	Rebel II	3.3	2.3	3.0	3.3	3.7	4.3	3.3
26	Bristol	3.3	3.7	2.7	2.3	3.3	3.7	3.2
27	Buckingham	2.3	3.0	3.0	3.0	2.3	3.7	2.9
28	Brigade	3.7	2.0	2.3	2.3	2.7	4.3	2.9
29	Adobe	2.3	2.3	2.3	2.3	2.7	3.0	2.5
30	Mirage	3.0	2.0	2.0	2.0	2.3	3.0	2.4
31	Rebel	2.3	2.3	2.3	2.3	2.0	2.7	2.3
32	Falcon II	2.7	2.3	2.3	1.7	2.0	3.0	2.3
33	Bonsai	1.7	1.7	2.0	2.0	2.0	3.0	2.1
34	Aztec	2.0	2.0	2.3	1.7	2.7	2.0	2.1

35	Supranova	1.0	1.7	1.0	1.7	1.7	2.3	1.6
	LSD _{0.05}	2.2	1.7	2.0	2.0	2.3	2.1	1.7

¹Visual quality was assessed using a 9 to 1 scale: 9 = best quality, 6 = lowest acceptable quality, and 1 = poorest quality.

Table 3. The average quality ratings for grasses in the Shade Trial: 1989 - 1996.

Cultivar	1989	1990	1991	1992	1993	1994	1995	1996	Ave.*
1 Victor (C.F.)	6.3	6.1	4.3	5.9	7.2	7.1	6.6	6.6	6.38
2 ST-2 (SR 3000) (H.F.)	7.3	7.3	5.1	6.3	5.7	6.1	6.1	5.5	6.30
3 Mary (C.F.)	6.2	6.3	3.9	6.4	6.7	6.6	6.7	6.3	6.16
4 Waldorf (C.F.)	6.2	6.2	5.5	7.3	5.9	6.2	5.8	6.1	6.14
5 BAR FO 81-225 (H.F.)	6.9	7.1	4.9	6.5	5.5	6.1	6.5	5.7	6.10
6 Rebel (T.F.)	6.6	6.6	5.3	6.0	6.9	5.9	5.7	4.6	6.03
7 Jamestown (C.F.)	6.0	6.0	4.2	6.0	6.5	6.6	6.2	5.9	6.01
8 Estica (C.R.F.)	7.0	7.0	4.1	5.6	6.6	6.1	5.6	4.3	6.00
9 Bonanza (T.F.)	6.3	6.4	6.5	6.9	6.3	6.2	5.2	4.2	5.98
10 Sabre (<i>Poa trivialis</i>)	5.4	5.0	6.9	6.4	7.4	6.2	4.8	4.9	5.93
11 Shadow (C.F.)	5.5	5.2	4.7	6.0	6.6	6.6	5.9	5.9	5.92
12 Falcon (T.F.)	6.4	6.3	5.3	6.0	6.5	6.3	5.2	4.2	5.87
13 Apache (T.F.)	6.6	6.8	6.0	6.0	6.3	5.4	5.3	3.7	5.87
14 Atlanta (C.F.)	5.7	5.7	4.9	6.1	5.8	5.7	5.5	6.7	5.86
15 Waldina (H.F.)	6.8	6.8	4.1	5.5	5.5	5.8	5.8	5.1	5.83
16 Biljart (H.F.)	7.5	7.0	5.1	6.1	5.0	5.1	5.1	4.8	5.82
17 Pennlawn (C.R.F.)	5.8	5.6	4.7	6.2	6.3	5.5	5.5	5.9	5.80
18 Rebel II (T.F.)	6.6	6.8	5.3	5.6	6.1	6.2	5.1	4.3	5.78
19 Arid (T.F.)	6.3	6.3	6.0	7.1	6.7	5.6	4.7	2.9	5.71
20 Banner (C.F.)	5.6	6.0	4.5	5.0	6.0	5.6	5.3	6.2	5.68
21 Spartan (H.F.)	6.9	7.2	3.5	4.2	4.7	5.1	4.9	5.0	5.46
22 Wintergreen (C.F.)	5.6	5.5	4.6	5.9	5.0	5.0	5.0	6.0	5.41
23 Agram (C.F.)	5.6	5.3	3.9	5.9	5.4	5.3	5.1	5.5	5.41
24 Ensylva (C.R.F.)	5.4	5.2	4.0	5.1	5.9	5.4	4.4	5.3	5.31
25 Koket (C.F.)	5.4	4.9	4.2	5.2	5.2	5.7	4.6	4.6	5.12
26 Scaldis (H.F.)	6.5	5.8	3.7	5.2	4.6	4.4	4.8	4.1	5.07
27 Coventry (K.B.)	5.3	5.3	5.7	5.4	6.0	4.7	3.8	3.9	5.00
28 RAM I (K.B.)	6.1	5.2	5.0	5.0	5.9	4.3	3.3	2.8	4.87
29 Chateau (K.B.)	5.8	5.5	6.2	5.5	5.2	4.1	3.0	2.2	4.77
30 Highlight (C.F.)	4.9	4.8	3.5	4.6	5.0	4.8	4.7	4.9	4.70
31 Midnight (K.B.)	3.8	4.7	5.9	5.5	6.4	4.6	4.4	4.0	4.63
32 Glade (K.B.)	5.3	5.4	5.5	4.8	5.3	3.3	2.8	2.8	4.48
33 Reliant (H.F.)	3.7	3.9	3.1	3.5	4.2	4.9	4.8	4.9	4.26
34 Bristol (K.B.)	4.7	4.3	3.9	3.9	5.0	4.1	3.6	2.8	4.12
35 Nassau (K.B.)	4.1	3.7	3.4	3.8	4.3	3.3	2.4	2.1	3.49

Quality Based on a 9 to 1 scale: 9 = best quality, 6 = lowest acceptable quality, and 1 = poorest quality.

*Average includes 1988 data (not listed).

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