and, to make a long story short, he will be out of commission for a while. We are still praying he doesn't lose the sight in that eye."

He went on. "Then, last winter, Laura and Martie asked me if they could go to the Olympics in Atlanta. They are a couple of great kids-both are on the UW women's basketball team-and they want to take advantage of a once in a lifetime opportunity. So I said 'sure, great, go for it.' It was a weak moment, but they should have my blessing to go. I wish I was going-Atlanta is only a long day's drive away. What I didn't even think about or calculate was the timingthey will be gone right during our big national tourney. It is going to hurt us and our efforts."

"You've got two choices, Morris." Bogey offered with a grin. "You can get some temp help for when the girls are gone, or you can stage your own olympics so they won't want to go to Atlanta.

Morris rolled his eyes, looked at Calhoun and said, "You are either drunk, on drugs or just plain dumb. Or you could be an idiot."

"Why?" Bogey said as he at first feigned surprise. But you could see his offbeat mind at work, see the wheels turning as a wise crack quickly evolved into a plan.

"Your course is closed on Mondays. Why not plan a big golf course olympics, not just for your crew but for everybody in the area—our crew, Fennimore's staff, all of us. Golf courses in some part of the state have softball teams and others get together for bowling. What would be so weird if we got organized in our town for a golf course olympics?"

Bill, Steady Eddie and I perked up and started listening to Calhoun, something we don't do all that often. If you know Bogey, it takes a while to get to know when to ignore him and when he is half serious. He was sounding half serious.

Scott and Tom looked at each other, wondering (like I was) just where Calhoun was heading.

He talked on, making things up as he went along. "Each club could send a competition team to MLCC. We could start at mid-morning, on the range at Maple Leaf, and if we needed more room for the events, we could use the holes and features contiguous —or nearly so—to the range. It would work out great."

Morris quickly straightened his back and nearly stood up. "Wait a minute, Calhoun; back that rig up. Why are we having the olympics at my course? Are you trying to get me fired? I think we should have the olympics at your place."

"Geez, TM," Calhoun replied, "my employees aren't the ones headed for Atlanta."

"Oh, yeah," Tom said with a certain resignation in his voice, "I forgot."

It seemed funny that Tom was so taken in by Bogey's babbling that he acted as if Calhoun was serious!

"I can see the events now." Bogey continued. "We'll start with cup cutting, and figure the winners based on how quickly the cup is cut, placement, perpendicularity, and tidiness."

"My crew won't even show in this event." Fennimore said. It seemed like he, much like Tom, was already in the competition and rooting for his team.

"That's up to you." Bogey said. He went on. "We'll have several mowing events—greens, fairways and tees. We will judge the teams on cut quality, so you'd better bring your Joe Check prisms and course mechanic to set the reels. Pattern and speed of completion will count in the scoring, too."

Ed smiled and pitched his crew. "We'll hammer you guys in the mowing events. Don't even bother to show up. That way you won't be embarrassed or humiliated!"

Bogey was rolling and he knew it. The food arrived but sat in front of us, (Continued on page 43)

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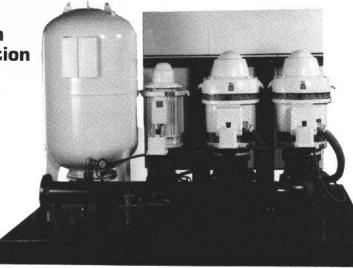
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(Continued from page 41)

getting cold. Nobody wanted to be bothered with eating right now; important plans were being made. Billie Flagstick hadn't said much. He finally piped up.

"We are going to have a bunker event, aren't we?" he asked with far too much seriousness in his voice.

"Absolutely," Bogey said with a big grin on his face. He had us eating out of his hand and he knew it. It was his ultimate pleasure. I always told Bogey his motto should be *Calhoun is my name, and b.s. is my game!* That was what we loved about him.

It had gone on long enough. I was hungry and the Reuben in front of me needed attention. I made my contribution to the foolishness.

"Seems to me like you are forgetting key golf course events, Bogey."

"Not possible, " he said.

