

game fields where space permits. Practice fields also will be offset running parallel to game fields to keep practice field size closer to regulation game size.

Vos says, "When there are different age groups using the same field area for games on the same day or weekend, game fields for the younger player group will be painted in yellow solid lines running perpendicular to the white-line game field for the older players. Our crews then move the portable goals to the appropriate spot for the game on that size field. We've found this spreads the wear better than dedicating certain fields to specific levels of play.

"Prior to games, crews post signs in the goal mouth stating 'no warm-ups shall be allowed in the goal areas.' We provide a goal area and goal away from the game field for teams to use for practice. These off-field goals are generally set in the area between fields and are moved from week to week, again to spread the wear."

These "extended field" methods increase the overall turf area that receives premium care, but they control excessive wear. To date, the complex has needed no supplemental sodding in any areas of the field.



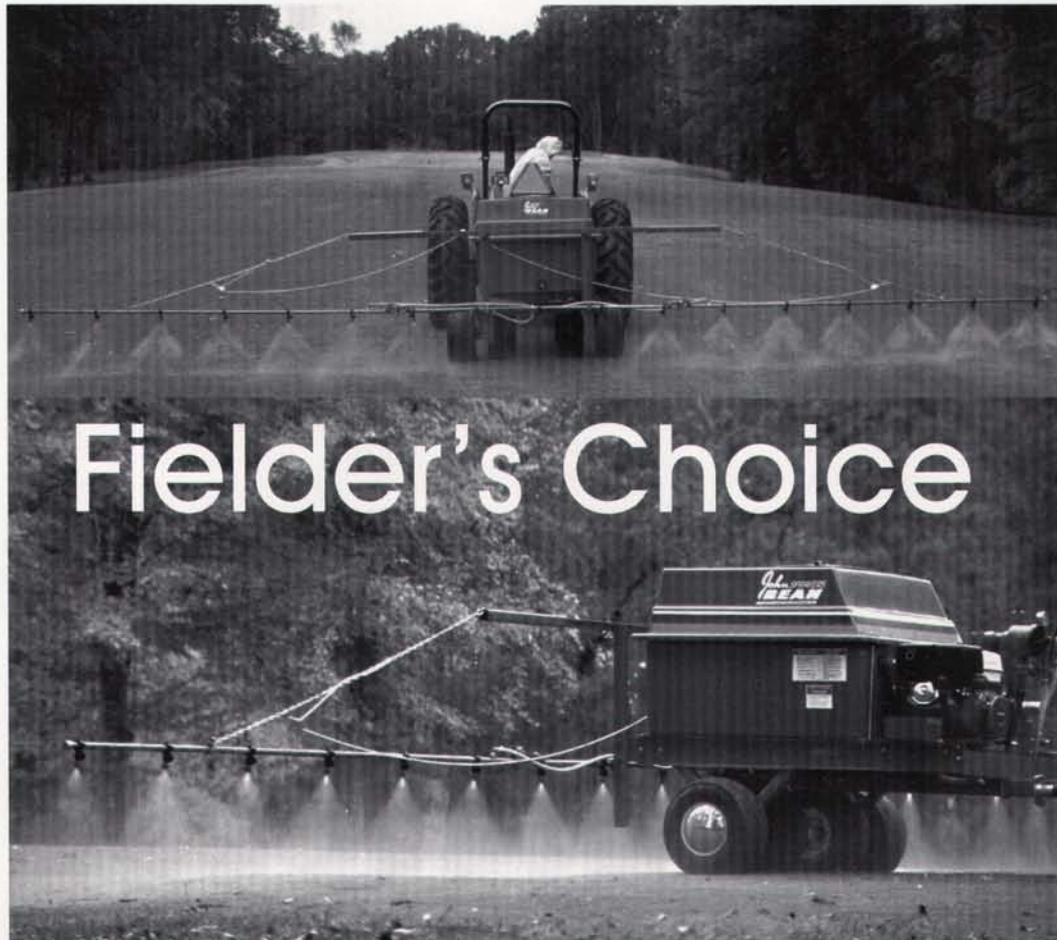
The two amended-soil fields are lighted and have bleacher seating for approximately 1,100 people.

Vos follows IPM practices, applying pesticides only as needed and where needed. A pre-emergent control generally is applied to *surrounding* turf areas in April. None is applied to the fields. Weeds are spot treated with post-emergent controls and fungicide control products only as necessary. The complex has required no insecticide applications.

