Why Has It Been So Hard to Control Anthracnose These Past Few Years?

By Dr. Geunhwa Jung and Dr. Tae-hyun Chang, *Department of Plant Pathology, University of Wisconsin-Madison*

Had problems controlling anthracnose disease the past several summers? Well, there might be one possible explanation. Dr. Tae-hyun Chang, who joined my lab in December 2001, carried out a field experiment this past summer to test fungicide efficacy for controlling anthracnose at the Blackhawk Country Club in Madison, WI. Dr. Chang came from South Korea and has played an important role in turf research by developing a pink snow mold inoculation method, assisting graduate students with experiments, analyzing field research data collected over the past years, and preparing a refereed publication. As one of the outcomes, he attended the annual national meeting of American Phytopathological Science (APS) last summer and gave an excellent poster presentation titled "Efficacy of Fungicides on the control of Typhula Snow Molds in Turfgrass". The manuscript is now being prepared for publication. His work with fungicides for anthracnose will hopefully lead to equally beneficial results.

Recently, anthracnose basal rot, caused by *Colletotrichum graminicola*, has become an important disease in Wisconsin and I have been repeatedly stating that the efficacy of some controlling fungicides has been reduced. Our lab had the opportunity of running an experiment with the cooperation of the superintendent at the Blackhawk Country Club. The objective of the study was to evaluate four systemic fungicides and one contact fungicide for their efficacy of controlling the disease. Hopefully, we will not only find the most efficacious fungicides, but also gain biological insight as to why the reduced efficacy in some fungicides was reported.

Materials and Methods

Fungicides labeled for controlling the anthracnose disease which

were selected for this study are as follows: four systemic fungicides (Propiconazole, Triadimefon, Azoyxystrobin, and Thiophanate-methyl), one contact fungicide (Chlorothalonil), and one control (no chemical). The experimental plot was set up on fairway turf where more than 60% of the turf is estimated to be *Poa annua* species and the rest is creeping bentgrass. Over the years, high disease pressure has been consistently observed at that location. Experimental design was a split-plot with three application rates (low and high label rates and a mixture of systemic and contact fungicide with the respective low rate) as whole-plot treatments in a randomized complete block design. The fungicides were applied to subplots (Table 1). Individual plot size was 3 ft x 7 ft. Preventive chemical applications (14 day interval) were made on June 16, June 20, July 4, and July 18, 2002. Liquid treatments were applied with a CO2-powered boom sprayer using XR Teejet 8005 VS nozzles at 30 psi in water equivalent to 2 gal per M sq ft.

Disease ratings (percentage of infected area) of the plot were visually recorded on August 2 and 17, 2002. The first disease symptom was noticed around the last week of July. In addition, the total percentage of *Poa* populations per plot was visually estimated twice. Since the anthracnose occurred only in *Poa annua* species, the percentage of the infected areas of *Poa* was recalculated by estimating the percentage of the entire plot that was infected and then dividing that amount by the percentage of *Poa* present in the plot. The final data analysis using the recalculated damage percentage was carried out and presented in Table 1.

Results

Tank mixing systemic and contact fungicides using their respective low label rate, had significantly higher efficacy for the anthracnose control than the systemic fungicides alone regardless of the label rates (Table 1). However, the contact fungicide performed as well as the mixtures. More research is required for further confirmation of the results found in this study.

Except for Banner Maxx, all of the systematic fungicides, regardless of the manufacturer's recommended high or low rate, demonstrated reduced efficacy for controlling the disease.

Conclusion

It was very difficult to perform a field evaluation of fungicides for the control of anthracnose due to the mixed growth of *Poa* and bentgrass species in the same area. The percentage of infected areas can be easily under- or over-estimated due to the difficulty of differentiating *Poa* populations from creeping bentgrass populations. However, a carefully designed experiment can be successfully performed if a golf course with a high *Poa* population can be identified and the percentage of the *Poa* population is accurately estimated.

A second year of data is required before drawing any final conclusion. In addition, for a future experiment, anthracnose isolates need to be isolated from the golf courses where the lack of control or reduced efficacy of systemic fungicides has been reported. This disease is becoming an important pathogen. Consequently, it requires more attention from researchers and more research in Wisconsin.

Rate/mixture	Treatment	Rate (oz a.i./M sq ft)	% of diseased areas	
			August 2	August 17
Low rate	Heritage (Azoxystrobin: 50WDG)	0.2	18.8a*	59.6a
	Banner Maxx (Propiconazole: 1.24MC)	1	1.6b	12.7ab
	Bayleton (Triadimefon: 50WDG)	1	19.5a	42.3ab
	Cleary's 3336 (Thiophanate-methyl: 4F)	2	14.1a	36.1ab
	Daconil (Chlorothalonil: 82.5WDG)	2.8	0.0b	7.3b
	Check (no chemical)		14.1a	51.0ab
High rate	Heritage (50WDG)	0.4	15.5ab	39.2a
	Banner Maxx (1.24MC)	2	2.0cd	8.8a
	Bayleton (50WDG)	2	22.7a	38.9a
	Cleary's 3336 (4F)	4	7.2bcd	24.1a
	Daconil (82.5WDG)	5.6	0.0d	2.3a
	Check (no chemical)		11.9abc	43.1a
Mixture	Heritage (50WDG) + Daconil (82.5WDG)	0.2 + 2.8	0.0a	0.0b
	Banner Maxx (1.24MC) + Daconil (82.5WDG)	1 + 2.8	0.7a	0.8b
	Bayleton (50WDG) + Daconil (82.5WDG)	1 + 2.8	0.6a	0.0b
	Cleary's 3336 (4F) + Daconil (82.5WDG)	2 + 2.8	0.4a	8.0ab
	Heritage (50WDG) + Bayleton (50WDG)	0.2 + 1	1.0a	2.5b
	Check (no chemical)		5.8b	30.0a

*Within each rate, numbers followed by the same letter are statistically similar.

Table 1. Systemic and contact fungicides evaluated for the control of anthracnose disease at the Blackhawk Country Club in Madison, WI.