"Well, I've got a guy I'd like to enter in a rough mowing contest. This cat can mow for hours on end and never get off the seat—not to move a barricade or a bench or a ballwasher, pick up a branch or move a bunker rake. He gets plenty of slack in the seatbelt, sits 'way back and relaxes as the

world goes by. Nobody—NOBODY—could beat him out in this event. He is world class, a blue ribbon winner. He's the champion!"

The guys laughed. Ed picked up and told about one of his experiences. "I've got the winner for the cup cutter throwing contests. I saw an employee stand in the mid-green area last year, hoist the cup cutter shoulder high and position it like a javelin, and launch it. I very nearly had an underwear problem, I was so shocked. The damnedest thing was that it landed perfectly perpendicular to the green in an excellent spot for the flag! Wouldn't that be a great event for our olympics?!"

Bill Flagstick came back. "What would a golf course olympics be without a Cushman creek jumping event? Or a Cushman bunker jump? Either could be a one-man or a two-man competition, like the bobsled race in regular winter Olympics!"

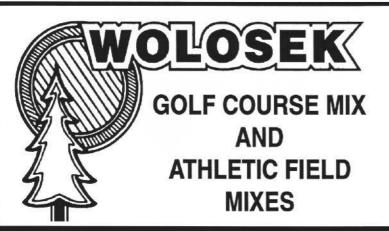
The gang was rolling now. We sat there eating and talking and having fun with what amounted to goodnatured foolishness. We talked about cutting up range balls, mowing tees with transport wheels on the machine, flag and pin pitching and others I cannot remember.

"So how do you feel now, Tom?"
Bogey asked. "Are you still worried that a couple of kids are going to Atlanta for a few days and your entire operation is a disaster as a result?"

"No," he replied. "I see what you are up to, Calhoun—putting a clearer perspective on what is, I admit, kind of a small problem. Actually, I hope they have fun while they are down there."

Planet Golf was buzzing with customers—diners and shoppers and browsers. It seemed everyone was cheerful and enjoying the moment. I think even Tom Morris saw that a humorous attitude toward the passing scene at his course makes life more bearable. The ability to laugh at oneself and your circumstances once in a while might actually be the distinction between the sane and the insane. For Tom, the good thing was to get that reminder from his colleagues, who also happen to be his best friends.

What a great sport—what a game golf is. And how lucky we were, myself and my friends, to be immersed dead center in the middle of it. Today, Tom Morris couldn't have agreed with that more.





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Jump-Starting Microbe Activity in Sand-Peat Root Zone Mixes

By Dr. Wayne R. Kussow Department of Soil Science, University of Wisconsin-Madison

The search for the perfect putting green continues, and if you buy into what the vendors are saying, the USGA's sand-based green is far from perfect. On one side of the aisle is the 'biologicals crowd. Their position is that sand-peat blends start out nearly devoid of microorganisms. This must be bad because everyone knows that "healthy" soils are those that teem with microbes.

From the other side of the aisle we are hearing that the problem is with the sand and peat. Inorganic materials such as calcined clay and diatomaceous earth have superior physical and chemical properties. They offer better soil structure and all that goes with it—more plant available water, higher infiltration rates, better aeration, and improved nutrient retention in the root zone.

The interesting thing is that the two sides are expressing somewhat opposing views on what is "wrong" with USGA putting greens. Replacing some of the peat, the bearer of microorganisms, with an inorganic product may be detrimental to initial microbe populations.

What I am about to do here is stick my neck out and offer my views on the biologicals and inorganics schools of thought regarding USGA greens. On the biologicals side, there seems to be two issues that single out low microbial activity as a problem in newly constructed sand-peat putting greens. One I discussed in the March/April issue of THE GRASS ROOTS. This is the notion that low microbial activity in new sand-peat greens limits nutrient biocycling to the extent that excessive fertilizer N rates are required for grow-in.

The second implicating piece of evidence for low initial microbial activity is the occurrence of Pythium root rot in young sand-peat putting greens. The strains of Pythium involved occur in virtually all soils, but at such low populations that they are innocuous saprophytes rather than pathogens. These low populations are thought to be the result of the antagonistic and competitive actions of other microorganisms present. This leads to the assumption that in young sand-peat greens the lack of antagonism and competition from other microorganisms is what allows Pythium to become pathogenic and invade the roots of stress-weak-ened bentgrass.

