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This publication includes lecture notes of papers presented at the 2005 New Jersey Turfgrass Expo. 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.

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Dr. Ann Brooks Gould, Editor
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EVALUATION OF KENTUCKY BLUEGRASS CULTIVARS AND SELECTIONS FOR POWDERY MILDEW RESISTANCE

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One of the major diseases of Kentucky bluegrass cultivars grown environments that are shaded or have low light intensity or poor air circulation is powdery mildew, which is caused by the fungus *Blumeria graminis* (Smiley et al., 2005). Powdery mildew first appears on the leaves of the plant as small, superficial patches of white mycelia (Turgeon, 2005). Over time, these patches enlarge and rapidly coalesce to cover much of the leaf surface, resulting in chlorotic leaves that may die (Smiley et al., 2005; Turgeon, 2005). Infected turfgrass has the appearance of being dusted with flour (Turgeon, 2005). *Blumeria graminis* is an obligate parasite, feeding on living plant tissue for survival. It overwinters as mycelial mats on live plants or as cleistothecia on dead plant tissue (Turgeon, 2005).

Conditions favoring the disease occur in the spring and fall during cool (65 ^{o}F), humid, and cloudy periods. Powdery mildew becomes especially severe on Kentucky bluegrass grown in shaded environments that receive heavy amounts of nitrogen fertilizer (Turgeon, 2005). Powdery mildew can also be seen on Kentucky bluegrass plants grown in cool, moist greenhouses, especially during winter months when light intensity is low.

There are several options to choose from when determining how to control powdery mildew. One option is to use fungicides, which has been shown to be an effective means of controlling this disease (Turgeon, 2005). In addition, cultural practices, such as the pruning of trees and shrubs, can help to increase light penetration and air circulation, which reduces disease severity. The most effective control strategy, however, is to use disease resistance cultivars of Kentucky bluegrass in shaded sites where the disease is common.

PROCEDURES

During the winter of 2006, 110 entries from the 2005 National Kentucky Bluegrass Test sponsored by the National Turfgrass Evaluation Program (NTEP) were established under greenhouse conditions to evaluate powdery mildew susceptibility.

Entries were sown by hand using a maximum of 0.08 g of seed per 3.5 X 3.5 inch pot (2.0 lb/1000ft^2). Pots were arranged in a randomized complete block design with four replications on 21 December, 2005. The seedlings were fertilized with 0.75 g nitrogen/ 1000 ft^2 using water-soluble fertilizer (20-20-20). Plants were inoculated with the powdery mildew fungus by placing diseased plants in close proximity to the study area 3 weeks after planting. Plants were periodically moved within replicates to ensure uniform infection. When disease symptoms began to appear, pots were watered at the base of the plant to minimize spread. Once disease symptoms were present, seedling were rated on a 1 to 9 scale, where 9 represented the least disease. Three disease ratings were taken while the disease was present, and the average of these ratings is presented in Table 1. Seedlings were also measured for plant height on February 28. This was done by measuring from the base of the crown to the average leaf tip of each plant.

RESULTS

Results are presented in Table 1. Entries are ranked according to the powdery mildew resistance. Kentucky bluegrass has a wide range of genetic diversity and this is evident by the wide range of resistance to powdery mildew among test entries (Table 1). Cultivars such as Prosperity, Avid, and Belissimo

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exhibited excellent resistance to powdery mildew. Moderate resistance was seen in cultivars such as Glenmont and Argos. Rugby II, Award, NuGlade, and Baron exhibited very poor resistance to powdery mildew.

Growth rates of the Kentucky bluegrass cultivars and selections varied greatly. Cultivars such as Julia, Impact, and Rhythm exhibited the greatest rate of growth (Table 1). Cultivars with a medium growth rate were Everglade, America, and Prosperity. Belissimo, Diva, and Glenmont were among the shortest of Kentucky bluegrass cultivars evaluated.

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Table 1. Performance of Kentucky bluegrass cultivars and selections in a greenhouse trial established in 2005 at New Brunswick, NJ. (Includes all entries of the 2005 Medium-High Maintenance Test - NTEP.)

