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Jack MacKenzie, CGCS
jmackenzie426@msn.com

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EXECUTIVE DIRECTOR

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11900 Wayzata Blvd., Suite 130
Minnetonka, MN 55305
952/473-0557 Fax: 952/546-1652
Toll Free: 1-800-642-7227
E-mail: scott@mgcsa.org

www.mgcsa.org

U of M Field Day Will Be A Great Time to Learn about Research



Scott Hoffman and Kerry Glader provided a tremendous amount of time and energy during their term on the Board of Directors during the mid-eighties. They envisioned a way to support turf research in the state when funds were needed. They probably did not foresee a University program that could have three professors supporting turfgrass located here in the state. They did know that a program providing research, out-reach, and teaching would need industry support. In 1989, the MGCSA created a trust fund, with the express purpose to:

+ Disburse monies for appropriate research projects concerning turfgrass and chemicals used in the development and maintenance of golf course turfgrass.

+ Solicit and otherwise procure donations and grants.

+ Receive and account for all monies.

At the June meeting, the Board of Directors discussed using the funds accumulated in the Trust Fund to help support the TROE Center at the University of Minnesota. The board concluded that there is not a better investment in turfgrass research that would help our association members. At this time though we are looking for a commitment from the University of Minnesota to partnership with industry to help build a facility at the research site. The MTGF is also looking for a similar commitment.

* * * * *

The dues statement sent out in April included a line to make a tax-deductible donation to the Association for research. We have had over 160 dues statements arrive back at the association office with donations from \$25 to over \$100. With these donations we were able to raise over \$5,000 dollars! It is an enormous commitment our members have made to support the research program in our state. Along with the monies raised from the dues statement, the Turf Tourney that many of the clubs participate in continues to be a strong fundraiser. Another important fundraiser for us is the Research Tourney. This year's tourney will be held at Oak Marsh Golf Course. The event is great a opportunity to bring your greens chairman and other members of the board and explain the benefits of turf research conducted here in the state. There is one area we had great intentions of tapping, but due to time constraints we were forced to wait until next year to promote it. The Hole in One concept, which would have asked for donations from golfers, will be delayed until next year to better organize the event.

We are all aware of the benefits of research and we will continue to raise funds, but the true benefactor of our labor is the golfer. In the spring, he enjoys playing on green grass which has come out of the winter in great shape due in part to cover studies and snow mold trials supported by our members. He gets to play on beautifully maintained turf during the summer that utilizes the most advanced technology and information based on studies that allow our members to continue to provide the conditions golfers ask for. We would like to partnership with the golfers to help support research here in our state.

* * * * *

The University of Minnesota Field Day will be July 24 starting at 7:45 A.M. The Field Day is a great time to learn about the research being conducted at the University and see many of the field trials. This is also a great opportunity to see the TROE Center and the future plans for the complex. We look forward to seeing you there.

Your President,
Rick Fredericksen, CGCS

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Linear Aerification - Is It For You?

By Paul Diegnau, CGCS
Keller Golf Course
St. Paul, Minnesota

Putting surface disruption from your core aerification got you down? Sick of the post-aerification whining and complaining from your golf clientele? Then pay attention. There is a new tool on the market that might just find a parking spot next to your core aerifier.

Back in 1990, in Melbourne, Australia, the owners of an engineering factory became frustrated by the poor condition of their municipal cricket pitches. To keep workers employed during an economic slowdown, they designed and manufactured a heavy-duty "ground groover" that could cut through the heavy, compacted soils of their playing fields. The machine was a pronounced success. Soon it was being shipped to many other countries. After some modifications for the softer playing surfaces of a golf course, the Graden GS04 Deep Vertical Mower was displayed at the GCSAA Conference and Show for the first time in the mid-1990's.

This heavy-duty machine resembles the Mataway Seeder but is different in several important respects. The Graden GS04 is outfitted with a variable speed hydrostatic drive to match the conditions you are working in. The cutting blades are spaced on one inch centers, carbide tipped for long life, and available in widths of 1,2,and 3 mm. The machine can cut to a depth of 1.75 inches. It should be noted, in fairness to other manufacturers, that several other deep verticut machines are now on the market.

The southeastern United States was really the first region to utilize and experiment with this type of machine. Acceptance has slowly grown into other areas of the country. So why the sudden interest in this type of machine? With the introduction of the new, high-performance bentgrasses over the past decade, the management of organic matter has become extremely critical. These machines pull out tremendous amounts of organic plant material from the upper soil profile. Depending on blade width and depth setting, these machines can be used for several different situations and end results. Case in point: Pinehurst Resort and C.C. (Pinehurst, N.C.) has G2 bentgrass greens on several of their golf courses. Using Graden vertical mowers, their greens are dethatched every six to eight weeks. A one inch depth setting is used for major organic matter removal. To assist with topdressing incorporation, a shallower setting is used to create channels in the tight, dense canopy of the G2.

