Effect of Rain and Mowing on Fungicide Performance for Dollar Spot Control in Fairway Bentgrass

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Objectives:

1. To determine the level of dollar spot control provided by chemically diverse fungicides applied approximately 30 minutes prior to a simulated rain event.
2. To determine if morning mowing to displace dew prior to fungicide application would impact fungicide performance compared to mowing a dry canopy at mid-day.

Start Date: 2006
Project Duration: two years
Total Funding: $6,000

The impact of rainfall and mowing timing on fungicide effectiveness is unknown. In 2006, it was shown that dollar spot (*Sclerotinia homoeocarpa*) control effectiveness of chlorothalonil was reduced when applied curatively and subjected to 0.25-inch simulated rainfall one hour after application. None of the fungicides evaluated in 2006 was impacted when applied preventively in early June when dollar spot pressure was low. In 2007, a 1.0-inch rainfall was simulated about 30 minutes after fungicides were applied and applications were begun in July, just prior to severe outbreaks of dollar spot. Turf in the experimental site was a blend of 'Crenshaw' and 'Backspin' creeping bentgrass (*Agrostis stolonifera*) and was maintained as a golf fairway.

Chlorothalonil (Daconil Ultrex, contact); boscalid (Emerald, acropetal penetrant); iprodione (Chipco 26 GT, localized penetrant); propiconazole (Banner MAXX, acropetal penetrant); and thiophanate methyl (3336 Plus, acropetal penetrant) target dollar spot and are chemically unrelated to one another. Only chlorothalonil is a contact protectant fungicide and therefore would not be expected to provide effective control for as long as the aforementioned penetrants.

All fungicides were applied initially on July 3, 2007. Daconil Ultrex was reapplied on July 26 and August 10 and Chipco 26GT, Emerald, and Banner MAXX were reapplied on July 31. Four blocks received approximately 1.0" of water within 30 minutes of each fungicide application. Four other blocks were not irrigated for several days or until there were visual symptoms of wilt, but no sooner than one day after fungicide application.

The irrigation system was calibrated with cans to ensure that water was uniformly distributed across each 5 ft x 10 ft subplot.

Subplots (5 ft. x 10 ft.) consisted of the five fungicide treatments and an untreated control. For sub-sub plots (5 ft. x 5 ft.), each plot was split in half and one half was mowed and clippings were removed when the canopy was wet in the morning just prior to the application of the fungicides (AM plots). Thereafter, the AM plots always were mowed in the morning in the presence of dew. The other half of each plot was mowed mid-day when the canopy was dry (PM plots) and clippings were removed the day after fungicides were applied. Thereafter, the PM plots were mowed mid-day when the canopy was dry.

Dollar spot was assessed by counting the number of *S. homoeocarpa* infection centers (ICs) per plot. A reapplication threshold was established when approximately 20 ICs appeared in at least two of the four replications in an attempt to ensure that none of the plots was severely blighted and unable to recover satisfactorily following re-treatment. In 2007, little or no dollar spot control was provided by thiophanate-methyl. An *in vitro* study showed that isolates from the site were resistant to thiophanate and these data will not be discussed.

Plots subjected to simulated rain 30 minutes after fungicide application generally had more ICs compared to plots that were not subjected to rain. Of the four fungicides evaluated, simulated rain affected the performance of Daconil Ultrex the most. Daconil Ultrex-treated plots subjected to simulated rainfall had significantly more dollar spot 13 out of 19 rating dates versus rain-free plots. Simulated rainfall affected the performance of Chipco 26GT least.

When data were averaged over all 19 rating dates and treatments, plots subjected to AM mowing had 54% fewer ICs than plots subjected to PM mowing. The percent of dollar spot reduction in AM versus PM mowing treatments for each fungicide and the control were as follows: Daconil = 36%; Banner MAXX = 48%; Emerald = 36%; Chipco 26GT = 52%; and control = 61%.

Summary Points

- Creeping bentgrass plots subjected to simulated rain and mid-day mowing sustained far more dollar spot injury than those that were rain-free and mowed in the morning.
- There were many more days when there were more infection centers in Daconil Ultrex-treated plots (i.e., a contact protectant) subjected to simulated rain versus the penetrant fungicides.
- In rain-free plots, Daconil Ultrex, Banner MAXX, and Emerald provided effective dollar spot control for about 8, 2, and 7 days longer versus simulated rain plots, respectively. Chipco 26GT was least affected by simulated rain since both treatments (i.e., rain vs rain-free) generally provided an equal level of dollar spot control.
- The lower level of dollar spot in plots mowed in the morning when the canopy was wet resulted in improved fungicide performance. Morning mowing resulted in a 48 to 64% reduction in dollar spot in fungicide-treated plots compared to plots mowed mid-day (dry canopy).