

Impact of post-application irrigation and pigment on the efficacy of spring fungicide applications targeted for large patch control

Principal Investigator(s):

G.L. Miller, and D.T. Earlywine

University of Missouri, Division of Plant Sciences, Turfgrass Pathology

Large patch, caused by *Rhizoctonia solani* AG2-2 LP, is a perennial disease that causes severe damage on zoysiagrass fairways in the United States transition zone. Control of this disease primarily relies on 2-3 fungicide applications per year, timed in the fall and spring in accordance with the disease infection period. Little research has been conducted to investigate fungicide application strategies aimed specifically at extending residual control and reducing the number of applications necessary.

Large patch, a foliar disease, infects the zoysiagrass towards the base of the leaf sheath. Utilizing less water carrier (1 instead of 2 gal H₂O/1000 ft²) is a common practice when applying fungicides aimed at large patch control to reduce the labor and time involved with more frequent trips to spray larger fairway acreages. When applying xylem mobile systemic fungicides, however, it may be critical to deliver the fungicide lower in the turfgrass canopy, and lower carrier volumes may be leading to a reduction in efficacy. Post-application irrigation may be an appropriate fungicide delivery method on zoysiagrass fairways, and provide more effective, long-lasting control.

In the last four years since being introduced to the turfgrass market, tebuconazole, a DMI fungicide, has increasingly been utilized for large patch control on zoysiagrass fairways due its effectiveness and low cost. More recently, Bayer CropScience released a tebuconazole formulation that includes its proprietary pigment branded Stressgard®, which may provide benefits in plant health and stress tolerance. Evaluation of the impact of this pigment vs. a non-pigmented fungicide on zoysiagrass greenup and large patch severity is an additional focus of this proposed research. The specific objectives of this research are to 1) investigate the impact of post-application irrigation on residual efficacy of single spring preventive fungicide applications targeted for large patch control on zoysiagrass fairways and 2) examine the effect of a pigmented tebuconazole formulation on zoysiagrass greenup and large patch severity, and determine if post-application irrigation has any influence on this effect.

A field research trial at Belk Park Golf Course in Wood River, IL was conducted in spring 2015. The site is an established ‘Meyer’ zoysiagrass fairway that had considerable large patch incidence in fall 2014, and was left untreated. Azoxystrobin (Heritage TL: 1.5 fl oz/1000 ft²) and tebuconazole (Torque: 0.6 oz/1000 ft² and Mirage: 1.08 fl oz/1000 ft²) were applied on April 6 – prior to greenup and April 27 – after 2 mowings. Fungicides were unirrigated for 24 hours or watered-in immediately with 0.1” or 0.25” of post-

application irrigation (3.1 or 7.8 gallons H₂O/50 ft² plot respectively). Irrigation was implemented with a simulator designed with a shut-off and flow valve, 8 Hunter irrigation heads, and a flow meter to measure water output.

Heavy rainfall from May 8 – 12 (4 inches), followed by sustained precipitation events at the site rendered the trial area saturated and under water until May 30 (**Fig. 2**). Results were presumably confounded by the persistent rain events, as ratings taken on 30 May through mid June showed no statistical differences among treatments (**Fig. 3**). This field trial will be repeated in 2016 at the MU Turfgrass Research Farm in Columbia, MO on plots inoculated in fall 2015.

- Fungicides applied in low volumes of water carrier may be less effective for pathogens that infect the lower leaf sheath.
- The effects of pigment containing fungicides on large patch severity and zoysiagrass greenup need to be investigated further.
- Heavy rainfall events confounded the results of this trial, as no treatment resulted in satisfactory control, and no differences were observed between treatments.

Table 1: Study Treatments
Fungicide
Heritage TL (1.5 fl oz/1000 ft ²)
Torque (0.6 fl oz/1000 ft ²)
Mirage (1.08 fl oz/1000 ft ²)
Timing
Early Spring (April 6)
Late Spring (April 27)
Post Application Irrigation
None
1/10" = 3.1 gallons/50 ft ² plot
1/4" = 7.8 gallons/50 ft ² plot