Sodded greens can also benefit from the use of this machine if used early in the life of the green. Greens established from sod invariably have issues with layering, whether they are the result of thatch components in the original sod or incompatible root zone media. Aggressive,



2mm Graden Slits Topdresser

deep vertical mowing into the problem area can disrupt and eventually minimize the problem layer, restoring water and air (oxygen) exchange to more acceptable levels. If the problem zone has moved below 1.75" in the soil profile, intense core cultivation is your only remaining option.

What if you manage Pennncross bentgrass greens that were established from seed? Does the Graden or a similar machine have a place in your arsenal? You bet! Without cultural intervention, all sand-based greens will eventually fail. That is the nature of the beast. From the time a sand-based green is established, the soil properties in the upper soil profile begin to change due to the proliferation of new roots, the sloughing of old roots and the accumulation of other plant matter. The accumulation of organic matter slowly plugs the soil macropores, altering the balance in pore spaces. As capillary pore space increases, so does moisture retention in conjunction with reduced infiltration rates and soil oxygen levels. As the process continues, turf quality declines and the soil surface eventually seals up, only to be followed by the eventual failure of the green.

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Under The Gun

By Merrell Noden, *The Met Golfer*

(Editor's Note: This article first appeared in The Met Golfer, the official publication of the Metropolitan (NY) Golf Association, published by GOLF MAGAZINE.)

Today's golf course superintendents are under more pressure than ever to present ultra-fast greens and perfect conditions-and it just might be working against the club members who demand them.

Lightning fast greens and a prolonged drought cost Chip Lafferty his job.

Todd Raisch couldn't believe his eyes on that awful morning in August 2001. There, where the sixth green of Ridgewood Country Club's Center nine had been just a few days earlier, was nothing but bare dirt. As the New Jersey club's superintendent, Raisch knew better than anyone how stubborn the club's anthracnose problem was, but this was ridiculous. The green had all but vanished.

"What was by all comparisons one of our best greens, with only a minor infection of anthracnose earlier in the week, was gone, and I mean gone," Raisch would later recall in the New Jersey Superintendents' Association newsletter. "There were no patches of yellow blades or even tan-colored leaves that were melting out. The green skipped those phases and went straight to dirt, overnight. To quote my Green Chairman, it was 'defense grade anthracnose.'

"You may recognize the problem, because Ridgewood is not the only Met Area club to recently do battle with anthracnose, a fungal disease that attacks turfgrass that is already under stress from heat, drought, a lack of exposure to sunlight and air, or such maintenance practices as frequent mowing, topdressing, and rolling. Worse, it has just added to the pressure so many superintendents find

themselves under, from severe weather conditions to budget cuts, to unrealistic expectations from club members.

The most unrealistic of those expectations is ultra-fast greens. And that's a serious problem for superintendents trying to keep their members happy, particularly during the dog days of summer when keeping bentgrass greens race-car fast can be like handing them a death sentence. That is, of course, if anthracnose doesn't get them first.

As golfers, we experience anthracnose as yellow, thinning grass. It's been around since the 1920s, but over the last five years the incidence of anthracnose has skyrocketed, and no region of the country has been hit harder than the northeast. Dr. Bruce Clarke, a turfgrass pathologist who directs the Center for Turfgrass Science at Rutgers University in New Jersey, says he is seeing three to four times as many cases as he did just a few years ago. "In the past," he says, "you heard about it from a few, isolated golf courses. Now, you hear it from dozens of courses each year."

Dr. Frank Rossi warns clubs not to pressure their superintendents for U.S. Open-like greens. *(Continued on Page 14)*



HOSTS OF THE SCHOLARSHIP SCRAMBLE, from the left, are Wayne Willey, Larry Weisenbeck, Tom Johnson and Chip Norman -- all from New Richmond Golf Club. Tom Johnson was host superintendent.

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Linear Aerification—

(Continued from Page 5)

As golf course superintendents, we head off this process by physically removing the organic matter and incorporating topdressing to dilute the accumulating organic matter. Managing the physical soil properties of the upper soil profile is critical to maintaining quality bentgrass through the stresses of the summer months.

Here at Keller GC, we have been experimenting with the Graden unit for several years now. It was purchased with the original intent of addressing a layering problem in twelve "new" greens. Our problems began in 1990 when twelve greens were rebuilt to USGA standards during an under-funded golf course renovation (12 out of 19 rebuilt). As with most government purchases, low bid determines the vendor. The Penncross sod that was laid over the 80/20 greens mix was of poor quality. It was a mature, thatchy sod. On top of that, the soil that the sod was grown on was incompatible with the 80/20 greens mix. What followed has been years of weak root growth, poor internal drainage, and poor soil aeration, resulting in poor putting surfaces.



