

course, and other attractions.

"They asked if I would be willing to help out a little bit, especially with their par-3 course," Erv explains. "It needed some improvement. I'm still working there. This is my eleventh year. I've enjoyed it. I put in an abbreviated schedule starting early in the mornings - I'm used to getting up early. I'm done by 10:30 or 11 o'clock in the morning.

"Working here keeps me active physically and out of my wife's way. They've asked me to stay for another 20 years. I said that would be great, but I don't know if I could handle it," he laughs. "I'm probably to the point where I won't be working here much longer."

Throughout his career, Erv has maintained his game of golf. "I still try to play a couple of times a week," he points out. "I play with some fellows who are about my age. One is a lifetime golf professional, Bill Furnari. Another is George Schiro, also a PGA golf professional who has done a lot for junior golf in the Madison area and is recognized by anyone involved with golf here. The third player is Dave Kelliher, a great friend of mine who recently retired from the Madison recreation department. For many years he was in charge of run-

ning the city golf tournament."

When he's not working or playing golf, Erv has another golf-related activity. "For 15 years or so I've been collecting antique and classic golf clubs," he explains. "I have quite a collection, particularly of old hickory shafted clubs. One of the things I do with these clubs, and I have quite a few people who call me, is to make attractive plaques with the beautiful old hickory shafted clubs. They're used for a retirement, a special golfing event, things like that. I do this mostly in the winter.

"My wife, she works with ceramics. I help her out with some of that. She has her own kiln," Erv adds.

Erv is now an "AA" or retired member of the WGCSA. But, in the past, he was active on some committees. "I helped set up the monthly outings at the various courses - deciding where we were going to have the outings, what type of play, promoting them to the membership," he explains. "I haven't been attending a lot of those meetings now, but occasionally I do stop in."

Erv's glad that he followed his father's career advice so many years ago. And, even though they probably don't know it, so are the golfers in the Madison area. ♣

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Foliar, Liquid, or Granular?

By Dr. Wayne R. Kussow, Department of Soil Science, University of Wisconsin-Madison

Combine today's putting green mowing heights with the new, high density bentgrasses and you have a problem — mower pickup of granular fertilizer. Industry has responded with smaller, higher density fertilizers. Yet, as reported in the July 2001 issue of *Golf Course Management* magazine, cumulative 9-day mowing losses of greens grade fertilizers can range as high as 75%. Low-density natural organic products can equally be a problem. We removed 14 to 62% of fine natural organic fertilizers in a single mowing at 0.150 inch after brushing the fertilizer in and irrigating the day before.

Are foliar or liquid fertilizers the answer to the problem of mower pickup? Before addressing this question, we need to understand the distinctions between these two types of fertilizers.

As the name implies, foliar fertilizers rely upon absorption through plant foliage rather than the roots. This places restrictions on the composition of foliar fertilizers. All of the nutrients have to be in the form of ions or simple molecules and the potential for foliar burn becomes a concern. To avoid burn, concentrations of compounds that break into ions in water have to be 1% or less. Urea, which breaks into simple molecules, can have concentrations of up to 10% and is typically a major component of foliar fertilizers.

The term "foliar" further implies that the intent of these fertilizers is to wet plant foliage and not the soil. Thus, spray volumes have to be kept low — on the order of 1 gallon/M or less. The combination of low nutrient concentration and low spray volume adds up to low rates of nutrient application. A simple example illustrates this point. If we have a hypothetical 15-3-4 foliar fertilizer that weighs 10.5 lb/gal and it is applied at the recommended rate of 5 oz/M, the rate of N per application is 0.06 lb/M.

Today's liquid fertilizers typically contain water soluble slow-release N carriers such as methylene ureas or triazone. These have low burn potential that permits application at relatively high rates and spray volumes. Rates of N per application can range as high as 1.0 lb/M, especially if application is followed by irrigation. Some foliar uptake of N may occur, but the primary mode of plant entry is via roots.

In summary then, the main contrasts between foliar and liquid fertilizers are the nutrient application rates possible, all water soluble, fast-release N versus slow-release N, and the mode of plant entry of the

nutrients. Rate of nutrient application is an important distinction from a turf management perspective.

In a typical year, a bentgrass putting green in southern Wisconsin produces about 95 lb/M of dry clippings averaging 4.0% N. That signifies removal of 3.8 lb N/M that needs to come from somewhere. For the sake of illustration, let's assume that 25% of this N is derived from fertilizer applied late last season and the decomposition of organic matter. That leaves 2.8 lb N/M that must be supplied during the current season.

