Underdressed, Underpaid

By Jacob Schneider, *2nd Assistant Superintendent, Blackhawk Country Club*

Baseball hats. Chewing tobacco. Hooded sweatshirts. If I'd told you that those items were on display at one place in the Milwaukee area this spring, you'd probably guess that I was at beautiful Miller Park watching the Brewers once again destroy our lovable losers from the Windy City, and I'd be lying if I told you that I wouldn't have rather been there. However, from the short time that I've been working at Blackhawk, it appears as if Monroe isn't in the practice of sending his newest full-timer for a paid trip to a weekday series to see Prince, Sheets, and the boys against the team that hasn't won a World Series since 1908. I digress. This isn't an article about my distaste for the Cubbies (that would be way too long, and it might offend some of you who still curse Bartman every morning). No, this article is about the baseball hats, chewing tobacco, and hooded sweatshirts that were found at an industry educational seminar that I attended. Unfortunately, it's not even surprising anymore.

Even as a relative greenhorn to the industry, it's become apparent that whether it be the WTA Expo, the Symposium, or a WGCSA monthly meeting, a select few will show up in jeans and a baseball hat. I can't imagine anyone in a group of lawyers or doctors dressing that way for one of their educational events. Now, I'm not saying that we should always model ourselves after the lawyers of the world (we're way too decent to do that in the first place), but it certainly wouldn't hurt the perception of this great state's hard-working superintendents if the speakers and other guests that come in from all over the country were greeted by a group of professionally-dressed golf course superintendents..

I'm not suggesting that we should all wear a three-piece suit and tie (which is good, because I don't own a suit yet), and we all know that perception doesn't always equal reality. But, when attending these events, leave the Carhartt jeans and the Red Wing boots at the course, and make sure that the more inexperienced members of your crew who might come along do the same. Fair or not, the way that the people around you are perceived will affect your perception. In my opinion, it's awfully nice that we don't have to put on our Sunday best everyday at work, so those dress clothes are usually clean and pressed. I can just about guarantee that your greens won't die and that you won't lose your job if you show up to the Expo in a sports jacket.

In an industry that prides itself on maintaining some of the most picturesque landscapes in the state, it's hard to believe that this would even become an issue. I can't imagine that any of you would decide to not mow the greens or cut the cups on the morning of your biggest tournament of the year, and if we expect our courses to look their best during these important events, why can't we look our best during our industry's most important events? We are in a profession that not everyone views favorably and that's constantly looking to gain respectability (and income), so leave the chewing tobacco, hooded sweatshirts, hats (and steroids) to the ball players. I'd say that a bunch of green industry professionals who actually look like professionals is a winning combination (something that the Cubs wouldn't know anything about) that everyone would cheer for.

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Disease Forecasting in Turfgrass... Is It Worth the Risk?

By Paul Koch, *Turfgrass Diagnostic Lab, University of Wisconsin - Madison*

Turfgrass disease management has come a long way in the last 25 years. New pathogens have been isolated and identified, fungicide resistance has been classified in many pathogens, root diseases such as take-all patch and necrotic ring spot are now recognized as their own diseases, and we no longer spray mercury like it's a race to empty it out of the chemical shed. But for all our advances and the millions of dollars worth of turfgrass research being completed every year, many areas of turfgrass pathology are frustratingly unclear. Little is known about the infection capabilities of root diseases. Fungicides continually break down in the face of heavy disease pressure from stress-related diseases like anthracnose. And dollar spot, the most common turfgrass disease in the world, isn't even classified correctly.

All superintendents, especially in slow economic times, are looking for ways to reduce both the overall number of fungicide applications to control disease as well as the overall cost of those applications. But this reduction cannot come at the expense of quality turfgrass. Knowing that most diseases are heavily dependent on specific weather conditions, pathologists for years have been attempting to develop mathematical models to predict precisely when conditions are ripe for infection. Predicting when conditions will be ripe for infection would limit fungicide applications to times when they are needed, providing the aforementioned reduction in fungicide applications without sacrificing turfgrass quality.

Well that sounds easy, so why aren't you all using these models? The answer in most cases is because in turfgrass they haven't been that effective. Some models have been more effective than others. Models for Pythium blight (Nutter *et al.* 1983), brown patch

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of perennial ryegrass (Fidanza *et al.*, 1996), and gray leaf spot (Uddin *et al.*, 2007) have been relatively effective. Though not really mathematical models, the use of soil temperatures in timing fungicide applications to control root diseases has improved the efficacy of those fungicides.

