

The Basic Biology and Etiology of *Sclerotinia homoeocarpa*, The Causal Agent of Dollar Spot

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Objectives:

1. *Examine the development, including possible apothecial production, of the pathogen in creeping bentgrass greens and fairways when present in leaf tissue, in root tissue or as isolated stroma and to determine the length of survival of the pathogen in infected tissue or as stroma.*
2. *Measure the genotypic variation of the pathogen from similar and diverse geographical locations using RAPD analysis and anastomosis groupings.*

Mesh bags containing an isolate of the fungus were buried in a bentgrass green and then retrieved at various times throughout the year. Upon examination, we found that the fungus exhibited two distinct growth phases. One phase grows rapidly and is characterized by copious amounts of hyphae. The other phase is slow growing with smaller colonies for about seven days and then a sudden burst of rapid growth typical of the first phase.

We hypothesize that *S. homoeocarpa* is present most of the time on turf in a dormant, nonpathogenic state. When directed by environmental or other cues, the fungus suddenly grows rapidly and becomes pathogenic, causing an explosive, epiphytotic.

In order to examine the natural infection of dollar spot, colored tees were used to mark certain dollar spots from which turf samples can be taken repeatedly over time. Non-symptomatic areas were also marked. As expected, samples taken in August (when dollar spot was infective) showed the actively growing phase but not the dormant phase. In November, we expect to see the dormant phase of the fungus since the infection phase is finished. Sampling will then resume in the spring, when we once again expect to see the dormant phase, and will continue into late summer when dollar spot epiphytotics usually occur in upstate New York.

Epiphytotics of dollar spot can occur at various times, in different areas of the United States and pathogenicity levels can vary depending on turfgrass cultivar. Understanding the genetic diversity of *S. homoeocarpa* is important for controlling and managing the disease. Thus, we collected over 50 isolates of the dollar spot fungus from around the US and Canada to determine their genetic relatedness using RAPDs and anastomosis groupings. Our results are as follows:

- Great diversity exists among collected isolates of *S. homoeocarpa*
- Only a few isolates share the same overall binding pattern, mostly those from the same location and the same cultivar of turfgrass.
- The isolate sh105ko demonstrates an unusual growth pattern during anastomosis pairings: it coils, around the hyphae of the other isolate 'similar to coiling characteristic of biocontrol interactions.

Upcoming research. Mitochondrial DNA (mDNA) assays will be performed to provide a more complete genetic survey of the isolates. Cladistic analyses will be completed to obtain groups with most similar and most dissimilar genotypes. We will determine whether dissimilar genetic types have similar or different modes of infection and levels of pathogenicity to bentgrass. We will continue to isolate and observe the pathogen from bags in soil and from naturally infected turf.