New Fungicides For The Turfgrass Market In 2013

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A few years back I had a conversation with a golf course superintendent where he lamented the lack of new fungicides coming to the turfgrass (ie golf) market. His frustration was along the lines that there were new herbicides coming to the market, new insecticides, even new wetting agents and plant growth regulators. But when it came to fungicides, the primary protectant applied to golf course turfgrass, all that was coming was premixtures of old active ingredients. This lack of new fungicides wasn't due to any decision by the primary fungicide companies or any lack of investment in research and development. Rather, a myriad of factors inhibited new development including natural ebbs and flows in new fungicidal molecules, increased regulatory requirements and cost associated with bringing a fungicide to market, and the pressure to make sure that a new fungicide will bring a novel addition to the fungicide industry and hence produce the hundreds of millions of dollars needed to recoup the costs of developing the fungicide.

For those left wanting for something new, something exciting, some new toys to play with… well the recent past, present, and near future will provide you with that expanded toybox. For others, however, the large influx of new products in the past couple years and the several products just hitting the market right now have led to confusion, consternation, and skepticism. For some this rather guarded view is the result of living through previous hype machines ('I just can't keep Imprelis on my shelves!' said one sales representative to me in the spring of 2011), for others it's more the belief that 'if it ain't broke, don't fix it' and the comfort in their current fungicide programs. In this article I will try and satisfy both those groups, not with a hype machine or shiny pamphlets, but through research completed here at the University of Wisconsin in the past couple years. One important disclaimer: the following descriptions are NOT an endorsement of any product or company, but simply reflect our research results with mostly new active ingredients (not new pre-mixtures…a few exceptions). All the primary companies that we test with were contacted for any new fungicides they may be bringing to the market soon, and the following products are the ones those companies responded with.

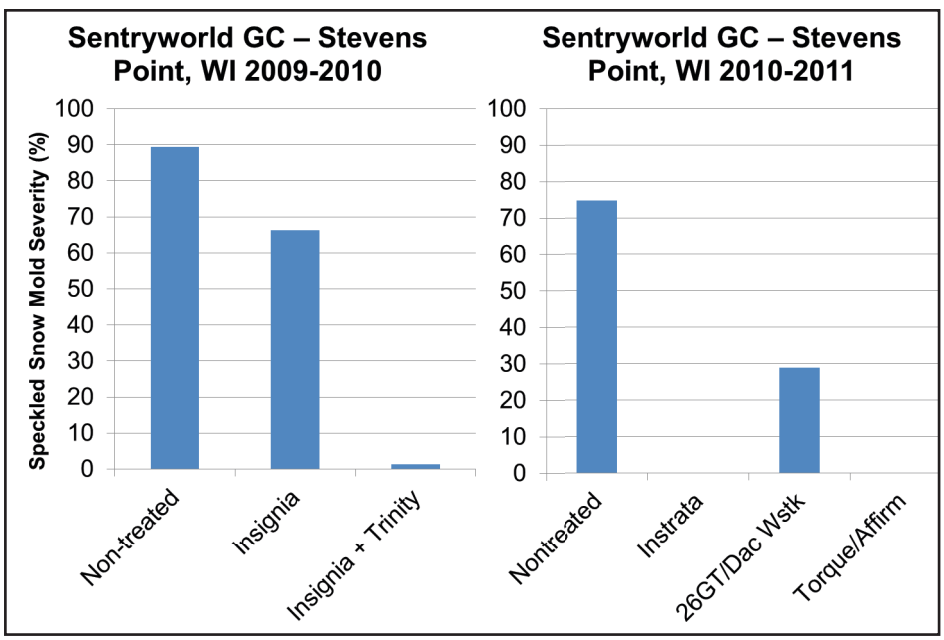

Figure 1: The graphs show speckled snow mold (Typhula ishikariensis) severity against a small sample of fungicide treatments from the 2009-2010 and 2010-2011 University of Wisconsin Snow Mold Fungicide Trials at Sentryworld Golf Course in Stevens Point, WI. Note the effectiveness of Trinity® and Torque® when mixed with other fungicides under this heavy disease pressure.

