

density and uniformity, reduce clippings, and for consistent, day-long ball roll. I have found it necessary to adjust rates and application intervals throughout the year to achieve expected results.

When superintendents speak of greens fertilization we mostly speak of nitrogen or how little of it we apply. The greens fertilization program at Pine Hills mirrors many with some granular feeding in fall and spring and spoon feeding during the growing season. Just over two lbs of N were applied in 2005.

Fertilizer Applications

Date	Fertilizer	Amount per M	Amount N per M
Nov-04	Milorg, Greens Grade	10 lbs	6 lbs
Mon May 2	Anderson's 14-0-29 w/ Poa Control	2.3 lbs	3 lbs
Sprayer Apps			
Tues May 17	Lesco 28-7-14 UMaxx 47-0-0 Lesco iron 12-0-0	15 lbs 30 lbs 1.80 oz	05 lbs 15 lbs
Fri May 27	Lesco 28-7-14 UMaxx 47-0-0 Lesco iron 12-0-0	15 lbs 30 lbs 1.80 oz	05 lbs 15 lbs
Fri June 3	UMaxx 47-0-0	35 lbs	16 lbs
Mon June 13	UMaxx 47-0-0	3 lbs	15 lbs
Tues July 5	UMaxx 47-0-0	3 lbs	15 lbs
Wed Sept 7	UMaxx 47-0-0	3 lbs	15 lbs
Tues Sept 20	UMaxx 47-0-0	3 lbs	15 lbs
TOTAL			2.06 lbs/M/year

The Aquatrols product Revolution was the wetting agent of choice in 2005. Label recommended rates of 6 oz per were applied on April 19, June 13, July 5, and August 1.

It is a near given that at the heart of every greens management program is well thought out preventative fungicide application program. The following monthly charts detail dates and rates for 2005 at Pine Hills.

May/June Fungicide Apps

Date	Pesticide	Amount per M
Tues May 17	Proxy Daconil Ultrex	4.50 oz 1.80 oz
Fri May 27	Chipco 26GT	2.20 oz
Fri June 3	Insignia	1.08 oz
Mon June 13 & Fri June 24	Fore 80 WP Chipco Signature Daconil Ultrex	4.20 oz 2.90 oz 1.80 oz

July Fungicide Apps

Date	Pesticide	Amount per M
Tues July 5	Insignia Daconil Ultrex	.90 oz 1.80 oz
Tues July 12	Fore 80 WP Chipco Signature Daconil Ultrex Wisdom TC Flowable (Talstar GC)	4.40 oz 3.00 oz 1.80 oz 1.85 oz
Tues July 18	Daconil Ultrex	1.80 oz
Tues July 26	Fore 80 WP Daconil Ultrex	2.20 oz 1.80 oz

August Fungicide Apps

Date	Pesticide	Amount per M
Wed Aug 3	Chipco Signature Daconil Ultrex Wisdom TC Flowable	3.00 oz 1.80 oz .55 oz
Fri Aug 12	Chipco Signature Daconil Ultrex	3.00 oz 1.80 oz
Wed Aug 17 (Only #3 Green - For Leaf Spot - Bipolaris Sorokiniana)	Insignia Quali-Pro DF	.90 oz 1.80 oz
Fri Aug 26	Fore 80 WP Chipco 26GT	2.20 oz 2.95 oz

September Fungicide Apps

Date	Pesticide	Amount per M
Wed Sept 7	Daconil Ultrex	1.80 oz
Fri Sept 16 (Only #13 Green - For Leaf Spot - Bipolaris Sorokiniana)	Daconil Ultrex Insignia Chipco 26GT	1.80 oz .90 oz 2.45 oz
Tues Sept 20	Daconil Ultrex Fore 80 WP Chipco 26GT	1.80 oz 4.30 oz 2.90 oz

Oct/Nov Fungicide Apps

Date	Pesticide	Amount per M
Mon Oct 10	Insignia Fore 80 WP Quali-Pro DF	.85 oz 4.40 oz 1.80 oz
Tues Nov 8	Daconil Weatherstik Chipco 26GT Insignia	3.50 oz 3.50 oz .85 oz
Wed Nov 30	Daconil Weatherstik Chipco 26GT	3.50 oz 3.50 oz

Operational Reports — Lessons learned from 2005 continued...

