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ABOUT THE COVER

It is with considerable sadness that we introduce this beautiful golf course Christmas cover for the last issue of 2006. It is also the last issue we will enjoy by our long time *Grass Roots* artist Jennifer L. Samerdyke. Read *Jottings From The Golf Course Journal* for more on this talented young woman.

"Time was, with most of us, when Christmas Day, encircling all our limited world like a magic ring, left nothing out for us to miss or seek; bound together all our home enjoyments, and every one around the Christmas fire; and made the little picture shining in our bright young eyes, complete."

– Charles Dickens
from " What Christmas Is as We Grow Older"

THE GRASS ROOTS

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Another One Down...

By Mike Lyons, *Golf Course Superintendent, Old Hickory Country Club*

Another golfing season has passed and, to say the least, it has been one that some won't easily forget. Here in Dodge County I have to admit it was not the worst season I have experienced. Last season will be pretty hard to beat and the summer of '95, my first year here, was a keeper. It rained when needed and more importantly, not too much.

The disease pressure was very high this summer. I never had dollar spot like this season and fairy ring – I wasn't aware how ugly it could get. But all in all it wasn't my worst.

Looking at a lot of postings on the Noer net made me feel very fortunate. I don't consider myself a veteran in this profession, but have been around a while and there has always been one constant. You never know how a year will go and it for sure won't be anything like the last. We just have to deal with the unknown and hope we do some things right. Also, Mother Nature plays a big part on how good or bad a season may go, and we sometimes feel hopeless at what she may or may not deliver.

Now we will have to start and deal with the EPA. I know we have been in the past, but now with some of the new regulations going into effect it doesn't look like fun at all. Most likely PCNB no longer is going to be available to us. What will be next? We can and must be heard. Many of us in the green industry have voiced our opinions and some have been heard. But to me it looks like we are just beginning to see what can happen when people are not informed.

I am not a political guy by any stretch. Unfortunately, all I hear when a politician speaks is confusion. I truly feel that is all they are after. I am trying to become more informed this year. Like I said, I am no political guy but one race has me very nervous—State Attorney General. If a certain someone wins I don't see it benefiting the green industry at all. I am not going to mention whom, so please pay attention. You only need to for a very short time to figure out whom I am scared of. Really, that is about as political as I will get. I know by the time this goes to print these elections will be over, but there will be more. So get out and vote and be heard. Take care.

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A Great Summer for Crabgrass

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

This year was a great summer for crabgrass. Crabgrass showed up in greater numbers, and in some instances new places, compared to recent years. At the O.J. Noer Turfgrass Research and Educational Facility any place we seeded turf after the beginning of May appeared to be mostly crabgrass by August. In some cases even applications of pre-emergent herbicides in existing turf didn't seem as effective as in other years. What was behind the population explosion?

Summer conditions dictate grass growth

The cool-season grasses adapted for Wisconsin grow best when air temperatures range between 60-75° F and soil temperatures range from 50-65° F. As temperatures increase above these ranges, leaf and root growth slow down and the lifetime of leaves and roots is decreased. While temperatures may have periodically been above normal, moisture also played a critical role in causing severe crabgrass infestations. In the northern two-thirds of the state lengthy periods of drought combined with high temperatures to reduce cool-season grass growth. In the southern third of the state, rainfall occurred consistently enough so that a drought period was never truly experienced. In fact, on some days we had too much precipitation which caused localized flooding. Even the bottom floor of our building on campus flooded, something that had not happened in anyone's memory.

Crabgrass is a warm-season grass and grows best when air temperatures are greater than 75 F. Being a warm-season grass it is remarkably efficient at photosynthesis during high temperatures. Cool-season grasses, however, cannot maintain photosynthesis very well at high temperatures because their enzyme system doesn't function well. Crabgrass also has lower water requirements

than cool-season grasses which allow it to grow and stay green long after our cool-season grasses have become dormant.

Why didn't my herbicide work?

In some cases crabgrass developed in areas that had even been treated with a pre-emergent herbicide. This doesn't necessarily mean the herbicide didn't work. On the contrary, if the herbicide hadn't been applied the crabgrass stand would have undoubtedly been much greater.

Most pre-emergent crabgrass products need to be irrigated into the soil before they are effective. Pre-emergent herbicides work by forming a "layer" of active ingredient just above/around the crabgrass weed seed. The herbicide makes contact with crabgrass roots and shoots as they emerge from the seed, preventing mitosis (cell division) and stopping weed seedling growth. Without the ability to quickly penetrate the soil and develop leaves for photosynthesis, the affected seedling(s) die(s).

In reality the "layer" of herbicide is rarely uniform and the herbicide may be at varying depths in the soil profile due to differential porosities and drainage rates. Moreover, crabgrass seeds certainly do not form a single layer but instead are scattered throughout the soil profile, although seed density declines with depth. Finally, and perhaps just as importantly, not all crabgrass seeds are capable of germinating at any given time. Pre-emergent herbicides ONLY kill germinating weeds; they do not harm dormant seeds. Some seeds are capable of remaining dormant for years. This differential dormancy within the seed population allows a "seed bank" to develop over time. Even if crabgrass hasn't been a problem for several years, conditions which reduce growth and density of cool-season grasses sufficiently to expose soil may stimulate the germination of long-dormant crabgrass seed. Such was often the case this year.

