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ABOUT THE COVER

Our cover artist Beverly Bergemann features the 469 yard Par 4 10th hole at The Bull at Pinehurst Farms. The Bull hosts the 2010 Wisconsin State Amateur.

"Summer afternoon - Summer afternoon... the two most beautiful words in the English language"

– Henry James (1843-1916)
British author/novelist

As summer rushes by, this quote reminds us to slow down and enjoy it.

THE GRASS ROOTS

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Front Row: Brian Zimmerman, Jeff Millies, Chad Harrington, Jim Van HerwynenBack Row: Brett Grams, Scott Bushman, Dustin Riley, Scott Sann, Colin Seaburg, Alan Nees, Not pictured Mark Storby

Relationship Building

By Brian Zimmerman, *WGCSA President*

As we embark on the summer golf season I am reminded of an article I was quoted in a number of years ago on communication when I was a first time Superintendent at Chikaming Country Club in Lakeside, Michigan. The article was about building relationships through sound communication. I was quoted as saying "I think the golf course Superintendents profession is one of the hardest jobs to explain in full detail to other people. An effort needs to be made every day to enhance what we do, whether it is an article in a newsletter, local paper, teaching an elementary class on the environment or being available on the busiest days of golf at the pro shop area to give members and patrons a chance to ask questions about the course. My experience with this has been very favorable with meeting golfers during men and women's days. I feel if I can get the correct information out before people start to receive diluted information I have won. This philosophy still stands true with me today. I am currently working under a new structure in my place of employment. I have a very diverse set of Parks Commissioners. I have developed 3 different ways in which I communicate with them. The first Commissioner likes face-to-face contact. I make sure that I am available to have lunch or a cup of coffee to go over the current state of the district. The second like to receive emails and phone conversations. The third is more involved in the new ways of social media. He consumes data through instant messaging and text messages. If you are a first time Superintendent, new assistant, veteran dealing with a new committee chair or new president the following tips could be used to help open the lines of communication.

Welcome letter

This is and excellent way to greet new committee members and provide introductory information

Golf Invitation

Inviting new committee members to a round of golf will allow you the opportunity to communicate with them on a more informal manner.

Golf Discussion Points

Develop a list of topics you would like to highlight as you go through the golf course. This could include an upcoming capitol project or topic related to course maintenance that you would like to change.

What ever your way is to communicate, make sure that you are able to adapt to how the person you are communicating likes to consume data. This will allow for the free flow of information and improve your overall effectiveness as a communicator.

I wish you all a great golf season.

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WTA Field Day 2010:
Can Mycorrhizae Replace Phosphorus Fertilization?

By Dr. John Stier, *Professor and Chair, Department of Horticulture, University of Wisconsin-Madison*

What are mycorrhizae and why are they important?

As water and fertilizer costs and regulations continue to increase, a number of agronomists and horticulturists are seeking ways to reduce the need for both inputs. Mycorrhizae are a group of fungi that infect plant roots without causing disease: the association between plant and fungus is deemed symbiotic, that is, beneficial to both the plant and fungus. A number of studies show mycorrhizae can enhance drought stress and/or recovery and extract nutrients such as nitrogen and phosphorus from soil for their host plants (Augé 2001; Javaid, 2009).

The plant roots provide a "home" for the fungi, which normally cannot grow without being associated with the plant. The plants benefit the mycorrhizae by providing them with carbon produced from photosynthesis. One study with Sheeps fescue *(Festuca ovina)* showed uninfected plants transferred only 10% of their carbon from leaves to roots, while plants infected with mycorrhizae transferred a whopping 36% of carbon fixed by photosynthesis to the plant roots (Graves et al., 1997). While the mycorrhizae likely used much of the extra carbon, some of the carbon surely must be used for root growth, too, as mycorrhizae infection can increase root mass. In most cases, however, the plants are able to compensate for this carbon "loss" by increasing their photosynthetic efficiency, which in fact may be enhanced by mycorrhizae positively affecting plant functions such as the opening and closing of leaf pores (Augé, 2001). Plants infected by mycorrhizae develop longer, finer roots which increase their ability to absorb water and nutrients. The increased water and

nutrients cause plants to grow larger, and probably faster, than non-infected plants.

Turfgrasses and mycorrhizae

Many cool-season grass species are capable of being highly colonized by mycorrhizae. At one Polish site, 40-95% of the roots of Kentucky bluegrass, hard fescue, red fescue, and tall fescue were highly colonized (Ryszka and, 2007). Colonization may be dependent on the grass variety: in the same study, colonization of perennial ryegrass was zero for one variety and high for another variety.