A claim is being made that there is 100% plant absorption of foliar fertilizer. For the moment, let's accept this claim and use the hypothetical foliar fertilizer mentioned earlier. That product, applied at label rate, provides 0.06 lb N/M/application. With 100% absorption, it would still take 46 or 47 applications to satisfy the 2.8 lb N/M requirement for the season.

But is 100% absorption a reasonable claim? Absolutely not. For foliar absorption to occur, the fertilizer, in its liquid state, must overcome the hydrophilic (non-wetting) property of the plant leaf waxy surface coating and come in contact with channels that extend through the cuticle layer of the



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leaf. Logic tells us that it is impossible for all of the foliar fertilizer to come in contact with these channels that are scattered across the leaf surfaces. Second, absorption ceases once the fertilizer has dried on the leaves and stems. Given these two requirements for absorption, it should not be surprising that researchers have measured foliar fertilizer absorption rates of 31 to 61% and have found that 40% is a good average value across different grass species, different fertilizer drying rates and different fertilizer compositions. Foliar fertilizers, because of the urea in them, are also subject to volatilization loss of N during the course of drying. One study conducted with foliarly applied urea reported a 17% volatilization loss of the N applied.

What happens to the 60% or so of the foliar fertilizer that is not absorbed by the turfgrass? This has been fairly well documented. About 40% of the amount applied is mowed off and the remaining 20% is washed into the soil via rainfall or irrigation water where its fate is that of any other fertilizer. So, if instead of 100% absorption of the foliar fertilizer the actual value is around 40%, the amount absorbed from the 0.06 lb N/M/application of our hypothetical fertilizer is 0.0024 lb N/M. Thus, to supply the turfgrass with our estimated seasonal requirement of 2.8 lb N/M, you would have to make about 117 applications.

Now we have to consider liquid fertilizers. Are they a viable alternative to granular products when the mower pickup rate is high (>10%)? They too are subject to mowing loss of material dried on leaf surfaces. The study reported in the July 2001 issue of *Golf Course Management* tested a liquid product and, with the methods employed, came up with a mowing removal rate of only 2 to 3%. Studies conducted with more sophisticated methods place the mowing removal rate at about 50% if none of the dried fertilizer is washed off the leaves. Since this is highly unlikely, the actual mowing removal rate is probably considerably lower, but we do not really know what that figure might be. My guess is that the mower pickup is somewhere in the range of 2 to 10% of the total quantity of nutrients applied. The controlling factor is how much dried fertilizer remains on the leaf surfaces that are removed by mowing.

So what can we conclude from this discourse on foliar, liquid, and granular fertilizers? First, I think it is fairly obvious that foliar fertilizers are not stand alone fertilizers. By this I mean that it is not practical to rely upon them as your sole nutrient source. Rather, they are supplements to a fertility program that involves and relies upon other forms of fertilizer. Foliar fertilizers are great for a quick green-up. Researchers have reported noticeable improvements

in turfgrass color within 6 hours after application.

Liquids permit higher nutrient rates and less frequent applications while providing N with some slow-release properties. But foliar and liquid fertilizers often have a common limitation. To minimize foliar burn potential, their N:K ratio is high, often in the range of 2 to 5:1. On sand putting greens, I advise an N:K ratio of 1:1 over the course of a season made up of three to four potassium applications during the season to compensate for leaching loss of K. This is hard to achieve with many of the foliar and liquid fertilizers but easily accomplished with granular products.

It makes the most sense to me to use granular fertilizers with demonstrated low mower pickup rates as the core of your fertility program. If it fits into your program and you have the means to do so, intersperse liquid fertilizer applications with granular applications. Liquids are great for spoon feeding because it is so easy to achieve uniform applications of very low nutrient rates. Foliar fertilizers come into the picture as supplements when, for whatever reason, you want a quick, short-term response. ♣



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Autumn Brings Relief From A Tough Summer

By Monroe S. Miller, Golf Course Superintendent, Blackhawk Country Club



It was a difficult year for golf courses in many parts of Wisconsin. Many of us suffered from a severe lack of rainfall for extended periods, and all of us experienced temperatures considerably above normal highs. The weather gave us a taste of summertime as it is known in the transition zone.

Turf diseases were rampant; I'd guess the TDL staff had their hands full at times. Budgets were exceeded, stress levels of grasses and superintendents were high, and at times our golf courses didn't look that good. I would like to say previous seasons like this one make it easier to tolerate for a seasoned superintendent like myself, but I cannot. I am worn out physically and mentally like everybody else.

