SHADE ADAPTATION OF SODDED AND SEEDED KENTUCKY BLUEGRASS CULTIVARS

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Many turfgrass field researchers continue to give recommendations of Kentucky bluegrass cultivar adaptation to shaded environments. Concern has developed as information has been passed on to many homeowners who seed or sod these cultivars in extremely dense shade where survival of even the most shade-tolerant cultivars is unlikely. Thus, definitions of the degree of shade under which research tests are conducted is necessary when reporting shade adaptation.

The MSU shade research area is a mature stand of hard maples that produces a dense shade. During the summer of 1977, two trees were removed from the research area and numerous other limbs were pruned. In order to characterize the degree of light reduction, the research area was measured in a 3 meter (approx. 10 ft.) square grid. During the third week of September when the day length is 12 hours, the sun flecks in each square of the grid were recorded every hour on the hour. An estimate was then made of the number of hours that the sun radiated each square of the grid and thus each cultivar that was later sodded in that area.

Table 1 shows the randomization pattern in the sodded Kentucky bluegrass cultivar study allowed for a range of 4.3 to 2.8 estimated hours of sun flecks per day. Table 2 indicates estimated average hours of sunlight on the seeded study ranged from 4.3 to 2.7. It is important to note that statistically, no differences between cultivars was evident in the sodded study, however, Nugget was found to be radiated at significantly higher levels than WTN-H6, A-34 and Adelphi in the seeded study.

On a bright sunny day, the photosynthetically active radiation was measured and shown to be a 96% reduction compared to full sun. This indicates that growth and survival of the cultivars was largely due to the sun flecks passing across the plot.

Throughout the 1979 growing season, Bristol, A-34, Nugget, Cheri and Enmumdi were the outstanding grasses in the shade research area (Table 3). Due to a severe powdery mildew invasion within 6 weeks after sodding, Baron, Merion and Victa were severely damaged and did not recover during the 1979 growing season. Adelphi and Bonnieblue were powdery mildew resistant, but ranked intermediate on a seasonal basis due to poor competition under the shade conditions. Helminthosporium leafspot was not a problem with any of the above named varieties.

Glade and RAM I ranked a low 17th and 20th, respectively, in the early spring rating, largely due to leafspot problems. However, the quality of both varieties steadily improved throughout the season to a late fall ranking of 10th and 7th, respectively. Thus, the overall seasonal ranking in Table 3 for these varieties was 12th and 13th of 23 varieties. Newport was also extremely susceptible to leafspot, but did not recovcer during the growing season.

Table 4 shows the performance of 16 Kentucky bluegrass varieties seeded on September 5, 1978. WTN-H6, Touchdown and Nugget were the best performing varieties. The superiority of WTN-H6 should be noted, especially when Table 2 indicates that WTN-H6 was receiving significantly reduced solar radiation compared to Nugget.

The cultivar RR-10 had poor germination and/or seedling vigor and was bottom ranked in the early spring rating. However, it ranked as high as 3rd and 5th before the season ended. Thus, its overall 1979 ranking of 9th will likely not be that low next year.

RAM I looked quite acceptable in the early spring rating, but experienced a leafspot invasion from which it did not recover. Based on this and the sod

evaluation, it would appear that RAM I should not be used in shady areas where leafspot is a problem. However, the recovery shown in the sodded test may give cause to re-evaluate such a statement after analysis of the 1980 data.

Table 1. Sodded Shade Bluegrass Variety Study
East Lansing (925)

Date Begun: 8-15-78 Date Evaluated: 9-21-79
Age of Study: 1 yr, 1 mo
Aspect of Quality: Hours of Solar Radiation Factors Affecting Quality: Mature Hard Maple Trees.

Relative Rank	Treatment Name	Hours*
1	Cheri	4.3 A
2	Vantage	4.0 A
3	Bonnieblue	3.8 A
4	Victa	3.8 A
5	Sydsport	3.7 A
6	A-34	3.6 A
7	Enmundi	3.6 A
8	A-20-6	3.5 A
9	Aquila	3.5 A
10	Nugget	3.5 A
11	Baron	3.4 A
12	Birka	3.4 A
13	Adelphi	3.2 A
14	Brunswick	3.2 A
15	Glade	3.0 A
16	Parade	3.0 A
17	Ram I	3.0 A
18	Bristol	2.9 A
19	Majestic	2.8 A
20	Merion	2.8 A
21	Newport	2.8 A
22	Park	2.8 A
23	Plush	2.8 A

*Treatments having the same letter are not significantly different. Mean separation by Duncan's MRT (5%). Standard Error = .5

Table 2. Seeded Shade Bluegrass Variety Study
East Lansing (924)

Date Begun: 9-5-78 Date Evaluted: 9-21-79
Age of Study: 1 yr, 1 mo

Aspect of Quality: Hours of Solar Radiation Factors Affecting Quality: Mature Hard Maple Trees.

Relative Rank	Treatment Name	Hours*
1	Nugget	4.3 A
2	Trenton	4.1 AB
3	K6-31	3.9 AB
4	Majestic	3.9 AB
5	Glade	3.8 AB
6	WTNj-H7	3.8 AB
7	SH-2	3.7 AB
8	Ram I	3.5 AB
9	RR-10	3.5 AB
10	BAR 73-4	3.2 AB
11	K3-160	3.2 AB
12	WTN-N1	3.2 AB
13	Touchdown	3.0 AB
14	WTN-H6	2.8 B
15	A-34	2.7 B
16	Adelphi	2.7 B

*Treatments having the same letter are not significantly different. Mean separation by Duncan's MRT (5%). Standard Error = .4

Table 3. Sodded Shade Bluegrass Variety Study.

Relative Rank	Treatment Name	Quality Rating Average for 1979 (1-9; 9 Superior)
1	Bristol	7.3
2	A-34	7.1
3	Nugget	6.8
4	Cheri	6.6
5	Enmundi	6.2
6	Adelphi	5.6
7	A-20-6	5.6
8	Brunswick	5.5
9	Sydsport	5.4
10	Birka	5.1
11	Aquila	4.9
12	Parade	4.8
13	Ram I	4.8
14	Glade	4.5
15	Bonnieblue	4.4
16	Park	4.0
17	Vantage	3.9
18	Majestic	3.7
19	Plush	3.0
20	Newport	2.8
21	Baron	2.0
22	Merion	2.0
23	Victa	1.6

Date Sodded: 8-15-78

Table 4. Seeded Shade Bluegrass Variety Study.

Relative Rank	Treatment Name	Quality Rating Average for 1979 (1-9; 9 Superior)
1	WTN-H6	6.3
2	Touchdown	5.4
3	Nugget	5.2
4	WTN-N1	5.2
5	Trenton	4.9
6	K3-160	4.9
7	SH-2	4.9
8	A-34	4.8
9	RR-10	4.6
10	K6-31	4.5
11	BAR 73-4	4.4
12	Glade	4.1
13	WTN-H7	4.1
14	Adelphi	3.9
15	Majestic	3.9
16	Ram I	3.5

Date Seeded: 9-5-78