Evidence that USGA putting greens initially suffer from lack of microbial activity is scarce. One field investigation of the microbe population of a 15-month old 80/20 putting green revealed bacteria numbers that rival native soil—a million or more per gram of soil. Fungi and actinomycete numbers were relative low in the root zone mix proper, but high in the thatch layer. Our research indicates that the global microbial activity in an 85/15 sand-peat putting green does start out low, but within 3 months after seeding, is as high or higher than in mixes amended with innoculum and/or organic materials that stimulate microorganism growth.

In our research and that of others, efforts to employ innoculums and various organic materials to fortify the microbe populations of soil have met with limited success. One reason is that inoculums, while teeming with microorganisms, generally do not add greatly to the total microbe population. For example, our addition of an inoculum containing 2.3 million organisms per gram at the rate of 5 lb/cu. yd. of root zone mix had the potential of increasing the total microbe population by a whopping 0.2%. The result was as expected—the uninnocluated green had just as high a level of microbial activity as did the innoculated root zone mix.

This brings us to a second reason why innoculation of sand-peat mixes often yields disappointing results. The native microbe populations are made up of those microorganisms that have managed to survive in a highly antagonistic and competitive environment. Introduced organisms seldom survive for long under these conditions.

Now we move to the other side of the aisle and consider what the inorganic amendment advocates have to offer. What I am hearing are recommendations that root zone mixes be compounded with 70 to 80% sand, 5 to 10% peat, and the balance, or 10 to 15%, with an inorganic amendment. The inorganic amendments are either calcined clays or diatomaceous earth. Common brand names of the calcined clay products are Profile, Greenschoice, and Ecolite. Axis and PSA are two diatomaceous earth products.

Without alluding to what research has been done with root zone mixes containing the inorganic amendments, much can be surmised about their influences simply by examining their properties in relation to sand and peat. Some of the key properties of each are shown in the following table.

Typical ranges in selected properties of root zone mix components.

Property	Component		
	Sand	Peat	Inorganics
Bulk density, g/cc	1/6-1.7	0.05-0.2	0.25-1.0
Porosity, %			
Total	35-40	†	60-80
Capillary	5-10	40-60	30-55
Non-capillary	25-30	†	20-45
Coarse+medium particles	60-80	+	70-90
Cation exchange capacity, me/100 g	<1	75-200	25-35

[†] Depends on fineness of the peat

As shown, the inorganics have bulk densities less than that of pure sand, although not nearly as low as for peat. Regardless, blending the inorganics with sand will reduce bulk density. This comes about because of an increase in porosity which, in itself, will create a better medium for root growth.

Further gains in porosity are achieved with the inorganics because they have porosities nearly double those of sand. Whether or not the inorganics are more effective than peat in this regard depends on the quantities of each blended with sand. Perhaps more important than total porosity is capillary pore volume. Capillary pores are those of sufficient fineness to hold water against the downward pull of gravity. In this respect, the inorganics appear to be at least on par with peat.

The inorganic amendments have particle size distributions that meet USGA criteria for root zone mix sand. This is reflected in the percentages of coarse+medium sand shown in the table above for three amendments. From this, we can surmise that at the percentages of inorganic amendments being recommended for root zone mixes, their use will not significantly alter the particle size distribution of the mix from that for the sand.

The cation exchange capacity of the inorganic amendments is typically 1/2 or less than that of an equal weight of peat. There are, however, some differences that can be important in certain instances. The cation exchange capacity of peat is dependent on soil pH; the higher the pH, the higher the cation exchange capacity. In the case of the inorganic materials, cation exchange capacity does not change with soil pH. This allows for greater predictability with respect to the contribution of cation exchange capacity to a root zone

mix. Another distinguishing feature of the inorganic amendments is that, unlike for peat, the cation exchange sites do not bond more readily to calcium and magnesium than to potassium ions. The net result expected is better fertilizer potassium retention in greens containing an inorganic amendment.

