the country, it is often difficult for university researchers to achieve high levels of snow mold on the sites where they conduct replicated small plot efficacy trials. This held true during the winter of 2012/2013, in spite of long periods of snow cover in many areas. Under low snow mold pressure, many treatments provide acceptable control. The real effectiveness test comes at sites with intense snow mold pressure. Fortunately, two field trials from AMVAC's 2012/2013 snow mold efficacy program showed very high levels of disease when evaluated in the spring. This level of disease pressure allowed Turfcide to demonstrate its versatility for snow mold control.

Paul Koch, Ph.D. and coworkers at the University of Wisconsin conducted a field trial in Champion, Mich., that developed 78.8 percent disease severity (primarily *T. ishikariensis*) in the untreated plots (Koch et al., 2013). Table 1 shows the results from selected treatments that were included in the trial.

The treatments were applied October 30, 2012 and were rated at 189 days after application on May, 8 2013. The low label rate of Turfcide 400 (12 fl. oz. per 1,000 sq. ft.) provided greater than 90 percent control. A treatment of Turfcide 400 applied at 8 fl. oz. /1,000 sq. ft. was included in the trial as a reference for other treatments where this rate of Turfcide was tank-mixed with companion products. Turfcide was tank-mixed with Banner Maxx II (propiconazole) (2 fl. oz. /1,000 sq. ft.), Daconil Ultrex (chlorothalonil) (3.2 oz. /1,000 sq. ft.) and Interface (3 fl. oz. /1,000 sq. ft.).

Each of these tank-mixtures provided excellent control under high snow mold pressure and the combinations provided significantly better control than did the companion products applied alone. The Interface plus Turfcide treatment was applied at a number of locations last fall and certain results may lead to a new area of further research.

Charles Golob, M.S. and William

FIGURE 1

Results of a snow mold trial conducted by Paul Koch, P.J. Liesch, Sam Soper and Jim Kerns of the University of Wisconsin in Champion, MI



FIGURE 2



Johnston, Ph.D. of Washington State University conducted a field trial in Columbia Falls, Mont., that developed 91.3 percent disease severity (65-percent pink snow mold [*Microdochium nivale*] and 35-percent gray snow mold [*Typhula* spp.]) (Golob and Johnston, 2013). Table 2 shows the results from selected treatments that were included in the trial. The treatments were applied November 2, 2012 and were rated for snow mold at 145 days after application on March 28, 2013. Under such severe disease pressure, the high label rate of Turfcide 400 (16 fl. oz. /1,000 sq. ft.) was required to provide excellent control. Tank-mixtures of Turfcide applied at 8 fl. oz. /1,000 sq. ft. with companion products performed exceptionally well in this trial. The combination of Interface (iprodione + trifloxystrobin) **Continued on page 42**

FIGURE 3

Results from a trial conducted by J. Popko and G. Jung of the University of Massachusetts in Queensbury, NY



Continued from page 41

(3 fl. oz./1,000) plus Turfcide at 8 fl. oz. /1,000 sq. ft. provided significantly better control than did the combination of Interface (3 fl. oz./1,000 sq. ft.) plus Chipco Triton (triticonazole) (0.75 fl. oz./1,000 sq. ft.). The combination of Concert II (chlorothalonil + propiconazole) (8.5 fl. oz./1,000 sq. ft.) plus Turfcide provided significantly better control than did the combination of Concert II (8.5 fl. oz./1,000 sq. ft.) plus Banner Maxx II (1 fl. oz./1,000 sq. ft.).

An issue with Turfcide that most superintendents are well aware of is that under certain situations there may be a transient yellowing of creeping bentgrass after application. This has generally been managed through application timing by using the snow mold rates only after the turf has stopped growing in the fall. Applying Turfcide immediately prior to precipitation or irrigating the treated area after application minimizes the potential for yellowing by moving the active ingredient from the leaves into the thatch.

An interesting area for further research has been discovered recently by Geunhwa Jung, Ph.D. of the University of Massachusetts. Table 3 shows phytotoxicity ratings for two treatments from a trial that he conducted in Queensbury, N.Y. (Popko and Jung, 2013). The results show a marked reduction in phytotoxicity of creeping bentgrass when Turfcide 400 was tank-mixed with Interface. These results suggest that the StressGard Formulation Technology that is included in Interface may also help to reduce phytotoxicity by PCNB. As one can imagine, additional research on this topic will be conducted in 2013.

At the completion of their first halfcentury of use, Turfcide brand products are still an important component of snow mold management programs based on their performance, economy, versatility and mode of action. And current research is focused on expanding these attributes to redefine their place in the market for many years to come.

Charles Silcox, Ph.D., is a Product Development Manager with Amvac Environmental Products and can be reached at charless@amvac-chemical.com.