BUT, September is here. The dog days are gone and any run of sweltering days will be of short duration. There will be early mornings soon when work on the course will require a light jacket or a sweatshirt.

It is a great time of the year. The red color of sumac and ripe tomatoes and the Badger football jerseys against the green grass of September is a sight to behold! So are woodbine and Viburnum berries. Summer annuals still bloom in September, but the mums remind us that the Fall Equinox is nearly here. September is a break in the seasons – not quite summer but not quite fall, either. It is transition time, days when golf course work becomes enjoyable again.

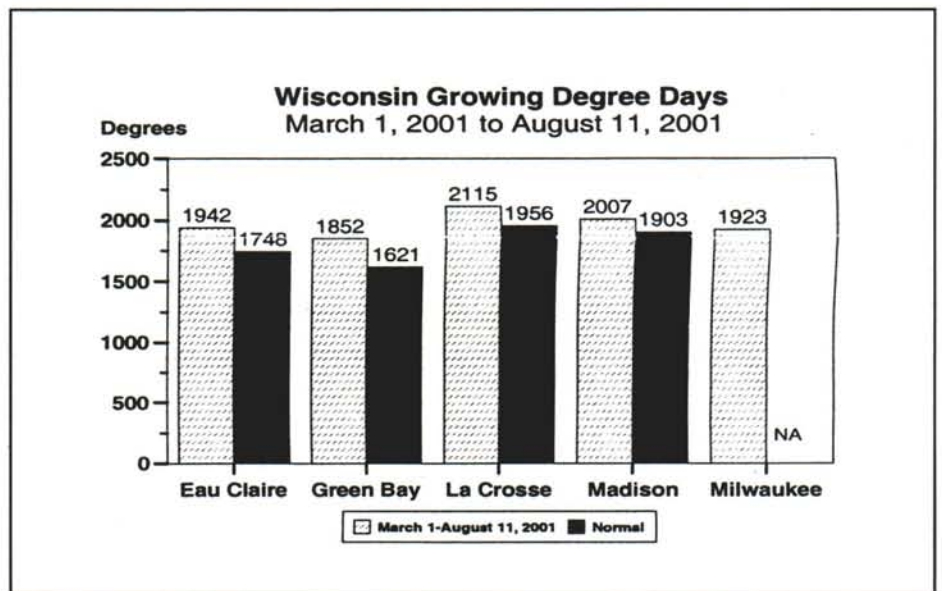
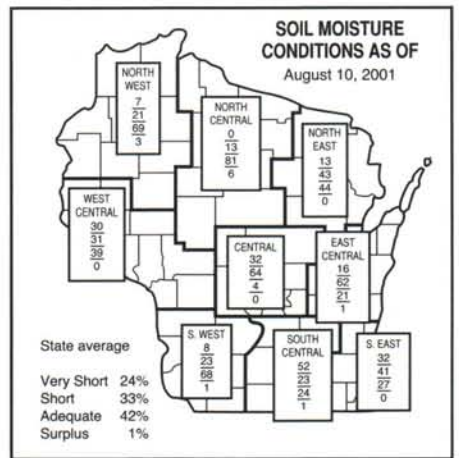
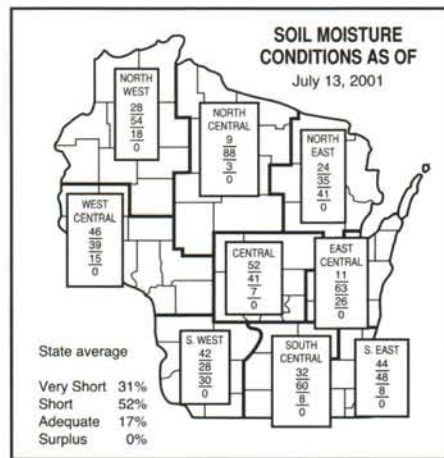
For sure, the workload isn't any less. In fact, it may be greater because summer employees are back at school but the routines of summer will continue for nearly

six weeks. There will be a lot of dust rising from greens and tees and fairways as aeration gets under full sail this month.

Former farm kids like me especially like autumn because in our youth it marked the completion of the cycle of planting, cultivation and harvest. It meant corn shocks and pumpkins and third crop hay. The days were ones to savor, and that emotion says with me all these years later.

The salient weather stats from the Wisconsin Ag Statistics Service from the past two months are here for your edification.

The 2001 Wisconsin Turfgrass Field Day at the O.J. Noer Turfgrass Research and Education Facility was, well, nearly beyond description. The entire place looked great - so neat and tidy and well kept.