The T-DMI's

Alright, so many of these products aren't terribly new, but it seems another one or two comes to the market every couple of years or so. While in the same chemical class as earlier demethylation inhibitors (DMIs) such as propiconazole and triadimefon, this new group that includes triticonazole (Trinity® or Triton FLO®), tebuconazole (Torque®), and metconazole (Tourney®) also has some distinct characteristics. First and second, they generally are quite affordable and have lower growth regulatory characteristics compared to earlier DMIs. Most importantly, they are generally more effective at managing anthracnose and snow molds than earlier DMIs **(Figure 1).** Unfortunately, they are also generally less effective at managing dollar spot than earlier DMIs, namely propiconazole.

Plant Defense Stimulators

While reports of natural plant defense stimulation has been around since the introduction of Chipco Signature and other related fungicides, the mechanisms behind this stimulation has been difficult to determine. However, the introduction of Daconil Action® (chlorothalonil + acibenzolar-S-methyl) and Civitas® (mineral oil) in recent years that have more well-defined plant defense stimulation mechanisms has led to increased attention to this potential disease management strategy.

The benefits are obvious, stimulating natural plant defenses can lead to reductions in the amount of fungicide introduced into the environment while maintaining acceptable levels of disease suppression. However, the reality is more complex. We have seen effective management of several diseases using Daconil Action® in our research trials with repeated Daconil Action® applications **(Figure 2)**, but have heard some disappointing reports from the field if the product is not used repeatedly as part of a program. Civitas®, while giving excellent green color, has performed poorly as a fungicide on its own when applied to manage snow mold and should be used as part of a mixture of different active ingredients.

Syngenta has been busy

You have likely been hearing a lot from your friendly Syngenta sales representative in the past few months, and for good reason. Syngenta has brought 3 new fungicides to the golf turf market this year. Secure® (fluazinam) has been around in the agriculture world for many years, but is just now making its way into the turf market and has the potential to become a key component of many fungicide programs for years to come. The main benefit of this product is that it's a contact, multi-site mode of action fungicide that has performed well against a broad range of pathogens **(Figure 3).** If this sounds similar to chlorothalonil, that's because it is, and it has the potential to replace chlorothalonil in many applications and lessen the concern about reaching the annual chlorothalonil maximums. Appear® (potassium phosphite) can basically be thought of as Syngenta's response to Chipco Signature, and is designed to be used in a similar manner. Namely, that it will provide some fungicidal activity against certain diseases (ie Pythium) but that it's primarily intended to be used repeatedly as part of a program on putting greens to reduce summer stresses. Briskway® (difenoconazole + azoxystrobin) contains a new DMI fungicide (along with the active ingredient in Heritage®), and can be used against a broad range of turfgrass pathogens. But the primary advancement with difenoconazole is the near absence of growth regulation, which allows its use even in stressful summer conditions.

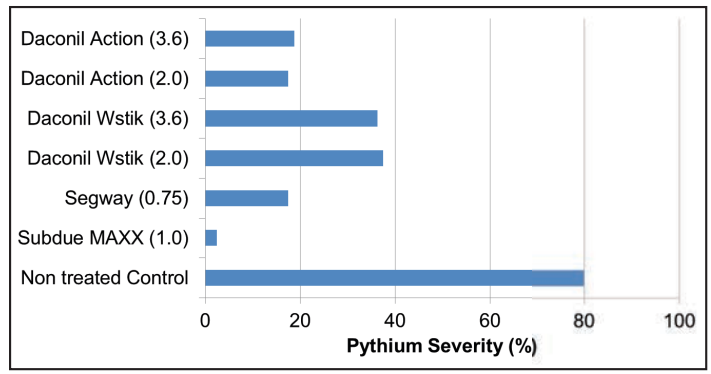

Figure 2: Pythium blight trial conducted on juvenile perennial ryegrass at the OJ Noer Turfgrass Research Facility in Madison, WI in 2011. Note the increased level of Pythium suppression with Daconil Action® versus Daconil WeatherStik®, presumably due to the effects of acibenzolar-S-methyl in Daconil Action®.