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While the weather conditions can be extremely variable, it's not too late to plan a sound preventive fungicide program for combating tough winter diseases such as snow mold. Syngenta invests extensively on Research and Development efforts across multiple geographic regions to provide you with the best snow mold recommendations. It is important to take into account the climate variability, length of control, infections from pink and gray snow mold and other diseases such as anthracnose that can infect turf with or without snow cover. With the Syngenta snow mold assurance program, you get the best possible snow mold solution for your course and we stand behind it every step of the way.

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Snow Mold Assurance Program

Enjoy a Winter Without Worry of Disease

Syngenta snow mold assurance program takes the uncertainty out of snow mold protection. Instead of trying to predict the particular weather conditions, superintendents now have a stress-free way of controlling pink and gray snow mold on greens, tees and fairways. The Syngenta program provides everything you need to ensure your course opens on time with the ultimate playability in the spring.

Syngenta Preventive Snow Mold Recommendations		
Greens	120+ days of control	Instrata 9.0 – 11.0* fl oz per 1,000 ft ²
Fairways	120 days of control	Concert II 8.5 fl oz + Banner Maxx II 1.0 fl oz per 1,000 ft ²

*(2) 5.5 fl oz applications or (1) 11 fl oz application.

Key Agronomic Practices:

- Give your snow mold application an advantage by utilizing a fall clean-up application to control cool season disease
- Summer stresses, such as plant diseases, take a toll on turfgrass health, give your turfgrass the best chance for recovery with properly timed clean-up and snow mold applications
- Apply snow mold applications prior to snowfall as a single or a split application
- Additional applications may be necessary in absence of permanent snow cover
- Apply in a minimum carrier volume of 50 gallons of water per acre on fairways and tees, and 90 gallons of water per acre for putting greens
- For enhanced turf quality and improved color as the snow melts, tank mix a pigment to the above recommendations. While it won't enhance your disease control, pigments provide superior visual turf quality after snow melt, and the color boosts turf recovery and growth coming out of dormancy in the spring.

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Syngenta Snow Mold Assurance Terms and Conditions

User must follow prescribed guidelines herein regarding application rates and timing for the user's region and apply on a minimum of 3 acres of greens or 20 acres of fairways in order to qualify for the Program. Instrata and Snow Mold Pallet Offer brand purchases and product applications must be made between August 1, 2013 and December 9, 2013 ("Qualifying Period"). All claims must be reported to and submitted in writing to your Syngenta territory manager within two (2) weeks after snow melt and no later than April 15, 2014. In the event you notify your Syngenta territory manager of snow mold Breakthrough exceeding 15%, your Syngenta territory manager will investigate and, if warranted, supply Syngenta products for rescue treatment with a value not to exceed the value of the Syngenta products already purchased and applied by user on the applicable acreage during the Qualifying Period. A "Breakthrough" is defined as more than 15% occurrence of snow mold snow mold control as compared to untreated areas of similar turf density, turf type, and environment at the discretion of the Syngenta territory manager and the user. Syngenta's determination as to whether less than acceptable control exists will be final. Syngenta retains the right to audit purchase records in assessing claims made pursuant to the Program. Syngenta will not pay for any application for rescue treatments. Cultural practices, mechanical issues or any other factors that are deemed contrary to standard practices and methods for preventive snow mold control will render the claim ineligible. Syngenta reserves the right to modify or discontinue this Program at any time without prior notice.

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"What makes the course unique, besides the sand greens and eight holes, is that you play the course with four hickory-shafted clubs and a golf ball that is limited to 60 percent distance of an ordinary golf ball."

KARL DANNEBERGER, PH.D., Science Editor

Golf off (and on) the beaten path

have read that 75 percent of the turf related sales is associated with the top 25 percent of the golf courses in the United States. I assume too that the top 25 percent are also the most visible and garner the most public attention. But it begs the question, what are the courses in the lowest percentile like?

I have been fortunate to visit many of these golf courses, in part due to our Ohio State Extension Specialist Pam Sherratt. Pam is often contacted by a local extension agent, a small town, or maybe an owner to make a visit to a golf course. Pam's primary expertise is in athletic fields, so she often invites one of the turfgrass faculty to go under the auspicious purpose to "provide backup." I rarely pass up an invitation even though I know Pam is more than qualified to provide suggestions and recommendations.

I personally enjoy the road trips. It allows me to get out of the office and into the real world. The trips themselves consist of talking turf with Pam with periodic stops at a Dairy Queen, and if we come across one — Starbucks. Many of the destinations are in remote areas. I know we are close to our destination when the voice in Pam's GPS says, "Danger, you are in an unspecified area, proceed with caution. Make a legal U-turn..."

