



HOW FINE IS FINE?

By Christopher L. Kerkman

Editor's Note: Chris Kerkman is a May, 1994 graduate of the Univ. of Wisconsin-Madison Turf and Grounds Management Program. Chris acquired his practical training in golf course management on the Geneva National and Blackhawk Country Club golf courses. In June he will begin working on an M.S. degree under the direction of Dr. Wayne Kussow.

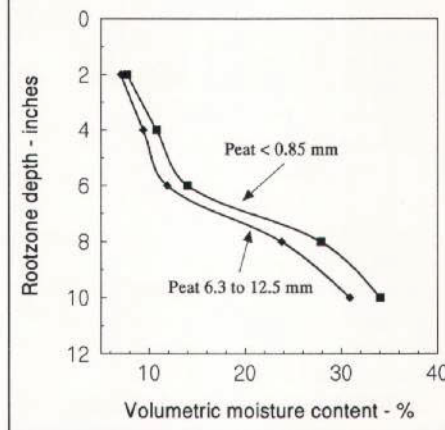
USGA specifications for putting green construction call for amendment of the rootzone sand with finely divided organic material containing 85 percent or more organic matter. The question is, "How fine is a finely divided organic amendment?" The answer to this question has practical implications as to how the peat needs to be processed before blending with the sand.

The purpose of this short-term, greenhouse study was to observe the effects of peat fineness on simulated putting green characteristics and on creeping bentgrass establishment. These provide a basis for deciding how fine the peat should be in rootzone mixes.

EXPERIMENTAL METHODS

Canadian sphagnum peat containing 95.4% organic matter was processed into six particle sizes. The finest particle size, <0.85 mm, was obtained by grinding the peat to pass through a 20-mesh sieve. The five remaining particle sizes were prepared by hand rubbing the peat and sieving to obtain size ranges of <1

FIGURE 2
Influence of peat particle size on moisture retention in the rootzone of putting greens.



mm, 1 to 2 mm, 2 to 3.35 mm, 3.35 to 6.3 mm, and 6.3 to 12.5 mm. These correspond to mesh sizes of <18, 18 to 10, 10 to 6, 6 to 1/4 inch, and 1/4 to 1/2 inch, respectively.

Rootzone mixes were then prepared by blending the various peat sizes with USGA specification sand at an 80:20 (v/v) ratio. The sand and peat were measured by hand-packing them into a container of known volume. The rootzone mixes were packed into 6-inch diameter PVC cylinders 15 inches in height containing 3 inches of pea gravel.

These simulated putting greens received a starter fertilizer application and were seeded with 'Putter' creeping bentgrass at the rate of 2.0 lb/M of pure live seed. Once established, the bentgrass was clipped every 2 to 3 days at a 0.5-inch height. The greens were fertilized with complete fertilizer every two weeks at the rate of 0.2 lb N/M.

OBSERVATIONS

Putting Green Characteristics

Peat particle size had an effect on the organic matter content of the root-

zone mixes. As long as the particle size remained less than 3.35mm (peat particle size #4), the rootzone mix organic matter content was fairly constant (Fig.1). As peat particle size was increased to greater than 3.35mm (6 mesh), percent organic matter content of the rootzone mix increased sharply and nearly doubled. The reason for this is the presence in the larger size ranges of peat particles in their original, highly compacted state. This led to more peat per unit volume as compared to the smaller size ranges where the original peat particles were completely disrupted and, for this reason, the peat was "fluffier".

Several weeks into the study a Time Domain Reflectometer was used to measure volumetric water content at different depths in the putting greens. The effect of peat particle size on moisture retention was slight, even when examined for the two extremes in particle size (Fig.2). All other treatments fell between these two extremes.

At the end of the study, water saturated flow rates were measured for all of the putting greens. As shown in fig-

FIGURE 1
Influence of peat particle size on the organic matter content of 80:20 rootzone mixes.