Pelletier and Dionne (2004) inoculated a lawn mixture of KBG, red fescue and perennial ryegrass with several rates of five species of mycorrhizae. They found slightly faster establishment (~10%) with some of the mycorrhizae inoculations, however, all roots were colonized to about the same extent even in the uninoculated plots. The experiment was done on a silt loam soil, though, which likely already had a large number of mycorrhizae spores. In sand-based root zones, for which the sand was dug from a pit, spores may be relatively absent or missing. One survey showed older sand-based putting greens had more spores than one or two year-old greens, with up to seven different mycorrhiza species present in greens older than two years (Koske et al., 1997a). They surmised the putting greens were either "contaminated" with soil during construction or entered the greens from the collars which were constructed of native soils, and the mycorrhizae fungi increased over time. Another survey of creeping bentgrass, velvet bentgrass, and *Poa annua* greens revealed 18 species of mycorrhizae, with the greatest amount of spores in creeping bentgrass and the least amount in *P. annua* putting greens (Koske et al., 1997b). The authors found the amount of mycorrhizae spores increased during the growing season and decreased during the winter, indicating a strong dependence on plant growth.

Besides the benefits already discussed, mycorrhizae may help turf managers in other ways. An English study showed inoculation of putting greens with mycorrhizae spores reduced *Microdochium* patch (i.e., pink snow mold; Gange and Case, 2003). If mycorrhizae can provide reasonable biocontrol of snow mold diseases, the impact could be tremendous in a state like Wisconsin where fungicides are essential for controlling the disease yet federal regulations make the future of fungicide use questionable. In another study,

putting greens had significantly less *P. annua* as the amount of mycorrhizae increased (Gange et al., 1999). The authors hypothesized that either the mycorrhizae were directly antagonistic to *P. annua*, or the mycorrhizae were more beneficial to creeping bentgrass. The work by Koske et al. (1997b) suggests the latter phenomenon, though a definitive study to show the mechanism of *Poa* control has not been done. A series of greenhouse and mini-plot studies from Rhode Island showed mycorrhizae could enhance drought stress, recovery from drought stress, and suggested some protection could be conferred against take-all patch disease of creeping bentgrass (Koske et al., 1995). The same group also noted that frequent application of P-containing solutions helped mycorrhizae colonization of bentgrasses, while too little or too high of P concentrations reduced mycorrhizae.

Mycorrhizae putting green plots at the WTA/UW-Madison Turfgrass Field Day

Because phosphorus fertilization has become such a contentious issue in Wisconsin, we have decided to see what the impact of phosphorus fertilization and mycorrhizae inoculation have on putting greens. We established creeping bentgrass and velvet bentgrass plots on a USGA-sand mixture in late summer of 2009 at the O.J. Noer Turfgrass Research and Educational Facility. Half of each plot was inoculated with mycorrhizae at the time of establishment, half was not (Fig. 1). The project is supported by the Robert F. Newman Wisconsin Distinguished Graduate Fellowship, which was developed by the Wisconsin Turfgrass Association (WTA) in conjunction with the UW-Madison Graduate School. The graduate student supported by the project, Rebekah Verbeten, is studying the effects of mycorrhizae and pH relationships on bentgrasses and low input turfs. In the field project to be shown at this summer's field day, we've been collecting information on the relative establishment rate and degree of mycorrhizae colonization at four pre-plant P rates (0, 1, 2, and 4 lb P/1000 ft^2) for both creeping and velvet bentgrasses. We'll repeat the study again this year and next to confirm our results. If you're curious to see for yourself, come visit us at the WTA/UW Turfgrass Field Day, Tuesday July 27.