Results from laboratory measurements tend to bear out these expectations of what the inorganic amendments can do to the properties of sand-peat blends. Their use can increase the plant available water content of the mixes and their permeabilities and hydraulic conductivities. Improved K retention is reflected in higher concentrations of the nutrient in turfgrass. Except for the latter effect, there is a caveat in all of this.

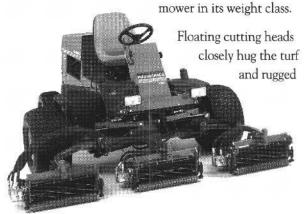
Exactly how much an inorganic amendment alters the moisture properties of root zone mixes is sensitive to the type of sand used. For sands that are on the fine side of the USGA specs, the increases in available water are minimal and permeability is enhanced. For sands on the coarse end of the USGA specs, the increases in available water are more substantial, but the effects on permeability and hydraulic conductivity are minimal and may not change at all.

My concluding thought here is that I am not convinced from what I have seen so far that tweaking the microbial activity of sand-peat blends or making minor modifications in their moisture relationships with inorganic amendments will cure what "ails" USGA putting greens. I feel the real issues are deviation from USGA specifications in materials and construction of putting greens, inexperience in their management, and the erroneous notion that USGA greens can tolerate much higher stress levels than can push up greens.

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Al Vrana Passes Away

Albert G. Vrana, president of the Wisconsin Golf Course Superintendents Association in 1975 and 1976, died Wednesday, March 13, 1996 in Bella Vista, Arkansas. Al was the golf course superintendent at Meadowbrook Country Club in Racine while he was president.

Al was born in Racine on December 2, 1922, and retired from Meadowbrook in 1986 and moved to Arkansas. He and another well known past president of ours, Woody Voigt, were neighbors in their retirement. Woody sent me Al's obituary, along with the touching letter that follows:

Dear Monroe.

Thought you would be interested to know Al died. There might be a few old timers left who would remember him. Al had a massive heart attack and died on his way home after playing cards. His wife, Mary, was driving and they were right in front of the fire station so she had help right away. Mary thought he died instantly. The medics worked on him and then they took him to the hospital but he never came around. Al had been in ill health for some time.

I will miss him. He lived next door to us and we saw each other almost daily. We often talked about the good times we had with the WGCSA. We both enjoyed THE GRASS ROOTS and read it cover to cover to keep track of what was going on in Wisconsin.

Tell the old timers we think of them often.

Sincerely,

Woody

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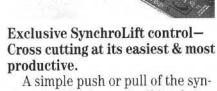
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Spring Educational Meeting Review

By Andy Kronwall

On Monday, March 4, our spring educational/business meeting was held at the Ramada Hotel in Fond du Lac. The day began with an array of pastries, coffee, and juices. The meeting was well attended by 71 superintendents from around the state.

There was a panel discussion on the issue of environmental concerns, moderated by Dr. Frank Rossi. The panel included four seasoned golf course superintendents: Jerry Kershasky (Westmoor CC), Mike Lee (Blackwolf Run), Gene Milota (Brown Deer Park GC), and Jake Renner (Trappers Turn GC). Also contributing were Brian Swingle (WI. Dept. of Ag.), Karen Hale (Madison Audubon Society), and Dr. Wayne Surles (Agr-Evo).

A lively discussion centered around different scenarios concerning daily golf course operations and unique approaches and solutions to common and not-so-common problems. It was clear at the end of the session that

each person had his own individual strategy for confronting the problems that Dr. Rossi presented. Although the opinions varied on how to react to the hypothetical dilemmas, each panel member proposed solutions that reflected the environmental concern we all share.

The panel members did an excellent job of fielding difficult questions before an audience of their peers. Dr. Rossi also proved to be extremely proficient in engineering extraordinary problems unique to our profession.

Following the panel discussion, GCSAA representative Randy Zidik presented a review of the chapter affiliation and dual membership requirements. A question-and-answer period sparked a lively exchange of viewpoints on these issues. It was apparent that more time for discussion would be needed before our association is able to decide on future involvement with the GCSAA.



Dr. Rossi fumbled both for words and at opening a going-away gift from the WGCSA. When he finally got the paper off, he found a Numen/Lumen lamp.

A steak sandwich lunch was served after the educational portion of the day, giving us time to relax and visit with friends.





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