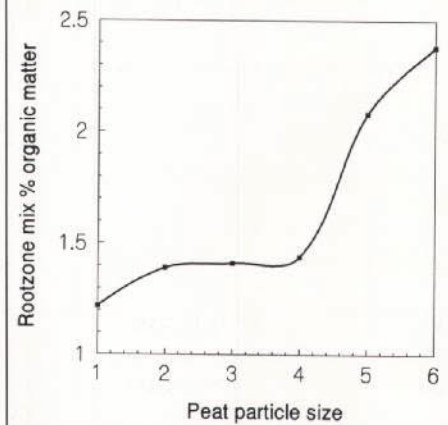


FIGURE 3
Influence of peat particle size on the saturated flow rates of sand putting greens.

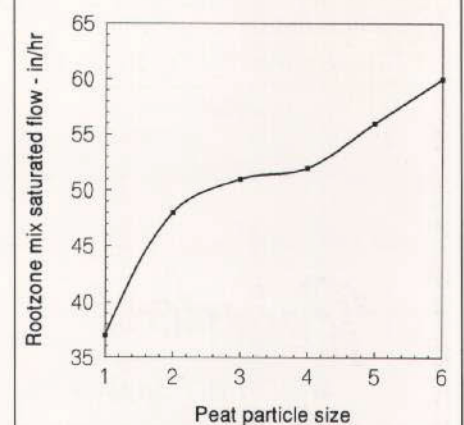
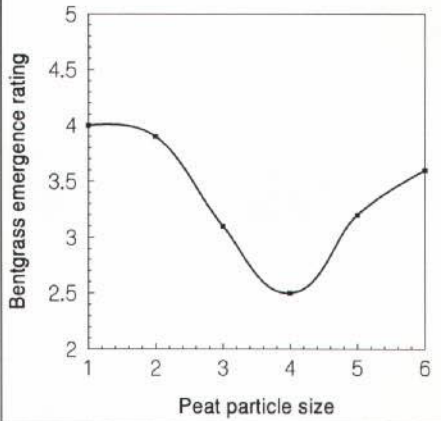


FIGURE 4
Influence of peat particle size on creeping bentgrass emergence rates.



ure 3, there were substantial differences associated with the different peat particle sizes. The lowest flow rate of 37 in/hr was achieved with the <0.85mm peat. Saturated flow rates increased nearly linearly with increasing peat particle size.

Bentgrass Characteristics

Bentgrass emergence was rated on a daily basis for the first five days following seedling appearance. Rate of emergence was observed to be highest for the two finest peat particle sizes (Fig. 4). There were no perceptible differences between the <0.85 mm and the <1.0 mm particle sizes. Further increases in peat particle size first led to a decrease in bentgrass emergence rate and then to an increase. The reason for the increased

FIGURE 5
Relationship between rootzone moisture as influenced by peat particle size and creeping bentgrass emergence rates.

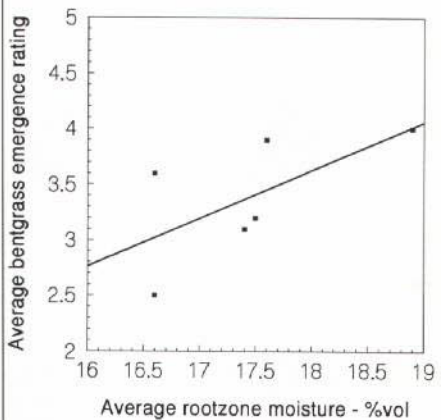
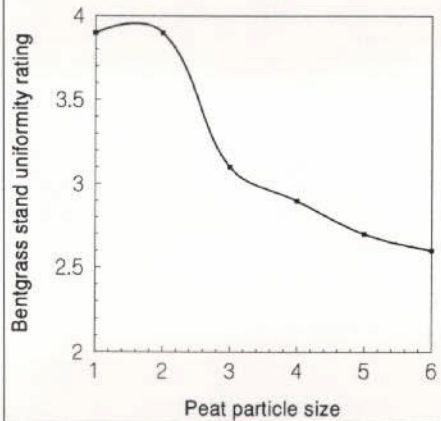


FIGURE 6
Influence of peat particle size on creeping bentgrass stand uniformity.



emergence rate at the two largest peat particle sizes is not known.