Club in Kennebunkport, Maine. Their hats – 41 and 43 – designate their presidencies. A safe bet is that they don't cheat at golf like slick 42 was known to do.

Two retirements this summer are worthy of mention. Both men were giants in their respective fields of study and contributed mightily to the turf industry in Wisconsin. Dr. Doug Maxwell's influence is known to all of you. Unknown by looking at him is the fact he is at retirement age. He will continue his international agriculture program for some time, but down the road you'll be able to find him nearly anytime at the Fox's Lair Golf Course.

Dr. Larry Binning's leadership as long time chairman of the Horticulture Department directly benefited us – Rossi's hiring, Stier's hiring, support at every turn for us in other departments as they filled turf positions, advocating for us in the halls of administration. We'll miss this personable guy with humble beginnings on a Wisconsin "dirt farm."

Their retirement parties were different but both were unique and singular experiences. Larry's was held on a perfect June afternoon in the O.N. Allen Centennial Gardens on campus. He was surrounded by friends and colleagues from the past 35 years. Doug and Martha secured the Wilson Street Grill, a well known downtown Madison restaurant, and were joined by family and friends from near and far to spend the evening talking about old times. Jim and Tammy Krieger were there, and Cheryl and I were honored to have dinner with Gayle and Mary Worf.

Of course, both men were honored by their departments with day long lectures and seminars covering their academic careers.

We are seeing more of Danny Quast these days, now that he has

Registration hassles were non-existent, parking was well handled and the tours were superb. Sound systems worked, the research book was worth the price of admission, and the weather could not have been better.

Time flew as professors and grad students and staff hit the high points at each stop on the tour. The signage, identification and plot definition was outstanding. I especially like the shallow boundary cuts on some of the plots; I need to find out how they do that.

And the Noer is becoming well known to Wisconsin's citizens. The

Madison newspapers have had any number of articles about the Facility in general and the Field Days in particular (that includes the Homeowner Field Day that was held on August 18th). Local television has picked up on the story, too.

This year's Field Day is really what the dream some twenty years ago was about. As a result of a lot of hard work and planning, it is living proof that dreams do come true.

The Presidents Bush love golf. The picture above was taken on July 6th at the Cape Arundel Golf



Danny Quast and Ed Devinger.



L-R: Al Vrana, Bill Sell, Andy Bertoni and Jim Latham

moved back to Wisconsin. Here are a couple of photos he shared from way back.

And from my pal Joel Jackson comes a good photo taken in Florida in April of a couple of Cornell grads with Wisconsin connections.



Frank Rossi and Bob Vavrek in Florida this past spring.

The upcoming winter will at least seem milder, the actual weather notwithstanding. The National Weather Service is switching to a tamer formula for calculating wind chills, one that is supposedly more accurate.

The combination of bitter cold and strong winds that generated a wind chill index of -70 degrees F. last winter will be a balmy -44 degrees F. this winter.

The old wind chill charts were based on research in Antarctica in 1945 when scientists measured how wind affects the rate at which water froze. One of the main differences with the new formula is that instead of using the wind speed measured at 33 feet above the ground, the readings will now be taken at five feet – face height they call it.

Theoretically the formula will now be a more realistic guide to how to bundle up since it is based on how the wind actually feels to exposed human skin.

We'll see.

There were ten 2001 Legacy Award winners chosen by GCSAA this year. Two were from Wisconsin - Natalie Lohman from Danbury and Claire Smith from Williams Bay. Natalie's father Guy is superintendent at Voyager Village Country Club and Claire's

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father Dave is the superintendent at Abbey Springs Golf Course in Fontana.

Congratulations to parents and children!

A special treat awaits you this fall as the Wisconsin Golf Turf Symposium convenes at The American Club in Kohler. The program will be excellent, but then it always is. The meeting site will add immeasurably to the event. It seems impossible we will be able to stay at Wisconsin's only five-star hotel for such a reasonable rate. It is one more reason NOT to miss the highlight of our educational program.

Take a deep breath, relax and go back to enjoying the business of golf course management. Soon there will be a calmness in the air and a sense of completion will arise within you. It always happens. Summer and all the accompanying activity will fade and thoughts will turn to winter. Those thoughts are more pleasant now than they will be before long. ♣

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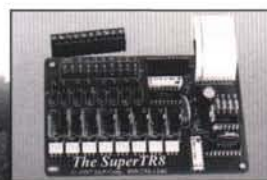
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