

Successful Biological Control and Fungicide Combinations for Control of Dollar Spot on Poa.

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Introduction

The disease dollar spot, caused by *Sclerotinia homoeocarpa*, is a major disease of turfgrass on golf courses. Turfgrass managers use various chemical and cultural means to control dollar spot. In some cases the management of dollar spot is becoming more difficult due to the pathogen's increasing resistance to the DMI fungicides. Resistance, as well as other concerns, has led us to explore new directions and methods for controlling dollar spot. One of these new methods is the use of the bacterium, *Pseudomonas aureofaciens* (Tx-1). Tx-1 is a bacterium that produces compounds that inhibit the growth of *Sclerotinia homoeocarpa*. When applied daily at a concentration of 10^7 CFU/cm² concentrations, Tx-1 can significantly decrease the occurrence of dollar spot.

Materials and Methods

The study was conducted at the Hancock Turfgrass Research Center on annual bluegrass (*Poa annua*) mowed at .5 inches. Fertility was maintained at .5 lb. N/ 1000 ft² per month. Each treatment was replicated four times in a randomized complete block design on plots 4.5 x 2 ft. in area, with a one foot alley surrounding each plot. The Tx-1 bacterium was applied 5 days/week at a concentration of 1×10^7 - 2×10^7 CFU/cm², and the two fungicide treatments were applied once on August 19th. The study was initiated on August 15th and concluded on September 25th.

Results and Discussion

Previous research has shown Tx-1 to be effective in controlling dollar spot. One of our main objectives of this study was to determine the effects of Tx-1 applied daily in conjunction with a single fungicide application. Understanding this would be helpful for those managing dollar spot with Tx-1 in years with severe disease pressure. We found that this Tx-1/fungicide combination increased both the effectiveness and interval of fungicide control compared to a single application of the fungicide. Another important aspect of this study was to determine the effectiveness of Tx-1 in controlling dollar spot on fairway height annual bluegrass. Previous studies were conducted on greens height bentgrass (*Agrostis palustris*). It was important to verify the effectiveness of Tx-1 in controlling dollar spot on annual bluegrass because this grass species is prevalent on many golf courses. Two growth regimes for Tx-1 were tested. One treatment of Tx-1 was grown for 8 hours and one had a 24 hour growth period. The Tx-1 used in the commercial application system is grown for 8 hours compared to our standard research treatment of Tx-1 which is grown for 24 hours before application. A comparison of the 8 and 24 hour growths showed no negative effects of the shorter growth period. In another treatment, Tx-1 was applied once per week to observe the effects of a lower interval compared to Tx-1 applied 5 days/week. One application per week showed some reduction in dollar spot occurrence; however, this level of control was not sufficient for acceptable control of the disease.