Preventive Use of DMI Fungicides on Golf Putting Greens

I have fielded a number of calls this week regarding the use of spring applications of preventive fungicides for disease control on putting greens. Below is the overall strategy, so superintendents can implement it quickly this spring. Then, in a short series of articles, I’ll use a reporter’s framework (not necessarily in order) to give the reasoning behind each part of the strategy. Don’t worry managers of other turf areas (lawns, sod farms, etc); I haven’t forgotten you and there are several lessons embedded in these recommendations that apply directly to pest management in your operations. Large Patch will also be on tap shortly.

Overall Strategy

1. **THE WHO** = Diseases targeted – Fairy Ring, Take-all Patch, Summer Patch, potentially Dollar Spot
2. **THE WHAT** – Low rates of fungicides in the DMI class including the 4 T’s (Triton, Trinity, Torque, Tourney) and Bayleton.
3. **THE WHEN** - First application when 2” soil temperatures average 55-60°F for five consecutive days. Second application 28 days later. 
   **Not yet, but soon.**
4. **THE WHERE** - Golf putting greens
5. **THE WHY** – DMI fungicides are plant growth regulators, and should not be utilized in the summer heat on bentgrass putting greens. Curative applications may need to be applied repeatedly and often result in more fungicide use.
6. **THE HOW** - Two applications 28 days apart. Do not tank-mix preventive fungicide with a wetting agent. Water in the application with ⅛” (preferably ¼”) of irrigation immediately after application (preferred) or at least that night. Remember the pathogens we are targeting are in the soil, so put the fungicide there.

**THE WHEN**

This is the most basic and important question with preventive applications, since you can’t see the plant symptoms, and are going on blind faith (ahem, research) that the pathogen is active. Like all other living things, pathogen biology is driven by temperature, and during the spring turf pathogens wake up from winter at different times just like plants do. Research suggests that turf pathogens may be a bit more vulnerable to control measures during their early infection stages (before symptom development) or at an early time in their life cycle. This theory makes a lot of sense, particularly thinking of my limited capacities before I’ve had my first cup of joe.
The key is utilizing temperature thresholds or predictive models that researchers have developed to time these sprays. For soil borne pathogens, (which I will concentrate on), it makes sense to use soil temperatures, whereas foliar diseases are a bit more complicated and use both air temperature and moisture.

Several disease thresholds exist for different soil or root-infecting pathogens. For take-all patch, spring applications in the 45-60°F average 2” soil temperature range are recommended. For summer patch, spring applications at 65°F average 2” soil temperature range are recommended. Recently, two low rate applications of the DMI fungicides initiated when 2” soil temperatures average 55 - 60°F for five days have been shown to dramatically reduce or completely control fairy rings. So, as you can see, there is considerable overlap here which we can take advantage of. Using two applications in the fairy ring strategy has the highest potential for controlling all three of these pathogens, because the 28 day interval is just about the time span between the prime infection activity of the take-all patch and summer patch pathogens.

With this recent cold snap, “average” soil temperatures (2” depth, taken at 11 am on a full sunlit, sand-based putting green) are in the high 30’s to lower 40’s. The Missouri Commercial Weather Network (click here to go the page) reports 2” soil temperatures in bare soil are averaging in the mid 40’s even in southern Missouri. So THE WHEN IS NOT THE NOW, YET.
As stated above, we need to average 55 - 60°F for five consecutive days to time the first application. Upon examining historical climate records, I tentatively estimate that in most years southern MO and St. Louis may experience these temperatures during the first week of April, and Columbia and Kansas City around mid April.

However, do not use the calendar to time these sprays!!! Spring seasons can be radically different – this year’s 3rd week of April can equal next year’s 1st. Here are a few options for approximating 2” soil temperatures.

- Use an on-site weather station with soil temperature probe
- Take them with a handheld digital or analog soil thermometer (normally 11 am in full sun gives the best approximation for an “average”),
- Use the Missouri Commercial Weather Network by following this link
- Approximate based on average air temperatures, which will be close to 2” soil temperatures in a sand-based root zone.

We will be continually updating you with soil temperatures as well, and will let you know approximately when the threshold for these applications has been reached.

**Diagnostic Update**

3/30/11 - First MTDL use - Microdochium patch diagnosis
A. Well defined patch with reddish brown margins.
B. Characteristic *M. nivale* conidia indicated by yellow arrows.
C. Microscopes set up and working away to assess the sample.

The first diagnosis of the mobile turf diagnostic lab (MTDL) was made this past Wednesday - Microdochium patch at a course near Jefferson City. The MTDL performed admirably during this first run, with total diagnosis time after sample collection being about 35 minutes. The superintendent and I were able to go over control options afterwards, and quickly have a management plan in place before the disease progressed much further.

Now admittedly this was an easy one as *Microdochium* spores were prominent in the sample, but the MTDL has potential for greatly reducing the time between...
noticing a problem and having it diagnosed and controlled. For single emergency visits, an additional maintenance/fuel surcharge for using the MTDL will be added onto our normal $50 in-state diagnostic fee (ex. $200 total fee for STL & KC-MO, $250 total fee for Springfield). This will be somewhat flexible if a number of visits are being made in the same area at the same time. I intend on being on the road for much of the season with on-site trials so call or email for availability. For a quick comparison of our traditional diagnostic service vs. the MTDL, click here.

Save the Date: July 26, 2011

Make plans to join us at the University Missouri Turf & Ornamental Research Farm on July 26th for our annual field day! We will be presenting the latest research on cultivar evaluations, pest controls, and management considerations for turf, trees, and woody ornamentals. It’s a fine day and a fine way to interact with colleagues and your local Mizzou research team.

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