But when it comes to dollar spot, the most sprayed-for turfgrass disease on the planet, these models have fallen woefully short. A model developed by Mills and Rothwell in 1982 recommended a fungicide application when maximum air temperatures were greater than 77°F and relative humidity was greater than 90% during any 3 days of a 7 day period (Mills and Rothwell, 1982). But these conditions are present for nearly the entire growing season for most of the country and, as you may have already guessed, the model recommended more fungicide applications than we would make without using the model (Walsh *et al.*, 1999). On the other end of the spectrum is the Hall model, which recommends a fungicide application after two consecutive days of rainfall and a mean air temperature of greater than 72°F or after three consecutive days of rainfall and mean air temperatures greater than 59°F (Hall, 1984). But this model doesn't account for the driving force behind dollar spot development, which is the duration of leaf wetness caused by dew and other moistures (Williams *et al.*, 1996). This model recommended far too few fungicide applications and the turf was heavily damaged by dollar spot.

Both these models used easily measurable variables such as temperature and rainfall, but those are not necessarily the major driving forces behind disease development. Many weather stations now have the ability to measure a range of factors, such as canopy humidity, and with the right model could provide more beneficial recommendations regarding a fungicide application.

But even with a weather station at the golf course to measure a range of factors both above and below the surface of the soil, problems can still arise due to the incredible environmental variance found within a golf course. Some of the more obvious variances are found due to shade, elevation changes, and exposure to the wind and other elements. But a more subtle variation lies on every single hole of the golf course. Research has shown that mowing the turf at a typical putting green height, fairway height, or rough height has a dramatic effect on the local turf-

