Identification, Pathogenicity, and Control of Leaf and Sheath Blight of Bermudagrass Putting Greens

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Objectives:

1. Collect isolates of *R. zeae* from symptomatic bermudagrass and complete Koch's postulates in greenhouse tests.
2. Determine the influence of Primo and thiophanate-methyl and Heritage treatments on disease severity.
3. Determine the effects of various rates of N and K on disease severity and control.

Start Date: 2007
Project Duration: two years
Total Funding: $6,000

In recent years there has been an increasing frequency of occurrence of 'leaf and sheath blight' caused by *Rhizoctonia zeae* (or related fungi) on bermudagrass putting greens. In South Carolina, *R. zeae* is a well documented pathogen of creeping bentgrass putting greens, causing brown-patch like symptoms in the heat of summer. The fungus has been identified and pathogenicity documented as well on St. Augustinegrass, centipedegrass, and seashore paspalum. In all cases, the disease has not been controlled with benzimidazole fungicides, as *R. zeae* is essentially immune to that chemistry.

Recent outbreaks have occurred on all of the common ultradwarf bermudagrass cultivars on putting greens ('TifEagle', 'Champion', and 'MiniVerde') as well as 'TifDwarf' and even 'TifGreen' in the southeastern United States. Generally, the disease is first noticed in late August to early fall months. Initial symptoms are bronze patches of a few cm up to 100 or more cm in diameter. If not controlled quickly with fungicides, the pathogen blights and bleaches the lower leaves that results in a persistent distinct patch symptom. Disease has been known to recur in spring months after turf emerges from dormancy and presumably can detrimentally affect spring transition in overseeded systems.

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Fungicide	Exp No.	Rate	Spray Dates	Disease Severity (%)
Heritage TL	1	1.0 fl oz/1000 ft^2	July 15, 29 and August 12	66.8 a
Endorse	1	4 oz/1000 ft^2	July 15, 29 and August 12	62.8 a
Tartan	1	2 fl oz/1000 ft^2	July 15, 29 and August 12	51.8 ab
Trinity	2	2 fl oz/1000 ft^2	July 15, 29 and August 12	35 b
DisArm	1	0.27 fl oz/1000 ft^2	July 15, 29 and August 12	55.8 ab
Banner Maxx 1.3 ME	1	1 fl oz/1000 ft^2	July 15, 29 and August 12	45.5 ab
Insignia	1	0.9 oz/1000 ft^2	July 15, 29 and August 12	60.5 ab
Fore + Chipco Signature	1	8 + 4 oz/1000 ft^2	July 15, 29 and August 12	59.5 ab
Untreated	1			61.3 a

Table 1. *Single component fungicides, rates and timings for early curative control of* Rhizoctonia *leaf and sheath spot in bermudagrass putting greens.*

In several instances, stress induced by aggressive verticutting has induced severe outbreaks of persistent disease symptoms. Low nutrition or reduced recuperative potential by any of the reasons outlined would be expected to increase disease severity. In the summer and fall of 2008, the disease again occurred on several golf courses in South Carolina and throughout portions of the southeastern United States. Cultivars were 'TifEagle', 'Champion', 'TifDwarf', 'MiniVerde', and 'TifGreen'.

Identification of *R. zeae* has been based solely on cultural characteristics, based primarily on sclerotia size and abundance. Recently, however, molecular methods have been used to distinguish among *R. zeae, R. oryzae*, and *R. circinata*. Cultures have been recovered from bermuda patches that resemble (culturally) all three of these fungi. Molecular identification of these isolates will be conducted during the winter of 2008/09.

In 2007, three trials were conducted but went out curatively after symptoms became well established. Trials were placed in late September (Experiment 1) and late October (Experiment 2) when symptoms were severe and day length and temperatures were not favorable for bermudagrass growth. In 2008, trials were conducted on a chipping green in Columbia, SC and a putting green near Florence. Intentions were to initiate the trials in July prior to symptom expression, but symptoms already were present when the trials were established.

Only Heritage gave some control in the single component fungicide trial. In another experiment, however, we looked at a 'program' approach of rotation of fungicides and fungicide mixtures with one set of treatments watered-in before sprays dried, and the other set left on the leaf. We did observe that watering-in the fungicides made a positive difference, and these trials gave us some evidence that preventive treatments have to be initiated much earlier than we first supposed.

Summary Points

- Leaf and sheath blight caused by *Rhizoctonia zeae,* and related fungi, on bermudagrass putting greens has not been controlled with benzimidazole fungicides.
- Molecular methods have been used to distinguish among *R. zeae, R. oryzae*, and *R. circinata* and will be conducted during the winter of 2008.
- Fungicide trials were conducted in 2007 and 2008. Only Heritage gave some control in the single component fungicide trial.
- Watering-in fungicides made a positive difference and suggested preventive treatments have to be initiated much earlier than first supposed.