Wisconsin Says It All: A Review of 2005

By **Gary Tanko**, Golf Course Superintendent, SENTRYWORLD

Rain and ice in January, record high temps in February, then cold again to extremely warm temps in early April. Those warm days proved to just tease most of us because it fell back into below normal temperatures, when we all needed to get on with seeding but soil temps kept any germination from happening.

Then we get into the early summer with all of us waiting and waiting for some rain. To make matters worse, temperatures and humidity were climbing.

Patience was running out not only from golfers wondering when everything would heal over, but also from ourselves. We were trying to do our best to recover from the winter yet starting to fight the stresses of the hot, dry summer we were experiencing.

Finally after really struggling to just keep turf alive Wisconsin had something to say: let's give these guys one more test – a week of hot humid weather in September to deal with right during a time most of us are hoping for cooler days to aerate and prepare for winter.

We finally came to the end of our season, hoping that what turf has survived the summer and our fall cultural practices will survive this winter.

Well, Wisconsin has decided to give us a break; a mild winter, one that may keep the heating bills down but one that may not harden off the turf. Wisconsin almost mimicked the



exact ice storm and rain of a year ago this past New Year's Day, but it did not happen. However, I was literally out two days before our snowcover using squeegees to push off standing water on greens. Of course Wisconsin gave us almost 3/4 inch of rain before it snowed. There is now some ice that formed under the snow that appears honeycombed. At least it is 34 days latter than last year.

Wisconsin really did have something to say for us in 2005.

It was a real test for most superintendents. We asked ourselves many questions. What should we do, how long can we wait, what is the next course doing, will we even have grass in the spring, or

maybe did we do the right thing?

For us, we decided that we better be proactive and do something. So the work started.

We decided to push the snow off greens that were covered with two to three inches of thick clear ice that formed from one inch of rain and ice that fell on unfrozen turf January 1st, 2005.

We then started to aerate the ice on an extremely cold morning which seemed to work the best for breaking chunks of ice up. We knew the future forecast was for record breaking temps, so we moved quickly.

Wisconsin once again did something not normal for this time of

year. Temperatures reached into the 50's. We literally had running water and big puddles sitting on the greens.

But all of sudden very cold temps were on the way, certain within 12 hours.

I was worried that the turf was going to suffer. Sure, all the ice was mostly gone, but now we had turf exposed to warm temps only to be shocked right back into winter.

April finally arrived and most of us jumped at the opportunity to start seeding all the areas where we lost turf. That worked for awhile until the weather changed and it turned cold again, which really made us start all over once it turned warm again.

One advantage of this was, I feel, the *Poa annua* did die and this was a chance to let the bentgrass fill in. I decided not to aerate and apply TGR and Dimension. Of course, many areas of greens where we lost turf or

was seeded had to be covered for this application. Covers were used and some of our staff had long hours coming back at night to pamper these injured areas back into playable surfaces.

Our summer was very warm with minimal rain, lots of humidity and turf that was beginning to thin, along with take-all patch showing its ugly symptoms. Greens were not reacting to any fertilizers or fungicides. Tests were made for nematodes, but I am still scratching my head on this.


Hand watering and syringing greens seemed to be taking up most of our time. Mowing greens became a real problem for us since we seemed to be scalping all the time and our collars were so delicate you could hardly mow them.

For most of Wisconsin, rain was needed but we received a straight line wind storm that devastated many 100-year old oaks and many other trees on the course.