This product will likely be more popular in the transition zone, the mid-Atlantic, and the northeast, but may become popular around the Midwest if summers like 2012 become more consistent.

BASF's irons in the fire

BASF is also bringing some new fungicides to the golf turf market in the near future. Encartis® is a fungicide pre-mixture that combines boscalid (Emerald®) with chlorothalonil, expanding the spectrum of disease control beyond the dollar spot that Emerald® alone could manage **(Figure 4)**. To my knowledge, this product has not yet been registered by the EPA for use on turfgrass, but registration is expected soon. BASF also has plans to bring a new fungicide molecule from the SDHI (succinate dehydrogenase inhibitor) class to the golf turf market. This fungicide, called fluxapyroxad (Xzemplar®), is similar to Emerald® in some respects but will control a broader range of fungal diseases. Xzemplar is not currently registered for use on turfgrass, but registration is expected late in 2013 with a possible launch in 2014.

Bayer, Cleary, and Quali-pro aren't resting either

Though not releasing a new fungicide this year, Bayer recently started a new 'Healthy Turf, Healthy Tomorrow' initiative. This initiative will focus on plant-health related research through significant donations to the Environmental Institute for Golf. Bayer was one of the original plant defense innovators with the release of their StressGard® formulation in Chipco Signature® in the 1990's, which has since been included in many of their other recent fungicide releases including Tartan®, Triton FLO®, and Interface®.

Cleary Chemical was recently acquired by Nufarm, which brings Cleary's broad fungicide portfolio into concert with the large herbicide and insecticide business that Nufarm already has. Cleary is working on several new fungicides that should be coming to market in the coming years that will likely expand on the successful launch of Torque® a couple years ago.

Quali-pro has also recently introduced a new fungicide, Enclave®, to the turfgrass market. While this is a pre-mixture of previous active ingredients (chlorothalonil, iprodione, tebuconazole, thiophanate-methyl), to my knowledge it is the first 4-way pre-mixture on the turfgrass market. With 4 active ingredients in one product, if you see any disease except for Pythium after applying this product you did something wrong. The race for a 5-way pre-mixture begins now.

How does all this affect me?

The effect of these new fungicides will not likely be measured immediately. I highly recommend that superintendents be skeptical at first, applying one application here and there to see how it affects the turf and suppresses disease at their course. All of the products listed here have been tested in our UW Fungicide Research Reports in the past few years (http://www.tdl.wisc.edu/research.php), and I urge you to peruse these reports yourself. One or two of these products may become mainstays in your fungicide program for years to come, while others may struggle to find a niche and replace older, effective products. Which ones thrive and which ones fall by the wayside will depend on a number of factors including efficacy, price, technical support, and ease of use. Please don't hesitate to contact me (plkoch@wisc.edu, 608-576-2673) if you have any questions about these or other products and how they fit into your program.