While drought in the northern part of the state encouraged crabgrass growth, in the southern part of Wisconsin frequent and intense rainfall combined with high temperatures may have been to blame. The wetting/drying cycles overcome the inherent dormancy factors in seed and probably encouraged more seed to germinate than normal. The high temperatures combined with moist soil may have hastened the natural degradation of pre-emergent herbicides, most of which normally last six to nine months after application. In 2006, it was not uncommon to see crabgrass germinating in August even in areas that had been treated in April.

One of the local lawn care company operators asked me the other day if they should switch to two applications of pre-emergent herbicide in the future. While long ago they used to apply an early spring application followed by a late summer treatment to catch the second "flush" of crabgrass, they now only apply dithiopyr in spring due to its longevity and ability to provide season-long control.

In the long run

We did see some "breakthrough" of crabgrass in our research plots this year. While control from a single spring time application was still excellent, the emulsifiable concentrate formulation did not provide as good of control as the wettable powder (Fig. 1). In our trial the turf was a creeping bentgrass mowed at one-half inch height. While normally the turf receives two 1 lb N applications per thousand square feet each year, the last application was 1 lb N/1000 ft^2 applied as a dormant application during autumn 2005.

To return to the lawn care question: Considering two treatments instead of one is very much a financial decision that depends mostly on the need to provide complete versus good to excellent control. Even though we saw a slight breakthrough by August, the EC formulation still provided 85% control while the Dimension Ultra 40 wettable powder provided nearly 95% control. Without being able to predict the summer conditions, my guess is that two pre-emergent applications each year to control crabgrass on golf course fairways would not be worth the cost. It may be better to spot-treat crabgrass infestations with post-emergent compounds such as quinclorac (Drive®). Maintaining good turf density by using the best cultivar or species along with proper mowing, fertility, irrigation and cultivation will also go a long way towards preventing crabgrass infestations.

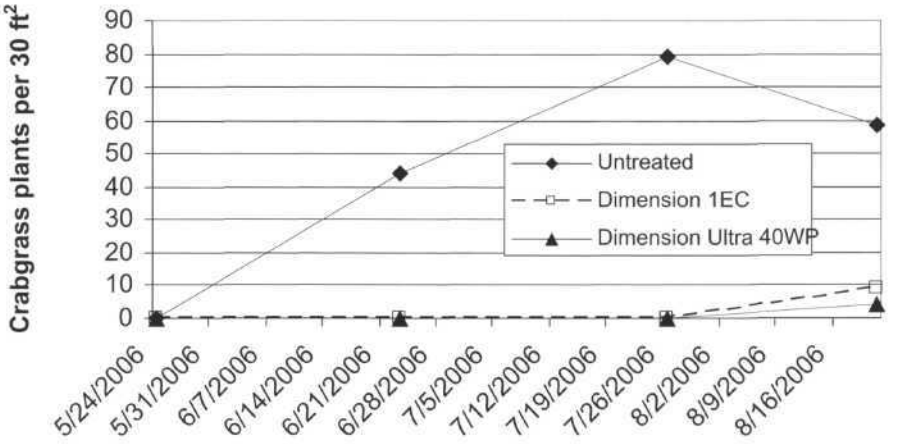

Fig. 1. Crabgrass (*Digitaria* spp.) control in creeping bentgrass turf maintained at 0.5 inch cutting height when treated with one of two formulations of dithiopyr pre-emergent herbicide (Dimension(r)) on 26 April 2006, O.J. Noer Turfgrass Research and Educational Facility, Verona, WI.

2006: The TDL Year in Review

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

The temperatures are dropping as fast as the leaves, the first snowflakes have fallen all across the state, and only the most intense homeowners are still submitting home lawn samples to the Turfgrass Diagnostic Lab. All this can only suggest that we have reached the end of another growing season, providing an opportunity to reflect on the year that was.

Being my first full year at the helm of the TDL, I wasn't sure what to expect. But Mother Nature kept everybody in the state guessing until the weather moderated in the fall, and provided for a wide range of diseases for both professional turf managers and homeowners to deal with (Table 1).

Consistent rains and cool temperatures early in the spring in the southern part of the state provided optimum conditions for damaging outbreaks of pink snow mold (*Microdochium nivale*). Many superintendents were caught off guard with the suddenness of the symptoms, and it took several weeks at some golf courses until symptoms finally disappeared.

Many older golf courses continued to see nagging but serious problems in the early summer with Bipolaris leaf spot (*Bipolaris* spp.) on their older clones of bentgrass (Figures 1 and 2). Fungicides that have controlled the leaf spots in the past were not providing acceptable control, and only after several fungicides were tank-mixed and applied at high label rates was control achieved. We still have not answered the question as to why this particular leaf spot outbreak was so difficult to control, and continued research is needed for further understanding.