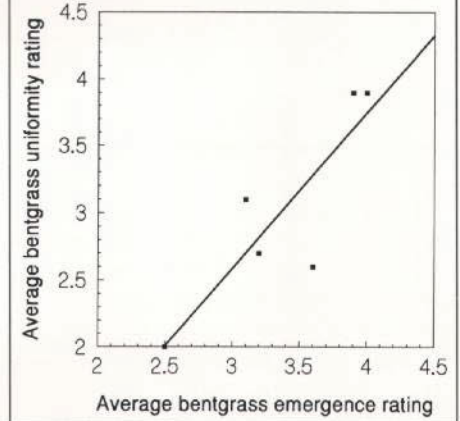
The anticipation was that emergence rate would be a function of the amount of water retained in seed zone. This was found to not be true. Rather, the bentgrass emergence rates seemed to relate better to the average moisture content of the entire rootzone (Fig. 5). However, the relationship was not very strong. There may have been several reasons for this. One is the fact that the moisture measurements taken reflect averages for rootzone depth increments of approximately two inches. They do not reflect uniformity of moisture over short horizontal distances within the proximity of the bentgrass seeds. This uniformity in moisture may have been considerably higher the finer the peat particle size. Additionally, the surfaces of the greens were kept moist through frequent watering during the emergence period and peat particle size had very little effect on average moisture in the top two inches of the greens.

Peat particle size had to be <1.0 mm to obtain maximum bentgrass stand uniformity (Fig. 6). Stand uniformity declined rapidly when the peat particle size was increased to more than 1.0 mm.

Of all the factors studied, the one that best related to bentgrass stand uniformity was emergence rate (Fig. 7). Uniformity declined rapidly when the peat particle size exceeded 1.0 mm.

Bentgrass clipping weights reflected a dependence on peat particle size. Considerably less clippings were produced when the peat particle size was less than 1.0 mm than at larger

FIGURE 7
Relationship between creeping bentgrass emergence rates and stand uniformity.

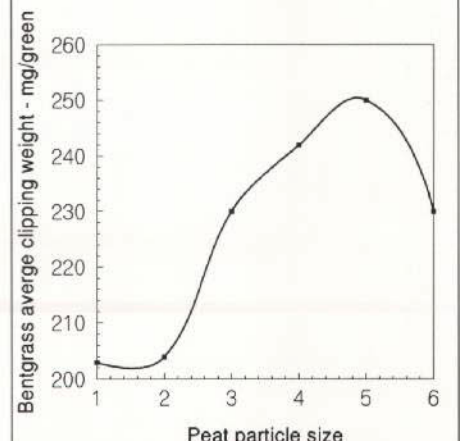


sizes (Fig. 8). This is thought to be a consequence of differences in bentgrass stand uniformity. At the larger peat particle sizes, the stand was not uniform. In patches of low density, the bentgrass leaves were decidedly wider and had a much faster extension rate than in patches of high stand density. The net result was higher clipping weights and a very uneven appearance to the greens.

SUMMARY

The results of this greenhouse study indicate that organic amendment particle size has a significant effect on the initial quality of bentgrass putting greens. High quality greens result from rapid and uniform bentgrass emergence. To achieve this, the particle size of the organic amendment need be 1.0 mm or less. 🌱

FIGURE 8
Influence of peat particle size on creeping bentgrass clipping weights.





Brown Deer's Gamble With Washed Sod

By Rob Schultz

It's not an impossible dream.

The Greater Milwaukee Open is at the crossroads with its move to Brown Deer Golf Course. The future of the tournament may hinge on how well Brown Deer's 9th and 18th greens perform this September after they were sodded with the new washed-sod method in May.

Dr. Frank Rossi thinks it can be done. But it will take some skillful work by the grounds crew, some luck from the weather and some intelligence by Milwaukee County officials.

"It's very much dependent on good weather. He's doing good there. The second thing is how aggressive a top dresser, verticutter and mower he is. He must be very aggressive top-dressing and must be willing to let those greens look lousy for a little while and skin them down," said Rossi, an assistant professor of turfgrass management at the University of Wisconsin-Madison. "And the other critical thing with the GMO, and it's my recommendation, is to keep the public off of them."

Rossi feels there's an 80 percent chance that the PGA Tour pros will be content with the greens under those conditions he just described. He said there's no chance the PGA Tour pros will be content with the greens if Milwaukee County officials let the public play on them prior to the tournament.

"That would be a nightmare," said Rossi. "If I'm responsible for the GMO and I know everything I know, there's no way the public plays on those greens. No way."

