Pythium or Rhizoctonia— a serious question this summer!

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None of us were mentally prepared for the early and persistent warm wet start-up we experienced this summer. But when it came, it re-wrote the disease patterns we normally expect. Whoever heard of Pythium occurring in May, for heavens sake! Few superintendents had preventive applications laid down before Memorial Day. But lots did soon afterwards!

One big problem that occurs when something out of the normal in the way of disease development takes place is the uncertainty of diagnosis. To be sure, when classical symptoms of Pythium "grease spot" occurs, along with quite a bit of white fluffy mycelium, we feel pretty secure with a visual diagnosis. Or when the traditional smoky ring occurs, and the disease seems to run through the turf blades in an outward radiating, but somewhat hit-or miss fashion (e.g., not every blade is affected), we think "Rhizoctonia" or "brown patch". Trouble is, classical symptoms don't always develop. And if you look at the affected spot a day or so after symptoms have started, you miss the benefit of early details. Add to that the fact that some other problems can be confused at times, including chemical injury, localized dry spots, take-all patch, etc. So—how **do** you diagnose Pythium and brown patch!?

One way is history—what you've seen before with similar symptoms.

Another is submitting a sample to the disease diagnostic clinic. The diagnostician can look for sudden collapsed foliage and see whether dark-colored right angle-branched hyphae are present in some abundance in or on the leaf blades. If so, "Rhizoc" will be the diagnosis. If the hyphae is finer, white in color, and lacking in cross-walls, Pythium is the diagnosis. Both of these can collapse and disappear, or be over-run by saprophytic fungi real easily, which makes such a quick detect impossible. (That's why a good fresh cross-section of symptomatic turf is so important to the laboratory). One can then resort to looking for the fruiting and survival structures (oogonia and oospores), and if enough of these are found, the diagnostician can feel pretty secure with a Pythium diagnosis. Isolations are a last resort, but this takes more time for both the technician and the superintendent. Two days is really minimum.

TABLE 1.

Rhizoctonia Pathogenicity on Bentgrass

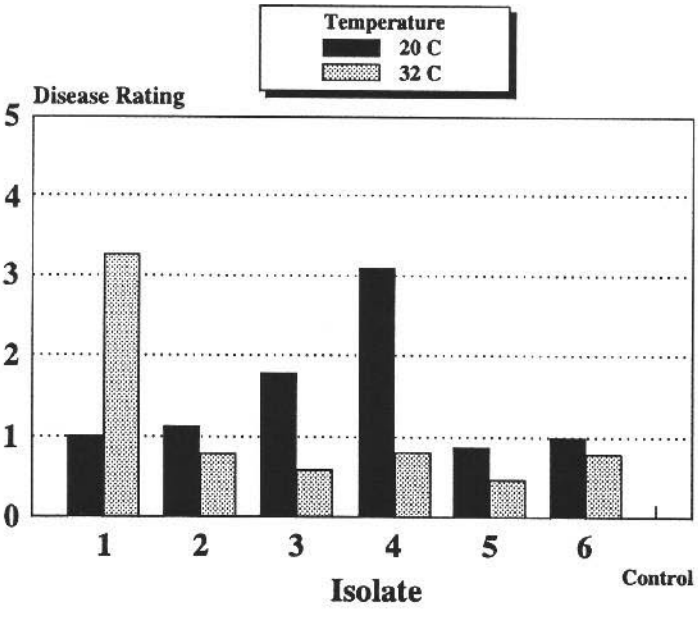
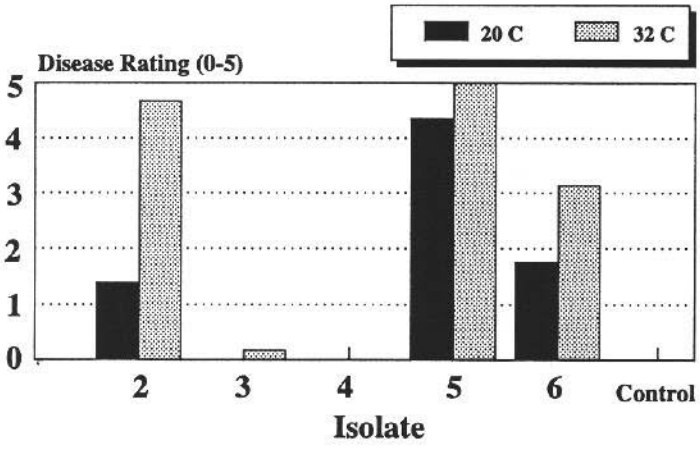