Wisconsin had something to say; "if you need rain you will get the damaging wind too, followed by hot temps and high humidity."

This storm left behind so much damage we had to close our golf course for one week to clean things up. It was not passable nor could we apply a fungicide, or mow greens, tees, or fairways. As of today we are still cleaning up from this storm.

Finally the fall was here, but again, one week of high humidity and hot temperatures tested the turf one last time.

As we prepared the golf course for winter I was determined to do all the cultural practices best for the turf, but also we let the greens, tees, and fairways grow out and we rolled more than ever. The height of the greens was obnoxious, but I feel they might be healthier going into a winter of unknown. After all, "Wisconsin Says It All!" 



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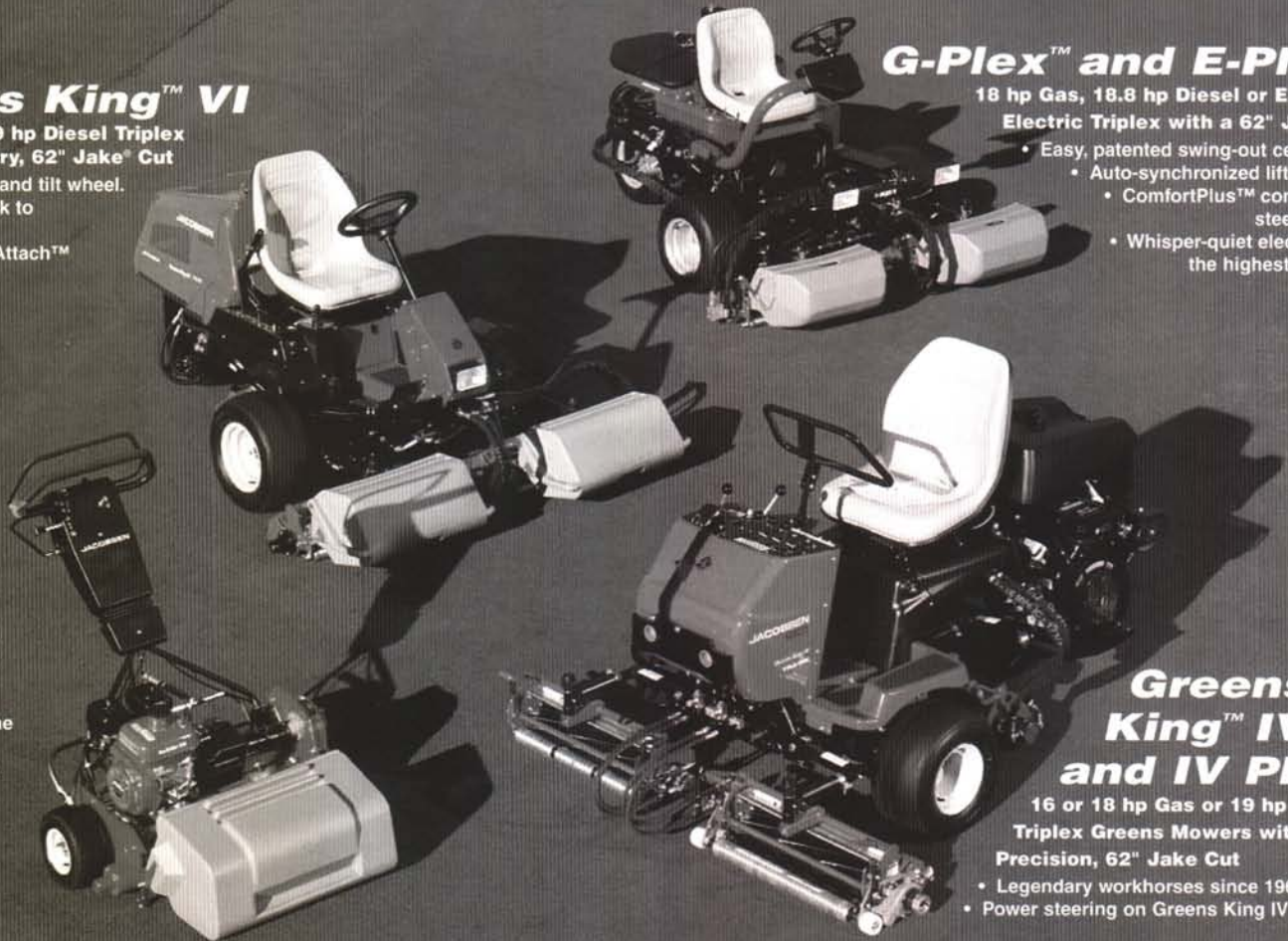
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Racine CC Greens Management Programs 2005