"This first year, I don't think they can have their cake and eat it too. I think they're setting themselves up. The pros, if they come up here and have lousy greens, they're not going to come up here anymore. A lot of them scout out ahead of time, and if they hear they're lousy, they won't come. I'm concerned."

Rossi doesn't need to look far past his office to use an example of how quickly washed-sod greens can show wear. Madison's Odana Hills used washed sod on two of its greens last fall, opened them a few days before the Memorial Day weekend and, by mid-June, they were showing wear and tear.

"If I'm (GMO executive director) Tom Strong I need to give those greens every opportunity to succeed," Rossi said. "And putting wear on them, at best, will set them back two weeks. At worst, it sets them back a month to two months. Wear doesn't do them any good."

"Wear stresses the plants. When you put golfers on there you get scuffing. If you try to get them ready for a tournament prior to the GMO and start rolling them and packing them better than they ought to be, then he sets up compaction problems."

"But the biggest thing is the scuffing of the spikes. You

get 200 golfers a day on a concentrated area on tender seedlings is dangerous. Even though it's washed sod, that grass is still barely a year old."

If history means anything, don't expect Milwaukee County officials to use great wisdom in their handling of this issue. When it comes to Brown Deer, they have been penny-wise and pound-foolish in every critical matter.

They closed the course too late—they wanted to get a few more greens fees during a warm September—a few years ago when they re-seeded the entire course with bentgrass and the results were disastrous. They ended up opening the course months after it was scheduled to re-open.

Then, last year, construction of six new greens on the course started late. The seeding process didn't begin until September and the 9th and 18th greens weren't seeded until early October.

"That's too late," said Jim Latham from his United States Golf Association's Green Section regional office in Milwaukee. "Even the highway department won't plant anything after September 15."

The design of the new greens was done by architects Andy North and Roger Packard. North was critical of the comment made by Latham and by the lack of communication among GMO and county officials regarding the greens.

First, North said, dormant seed was used on the 9th and 18th greens. He also felt GMO, Milwaukee County officials and the grounds crew didn't give the greens enough time to recover before ripping them up and using washed sod.

North also said he doesn't want the paying public on Brown Deer's new greens before the tournament. But GMO and Milwaukee County officials held a press conference in May to announce that Brown Deer is on track to impress PGA Tour golfers in August and re-open all its holes for play to the public sometime by mid-summer. Also, a Wisconsin State Golf Association junior event is scheduled there for August.

At that press conference, Strong announced that Allan MacCurrach, senior agronomist for the PGA Tour, was pleased with the direction Brown Deer is heading during a visit to the course recently.

"(MacCurrach) gave us a big thumbs-up and told us the course will be ready, without question," said Strong. "We're excited about it."

Also, golf course superintendent Greg Milota, who just began his job there May 2, showed reporters the washed sod at the 9th and 18th greens.

"They already are to the point where they are tacking down and there's a good layer of soil from the green attached to the roots. Everything is on schedule with these greens," Milota said.

(Continued on page 35)



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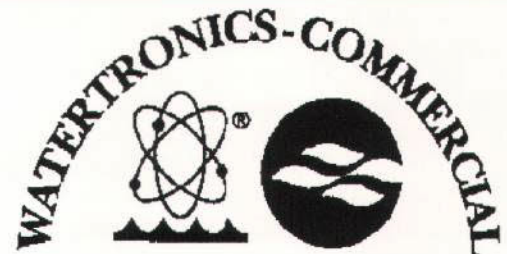
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Milota, who moved to Milwaukee after working several years at a golf in Portsmouth, Va., also pointed out to reporters that the other seeded greens were making tremendous progress.

"Within the past few weeks since I've been here, the (seeded) greens have really popped with the warmer weather," Milota said. "We're taking a considerable number of clippings off these greens on a daily basis."

There's no getting around the fact that Brown Deer had a serious problem and now they are working extremely hard to get the greens in shape and to convince the PGA Tour and the golfing public that everything will be OK. Spin control is the word of the day in Milwaukee.

Rossi was unimpressed by the fact that the washed sod had already rooted in two weeks. "That's nothing. The fact they rooted means nothing. Of course they'll root, they have no soil on them. That's a non-comment," he said.