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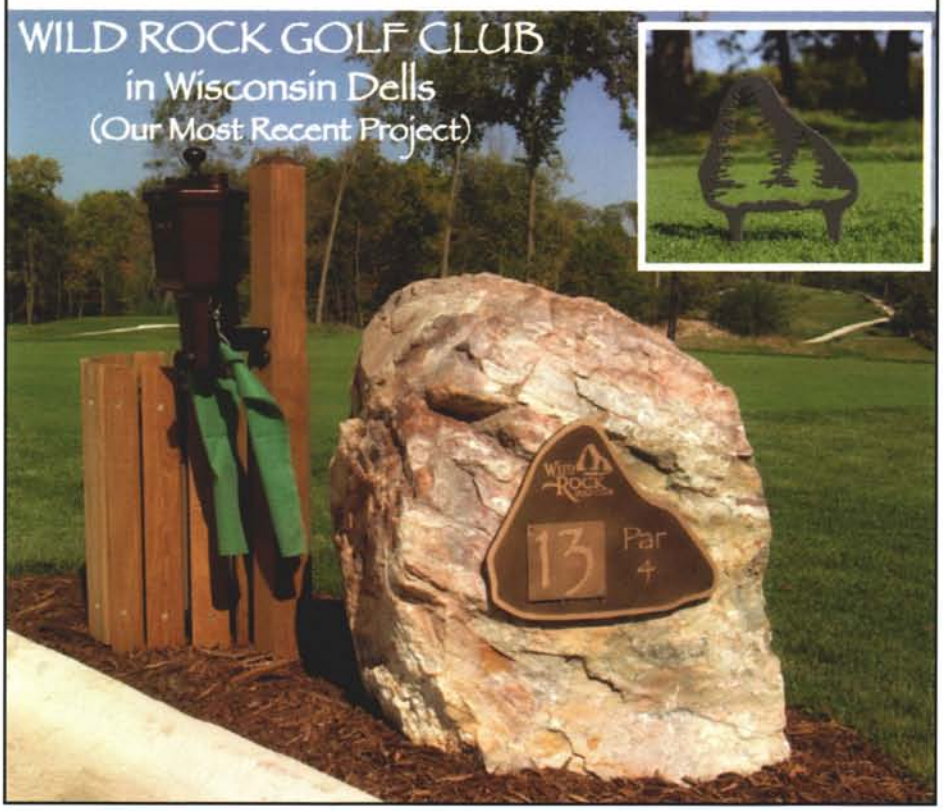
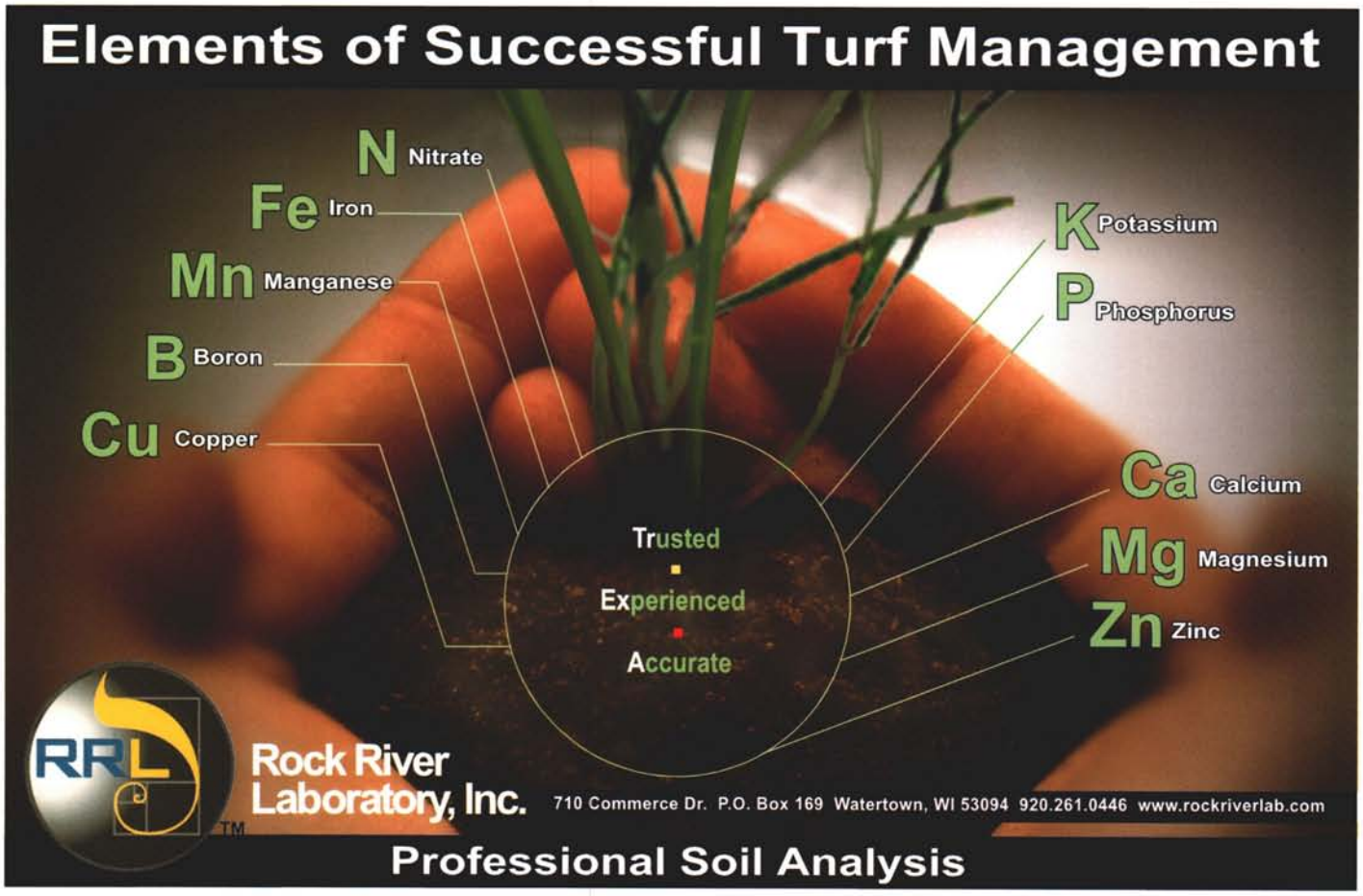


grass environment and in turn the pathogens inhabiting it (Giesler *et al.*, 2000). This would mean that while environmental conditions may be ripe for infection and warrant a fungicide application at one location, it may not at another. This uniformity is a key difference between turfgrass management and agricultural production, where forecasting models have been more successful.

So are turfgrass disease models completely useless? No, they can have great value to any turfgrass manager. But a superintendent cannot use these models in a vacuum, they must be a single tool in his or her decision-making toolbox. Models can be useful in making a superintendent more aware of the need to spray, but in the end it must come down to the superintendent's knowledge of the disease-prone areas of the golf course and what the future weather holds. A prime example this spring has been root-disease fungicide timing and annual bluegrass seed head suppression timing. A string of warm days in early spring triggered a spray in many models, but a rapid drop in temperatures soon thereafter meant the conditions may have been too cold to really warrant the application. In the end you can't let a model make the decision for you, since I'm guessing it won't be the model that gets fired if things go wrong.