I am always pleasantly surprised by the visits because they are never what I expected. For example, one visit was made to the Morgan County Fair Grounds and Golf Course in McConnelsville, Ohio. The golf course is a 9-hole Par 3 located on the fairgrounds along the Muskingum River.

The course is run by one employee along with volunteers associated with the fair's board. The enthusiasm and love they show to this golf course can't help but make you excited to be around them. The reason for the visit was to help them achieve their goal of better quality greens. I asked about the fairways, and was informed that is where the RVs park during the fair. We focused on improving the greens.

As we were leaving I asked one of the board members if Demolition Derby was still an event at the fair. His reply was a classic, "Cash for junkers killed the Demolition Derby." I found ways to use that quote a number of times this past summer.

A second example is Glenlaurel Inn in Southeast Ohio. As Pam and I traveled down a rather nondescript winding road and through a hollow, we came upon the golf course, to which Pam said looking at the greens, "It looks like they've started renovating them." My reply was, "Those are sand greens." Pam replied, "Oops," and had a good laugh. This was the first time I have seen sand greens in Ohio. For Pam, it was possibly her first time seeing sand greens anywhere.

Glenlaurel is a luxurious Scottish Inn with an eight-hole Scottish links golf course. Hurdzan Design worked with the owners to lay out the course eight years ago. I asked one of the owners, why eight holes? And he replied with a smirk, "So that you would ask me." What makes the course unique, besides the sand greens and eight holes, is that you play the course with four hickory-shafted clubs and a golf ball that is limited to 60 percent distance of an ordinary golf ball.

Their issue was how to improve the quality of those sand greens. No matter where you go it always seems like the focus of discussion is on improving the quality of greens.

I bring these courses up not to give some agronomic insight or even promote better conditioned courses. What these courses represent, in part, is what is good about golf: the people who have a passion and love for the game and the close attachment they have for the golf course. Whether you're in New York City or the hollows of West Virginia, people who associate themselves with golf are people I like to be around.

Karl Danneberger, Ph.D., *Golfdom*'s science editor and a professor at The Ohio State University, can be reached at danneberger.1@osu.edu.

Winding down the bermudagrass season in preparation for overseeding

Jason Kruse, Ph.D., is an assistant professor of turfgrass science at the University of Florida. Jason's research focuses on turfgrass fertility and management. Jason can be reached at jkk@ufl.edu.

QWhat should a superintendent be thinking about right now in preparation for overseeding?

A successful overseeding program relies heavily on a well-developed thatch management program. Thatch control is a yearlong process. At this point most superintendents should be wrapping up their thatch-control activities. Their efforts, along with the cooler weather, will be easing the bermudagrass toward dormancy. If the thatch control isn't completed by now, there isn't much that can be done now to manage thatch.

QAssuming the thatch control is completed, what steps can a superintendent take to ease the bermudagrass into dormancy?

First, for central Florida we suggest no nitrogen fertilizer after mid-August. Let the bermudagrass take its cues from the shorter day length and cooler temperatures to decrease leaf growth and start to enter dormancy.

Second, raise the mowing height on all areas of the golf course. A small change in mowing height will improve bermudagrass health whether overseeding or not. The higher mowing height will lead to more leaf area which will provide the plants with more carbohydrates and a larger root system. Most golfers will not notice a slight increase of about 0.03 inches on putting greens at this time of the year. Since "THE CHALLENGE FOR SUPERINTENDENTS IS TO KEEP THE SURFACE MOIST WITHOUT BEING TOO WET. TOO MUCH WATER AND THE SEEDLING TURF IS VERY SUSCEPTIBLE TO DISEASES. TOO LITTLE WATER, THE SEEDLINGS DRY OUT AND DIE."

JASON KRUSE, PH.D.

the bermudagrass is growing slowly this time of year naturally, a slight increase in mowing height is easier to accommodate.

QWhat tips do you have for successfully overseeding greens?

Look at the calendar and note your planned overseeding date when planning the last preemergence herbicide application to make sure that all preemergence herbicides have dissipated by the time you plant.

Water management is extremely important for a successful overseeding, especially in the first 7 to 14 days after seed germination. The challenge for superintendents is to keep the surface moist without being too wet. Too much water and the seedling turf is very susceptible to diseases. Too little water, the seedlings dry out and die.

Raise the mowing height for the first 14 days after the seedlings emerge. This will give the seedling turf a chance to develop a root system and become established. After about 14 days the mowing height can be gradually lowered.

Keep the reels and bed knives sharp. New seedlings aren't anchored in the soil very well. A slightly dull mower can tear out the seedling turf rather than cut it. If the mower tears out the seedling turf plants, a poor stand will result that looks bad and plays poorly. About one week after seed germination, apply a foliar nitrogen source at a low rate using a nitrogen source with a low burn potential. Using a low rate of nitrogen is important to not stimulate bermudagrass growth. The goal is for the bermudagrass to go dormant. Once the bermudagrass is dormant, the overseeded turf stand can be fertilized at higher rates to encourage the growth and development of the overseeded turf.

