Operational Reports — Lessons learned from 2005

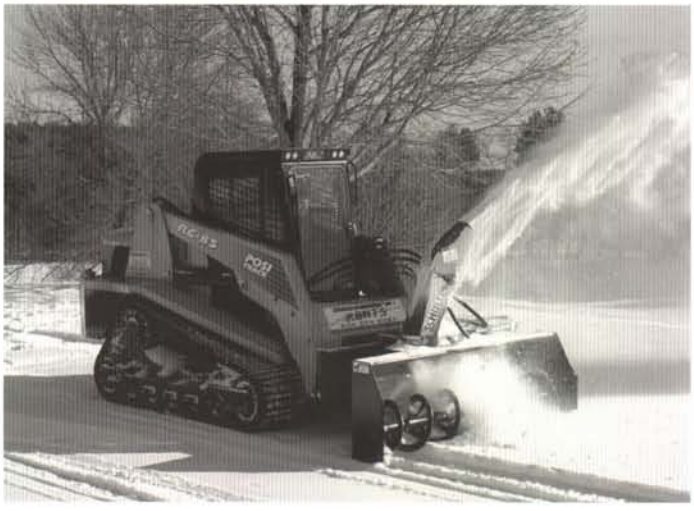
One of the best parts of the WTA EXPO last January was the discussion of winter injury recovery and golf turf management during the season of 2005. Rod Johnson, Mike Handrich, Gary Tanko and Pat Sisk made excellent presentations to an audience that was listening intently. They agreed to provide a summary of their remarks for The Grass Roots, and those reports follow.

Pine Hills Greens Management Programs 2005

By Rod Johnson, Golf Course Superintendent, Pine Hills Country Club

The following is a summary of a presentation given at the January 2006 WTA Expo. A large portion of the presentation was slides and charts with "off the cuff" remarks so I will attempt to summarize the presentation.

The thoughts of Wisconsin superintendents in early 2005 were on a thick ice accumulation that had been on courses since the first week in January. The potential for large areas of turf loss was high. Pine Hills shared those concerns with solid dense ice accumulations ranging from two to four inches in thickness. With those concerns in mind we went forward with a snow and ice removal program in early March. Rented and in house snow blowers were used to remove up to 12 inches of snow cover and Milorganite was used to darken the ice and take advantage of warm sunshine. All greens were cleared completely of all snow and ice over a five day period in the first week of March.



The physical removal of ice and snow accumulations is subject to debate. I don't know how big of a factor removal was, but turf damage to greens at Pine Hills was minimal with only small "dots" of *Poa Annua* affected. Our recovery program consisted of a "kick the dog" philosophy with an application of Andersons 14-0-29 with *Poa annua* control. With a fairly large percentage of bentgrasses I have found an early season application of a *Poa*-controlling growth regulator beneficial in further reduction of annual species. An application of 2.3 lbs of the product per M was made on May 2.

Greens at Pine Hills are mowed with four Toro 1000 mowers normally equipped with heavy cast grooved front rollers. The first mow of the 2005 season took place on April 7. From April 16-May 14 greens were mowed three times per week on a Tuesday, Thursday, and Saturday schedule. Between May 15 - October 22 greens were mowed daily. From October 25 - November 8 we were back on the 3 times per week schedule.

Height of Cut

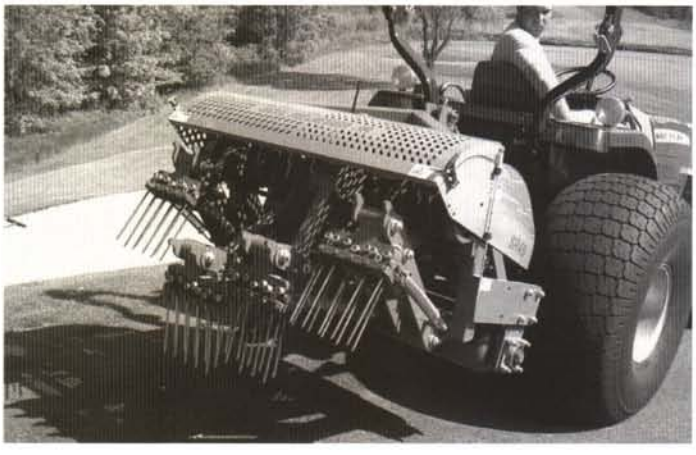
- First Mow - .170 (April 7)
- Mid May - .160
- Late May - .150
- June 16 - .140
- July 9 - .130
- July 11 - .115 (solid roller)
- July 19 - .140 (grooved roller w/daily rolling)
- Aug 20 - .135
- Sept 4 - .130