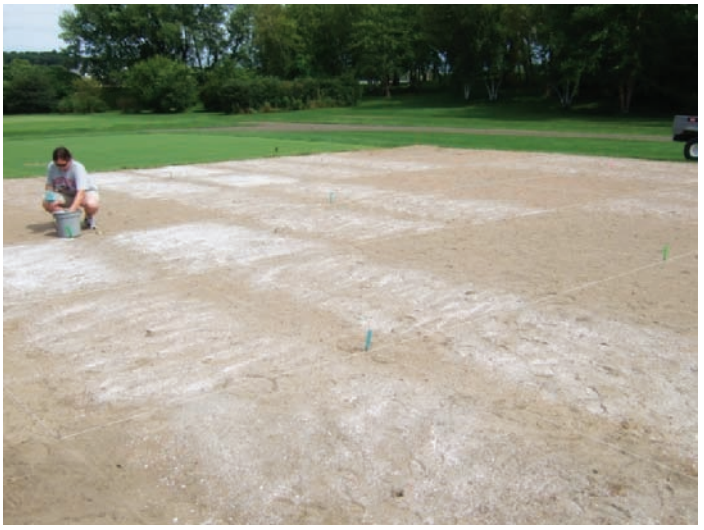

Fig. 1. Application of putting green root zone with phosphorus and mycorrhizae spores at the O.J. Noer Turfgrass Research and Educational Facility, August 2009.

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Snow Mold Across America

By, Paul Koch, *Turfgrass Diagnostic Lab Manager, University of Wisconsin - Madison and* **Dr. Jim Kerns,** *Department of Plant Pathology, University of Wisconsin - Madison*

Though it might not have the sheer number of followers of some past cultural icons, The Grateful Dead and the McRib® come to mind, there is an annual tour throughout the upper Midwest that attracts followers of a different kind. Rather than music, drugs, and cholesterol, these followers come to see snow mold. Or, more specifically, what controls snow mold. The most committed followers travel from as far as the east or west coast and travel with the tour from northern Minnesota, through central Wisconsin, on up to the upper peninsula of Michigan. The travel can make one weary, the days can be long, and after seeing so much snow mold one might even forget that grass isn't supposed to be tan or bleached. But to those on the Snow Mold Tour, only the thrill of the effective treatment matters. Since every good following has a nickname, we'll call those dedicated followers Mold Heads (Figure 1 and 2).

The University of Wisconsin Snow Mold Field Days have been held every year since 2005, when I started with the Turfgrass Diagnostic Lab, and for many years prior to that under Drs Jung and Worf. The Field Days have been held everywhere from southern Wisconsin to northern Michigan, from the Twin Cities to north of Duluth, and many points in between. They have been held in 70 degree sunshine, sideways sleet, and even 6 inches of snow (Figure 3). To the dismay of the Mold Heads, the events have even been pushed inside or cancelled altogether on rare occasions when weather won't allow for travel. No matter what the weather or how far the travel, one thing unites them all; the confused look of outsiders viewing the spectacle of 30 odd men crouched on the ground looking for sclerotia.

The planning for Snow Mold Field Days begins when snow mold is the furthest thing from a superintendent's (and diagnostician's) mind, usually somewhere in June to July. It is during this time when sites to host the upcoming snow mold trials are selected. Five to six sites are selected and several factors go into selecting each site, with the number one factor being the level of snow mold pressure usually observed at that golf course. Other factors include, in no particular order, the superintendent's willingness to host, proximity to major population centers or interstate highways, and ease of access to the trial site on the golf course. Successful sites are used again; unsuccessful sites are usually removed after 1-3 years of either low snow mold pressure or difficulty in another aspect of administering the trial. Sentryworld GC in Stevens Point, WI for example has hosted snow mold research for a decade or longer. Excellent disease pressure, easy access from Interstate-39, and the tremendous assistance offered by Superintendent Gary Tanko and his staff make Sentryworld a site we will test at as long as we are allowed.

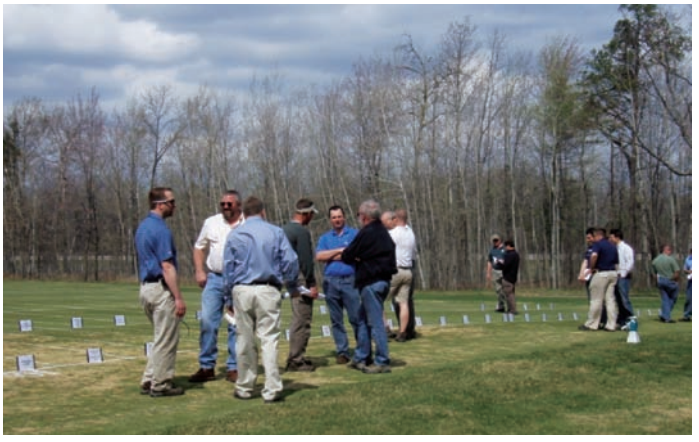

Figure 1: The attendees at Sentryworld GC in Stevens Point enjoyed warm, breezy conditions. Warm enough for one attendee to break out the shorts, much to the dismay of the rest of the crowd.