	Cultivar or Selection	Powdery mildew[1] Avg.	Plant Height (cm)
1	DLF 76-9075	8.9	10.4
2	1QG-38	8.9	8.8
3	Prosperity	8.9	9.0
4	PSG 711	8.9	8.0
5	Avid	8.8	11.4
6	Belissimo	8.8	8.1
7	STR 2553	8.8	8.7
8	PST-101-73	8.8	7.8
9	BAR VV 0665	8.7	11.2
10	Bd 99-2103	8.6	7.1
11	MSP 3723	8.6	8.4
12	Bd 03-159	8.5	9.3
13	MSP 3724	8.5	8.4
14	A00-1400	8.5	9.5
15	H98-701	8.5	8.4
16	Kenblue	8.4	12.3
17	Bd 03-84	8.4	8.1
18	STR 2485	8.4	13.0
19	SW AG 514	8.3	10.5
20	A00-247	8.3	7.9
21	A99-3119	8.3	8.1
22	RAD-0AN64	8.2	9.8
23	STR 23180	8.2	10.6
24	America	8.2	9.0
25	Bd 98-2108	8.1	8.1
26	Washington	8.1	11.6
27	Reveille	8.1	10.5
28	Diva	8.1	7.9
29	POPR 04594	8.0	11.3
30	A97-1287	7.8	8.6
31	Bd 95-1930	7.7	11.3
32	RAD-343	7.7	10.8
33	PST-Y2K-169	7.6	9.1
34	LTP-73	7.6	7.8
35	LTP-149	7.6	10.0

(Continued)

Table 1 (continued).

	Cultivar or Selection	Powdery mildew[1] Avg.	Plant Height (cm)
36	RAD-762	7.6	10.7
37	A01-299	7.5	9.2
38	RAD-504	7.4	10.4
39	Zinfandel	7.4	8.3
40	Blueberry	7.3	8.6
41	PSG 366	7.3	9.0
42	STR 2703	7.2	9.7
43	DP 76-9081	7.1	9.9
44	PST-109-752	7.1	9.9
45	Glenmont	6.9	6.9
46	MSP 3722	6.7	8.1
47	NA-3257	6.4	9.7
48	DP 76-9066	6.3	9.6
49	Argos	6.3	8.6
50	NA-3248	5.9	9.4
51	H94-305	5.8	11.1
52	CPP 821	4.8	7.8
53	NA-3271	4.8	10.9
54	Bewitched	4.8	8.1
55	Mystere	4.8	10.2
56	CPP 817	4.5	11.2
57	CPP 822	3.8	8.5
58	CP 76-9068	3.4	9.0
59	A99-2559	3.0	11.0
60	NA-3261	2.9	11.4
61	PST-101-390	2.9	10.4
62	Harmonie	2.8	8.8
63	Bariris	2.8	12.0
64	BAR VV 0709	2.7	9.9
65	Julia	2.6	13.3
66	Dynamo	2.6	11.8
67	Barrister	2.6	11.0
68	NA-3249	2.5	11.1
69	Bluestone	2.5	11.7
70	A01-349	2.4	7.4
71	A95-410	2.3	11.5
72	J-2791	2.3	11.6
73	A00-1254	2.3	11.4
74	J-1466	2.2	12.3
75	Everest	2.2	12.1

(Continued)

Table 1 (continued).

	Cultivar or Selection	Powdery mildew[1] Avg.	Plant Height (cm)
76	Impact	2.2	12.5
77	SPTR 2959	2.2	9.2
78	NA-3259	2.2	9.9
79	BAR VK 0710	2.2	10.8
80	Shamrock	2.1	10.8
81	A98-689	2.1	11.7
82	J-1326	2.1	10.8
83	Nu Destiny	2.1	11.5
84	Beyond	2.1	12.0
85	A98-999	2.1	10.0
86	BAR VV 9630	2.1	9.2
87	NuGlade	2.0	10.2
88	SPTR 2LM95	2.0	10.7
89	PST-1A1-899	2.0	12.0
90	BAR VV 8536	2.0	11.0
91	Midnight	1.9	9.8
92	J-1334	1.9	12.9
93	J-2404	1.9	11.6
94	Rugby II	1.9	10.4
95	Rhythm	1.9	12.5
96	Bd 98-1358	1.8	9.6
97	A98-948	1.8	10.4
98	J-2399	1.8	9.3
99	J-2870	1.8	11.8
100	J-3429	1.8	11.7
101	Excursion	1.8	10.5
102	A97-890	1.8	11.0
103	Everglade	1.8	9.6
104	Award	1.8	10.4
105	Baron	1.8	10.6
106	AKB449	1.8	11.5
107	Skye	1.7	8.9
108	J-2502	1.6	12.0
109	BAR VV 9634	1.6	9.6
110	J-2024	1.4	9.9
	LSD at 5% =	0.8	2.0

[1]9 = least disease