

Dollar Spot Severity as Influenced by Nozzle Type and Fungicide Mode of Activity

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Objectives:

1. The primary objective of this study is to determine the influence of various nozzle types on dollar spot control when applied in lower water volumes.

Start Date: 2005

Project Duration: two years

Total Funding: \$6,000

Dollar spot (*Sclerotinia homoeocarpa*) is perhaps the most chronic and problematic disease of golf course turf throughout the United States. In New England, the disease often appears during late-spring or early-summer and remains active until the onset of colder temperatures during the autumn months. In recent years, many turf managers have reported a reduction in efficacy and length of control with regard to fungicides commonly used to manage dollar spot on golf course fairways. This reduced level of control may be attributed to the development of resistant strains of *S. homoeocarpa*, variation in fungicide application methods, and increases in fairway thatch levels, among others.

Field studies were established on golf course fairways in Connecticut and on research plots at the Plant Science Research and Education Facility in Storrs. Trials were conducted on monostands of creeping bentgrass (*Agrostis stolonifera*)

or mixed stands of creeping bentgrass and annual bluegrass (*Poa annua*). Fungicides were applied using different nozzle types designed to distribute varying droplet sizes. Nozzles were selected to produce droplet sizes ranging from extremely coarse to fine. All nozzles were used to apply an acropetal penetrant (propiconazole), a contact (chlorothalonil), and a tank mix of the two fungicides.

In 2006, a localized penetrant (iprodione) also was included in the evaluations. All fungicides were applied on a 14-day interval at the low recommended use rate for preventive control of dollar spot. Treatments were applied with a CO₂ pressurized (40 psi) sprayer equipped with a three-nozzle boom and calibrated to deliver 44 gal. water per acre.

Studies conducted on golf courses and at the University of Connecticut between 2005 and 2007 have revealed significant differences in the level of dollar spot control from varying nozzle types and fungicides. Although all fungicides reduced dollar spot when compared to untreated turf, nozzle type influenced the level and length of fungicidal control.

Data indicate that contact fungicides performed better when applied using nozzles that produced a medium or fine droplet size. Similar levels of control, however, were observed when chlorothalonil was applied using an air induction nozzle, which produces a coarse water droplet. When an acropetal penetrant was applied alone and dollar spot was severe, moderate to poor disease control was exhibited from all nozzle types except the air induction nozzle. Tank-mixes of the contact (chlorothalonil) and acropetal penetrant (propiconazole) generally provided

better control than when applied alone, regardless of nozzle type.

In a separate study, the ability to reduce *S. homoeocarpa* inoculum with fungicides applied early in the season was assessed on a Connecticut golf course fairway in 2006 and 2007. Various fungicides were applied on April 13, 2006 and April 24, 2007. Treatments were initiated after the second spring mowing and approximately 4 to 6 weeks prior to the appearance of dollar spot symptoms. In 2007, the influence of post-application irrigation was also assessed.

Disease pressure was considered high in both years and untreated plots had an average of 33% and 21% dollar spot on the final rating dates in 2006 and 2007, respectively. When compared to the untreated control, dollar spot was reduced 48% to 67% 5 weeks after the appearance of initial symptoms in 2006. In 2007, percent dollar spot was reduced between 68% and 87% when rated 6 weeks after initial symptoms appeared. Post-application irrigation did not positively or negatively influence the fungicides' ability to suppress disease. Results of these field experiments suggest that *S. homoeocarpa* may be active in the thatch, soil, or living plant tissues for up to one month prior to the appearance of dollar spot symptoms on golf course fairways.

Summary Points

- Fungicide efficacy for dollar spot control when applied at low water volumes (e.g. 1.0 gal./1,000 ft²) is influenced by nozzle type.
- Preliminary data suggests that early season suppression of dollar spot is not dependent on droplet size or post-application irrigation.
- In northern regions of the United States, *S. homoeocarpa* appears to be active in the thatch and/or soil for several weeks prior to the development of initial dollar spot symptoms.



Fungicides were applied using one of five nozzle types designed to distribute varying droplet sizes.