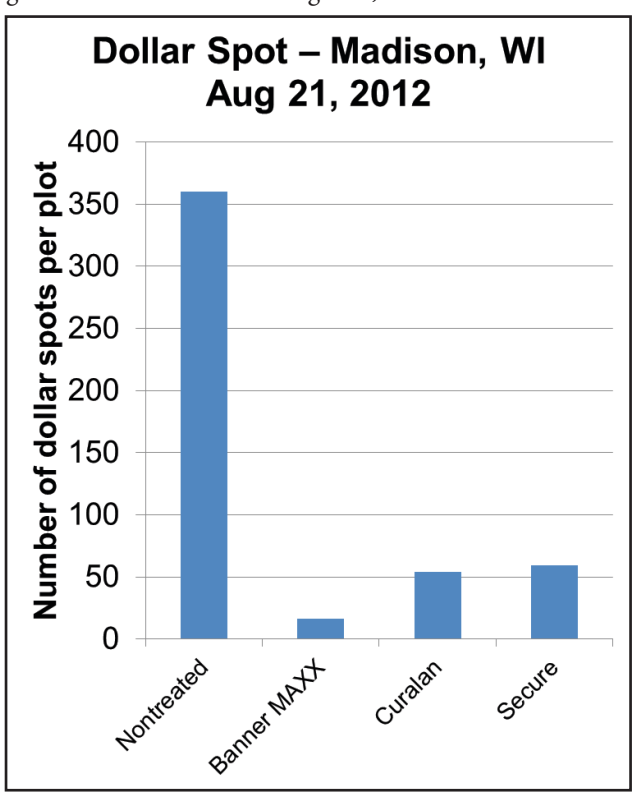

Figure 3: Small sample of treatments from a dollar spot trial conducted at the OJ Noer Turfgrass Research Facility in Madison, WI in 2012. Note the significant reductions in dollar spot seen with Secure applied on a 14 day interval despite extreme disease pressures. Because this is a contact fungicide, decreasing the reapplication interval or tank-mixing with a penetrant fungicide would likely have increased the level of suppression.

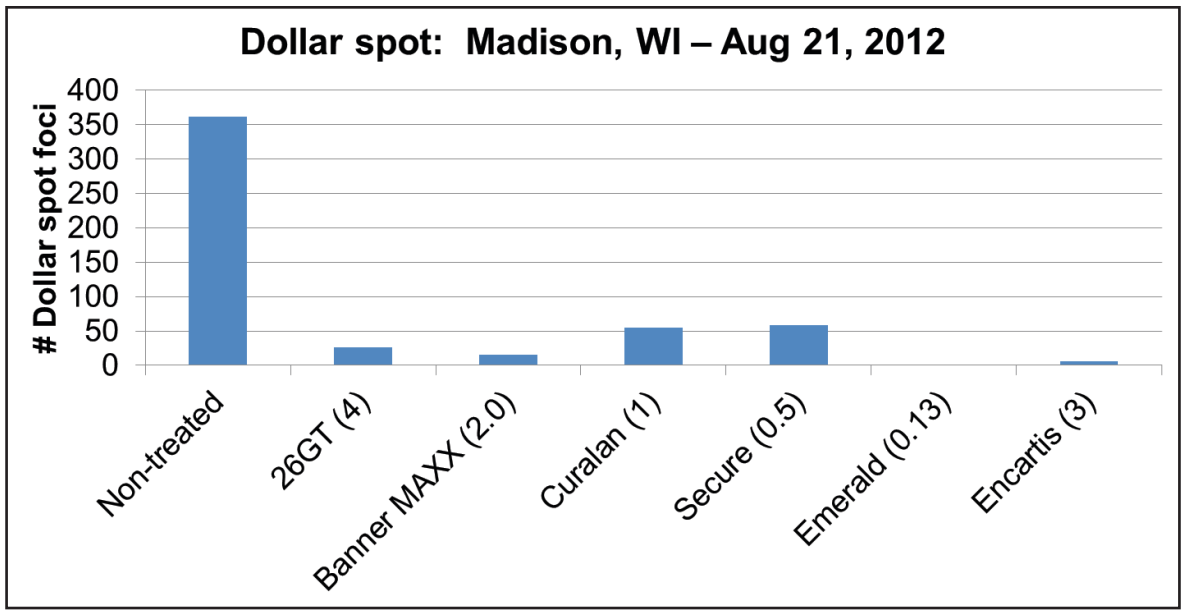

Figure 4: Small sample of treatments from a dollar spot trial conducted at the OJ Noer Turfgrass Research Facility in Madison, WI in 2012. Note the near absence of dollar spot observed in plots treated with both Encartis® and Emerald® (which both contain boscalid) despite heavy disease pressure.