By **Mike Handrich**, Golf Course Superintendent, Racine Country Club

The 04/05 winter proved to be devastating on golf turf all throughout Wisconsin. A thunderstorm in southeastern Wisconsin on January 12th, 2005 dumped close to one inch of rain on top of 11 inches of snow cover. The melting snow in combination with the driving rain turned our golf course into a running river of water. On January 14th the temperature dropped from the mid 30 degree range to two degrees in a very short time frame. This resulted in Racine Country Club being 85% encased in ice. Most of the ice remained well into the month of March.

Every green was covered with a two to four inch thick layer of ice, and the majority of tee and fairway turf resembled ice skating rinks. In February we began removing snow from the greens to expose the underlying ice. The smell of decaying turf under the ice was very pronounced on certain greens. At this point I knew we needed to remove the ice from greens; we had already lost some turf, and I needed to get the word out to the membership fast.

Fortunately, many other superintendents were also in the same boat. In mid-March, Jerry Kershasky, veteran superintendent at Westmoor CC, did a brilliant job in organizing a meeting where USGA agronomist Bob Vavrek, and UW-Madison turfgrass professor John Stier discussed at length the causes and effects and repercussions of winterkill. The

meeting was very well attended with over 200 people in attendance. The meeting was a great educational forum for managers and officers alike. After the meeting, representatives of Racine CC went home understanding and expecting losses from winterkill.

Based on the smell and appearance of the turf after the ice was removed, I knew we already lost some turf. I also felt that there would be three keys for a successful recovery:

1. Good and strong communication to the membership and my staff.
2. We needed to take the proactive approach rather than being reactive.
3. We needed to take this negative and turn it into a positive by bringing the course back quickly.

I explained to my staff of the ravages of winterkill and that no apologies were necessary. We needed to attack the problem head on, be confident in our abilities, and have a strong desire to succeed.

In mid-February we used a backpack sprayer to apply spray pattern indicator to the ice encapsulated greens. The dye in combination with sunlight did a remarkable job of loosening the ice. Once loose, the ice was removed with ice picks and shovels. The low lying areas lacking drainage and areas receiving the least amount of sunlight throughout the winter sustained the most kill. Our

biggest challenge was germinating bentgrass quickly during a cold and dry Wisconsin spring. We seeded early and then we had to find a way to **limit the limiting factors** for germinating seed which were low soil temperature, unavailable nutrients, and a lack of moisture.

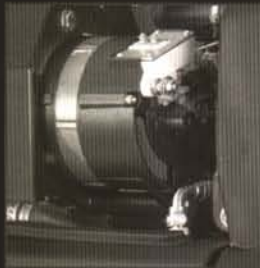
On April 6th we quadtined all fairway areas suspected of winterkill. The holes from aeration provided excellent warmth and protection for germinating seed. Penntrio bentgrass was seeded at 2 lbs. per thousand square feet with a rotary spreader, Milorganite and starter fertilizer. The areas were then topdressed with 70 percent sand/ 20 percent peat/ 10 percent soil construction mix. On April 20th the areas were covered with seed guard for heat and moisture retention. On May 5th, the covers were removed. **The bentgrass was so thick and high we needed push mowers to mow it down.**

