

Biological Management of Dollar Spot

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Dollar spot, caused by *Sclerotinia homoeocarpa*, is one of the most common diseases of high maintenance turfgrasses. Although chemical fungicides can effectively manage this disease, both the development of resistance to certain classes of fungicides and public concerns over fungicide use have prompted research for alternative management strategies. Considerable progress has been made in recent years toward the development of effective biological control agents to manage dollar spot.

Research at Michigan State University toward this goal has focused on the application of the bacterium *Pseudomonas aureofaciens* strain Tx-1, a soilborne bacterium which produces antifungal compounds. Last year's field study showed that application of this bacterium three times a week could reduce dollar spot incidence by up to 60 %. The high frequency of application is required in order to maintain high populations of this antagonistic bacterium on the turf foliage. If the bacteria are not reapplied frequently, the populations decline due to ultra-violet radiation, competition, and removal through mowing. The practicality of this approach has been made a reality through the development of on-site fermenter systems which allow the golf course superintendent to grow the bacteria overnight and make applications daily through the irrigation system.

This year's field study further examines the effectiveness of this bacterium to manage dollar spot. The frequency of application of bacteria has been increased from three to five times per week to better simulate daily applications. Unlike last year's study, the bacteria are applied late in the afternoon to reduce mortality due to ultra-violet light. A set of treatments has been added in which the bacteria are grown for a period of two days and applied once and twice a week. These have been added to simulate application of the bacteria under conditions in which application through an irrigation system is not possible, and the bacteria must be dumped from the fermenter system into a spray unit to be sprayed manually.

In addition to testing the frequent application of *Pseudomonas aureofaciens* Tx-1, several other biological control treatments are being tested, including two commercial biological products. A final treatment an organic carbon source which is applied to stimulate the biological activity of microbes present in the turf. This may enhance the natural microbial flora's ability to suppress populations of pathogenic fungi.