"No matter how much we accomplish, there's always a wish list of things we'd like to do and improvements we'd like to make," says Vos. "We're always striving

to make the fields just a little bit better. Probably best of all is the sense of satisfaction that comes from watching your efforts bring about a safe, playable arena for players of all ages to improve their skills and have fun." □

Bob Tracinski is manager of public relations for the John Deere Company in Raleigh, NC, and public relations co-chair for the national Sports Turf Managers Association.



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If thatch levels are between 1/4 and 1/2 inch and turf is showing no signs of stress, vertical mowing is probably unnecessary.



Thatch Management for Warm Season Turf

By Dr. Gil Landry

Thatch is a layer of living and dead organic matter that develops between the soil surface and the top green segment of a grass plant. Living roots, stems and shoots grow into and through the thatch layer.

Thatch Happens

The thatch layer accumulates when decomposition occurs at a slower rate than the growth rate of the shoots, crowns, lateral stems and roots of the plant. Different grasses, and different varieties within turf species, produce thatch in varying quantities. Faster growing grasses produce more thatch, as do those with a higher lignin content, because lignin resists decomposition.

Turf management programs geared to promoting dense, rapid growth can intensify thatch production. Frequent high nitrogen fertilization can force excessive growth. Excessive irrigation levels may reduce oxygen movement into the thatch level, thus limiting decomposition activity. Too high or too low pH levels and the use of certain pesticides may suppress the activity of microbial organisms necessary for decomposition.

Mowing heights and frequency can also influence thatch production. When no more than 1/3 of the grass blade is

removed at any one mowing, the clippings created are primarily leaf tissue, which is 85 to 95 percent water. These small clippings filter into the turf and decompose quickly, contributing nitrogen and other nutrients to the soil. Mowing that removes more of the grass blade will contain more of the stem portion of the plant. These grass clippings are larger, slower to decompose and less likely to work down into the turf.

Thatch — Good or Bad?

In moderation, thatch is a good thing. Levels ranging from 1/4 to 1/2 of an inch retain moisture, protect grass roots and delicate young plants from excessive heat or cold and shield them from drying winds. On sports turf fields, thatch provides a cushion that both protects plant crowns from wear damage and creates a softer, safer playing surface for athletes.

Too much thatch causes problems. It harbors insects and disease organisms. Excess thatch makes plants more susceptible to heat and cold stress. Root development is restricted, decreasing drought tolerance. The thatch forms a barrier that reduces the penetration of water, fertilizers and pesticides. Turf growth becomes “puffy” and uneven, and the plants are more susceptible to scalping. Wear tolerance is reduced and players begin slipping.

Practical Solutions

Core aeration does have a role in reducing thatch but, by itself, shows limited results. Aeration reduces compaction and increases air, water and nutrient penetration — which improve growing conditions. A minimal amount of soil is brought to the surface whether the cores are removed or dragged in. This provides a light topdressing to aid thatch decomposition.

Testing shows that vertical mowing produces limited thatch reduction. Often this procedure is used annually even when thatch buildup has not reached an unacceptable level because turf managers have traditionally included it in the turf care program. Acceptable thatch levels vary by grass variety, cultural practices and turf use. If thatch levels are between 1/4 and 1/2 of an inch and turf is showing no signs of stress, vertical mowing is probably unnecessary.

Thatch levels also will vary across a sports turf field depending on the amount of play and other traffic each area receives. Non-traffic sections of the field may have significant thatch buildup, while heavy-use areas show little or no thatch. Consider vertical mowing only in those parts of the field where thatch buildup is too great.

The timing of vertical mowing is critical to turf performance. It is generally safest to vertical mow when the turf is actively growing. In the South, vertical mowing often is done while the turf is dormant. This frequently increases green-up, which is generally good. However, sometimes early green-up ends up being killed back by low temperatures. Also, green-up should not be encouraged if irrigation is not available.

Some research on overseeded bermudagrass golf putting greens showed that vertical mowing performed too early in the season may damage bermudagrass more than the overseeding. Vertical mowing later in the season — when the warm season grasses are strong, well-established and growing vigorously — is showing better success in test comparisons. Vertical mowing twice during the season generally is more effective than once.

Topdressing is the most effective means of thatch reduction. Topdressing helps to smooth out rough surfaces and helps decompose the thatch. One or two applications of topdressing per year, at the standard rate of 1/4 of an inch, speed thatch decomposition by increasing the contact between soil particles and thatch.



Core aeration prior to topdressing (the most effective means of thatch reduction) increases air and water penetration and allows topdressing materials to filter into the openings created.

Core aeration prior to topdressing increases air and water penetration and allows topdressing materials to filter into the openings created, further increasing the degree of contact of the topdressing material with the thatch.

In extreme thatch situations, it may be most efficient to strip away the sod and thatch layer and reestablish grass in the affected area.