All greens were quadtined, overseeded with L-93 bentgrass, and then topdressed on April 4th. On April 6th we opened a badly damaged golf course to walkers with six temporary greens which remained covered. At this time the course was not good, but the members could plainly see we were already on our way to recovery. All throughout April we fertilized, syringed, mowed, covered, uncovered, topdressed, spiked, and overseeded all damaged green areas. On April 29th we recorded a 19 degree tempera-



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ture difference (65 degrees vs. 46 degrees) between covered and uncovered green surfaces. April was very cold, but under the covers the newly emerging seed was growing quickly! Our sound cultural practices in combination with the protection of the covers provided the perfect environment for the re-establishment of bent grass on our greens.

On May 7th, all greens at Racine CC were open for play. On May 29th our greens were all 100 percent back and averaging 10.5 feet on the stimpmeter. Other keys to our timely and successful recovery were:

1. Slow healing *Poa* colonies were regularly cupped out to the edges of the greens for faster recovery.
2. The greens were topdressed on a regular basis.
3. The worst greens were kept covered during cold days and nights.
4. Temporary greens were utilized when and where needed.

I can confidently say that we took advantage of every single heating degree day and ray of sunshine throughout the recovery period. Timely syringing in the afternoons paid big dividends going into the evenings. We certainly were aggressive in growing grass versus maintaining it. We were not shy in closing and covering any area that would benefit from that. We were confident in our practices, we stuck to our convictions and we felt we were on an important mission to bring our course back as fast as humanly possible!

As for managing our greens throughout the year, simply put, we manage for the root system. Our main goal is to keep as much oxygen in the soil as we possibly can. We routinely core aerify in the spring and vertidrain with solid tines in the fall. I believe the

most important decision we make as turfgrass managers is the amount of water we supply on a daily basis. We water timely and judiciously, and we hand water wherever possible. In doing so, we avoid compaction and retain the maximum amount of oxygen in the vital root system.

In regards to fertilizer, we use about two pounds of nitrogen per year. We spoonfeed throughout the growing season, and we treat greens individually according to their intrinsic needs. I like using a variety of products in order to take advantage of unique chemistries and nutrient ratios and packages. I like taking the golf course into winter "mean and lean" to avoid possible top growth during periods of mild weather.

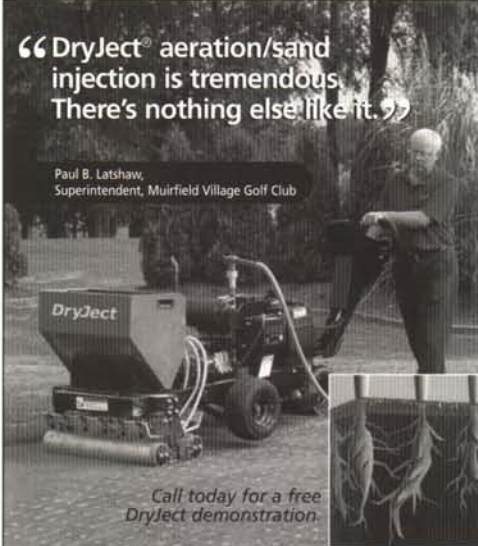
Our spray program is very simplistic with chlorothalonil as the backbone. Generally speaking greens are sprayed bi-weekly with a combination of broadspectrum contact and systemic fungicides. We spray on the low end of label rates and never spray when conditions are adverse for doing so. We regulate our greens bi-weekly with Primo. Our cutting height is constant at .120 inch, and we double

cut and roll when necessary. We topdress in accordance to growth rates of cool season grasses, more in spring and fall and less throughout the summer.