But Rossi is impressed with the effort put forth by Milota and his crew. "He has to be careful with his nitrogen because if he gets too much grass it'll be hard to get rid of it and for the ball to roll properly," he said. "He could also set himself up for disease problems and the fungicides he might use could slow growth down. It's not an ideal situation but there's a possibility he could pull this off.

"The key is to keep play off."

The washed-sod method has been used in New Zealand for years and just recently caught on in the United States. Rossi wishes the method had stayed in New Zealand.

Washed sod is to golf course management what fast-food is to your diet. Both create a quick-fix to your problem, but the long-range effects can be disastrous.

"The superintendents I've talked to and the greens I've looked at after three or four years, my opinion is that you're better off seeding," said Rossi, who disagrees that the method is cost-effective because greens are back in play quicker. "I don't see any benefit to that because you're on those greens too quickly and start wearing it too quickly, the long-term effect is that they become *poa* infected. "We sacrifice a lot of things short-term to satisfy the golfer, but long-term the sacrifices are even greater." ♣

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(It's about time.)

Schwab Hosts Meeting at Monroe Country Club

By Kris Pinkerton

The May meeting of the Wisconsin Golf Course Superintendents Association was hosted by Tom Schwab. Monroe Country Club has held this meeting in past years, and once again players were treated to beautiful day and a well-groomed golf course.

Over fifty members and guests played the Two of Four Man Bestball event, and another dozen attended dinner. Results are as follows:

First place:John Krutilla, James Krutilla, Brad Wagner and Don Feger.

Second place (tie):Tom Schwab, Tom Parent, Randy Smith and Chuck Frazier; Tom Emmerich, Jim Shaw, Dan Shaw and Ed Devinger

Closest to the pin on #12: ...Andy Gruse

Longest drive on #4:Scott Schaller.

After dinner, Mike Handrich introduced our guest speaker, Dr. Edward Hasselkus. Dr. Hasselkus is a professor and extension horticulturist for the University of Wisconsin-Madison. The title of his discussion was "selection and care of conifers on the golf course."

Dr. Hasselkus emphasized how critical it is to take shade tolerance into consideration when selecting plants. Conifers requiring full sun are junipers, pine and spruce. Arborvitae and firs will tolerate partial shade, while hemlock and yews require shady conditions. He also made the point that yews are very susceptible to winter sun and wind damage in Wisconsin.

Professor Hasselkus also made recommendations on varieties to consider when purchasing evergreens for golf courses. Hetz Wintergreen and Techny are two outstanding choices for arborvitae because of their consistent habit and fast growth. Black Hills was the most common spruce recommended, while the Austrian and Scotch pine are two that do well in Wisconsin.

For those who hadn't heard, Dr. Hasselkus will end his outstanding and sterling career on the faculty at the University of Wisconsin-Madison in August. He will be absolutely irreplaceable, even if his position is funded and filled by CALS. Fifteen of his former students were in the audience at this meeting, testimony to a man who has had major impact on thousands who have chosen careers in landscape management. We were lucky to hear him one more time.

Thanks to Tom Schwab and the rest of the staff at Monroe Country Club. Their effort showed and was appreciated by everyone at the meeting. ♣



It cannot be that this youthful faculty member is going to retire! UW alums will always remember him as the best. Dr. Hasselkus will be remembered for years to come.



A beautiful place for a WGCSA meeting — Monroe CC, in the heart of Green County's Swiss heritage.



Thanks from former student Mike Handrich to Professor Ed Hasselkus.

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The 1994 Wisconsin Turfgrass Field Day: *The Tradition Continues*

The excitement is building for the 12th Annual Wisconsin Turfgrass Field Day scheduled for Tuesday August 16 from 8:00am to 3:30 pm at the O.J. Noer Turfgrass Research and Education Facility in Verona. This is our third year at the Noer Facility and we have an eventful day filled with research, equipment, and friendship. We have incorporated many of the suggestions from the 1993 evaluations and will open the 1994 Field Day with the trade show, product demonstration and auction followed by our traditional Wisconsin barbecue lunch. The afternoon will spotlight the research and demonstration areas with presentations by the UW-Turfgrass Group.