Root-rotting diseases such as take-all patch, summer patch, and necrotic ring spot continued to cause significant damage to Wisconsin turfgrass. But with what appeared to be an extremely long window of optimal growing conditions for the fungus, damage

2006 TDL Diagnoses

Diagnosis	Professional*		Homeowner*	
Take-All Patch	11	(17)	0	(0)
Abiotic	11	(10)	44	(20)
Microdochium Patch	9	(13)	0	(7)
Bipolaris Leaf Spot	8	(NA)	0	(NA)
Insects	5	(0)	2	(2)
Anthracnose	4	(NA)	0	(0)
Fairy Rings	3	(0)	3	(1)
Necrotic Ring Spot	2	(7)	16	(19)
Summer Patch	2	(8)	0	(0)
Rhizoctonia Brown Patch	2	(3)	4	(1)
Rhizoctonia zeae	2	(NA)	0	(NA)
Rough Bluegrass (*Poa trivialis*)	0	(8)	11	(5)
Typhula Blight	1	(0)	1	(1)
Weed ID	0	(8)	39	(12)
Dollar Spot	0	(NA)	3	(0)
Other	13	(NA)	0	(0)
TOTAL	73	(96)	123	(103)

Table 1. *Numbers in parentheses are diagnoses in 2004 (Numbers not available for 2005)

was actually a bit less than anticipated. Increased damage from take-all patch and necrotic ring spot were seen in the northern parts of the state, where very dry conditions persisted for much of the summer.

In comparison to recent summers, the summer of 2006 was proceeding relatively quietly until the middle of July. That is when some of the most intense heat and humidity we have seen in recent memory gripped the state for several weeks, providing optimum conditions for hot weather diseases such as brown patch, Pythium blight, and even Rhizoctonia leaf and sheath spot (*R. zeae*). Disease pressure was so high in this period that golf courses that haven't seen either disease in many years suffered serious turf loss, and even some courses that did apply preventative fungicides experienced some disease breakthrough.

Figure 1: The Bipolaris leaf spot damage we have seen over the past couple of seasons has resembled dollar spot, but with a pronounced reddish color.

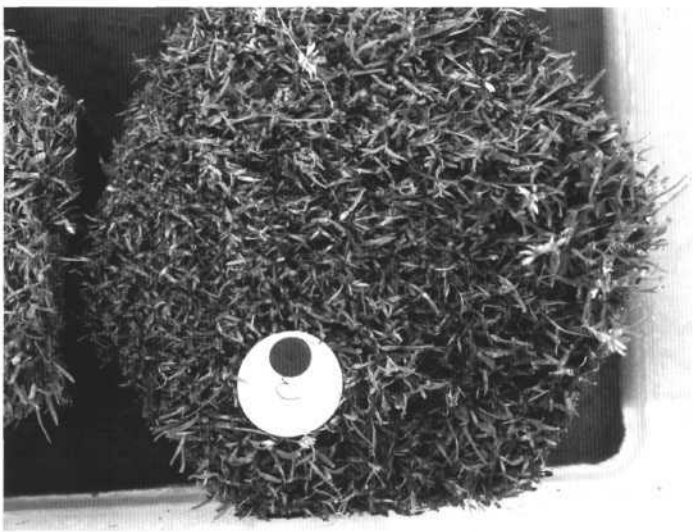

Figure 2: In some cases, the Bipolaris leaf spot spread from the distinct lesions found in Figure 1 to cause widespread damage over relatively large areas.

The wet spring coupled with the extreme heat and humidity also allowed for rather severe Type I (hydrophobic soil) fairy ring damage to occur. In one bizarre instance, the nitrogen released by the fairy ring fungus that causes the green fairy rings (Type II) was enough to promote *Rhizoctonia zeae* in the exact same rings, forming several yellow rings on many putting greens.

Fortunately for everyone, the weather moderated soon after the Wisconsin Turfgrass Association's Summer Field Day on August 1st. Only minor turfgrass problems were sent to the Turfgrass Diagnostic Lab the rest of the growing season, and most of those dealt with abiotic issues such as soil compaction or shade.

But unfortunately at the same time that the intense summer conditions had dissipated and we said hello again to Wisconsin's comfortable summers, we had to say goodbye to Dr. Geunhwa Jung (Figure 3). Dr. Jung was my major advisor and the man that convinced me to stay at the University of Wisconsin to pursue my master's degree. His tireless work ethic, boundless energy, and constant support made what could be a boring laboratory study interesting and meaningful. Even after the sometimes nasty battle to keep Dr. Jung in Madison had ended unsuccessfully, he continued to support my research and be available for guidance anytime I or anyone else needed him. Considering the conditions, that is a remarkable accomplishment. But our loss is the University of Massachusetts-Amherst's gain, and I wish him all the best as he builds on the success that he started here.

Figure 3: Dr. Jung is a renowned leader when it comes to Typhula blight, which is probably why he's smiling so broadly standing amongst all this disease.

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