Stop #8

Resistance of Kentucky Bluegrass Cultivars to Necrotic Ring Spot

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Necrotic ring spot (NRS), is an extremely devastating disease of Kentucky bluegrass (Poa pratensis) in Michigan. NRS is caused by the root infecting fungus Leptosphaeria korrae. Symptoms appear as depressed frog-eye type patches ranging in size from 7 centimeters to 1 meter in diameter. Red to yellow blades of grass appear in the infected area when the disease is active in the cool weather of spring and fall. During hot dry weather the affected blades wilt and turn straw colored.

Current disease management strategies include application of fungicides such as fenarimol (Rubigan), propiconazole (Banner), and iprodione (Chipco). Cultural strategies include regular applications of organic fertilizers like Lawn Restore, or Sustane, combined with daily irrigation. Overseeding or re-establishment with resistant varieties may be another alternative, although there remains some discussion as to selection of resistant varieties. Studies performed by J. Steward, 1985, found Adelphi, Majestic, Merion, Midnight, Mystic, Park, Vantage and Wabash to have good resistance to NRS, while Burke, Columbia, Georgetown, Glade, Haga, Nassau, Ram I, Sydsport, and Trampas had many patches. The purpose of this investigation was to examine existing and newly developed Kentucky bluegrass cultivars for resistance to necrotic ring spot in Michigan.

Twenty-five cultivars of Kentucky bluegrass were established from seed on an Owosso-Marlette sandy loam soil in 1985 at the Hancock Turfgrass Research Center, Michigan State University, East Lansing, MI. Cultivars were established in 4 by 6 ft plots with three replications. The area is mowed 3 times per week at 1.75 inch and irrigated on an "at wilt" basis to promote disease expression. On 2 June, 1988, wheat seed grown L. korrae was sliced into the soil-thatch interface. Each cultivar received nine inoculations (three per plot) with 6-8 infested seeds per inoculation. Symptoms of NRS first appeared six weeks later. At present, disease development has been monitored for two years and L. korrae is frequently re-isolated from the edge of active rings.

On 15 July, 1990, the number and size of ring spots, and percent disease was recorded. At this time the pathogen was inactive but existing rings were expressed due to drought stress. Disease ratings were subjected to statistical analysis and treatment means were analyzed using Duncan's multiple range test (Table 5). The cultivars Monopoly, Able I, Midnight, and Eclipse showed no sign of disease, while Mystic, Kenblue, and America had good resistance. Georgetown, Welcome, Ram-1, A-34, Sydsport had many rings and large areas of infected turf.

Table 5. Resistance of 25 varieties of Kentucky bluegrass to necrotic ring spot. Hancock Turfgrass Research Center, Michigan State University. Rating taken 15 July, 1990, two yr after inoculation.

Variety	average number of rings/plot	ring size#			total rings	average % area infected@
		1-3"	3-6"	6-9"		
Monopoly	.0 D*	0	0	0	0	0.0 C
Able I	.0 D	0	0	0	0	0.0 C
Midnight	.0 D	0	0	0	0	0.0 C
Eclipse	.0 D	0	0	0	0	0.0 C
Mystic	.7 CD	2	0	0	2	1.7 BC
Kenblue	.7 CD	1	1	0	2	2.3 BC
America	.7 CD	0	0	2	2	5.0 ABC
Merion	1.0 BCD	3	0	0	3	2.7 BC
Glade	1.3 ABCD	1	3	0	4	6.7 ABC
Challenger	1.7 ABCD	2	3	0	5	8.0 ABC
Baron	1.7 ABCD	3	1	1	5	8.7 ABC
Bristol	1.7 ABCD	3	0	2	5	8.7 ABC
Victa	1.7 ABCD	1	1	3	5	11.0 ABC
Aquila	2.0 ABCD	3	0	3	6	11.7 ABC
Parade	2.3 ABCD	2	1	4	7	12.7 ABC
Cheri	2.3 ABCD	2	1	4	7	12.7 ABC
Rugby	2.7 ABCD	6	0	2	8	13.3 ABC
Trenton	2.7 ABCD	1	1	6	8	17.7 ABC
Blacksburg	3.0 ABC	3	3	3	9	15.0 ABC
Merit	3.0 ABC	1	5	3	9	18.3 ABC
Georgetown	3.3 ABC	4	3	3	10	21.0 AB
Welcome	3.3 ABC	1	4	5	10	23.3 A
RAM-1	3.7 AB	5	2	4	11	18.3 A
A-34	4.0 A	3	3	6	12	22.7 A
Sydsport	4.0 A	8	1	3	12	22.7 A

#Number of active rings measured and grouped according to size.

@Percent area infected based on visual readings.

*Treatments followed by the same letter are not significantly different from each other at P=0.05, Duncan's multiple range.