In summing up our management practices at Racine CC, we do what we need to do agronomically for the management and proliferation of healthy turfgrass. I believe that sound management practices are accumulative and when repeated year in and year out championship playing surfaces are the end result. The year of 2005 was a success at Racine CC. We showed our members our capabilities as turf managers under very difficult circumstances. Today most of our members have forgotten which greens and how many were temporaries last spring; however, they all remember the great playing conditions they had last summer. Every golf course superintendent loses turf during his/her career, some more than others. I believe job success and security are not directly related to the amount of turf lost. Rather the most successful people are the good communicators and best leaders. ♣

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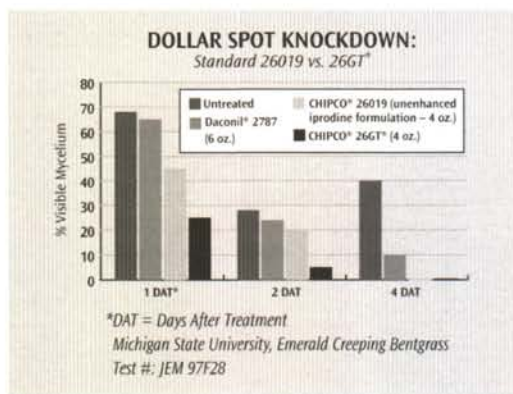
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At Long Last: Meridian (thiamethoxam) is Slated for EPA Registration in Late 2006



By Dr. R. Chris Williamson, Department of Entomology, University of Wisconsin-Madison

Since early 2000, Syngenta Crop Protection had been anxiously anticipating the registration of Meridian (thiamethoxam) for use on turf (golf and lawn/landscape) and ornamentals (urban landscape). Due to some regulatory considerations, the registration of Meridian had been delayed until additional information/data were provided to complete the necessary fulfillment of Environmental Protection Agency (EPA) guidelines. These requirements have recently been completed; consequently, Meridian is slated for EPA registration in late 2006.

What is Meridian and what does this mean for you?

Meridian™ is the trademark for thiamethoxam, a thianicotinyl insecticide in the neonicotinoid class of insecticides. Meridian controls a wide spectrum of sucking and chewing insect pests at very low use rates through contact and ingestion activity. Meridian is also an excellent systemic compound that is rapidly absorbed and transported in the xylem of the plant, thus providing an alternative use strategy. Meridian has a relatively long residual activity (about 120 days), thus providing long lasting control. Lastly, Meridian will be assigned the pesticide signal word "CAUTION" due to its relatively high Oral LD₅₀ value of > 5000 mg/kg (ppm).

What will the Meridian label look like?

Meridian will likely be available in two formulations (25WG and 0.33G), offering the flexibility of applying it with various application equipment. The target insect pests in turf will likely include: Japanese beetle, northern masked chafer, southern masked chafer, European chafer, May/June beetle (*Phyllophaga* spp.), Asiatic garden beetle, Oriental beetle, green June beetle, black turfgrass *Ataenius* (BTA), billbugs (*Sphenophorus* spp.), *Aphodius* spp., and ants. As a result of the relatively long residual activity of Meridian, it (like other related compounds) will enable turfgrass managers to have a wider application timing window, thus allowing greater application flexibility.

From an ornamentals perspective, the Meridian label will likely include: aphids, whiteflies, mealybugs, black vine weevil (adults), leafhoppers, plant bug, nipple gall, and blister gall. An added beneficial attribute of Meridian is that it has translaminar properties that enable the active ingredient (thiamethoxam) to penetrate the leaf surface.

What is the potential impact on beneficial arthropods (predators and parasites)?

The potential negative impact of Meridian on beneficial arthropods is minimal due to two factors: 1) short leaf surface residual activity and 2) the systemic properties (root absorption) of Meridian. These are important attributes that allow Meridian to be included in integrated pest management programs.

The registration of Meridian will be a viable addition to the relatively narrow selection of control agents (insecticides) currently commercially available in the turf and ornamental arena. As a result, turfgrass and ornamental plant material managers will soon have another possible choice in their insect control arsenal. ♣

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