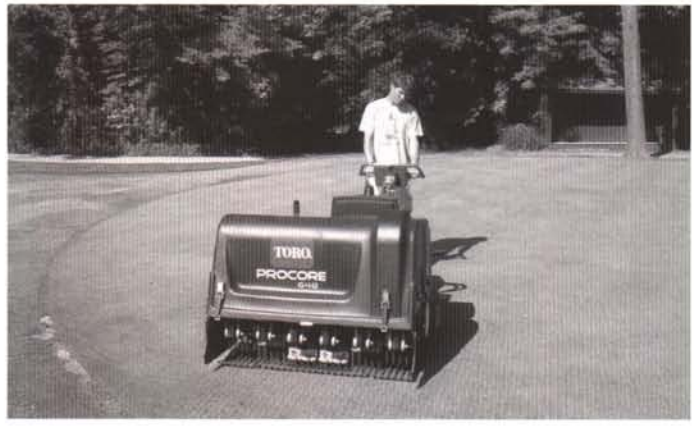
Starting on June 2 as seasonal labor became available greens were rolled on a three times per week basis, again Tuesday, Thursday, and Saturday. A Tru-Turf side-winder type roller was used. Starting on July 19 and continuing until September 22 entire greens were rolled on the three time per week schedule, and on alternating days the 30% of the green where the hole was located was rolled. This schedule resulted in a consistent day to day ball roll.

Greens at Pine Hills are historically aerified the first Monday of June. The following chart provides the details.

Greens Aerification – June 6th

- Soil Reliever @ 8 " depth and spacing
- Followed with Toro Procore 648 fitted with 3/8 " solid quad tines @ 2" spacing and 2 1/2" depth
- Collars aerified with Toro Procore 648 fitted with 5/8 " hollow tines @ 2 1/2" spacing and 2 " depth
- Sand applied @ 1.2 cu ft/M (180 cu ft or 9 tons used total)
- Drag once over with astroturf mat
- Vibrating roller twice over, two different directions
- Hand water heavily due to wilt and to wash sand down
- Greens syringed often during the day due to high temps and wind
- Time spent aerifying 20 greens (not including collars):
  Soil Reliever – 8.5 hrs.; Toro Procore – 9 hrs





Sand topdressing is applied on a light and frequent basis. Thirteen sand applications were made in 2005 with rates and annual totals of sand applied contained in chart form.

Sand Topdressing

Date	Amount per M	Total sand applied
Mon May 16	.45 cu ft	60 cu ft
Mon May 23	.45 cu ft	60 cu ft
Mon June 6 (greens aerification)	1.35 cu ft	180 cu ft
Mon June 13	.45 cu ft	60 cu ft
Fri July 1	.45 cu ft	60 cu ft
Mon July 11	.45 cu ft	60 cu ft
Mon July 18	.90 cu ft	120 cu ft
Mon July 25	.90 cu ft	120 cu ft
Mon Aug 15	.45 cu ft	60 cu ft
Mon Aug 29	.45 cu ft	60 cu ft
Mon Sept 12	.45 cu ft	60 cu ft
Mon Oct 3	.45 cu ft	60 cu ft
Tues Nov 29	.90 cu ft	120 cu ft
TOTAL	8.1 cu ft/M/yr	1080 cu ft 40 cu yds 54 tons

Growth regulators are a major component of the greens management program at Pine Hills. I have chosen to use Primo on a regular basis to improve turf

Primo Applications

Date	Amount per M
Tues May 17	.10 oz
Fri May 27	.10 oz
Fri June 17	.16 oz
Fri June 24	.13 oz
Tues July 12	.20 oz
Mon July 18	.20 oz
Tues July 26	.15 oz
Wed Aug 3	.20 oz
Fri Aug 12	.20 oz
Fri Aug 26	.23 oz
Wed Sept 7	.20 oz
Tues Sept 20	.20 oz
12 Total Apps	2.07 oz/M/year

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	4.50 oz
	Daconil Ultrex	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	4.20 oz
	Chipco Signature	2.90 oz
	Daconil Ultrex	1.80 oz

July Fungicide Apps

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

August Fungicide Apps

Date	Pesticide	Amount per M
Wed Aug 3	Chipco Signature	3.00 oz
	Daconil Ultrex	1.80 oz
	Wisdom TC Flowable	.55 oz
Fri Aug 12	Chipco Signature	3.00 oz
	Daconil Ultrex	1.80 oz
Wed Aug 17 (Only #3 Green - For Leaf Spot - Bipolaris Sorokiniana)	Insignia	.90 oz
	Quali-Pro DF	1.80 oz
Fri Aug 26	Fore 80 WP	2.20 oz
	Chipco 26GT	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	1.80 oz
	Insignia	.90 oz
	Chipco 26GT	2.45 oz
Tues Sept 20	Daconil Ultrex	1.80 oz
	Fore 80 WP	4.30 oz
	Chipco 26GT	2.90 oz

Oct/Nov Fungicide Apps

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

Operational Reports — Lessons learned from 2005 continued...

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 aerification 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-

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.