Prevent Pathogen Foes’ Fires

Weather

April started out average, but recent heat has swung the pendulum again towards a fiery spring. Throughout the state, April is running approximately 5 degrees above normal, which has sent plants and some pathogens galloping along in its stride. Even with the inclusion of the March 14-15 dip in temperatures, the last 30 days have been 4-5 degrees above normal. Combined with the forecast and history (see The Missouri Frost/Freeze Probabilities Guide), the frost chances are slim to none at this point for much of the state, and perhaps region. We are approximately 140 base 32 and 105 base 50 growing degree days ahead of spring 2016, which was warm early but cooled off in late March/early April. This equates to approximately two weeks ahead of time, are towards the start of May. No such cool down is left in this forecast, so by most measures it seems to be go time. As announced below, (and earlier this week on Twitter), large patch at the MU research farm heard the call and is considerably severe now.

Over the last 7 days, rain events took a break and most areas are running right about on average for April showers. If the last two weeks of March are added, however, the story is much different as shown in the above figure. Along the I-70 corridor and north (and more south in KS), rainfall totals are an inch to up to 3+ inches above normal. This trend looks to reignite next week with 1 – 2” of rain forecasted for the period (with some already here today). Along with the current and continued trend of warm temperatures, it’s easy to anticipate the flare up of disease pressure on many fronts.
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Spring Heat Continues, Rain Returns
A. Mid April is forecasted to stay warm. - Source: NOAA CPS
B. Over the next 7 days, 1 - 2” of rainfall is forecasted in the region. - Source: NOAA CPS

Pythium Root Rot Prevention on Golf Greens

5 day average = 60 F
A. Springfield: Current 5-d average = 61.3 F
B. Columbia: Current 5-d average = 60.7 F
C. St. Louis: Current 5-d average = 60.9 F
D. Kansas City: Current 5-d average = 59.8 F
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If history serves and the forecasted heat spikes, the soft volley that was the 2016 - 2017 winter season is over. As noted in the previous update, the 55-60 F application threshold for fairy ring prevention was upon us and has now rapidly past (see above). As this threshold passes, however, another has quickly taken its place. All areas of the state now are at, or slightly beyond a 5-day average of 60 F for 2” soil temperatures. This threshold is the spark to begin preventive applications for Pythium root rot prevention, our most often diagnosed disease on bentgrass putting greens in the last 5 years. A preventive program should employ a variety of fungicide classes for two reasons, 1) a variety of different Pythium spp. may infect bentgrass roots, and their sensitivity to fungicides can vary and 2) we know fungicide resistance has developed in the Pythium blight pathogen, and there’s no reason to imagine it won’t in Pythium root rot pathogens. These two reasons, and the pathogen being soilborne, also may be contributing to the difficulty in controlling this disease.

With forecasts indicating temperatures will continue to rise and rain will persistently fall, the time to begin prevention of Pythium root rot at sites with a previous history is now. Of the fungicide classes for Pythium, I would select the QoI or strobilurin class for the first shot, which includes Insignia, Heritage Action, Lexicon, etc. This employment of a broader spectrum fungicide at the early stages of spring also should knock back some of other troublesome soilborne pathogens, including those that cause take all patch, summer patch, and fairy ring. This timing also puts it approximately in the middle of a two DMI application strategy for fairy ring control, detailed ad nauseam in these updates.

After this initial shot across the bow, prevention will presumably need to continue throughout the season, at least until the end of August. Applications on 14-21 day intervals rotating among the effective fungicides - QoIs, fosetyl-Al (Signature Xtra), propamocarb (Banol or Stellar), metalaxyl (Subdue Maxx), phosphites, and cyazofamid (Segway) – should be the foundation of the program. Of these, Segway (and particularly Segway tankmixed with a QoI) has been found thus far to be most effective for symptom control. With a usage limit of 2.7 fl oz/1000 sq ft, Segway may best be applied preventively at the 0.45 fl oz rate with a stronger 0.9 oz rate being saved in case a curative rescue application (0.9 fl oz) is necessary (along with Koban).

As a last note, please remember these applications need to be watered in to deliver the fungicide down to the targeted rootzone. I’m unsure if the golf clientele will respond more oddly if the application is sprayed in the rain or if post-application irrigation is used during this rainy weather, but either way an explanation of the why may be necessary. Of these two methods, the use of post-application irrigation during a window of dry weather is preferable so potential runoff of leaching is minimized.
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Spring N Doesn’t Summon the Large Patch Reaper

Our first major large patch outbreak occurred earlier this week at our research farm, so the time for spring prevention is near passed. The following section was written by my graduate student John Koehler detailing a portion of his research, which, along with our collaboration with Kansas State University, appeared in a recent issue of Golfdom (click here to view).

Rising spring temperatures and frequent rainfall means large patch has started rearing its head once again. In the past, the belief has been that nitrogen applications at this time would increase large patch severity. However, no research has confirmed any link between spring or fall nitrogen applications and increased large patch severity. In 2014, we initiated a trial focused on the impact of nitrogen application timing, nitrogen source, and a single spring fungicide application with the aim of developing an integrated large patch
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management strategy. Nitrogen applications of urea, calcium nitrate, or ammonium sulfate were applied when 5-day average 2” soil temperatures reached 65 degrees in the spring and/or fall. These treatments were supplemented with nitrogen in the summer and were compared to the same nitrogen sources only applied in the summer months. Duration® CR fertilizer, a polymer coated urea, was applied as a separate, single spring treatment. Duplicates of all nitrogen source and timing combinations received a single application of tebuconazole in the spring at the same time as spring fertility applications.

Contrary to previous beliefs, spring applications of small amounts of nitrogen (0.5 lbs N/1000 ft² made on May 6) did not increase large patch severity. In both spring of 2015 and 2016, plots receiving spring and fall+spring nitrogen applications actually had lower spring large patch severity compared to those only receiving summer applications. There were no significant differences between nitrogen sources, although Duration® did have higher quality turfgrass, likely due to a higher nitrogen rate and release. At the 65 degree average spring soil temperature, large patch was already active. As mentioned in a previous report, fungicide applications earlier in the spring would be more successful in controlling large patch.

Our findings demonstrate that you should not be afraid to start feeding a little nitrogen to your zoysiagrass in the spring rather than waiting until the summer months. These early spring applications may help boost zoysiagrass metabolism, allowing the turfgrass to fend off pathogen infection. – John Koehler, M.S. candidate

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