



Dollar Spot Control: The Ins and Outs and What You Should Know

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In the recent weeks leading up to the composition of this article, many of the superintendents in Wisconsin were experiencing severe dollar spot outbreaks. Some also reported that the length of control of some stand-by chemicals was diminished. In the following, I hope to answer any questions that you may have about dollar spot control.

Why doesn't my fungicide application last as long as it did in the past?

There are numerous factors

involved with the length of efficacy of chemicals. I will look at several that pertain to the type of weather that we are having this summer.

Early on in the season, rain would have been a major factor reducing the length of efficacy. Rain not only washes off contact chemicals, which provide protection on the outside of the plant, but also increases shoot growth. With increased shoot growth, you lose protection by both removal at mowing and the emergence of new, unprotected leaves. Under

normal conditions, emergence of new leaves occurs about every five days. With localized protection, any leaf that emerges after application will have reduced or no coverage. Chemicals that are local protectants include iprodione (Chipco 26 GT) and vinclozolin (Vorlan). Chemicals that provide the best coverage on old and unemerged foliage are acropetal systemics. Acropetal is the movement upwards in the plant. Fungicides with this type of action include the DMI's (Banner Maxx, Bayleton,

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Eagle, Rubigan).

If you want the best protection, you need to also consider the carrier volume or the amount of water used to apply the chemicals. In comparing different volumes, I have found that there is little difference between 1 gallon to 4 gallons per thousand on greens height of cut. But, this might be dependent upon several factors that I did not include on my study. For example, the density of the stand may inhibit the penetration of the fungicide, therefore decreasing its length of efficacy. I noticed that several of the DMI fungicides lasted upwards of 65 days. An ounce of caution though with DMI's and growth regulators. In combination these two can result in the loss of turf, and *Poa annua* populations should be determined before this combination is used.

In relation to volume, our current studies indicate that volume plays a major role in efficacy of fungicides used on fairways with the higher volumes lasting longer than the lower volume applications.

Finally, one other factor that may be diminishing the length of efficacy of fungicides is resistance. So far, several types of resistance have been found in the United States. The only positive case that I have identified in the state is benzimidazole resistance. The chemicals in the benzimidazole family include chemicals like benomyl (Tersan 1991) and thiophanate methyl (Fungo and Cleary's 3336). However, this does not limit the possibility of other resistance in the state.

I think I have resistance; how can I find out for sure?

On the course, one way to determine if you should test for resistance is to evaluate the length of control that you are getting with certain products. This can sometimes be difficult because the

labeled application timings can be based on normal conditions and properly calibrated equipment. Another issue is chemical application volume. Most chemicals have recommendations from 1-5 gallons per thousand square feet, but the

most people tend to stay on the low side of the recommendation.

If a product like chlorothalonil is only lasting seven to ten days, this may not be abnormal. Consider the weather that you have had since the last application. If it has been



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raining, the product will be washed from the foliage and protection will be lost. In comparison, if a product like triadimefon only last 7 days it could be a mis-application or evidence of resistance.

In the TDL, we have a test to determine whether or not resistance is present on your golf course. With a sample we are able to test it against several of the chemicals that can pose a resis-

tance threat. These are compared to one that is grown on unamended media, and the growth rates are compared. This test can take several weeks as the pathogen is first isolated then plated on the amended plates.

Before submitting a sample to test for resistance, go through a simple check list evaluating the following; spray volume, calibration of sprayer including coverage by the spray nozzles, proper amount of chemical, weather conditions, amount of turf removal, typical application timing, etc. This evaluation may identify problems not associated with resistance.

What are my options at managing for prevention of resistance to dollar spot?

As you know, dollar spot has the ability to develop resistance to the systemic chemical used for its control. A contact chemical such as chlorothalonil has several modes of action so the chance of resistance developing is greatly reduced. In a dollar spot management program, great care should be taken to implement a plan that

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safeguards against resistance. Currently, there are two such strategies, alternation and reduced-rate mixtures.

Alternation is the constant rotation of chemicals each time an application is made. With dollar spot, there are basically four classes of chemicals to choose from; benzimidazoles, DMI's, dicarboximides, and contacts. Understanding what class a chemical is classified under is vital to the development of such a plan. In each of these classes the following chemical are included:

Benzimidazoles:

Thiophanate Methyl (Fungo, Cleary's 3336)

DMI's:

Triadimefon (Bayleton), Propiconazole (Banner Maxx), Fenarimol (Rubigan), and Myclobutanil (Eagle)

Dicarboximides:

Vinclozolin (Vorlan, Curalan) and Iprodione (Chipco 26 GT)

Contacts: Chlorothalonil (Daconil, Echo, Manicure) and Mancozeb (Fore)

With reduced rate mixtures the idea is to provide 1/3 control from each of the three components. This way none of the chemicals in the mix will be overpowering each other and leading to the selection of an isolate that is resistant to one class of chemistry. These chemical combinations have been evaluated for several years and provide 21 days of coverage or more. The principal behind them is similar to alternation with the use of several different chemistries. For current rates of these mixes please refer to the Wisconsin Turfgrass Research Reports or feel free to give me a call @ (608) 845-2535.

The take home message from this is that just because you have failure of a chemical doesn't

always mean that you have resistance. Chemical applications have many influences of which many can be controlled. With proper

calibration, following label directions and fair weather, you should be able to obtain near 100% control of dollar spot. ♣

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