The Trade Show will display the finest and latest technologies in turf-

grass and landscape management. Equipment demonstrations of mowers, sprayers, cultivators and much more will be highlighted. Also, turfgrass supplies such as irrigation equipment, fertilizers, turf chemicals, and seed will be on display. The morning program will continue with the 2nd Annual Fund-Raising Equipment and Supplies Auction. New and used supplies and equipment such as seed, landscape rakes, golf flag sticks, etc. will be auctioned off to benefit the WTA in support of turfgrass research and education. **If you are interested in having some equipment, supplies, etc., that are in good condition, auctioned off, please contact the Noer Facility at (608)-845-6536.**

The 1994 research tour will be

highlighted by the WGCSA sponsored Putting Green Management System Study. Also, as with each Field Day this is your chance to "put pictures" to the data and recommendations we provide each winter at the EXPO. We will display many of the studies established last year and provide an opportunity for you to view the plots as they mature. The UW-Turfgrass Group is growing with new staff and students and there will be over a dozen presentations. It should be a fun time!!

Advanced registration is \$15 for WTA members; \$20 for non-members, and includes lunch and a field tour book. On-site registration for WTA members is \$20; \$25 for non-members. If you would like more information contact the Noer Facility. 🌿

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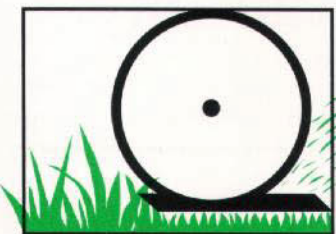
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WASHED SOD: *A Legitimate Management Option*

By Ray Shane

The spring of 1993 is one that this golf course superintendent will never forget. One of the worst winters for turfgrass had finally taken its toll on Odana Hills Golf Course. The sight of old native soil greens without any trace of plant growth is permanently etched into my memory.

One of the positive items that came out of this was the proof of the value of greens constructed to USGA specifications. At Odana, the top half of the practice putting green is the original surface from 1957. The lower half was built in 1988-1989 of an 80/20 mix. We experienced very little turf loss on the new section, and 100% turf loss on the old half. We had several greens on the four Madison courses that experienced turf loss with Odana and Glenway the hardest hit. These are also the two oldest of the city courses with the oldest greens.

The staff immediately went into a "damage control" mode by overseeding and aerifying using quadratines to bring up any *Poa* seed that was in the soil. In addition we also pregerminated bentgrass by the bucket fulls. By mid-June the courses were in playable condition, but my wife was ready to divorce me for the constant aroma of seed being pre-germinated in our basement.

In July a decision was made to rebuild two of the most affected greens—Odana's #7 and #18. A budget was set at \$70,000 to rebuild the two greens. This budget was to include enlarging and re-bunkering on #7. The 18th green was to remain much the same. It was also decided that staff would do the design work and prepare specifications, but the construction would be contracted out. Washed Penncross sod would be used to minimize the amount of time our customers would have to play on temporary greens.

My first call was to Jake Renner of Trappers Turn on his experience with washed sod and possible vendors.

Jake was extremely helpful and directed me to Huber Sod Farms, located in Indiana as the supplier for this area. A phone call to Huber Sod Farms followed at which time I was informed that he expected to be sold out of Penncross in September and that I would be required to have a 50% deposit to hold the 1,400 square yards that this project required.

The bid document and drawings were completed in August with construction to start the first week in October. Both greens were to be constructed using USGA specifications. Pre-approved suppliers were given the materials specifications. All greensmix was to be mixed off-site and tested prior to delivery. The city was responsible for supplying the washed sod with a seven day advance notice.

Gilmore Graves Golf of Spring Green, Wisconsin was the successful bidder. On October 6th the destruction/construction began. It was a wonderful feeling to take a shovel and dig a hole in the middle of a green that had caused you sleepless nights even during good years. After looking at the soils that we were working with, it was amazing that we provided the golfers with the stand of grass that we did.

The construction phase of the project went very well. The weather was ideal for a project of this type with only minor problems surfacing. The contractor was very acceptable to last minute changes in design and grades. The drainage tiles were laid with wire so that tracking would be done in the future and the ends of the main drain lines were placed in valve boxes in case any future flushing would be necessary.

