



Brown Patch Pounces Again

By Dr. Gayle L. Worf
Department of Plant Pathology
University of Wisconsin—Madison

Rhizoctonia brown patch is one of the first diseases taught to fledgling turf students. It's a classic disease. Brown patch is, in fact, the first disease to be recognized as a golf course disease problem. This came about in 1914, in Philadelphia, in a turf garden. At that time, both turf maintenance and turf pathology were still in their infancy, but enough was known about causation of plant disease to know how to isolate the suspect fungus, put it back onto turf in the greenhouse, reproduce the symptoms and re-isolate the suspect pathogen from the recently inoculated and killed grass (complete Koch's Postulates, as this process is known). The disease undoubtedly occurred earlier, but according to the early accounts, it was overlooked because turf was not being as well maintained (and therefore less susceptible, possibly), but it was easier to recognize a malady once grass culture improved. Of greater significance: it was simply assumed that grass often naturally "died out" during warm summer times! (Sounds familiar, doesn't it?)

Interestingly enough, Bordeaux fungicide was around at that time, being used for brown rot control in peach orchards, late blight in potato fields, scab control for apples, and a number of other crop diseases. So it was only natural that it was tried on turf. It worked. But Bordeaux contains copper, which is toxic to grass, especially after repeated applications or too high rates.

R. solani, the incitant of brown patch, is an extremely variable fungus. It can attack many different crops when the conditions are favorable. Usually those conditions are high temperature, high moisture or humidity, and an abundance of lush, soft growth. The same is true with turf.

By this time you're in tune with the fact that *R. solani* is only one of several different species of Rhizoctonia causing turf diseases. Yellow patch is caused by *R. cerealis* and is sometimes called cool season brown patch.

We're learning more about *R. zeae*, the cause of Rhizoctonia sheath and leaf spot disease. The book says that *R. cerealis*, *R. solani*, and *R. zeae* grow best at 72, 82 and 90 degrees F, respectively. But we've come to appreciate considerable range, I think especially with the brown patch fungus. It appears that we need to loosen up a bit in our thinking as to when brown patch can get started, temperature-wise. Of five cultures we tested last winter, four of them were more pathogenic at 20°C (68°F) than at 32°C (90°F). And the one that was active at high temperatures turned out to be *R. zeae*!

And that fits with what we encountered several times this summer. The temperatures were not really that uncomfortable when disease was active. Sometimes it was downright cool!

So why did we have so much disease this year? I'm not really sure, at the moment, but we did have some very extended, wet periods. Again, the book says it takes leaf wetness for periods longer than 12 hours. During August when several superintendents reported brown patch troubles, we were encountering days and nights of rain or high humidity, brief periods of 90 degree weather, but mostly cool conditions. Extended wet weather appears to be much more important than warm weather.

Rhizoctonia grows over the surface of the grass before it invades. It must build up at least some inoculum load before it does severe damage. The fungus is actually not a very good competitor with other organisms. In fact there has been quite a bit of research, mostly on other crops but a little on turf, looking at competition with other organisms as a way to combat the disease without use of chemicals. It's quite conceivable that something happened this summer to lower, or knock out competitive organisms, and thus to give Rhizoc a better chance.

A number of studies over the years have pointed out influence of nutri-

tional conditions, especially nitrogen, and most of us know to avoid succulent turf to help with brown patch control. Some other cultural methods suggested to control brown patch include keeping the grass mowed with a sharp blade to reduce damaged leaf tips; collecting clippings during hot, humid weather to eliminate the starting food base for the fungus; eliminate prostrated turf, which is closer to the ground and more easily attacked; slightly lowering the mowing height of taller turf to improve air circulation; selectively pruning nearby trees and shrubs for the same reason; providing optimum surface and subsurface drainage; don't irrigate unless the soil is dry, then making sure the turf dries off before nightfall, and removing morning dews. I'll leave it to you how many, or how effective and realistic these approaches may be for you.

Of course, fungicides are first lines of defense for golf courses. And a number of products are registered, in fact, nearly all turf products are. But superintendents disagree on which one is best. Benomyl is regarded as outstanding in some states, but it has failed miserably against sheath and leaf spot Rhizoc. Sterol inhibitors effectiveness is a subject that usually draws debate. The older standards, such as Daconil and Fore may be the most dependable. Newer products such as Chipco 26019 and ProStar are supposed to be effective.

You have reason to ask why we are not more emphatic about fungicide efficacy for Rhizoctonia control in Wisconsin. It turns out that we have rarely encountered the disease in our plots over the 20 years we've been testing. This past summer we elected to do something about that, and with Tom Harrison's help at Maple Bluff, we inoculated areas with two different Rhizocs. We didn't get much disease. That's what other pathologists report with field inoculations. It probably goes back to those conditions we were talking about earlier. But what was frustrating to us is that the disease was popping up elsewhere around town, where we didn't have plots! Fortunately, it did occur in one location where we had a summer patch/anthracnose study, with Monroe Miller. We got some interesting results there which we are looking forward to sharing with you at the winter meetings.