3mm Graden Slits

In 1998, we began sending undisturbed soil cores to the International Sports Turf Research Center (ISTRC) in Olathe, Kansas for physical soil analysis. We tested the worst USGA green, #2, against one of our better USGA



Filling the grooves with drag brush.

greens, #18. The results confirmed what we had suspected. Organic content in the upper 1-2 inches of the soil profile was rated extremely high at 2.94-3.26%. The top end of the acceptable organic content range is 2.5%. ISTRC also concluded that with an infiltration rate of .81 inches/hour, #2 green was sealed off. The roots were essentially suffocating. The one inch thick organic sod layer buried in the soil profile was causing problems with perched water tables and limited air and water exchange.

Another issue often overlooked is the accumulation of fines (fine sand, silt and clay) in the upper soil profile. As greens age, contamination is inevitable, whether it be from wind blown material, poor quality topdressing, tracked material, bunker material thrown onto the green or even contamination during construction. According to USGA / ISTRC guidelines, clay, silt, fine sand and very fine sand combined should not total more than 10% of the particle size distribution. Our numbers varied between 12.4 - 13.4% fines in the upper four inches of the soil profile. So in addition to our high organic content, we are also hindered by excessive fines plugging our macropores in the root zone.

After seeing those numbers in the Spring of 1998, we elected to core aerify with three-quarter inch tines two times per year. We continued on this program through the 2000 golf season. We combined the core cultivation with frequent, light topdressings using straight sand throughout the golf season. The golfer response to this program was anything but pleasant. Three-quarter inch holes on the putting surface were not well received and are very slow to heal. We purchased the Graden unit in 2001 and began experimenting.

(Continued on Page 9)

Linear Aerification—

(Continued from Page 8)

In May of this year, we elected to deep verticut all of our putting surfaces in conjunction with one-half inch solid tine aerification. We used the widest blade available at 3mm and cut grooves to a one inch depth. In the past, we used the 2mm blades, which are the most popular blade size, but we found it difficult to incorporate the topdressing sand into the grooves. The 3mm (1/8") groove width was easily filled with straight sand topdressing and surface disruption was kept to a minimum.

We have found that the advantages of deep vertical mowing or "linear aeration" include, but are not limited to:

- + Minimal surface disruption, especially with the 1mm and 2mm blade.

- + Fast recovery with the 2 mm blade; the 3 mm seem to recover quicker than 5/8" tine holes.

- + Using the 3mm blades on one inch centers impacts approximately 14.1% of the putting surface. This compares to 4.9% when using 5/8" hollow tines on 2.5"x 2.5" centers. The 2mm blades impact 7.8% of the surface area. The 1mm blades impact 3.93%.



Graden in Action

- + When done in conjunction with sand topdressing, the process creates sand channels on one inch centers, up to 1.75 inches deep, across the entire putting surface. These channels not only improve surface drainage and air / water permeability, but aggressively manage the organic and "fines" issues we are dealing with.

- + These sand channels will link deep-tine, sand-filled aeration holes that have sealed off at the surface and rejuvenate their effectiveness.

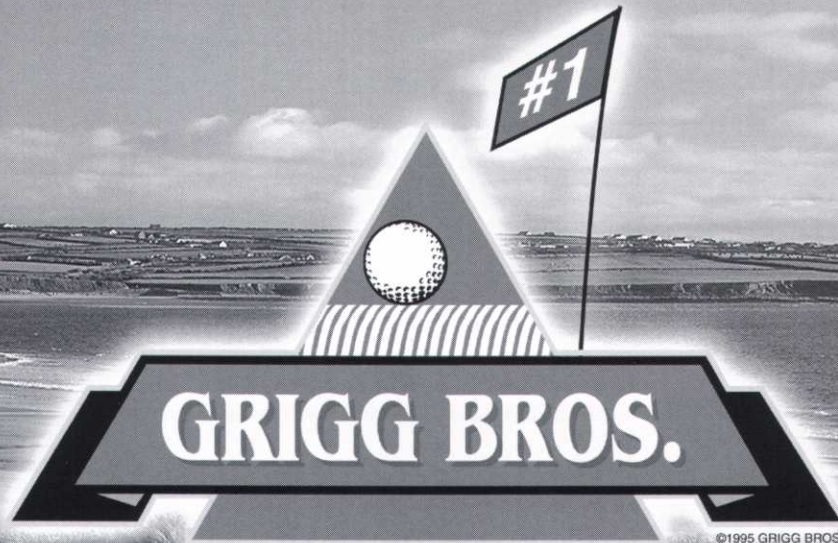
- + This machine will produce an excellent seed bed when bent seed is spread over the topdressing and dragged into the channels.

Deep vertical mowing is surely not a replacement for core cultivation. We intend to core cultivate a minimum of one time per season in the years ahead. Deep vertical mowing is simply another tool to help you deal with organic accumulation and poor physical soil properties that can occur when growing bentgrass on sand-based greens. But the greatest benefit, in the eyes of a golf course superintendent, is the good will this machine will spread for you...no holes equal happy golfers!



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