Some superintendents topdress right after seeding to enhance seed to soil contact and enhance establishment. It is important to carefully manage topdressing application in the weeks after germination to minimize damage to the seedling turf. Wait until the seedling turf has developed a root system and is well anchored before topdressing.

Q Anything else to add? Believe it or not, it is important to begin planning for the transition back to bermudagrass in the spring. Coordinate golf events with the planned time to remove the overseeded turf. Holding overseeded turf too long in spring increases the risk of damaging or killing the bermudagrass base.



Clark Throssell, Ph.D., loves to talk turf. Contact him at clarkthrossell@bresnan.net.



SNOW MOLD SEASON NEARS

DISREGARD THE LATE HEAT WAVE, WINTER IS COMING

SNOW MOLD IS A DAMAGING TURFGRASS DISEASE that occurs wherever snow cover is prevalent. Damage from snow mold fungi usually becomes apparent as the snow melts and exposes the grass. Snow mold appears as circular patches (at least 3 to 12 inches) of dead and matted grass blades. In severe cases, these patches coalesce. The web-like mycelium of

vere cases, these patches coalesce. The web-like mycelium of pink snow mold (*Microdochium nivale*) may initially look white and mature to a faint pink to salmon color. Gray snow mold (*Typhula* spp.) is white to gray in color.

BY SETH JONES // Editor-in-Chief

1. Snow mold webinar

In a recent free GCSAA TV webinar, Matt Giese, M.S., Midwest technical manager for **SYNGENTA**, discussed the need for a sound snow mold program, particularly if your course has a history of the disease. The main concepts discussed in the Webinar are:

- The importance of understanding snow mold
- Distinguishing between snow mold species
- Timing and recommendations for control
- Post-emergent control

gcsaa.tv/webinars/sponsored/ view.php?id=205

2. Interface

From BAYER comes Interface, providing flexible, effective disease control under all conditions and mitigating plant stress. The combination of iprodione, trifloxystrobin and Stress-Gard Formulation Technology provides a solution for diseases and plant stresses under hot, cool, wet or dry conditions. As a non-DMI fungicide, Interface can be applied throughout the year without harmful plant growth regulator effects, and help control DMI-resistant plant pathogens. Interface delivers effective control of key diseases, provides plant

TIPS FROM DR. THROSSELL

- Always apply your product after the last mowing of the year. If it gets warm again and you have to mow again, it's going to cut down on your success rate.
- How many days of snow cover are you expecting? The length of your winter determines your strategy. A good rule of thumb, the longer your snow cover, the more active ingredients you'll need. If you have a short snow cover, one active ingredient may do the trick. But if you have a long winter, you might need three active ingredients to get you through.
- Spring may seem like a long ways away. But when the snow melts, keep in mind that you're not out of the woods yet — it's still possible to get pink snow mold.

health benefits and improves turf color and quality. Use Interface alone or in combination with Tartan or Chipco Triton FLO for pink and gray snow mold control. backedbybayer.com/interface

3. Trinity

BASF'S Trinity fungicide delivers value for controlling a broad spectrum of diseases. Plus, it's the ideal tankmix or rotation partner for Insignia fungicide to control your most troublesome turf problems. Trinity controls a broad spectrum of diseases, including gray and pink snow mold, anthracnose, brown patch, take-all patch, summer patch and dollar spot. Trinity is highly rainfast and is quickly absorbed by leaves, crown and roots of treated turfgrass. Trinity disrupts cell membrane function in the sterol biosynthesis pathway. Absorbed by leaf, crown and roots; acropetal penetrant; provides both contact and upwardly systemic activity. betterturf.basf.us/products/ trinity-fungicide.html

4. Enclave

From QUALI-PRO comes Enclave, a new broad-spectrum fungicide. The first product of its kind in North America, Enclave is formulated with **Quad-Control Technology** that delivers effective, longlasting protection from snow mold, anthracnose, brown patch, dollar spot and a broad range of ornamental diseases. From now through Dec. 6th, Quali-Pro is offering a \$25 rebate per case on Enclave, and a \$20 rebate per 30-gallon drum or \$3 per case on Foursome turf pigment.

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5. Turfcide 400 AMVAC ENVIRONMENTAL

PRODUCTS offers Turfcide 400, preventing soil borne diseases in turf and labeled ornamentals. Turfcide is an excellent solution for control of persistent diseases of turf – from snow mold and brown patch to leaf spot and dollar spot. Turfcide is a contact fungicide to which no resistance has developed after nearly 50 years of use. Available in both granular and liquid formulations.

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3



4



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