The most effective thatch reduction programs incorporate concentrated thatch reduction efforts with such balanced cultural practices as fertilization levels matched to turf needs, proper mowing techniques and timing, and adequate, but not excessive, irrigation.

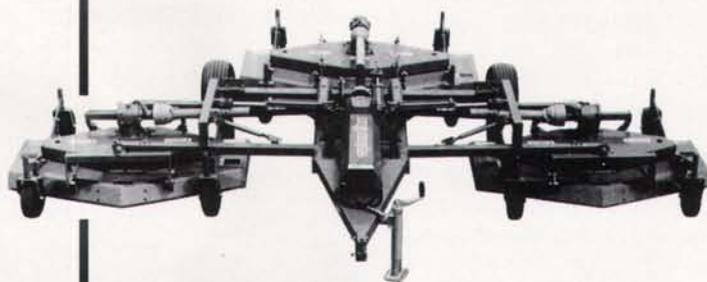
Well-managed field use, including good communication between the sports turf manager and field users and user groups, can limit excessive turf wear and the need for overly aggressive cultural practices.

Finally, remember that thatch does not develop overnight, and it also can't be removed overnight. □

As extension turfgrass specialist with the University of Georgia, Dr. Gil Landry provides leadership in the development of statewide educational programs in turfgrass management. He's a past president of the national Sports Turf Managers Association, co-chair of the Public Relations Committee, and recipient of STMA's highest award, the Harry C. Gill Memorial Award: STMA Groundskeeper of the Year.

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Turf equipment mechanic Andy Bates checks the switches on an electrically operated control he installed to update a turf sprayer. Photo courtesy: Alan Ginsburg.

SUNY Cobleskill's Turf Equipment Program

By Alan Ginsburg

Turf equipment mechanic Andy Bates checks the switches on a TeeJet sprayer control he installed to update an old Agrotec turf sprayer. The sprayer, mounted on the back of a Cushman truckster, was operated by a rope attached to a valve. Now the sprayer booms can be electrically controlled, either separately or together, similar to mechanisms found on the latest turf equipment.

Bates also installed a tachometer on the truckster to gauge speed to determine amounts of fertilizer chemicals to be sprayed on the turf.

Whether he's updating equipment, repairing or replacing worn parts, or troubleshooting mechanical problems, Bates, who's a mechanic at Leatherstocking Golf Course in Cooperstown, NY, is applying skills he learned at the State University of New York College of Agriculture and Technology, where he completed his associate's degree in agricultural equipment technology. As a mechanic on a golf course, he plays a key role in ensuring quality turf by keeping equipment used to maintain fairways and greens in excellent working condition.

"It's real important to have a good mechanic here," says Leatherstocking Assistant Superintendent Bernie Banas. "Andy is great at troubleshooting problems with any of the equipment. If the machines aren't working right, it's going to reflect on the overall condition of the course. And manpower is wasted if equipment is waiting to be fixed. A mechanic who has a good preventative maintenance program reduces downtime on machinery."

Good Mechanics Are Hard to Find

Banas notes there are few schools that train mechanics for the golf or sports turf industry because it requires such a variety of skills, from reel grinding to a knowledge of hydraulic systems and diesel engines, and it's a field that's becoming more high tech.

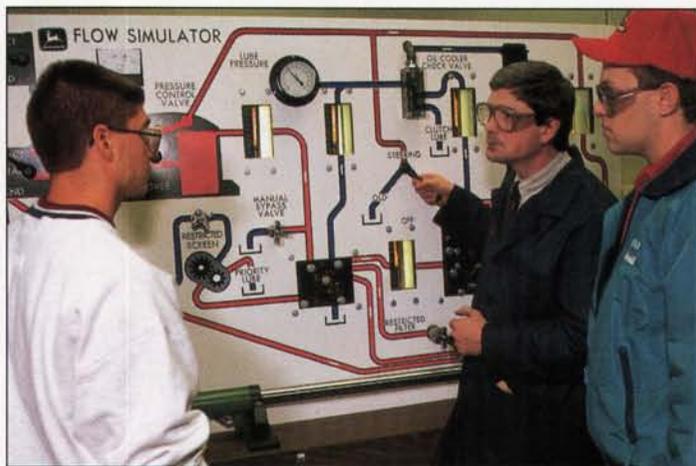
Mark Michaud, superintendent at Pebble Beach Golf Links in Pebble Beach, CA, agrees. "I consider my mechanic one of the top five most valuable people on our crew, because in a nutshell your course only looks as good as your equipment runs," he says. "It requires a specialized type of skill to be a mechanic on a golf course, since golf course equipment is precision machinery and unlike any other type of equipment a mechanic would maintain."