Figure 1: The weather was pretty nice for the Sentryworld GC Field Day, once the snow was cleared off the treatment plots of course. Thanks to Gary Tanko and his staff for their assistance.



Successful Snow Mold Field Days

The Turfgrass Diagnostic Lab, along with the Wisconsin Turfgrass Association, held their Snow Mold Field Days in Edina, MN; Stevens Point, WI; and Iron Mountain, MI on April 28th, 29th, and 30th, respectively. Despite low disease pressures at one site and snowfall at another there was good turnout at all three sites, especially at our inaugural event held at Edina CC. Thanks to superintendents Mike Powers, Jared Finch, and Bill Kehoss for making their courses available for this valuable research. And a special thanks goes out to Gary Tanko and his crew at Sentryworld GC for their help in making the field day possible. When I showed up at the golf course the morning of the 29th they were covered in a fresh 6 inches of snow. Unfazed, Gary and his crew (even I picked up a shovel) shoveled off the entire treatment area in less than an hour (Figure 1). It just goes to show that there's nothing like a coating of fresh snow to go with Snow Mold Field Days.

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The Science Behind Wetting Agents

By Dr. Doug Soldat, *Department of Soil Science, University of Wisconsin-Madison*

Wetting agents have become invaluable tools in this era of turf management where fast and firm is a mandate and conservation of water is becoming a major issue. The number of wetting agents on the market is overwhelming and growing day by day. Marketing claims can sometimes make you believe that two wetting agents are as different as night and day. Conceptually, wetting agents are fairly simple and this article will attempt to help you understand how and why these products work (or don't work). But before we can begin to talk about how wetting agents work, we need to understand three basic properties of water; cohesion, adhesion and surface tension.

Water has a high degree of cohesion, and therefore, water molecules have a tendency to "stick" to other water molecules. You can see this property at work next time you are driving in the rain. Take a look at a raindrop as it runs down the windshield; it will veer off course from a straight line to gobble up other smaller rain drops on the window. Water's cohesive properties give rise to another important property: surface tension. Surface tension is a measure of how hard it is to break the surface of a liquid. The high surface tension of water allows some bugs to walk across its surface (Figure 1). The final important property, adhesion, describes the attraction of water to other materials. Adhesive forces between water and a material like wax paper are very low. When this is the case, cohesive forces overwhelm the adhesive forces and water forms a fairly round droplet (Figure 2). However, when adhesive forces between a material and water are high, the adhesive force overcomes the cohesive force of the water, and the droplet will "flatten out" as seen in Figure 3.

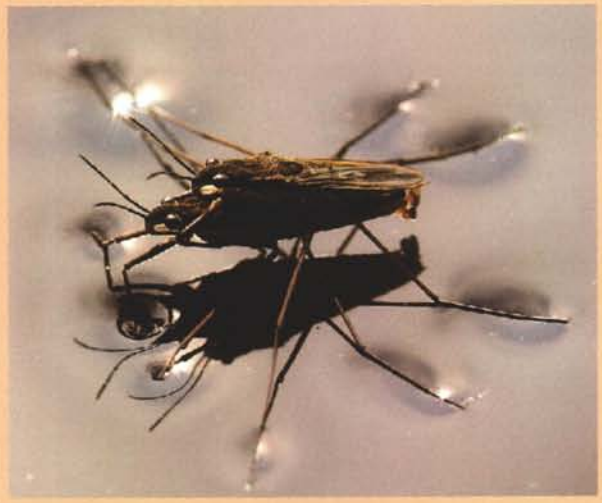

Figure 1. Two water striders take advantage of water's high surface tension. Photograph by Markus Gayda.

Figure 2. A drop of water sitting on wax paper forms a droplet because the water's cohesive forces are larger than the adhesive forces between the wax and the water.

Figure 3. When a surfactant is added to water, the cohesive forces decrease and the water droplet spreads out along the wax surface. The amount of water in this picture is exactly the same as in Figure 2.