TABLE 2.

Pythium Pathogenicity Test on Bentgrass



We really should be using the field diagnostic kits more, I believe. They clearly have their limitations. The brown patch kit won't detect the "high temperature brown patch", caused by *R. zeae*, and officially referred to as Rhizoctonia sheath and leaf spot." We have a little of that in Wisconsin. Nor will it detect "cool temperature brown patch", or yellow patch, caused by *R. cerealis*. But the symptoms aren't the same. You wouldn't be checking that turf, anyway. But you know that you are dealing with Pythium when you get a positive—the same for brown patch.

Temperature responses of Pythium and brown patch.

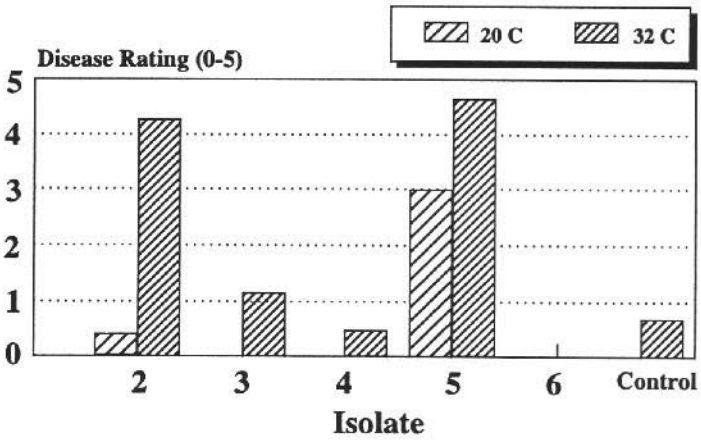
Another fact we are facing up to these days is a greater appreciation of the diversity of temperature responses we are seeing. We commonly think of these as "high temperature" problems. In Table 1 we look at the results of some growth room studies we did two winters ago, at two temperatures (20 C = 68 F, and 32 C = 90 F), with 6 cultures of *Rhizoctonia* taken from several different grasses. Only "1" was severely pathogenic at this high temperature, while two were more

damaged at 68 F! We couldn't test at in between temperatures, which may have been more favorable to the other cultures.

Take a look at tables 2 and 3 for results of similar studies with Pythium, this time with bentgrass versus annual blue-

TABLE 3.

Pythium Pathogenicity Test
Poa annua



grass responses. First of all there are some differences in reaction between the two grasses. Isolate "6" was damaging to bentgrass at both temperatures, especially the higher, but did nothing to Poa—at either temperature. Isolate 2 attacked bentgrass at both temperatures, but only caused damage to Poa at the higher temperature.

This was not an exhaustive study, but the Pythium research makes two important points: (1) grasses vary in their susceptibility to different "strains" of the same disease, so you can't live with the idea that you are inherently "safer" with one species or the other, and (2) Pythium—like Rhizoctonia—may start at lower temperatures than commonly thought. These results are not revolutionary, by the way, but it is interesting to see how it shows up with Wisconsin isolates. And of course these are isolates from around the state. They don't all occur on any one golf course! Your strains may follow a very predictable pattern for you—I hope so.

Is there a lesson among all these comments? Well, I don't believe we should despair, first of all. But we should be more sensitive to the variabilities and vicissitudes of nature. And do what we can to keep on track of what may be causing peculiar patterns and disease responses on our own course. And then act accordingly!

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