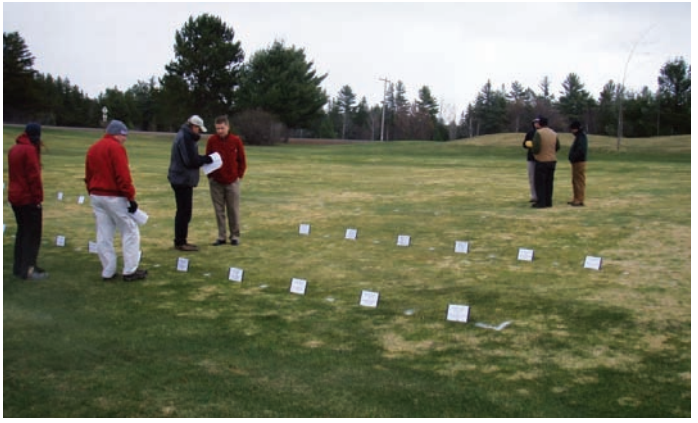

Figure 2: The small crowd that attended the event at Wawonowin CC got to see some intense snow mold pressure, as well as the variable springtime conditions of the upper Midwest. This field day was less than 24 hours after the field day at Sentryworld, where short sleeves were the preferred attire.

After the research sites have been selected, cooperators from fungicide-producing companies submit treatments to test the efficacy of standard and experimental fungicides. Sometimes a completely new compound is being tested to determine if it controls snow

Figure 3: Field Day must go on, even when 6 inches of snow falls on the morning of the event. Here Gary Tanko and his crew provide an assist in readying the plots.

mold as well in the field as it did in the lab. Sometimes a fungicide registered for use on turf 30 years ago is tested at a new rate in combination with a more recent compound. The number of treatments in each trial can vary between 50 and 75 in an average year, though more or less have been tested on occasion.

Once the treatments have been received the fall travel can begin. Two trips are made to each site, and more than one site is usually grouped into each trip. The plots are laid out and the early fungicide applications are made (if necessary) during the first trip to a given site. Three to four weeks later, a second trip to each site is made to apply the late timing of treatments. While all treatments have an application during the late timing, on average usually only 10-15% of treatments have an early application. Trips are scheduled so that the late timing applications are made 2-3 weeks prior to the first average snowfall, though weather conditions are closely observed and have been moved up to beat impending snowfall.

Following snowmelt the following spring, a trip is made to each site to rate the amount of snow mold present in each site and photograph each treatment. Snow mold is rated as a visual percent disease, turfgrass quality is measured visually using a 1-9 scale, and turfgrass color is rated using a TCM 500 NDVI Turf Color Meter® from Spectrum Technologies. Upon returning to Madison, the Field Day dates for each site are scheduled and emailed to the turf industry and the reports are written and compiled.

The 2010 Snow Mold Field Days were held on April 14th, 15th, and 16th in Brainerd, MN, Stevens Point, WI, and Champion, MI, respectively. Dr. Jim Kerns and myself traveled from Madison to Brainerd the night of

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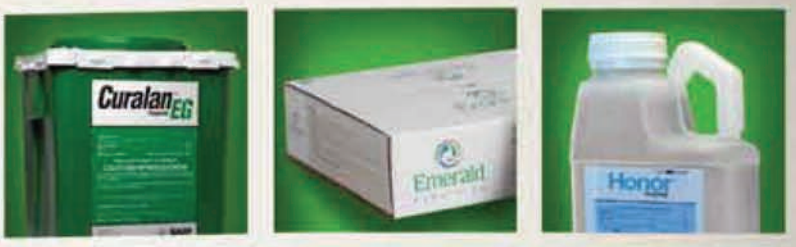

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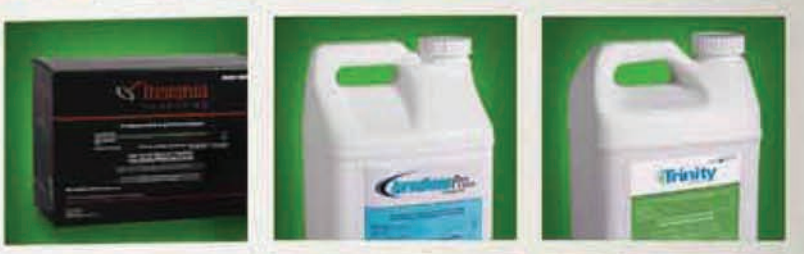

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