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Normally, most soils are highly adhesive to water (wettable). However, non-wettable soils (AKA hydrophobic soils) can develop when organic coatings form around soil particles and then are allowed to dry down to very low soil moisture levels. Many field studies, including some conducted in Wisconsin, have found that wetting agents can prevent the development of hydrophobicity in soils. During a surfactant trial last season, I gave new meaning to "firm" by watering to replace only 30% of the water lost to evapotranspiration (ET). Severe hydrophobicity and localized dry spot (LDS) symptoms developed on plots with no wetting agent, but LDS never appeared on treated plots. Figure 4 shows the soil moisture levels from two of the plots from the study. Notice how the control plot has very dry areas and very wet areas, while the wetting agent-treated plot has relatively constant, but mid-range soil moisture levels. In this case, the wetting agent prevented the development of LDS and kept soil moisture levels even across the plot area. At no time during the study period did significant LDS symptoms appear from plots treated with Aqueduct, Primer, Respond 2L, or Revolution.

Don't rely on marketing alone

More wetting agents are available this year than ever before. Unfortunately, very few of these products have been evaluated independently in field settings. Instead, most products are sold based on testimonials and/or marketing claims. Some products are purported to cure LDS, while others prevent it. Some manufacturers claim that their product holds water near in the upper part of the root zone; others claim that their product facilitates the downward movement of water. The most clever manufacturers claim that their products can do both! Actually, the science of wetting agents supports this notion. Here's the logic: In general, under wet, non-hydrophobic conditions, wetting agents will decrease the surface tension of water and facilitate downward water movement which will result in a very slight decrease

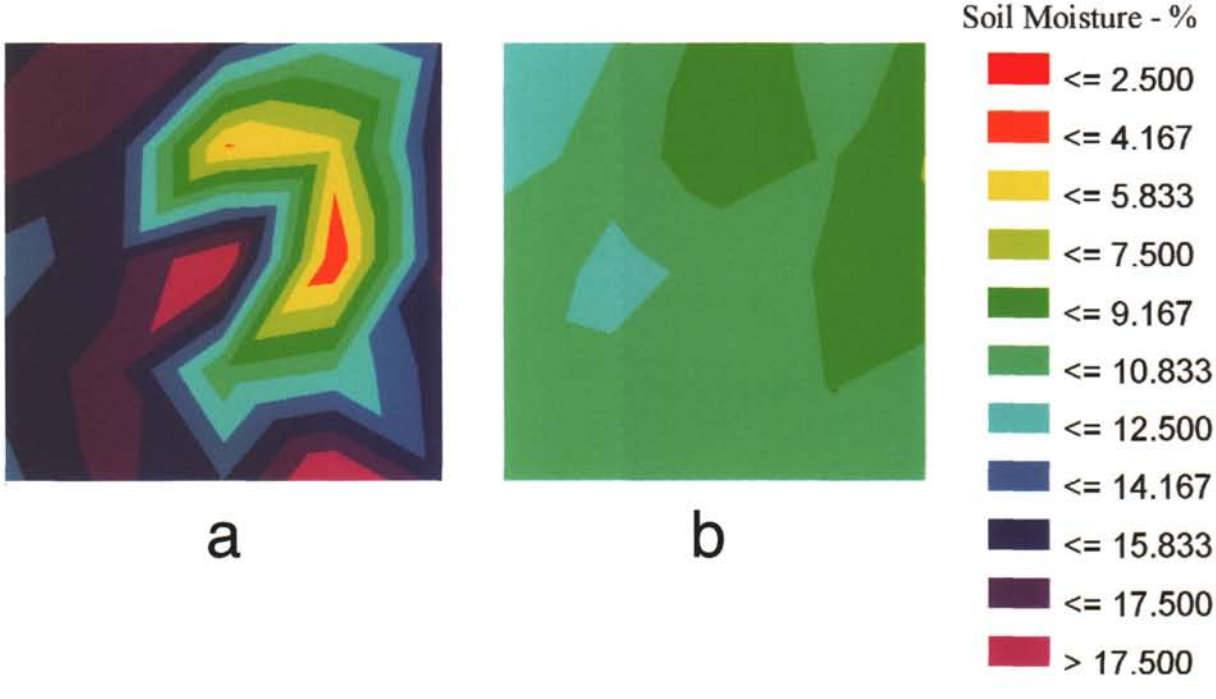

Figure 4. Soil moisture levels of a dry control plot (a) exhibiting symptoms of LDS and a wetting agent-treated plot (b) with no symptoms of LDS. Note the large range of soil moisture levels in the control plot compared with the relatively constant moisture levels found in the wetting agent-treated plot. Notice the relatively high soil moisture levels in the wettable regions of (a) and the relatively low moisture levels in the hydrophobic regions. Compare this to the almost constant, but middle range of soil moisture levels found in (b). Both plots are 6 by 6 feet.