A phone call was made to Huber Sod Farms telling them that we would like the sod delivered on Friday, October 15. The next day we received a call saying that they would be unable to deliver the sod until Monday, October 18th. That was fine with us and a call was made on the 14th to

confirm delivery. At that time I was informed that Huber Sod Farms was not going to be able to get the sod from their farm to us and that he was going to have another supplier provide us with the sod. This was acceptable to us, but trucking had to be arranged. Finally on Wednesday, October 20th the sod was on its way from Gold Star Sod Farms in New Hampshire.

The concern over the sod was twofold. First, it was going to take the best part of a day to lay the sod for two greens working with a crew of five people. Secondly, the sod was going to be shipped refrigerated and would already have been sitting on a pallet for two or three days. The next phone call went to a truck line to arrange for the delivery. The good news was that the truck was scheduled to arrive late on Thursday and unload early Friday. This would be great for our scheduling. On Thursday I again called the trucking company and was told that the truck had broken down in Pennsylvania and arrival was now unsure. When I went to bed that Thursday night I still had no idea where my sod was. Upon arriving at my office on Friday, there was a message on my answering machine from the driver. The sod was in Madison and he would be at Odana around 6:00 a.m. The Penncross sod looked great and a large bacon and egg breakfast was arranged for the truck driver.

The sod was off loaded at the two greens. Fertilizer was applied to the finished surface and final dragging was completed. A string line was laid out to set a straight line in laying the sod. Plywood planking was used to work off of so not to leave footprints in the final grade. The irrigation had previously been installed and the surrounds had already been completed and sodded. We were fortunate to have our neighbor, Randy Smith, offer advice and assistance in this project.

A light amount of oats was put down under the sod with the idea that

the oats growing up through the sod would help hold the sod in place during root establishment. Extra time was spent to get the edges as close together as possible. The sod is extremely easy to work with as one person can carry several rolls in one arm. The hardest part was having to constantly move the plywood and the beating one's knees took working from the plywood. In 12 hours both greens had been sodded and the irrigation system was set to run for five minutes every hour. It is extremely important to keep the sod moist for the first two weeks. The water not only kept the roots moist, it also helped hold the sod down on windy days.

The biggest problem we incurred was with wind picking up the sod and rolling back. Some staking was done on the most affected areas. Another problem was the few crows that make Odana their home. They wanted to pick up the sod to get at the oats we put down. I am not sure the oats was a good idea because of the crow problems. On the plus side, the oats were growing through the sod in 10-14 days and certainly helped anchor the sod and protect it from the wind pick up. It was apparent early on that we would be hard pressed to have any root

growth before going into the winter months, so blankets were ordered. I selected Evergreen because they are lightweight and I felt they would be more tolerant of the warm spring days as I do not have staffing to be constantly removing and covering as the temperatures might dictate.

A snow mold application was made to the greens in late November and the blankets were put into place. I did not have enough Evergreen blankets to cover all of the greens so we borrowed a Warren's from Randy Smith to cover the remaining area.

On April 7th, the blankets were removed. There was no noticeable difference in the root growth between the areas that were covered with the Evergreen blankets and the areas that were covered with the Warren's blanket. Both sections had roots that were about an inch in depth and had knitted nicely into the greensmix. The top-growth was much more apparent under the Warren's than the Evergreen. After seven to ten days the areas that were covered with the Evergreen blanket had caught up to the Warren's section and also had better color than the Warren's section.

We immediately started to topdress and special attention was given to the

seams as some of them did widen over the winter months. Mowing was done by using a walker set at 1/2 inch. By May 10th the greens had been topdressed four times, fertilized, the mowing height reduced to 9/32 inches and roots had developed to a six inch depth. Some of the seams were visible, but looking very good nevertheless.

The greens were opened for play in late May. They weren't perfect, but no one expected them to be. But they were certainly better than the temporaries our customers had been playing. I feel that it will take the better part of the year to get them as smooth and at the speed we desire.

Would I use washed sod again?
YES!

Would I do anything differently?
YES.

I would start the project much earlier. The sod should be in place no later than September 15th. Another option would be to have everything ready for sod in the fall of the year and do the actual sodding in the spring. The sodding did add an additional \$5,000 to the cost of each green. But the golfers are going to be able to have a playable surface much sooner than if they were seeded. 🌱