Yet there's a shortage of mechanics trained in the technology to repair the latest sports turf and grounds-care equipment, golf course superintendents around the country say.

"A good mechanic on a golf course is hard to find," says Joseph Hahn, superintendent at Oak Hill Country Club, Rochester, NY. "I have a super mechanic now and a good assistant mechanic, but it took me about eight years to get that into place, just by trying different people and finally getting the right ones."



Professor Larry VanDeValk (right) shows grinding angles on a reel-unit training aid to students Greg Bernoi and Dan Gross. Photo courtesy: Larry Abrams.



Professor Mike McCaskey (center) explains hydraulic principles on a John Deere training aid to students Mark Dailey and William Saine. Photo courtesy: Larry Abrams.

Says Hahn: "There is a real need for qualified mechanics to service golf course equipment, people trained in mower sharpening, adjusting, maintaining the mowing units themselves. But also they need a knowledge of diesel engines and hydraulics, and now an understanding of computer diagnostics. So a lot of the mechanics already in the field will need more training, and the new ones will need a lot more training than they did in the past."

Steve Lucas, president and founder of the New England Chapter of the Golf Course Mechanics Association, based in Weston, MA, says the demand for well-trained mechanics to service golf course and sports turf equipment has been increasing rapidly over the last few years, especially as the equipment becomes more sophisticated.

"I have never seen so many job openings and so few mechanics," says Lucas, equipment technician at Weston Golf Club. "We've heard of anywhere from three to five openings almost consistently since last fall. Right now there are three openings for mechanics at golf courses in the New England and New York area and no one to fill those positions."

Lucas attributes the shortage of mechanics to a lack of adequate technical training necessary to service and maintain the latest turf machinery. "The technical aspects of this industry are changing every year. The equipment is getting more computerized, more versatile in hydraulics and electronics. So you can't just be your average auto mechanic today or small engine mechanic and just do it. The equipment is just as sophisticated as systems on today's automobiles, and the technical advancements are just overwhelming. There's been a vast change in the industry in the last eight to ten years."

Supplying Demand

To meet the demand for qualified mechanics, SUNY Cobleskill has updated its equipment technology curriculum and is now offering an associate's degree with a major in turf and grounds-care equipment technology.

Lawrence VanDeValk, assistant professor of agricultural engineering, who coordinates the program, says the college gets a couple of dozen calls a year from golf course superintendents and grounds-care firms seeking mechanics to fill vacancies.

"We used to do quite a bit of lawn mower consumer-product type work in the program, but we're shying away from that and leaning more toward the commercial products which are more high tech," he says, especially since "there's more demand for our graduates in this area."

Besides courses in diesel engine repair, hydraulics and electrical systems, he says, students will be required to take turf management courses, horticultural machinery, small engine repair and diagnostics and welding, along with courses in the liberal arts and sciences.

"For years, the types of equipment used on golf courses were very similar to what you would buy at a lawn and garden dealership, very simple straightforward units, and pretty much anyone who has torn apart lawn mowers in his garage can grow up to fix that type of equipment," says VanDeValk. However, he adds, "What's changed in the last ten years in the industry is that the value and complexity of equipment used on golf courses has grown astronomically."

"It's not uncommon to run into a lawn mower used on a golf course now that costs \$60,000. A Toro Groundmaster is about, depending on options, a \$40,000 to \$60,000 machine. That's as much as you would spend on a good-size agricultural tractor. While farm tractors are getting to be like automobiles with their on-board computers and diagnostics, turf equipment is getting the same way."

For example, he notes, Toro, in many of its units, has an on-board computer that records the last 300 functions. "So if the mower breaks down and they fix it and in another couple of weeks it breaks down again, the mechanic can plug in a little handheld diagnostic computer that records or tells him what's been serviced on the tractor, providing him with some indication of the cause of the recurring problem."

All the Right Equipment

VanDeValk says SUNY Cobleskill's turf and grounds-care equipment technology program will emphasize hands-on experience. Turf equipment dealers such as S.V. Moffett, a

continued on page 20

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continued from page 19

Rochester, NY, based company with a branch in Cohoes, NY; John Deere Company, Raleigh, NC, branch; and Briggs & Stratton Company, Milwaukee, WI, have either donated or loaned equipment to the college for the program. Included are gang mowers, commercial walk-behind mowers, front-mount mowers, residential lawn tractors, compact utility tractors, utility vehicles, skid-steers, string-trimmers, blowers, turf sprayers, overseeders, topdressers and aerators.

So, students will be exposed to a wide variety of machinery manufactured by such firms as Ryan, Cushman, Ransomes, Jacobsen, John Deere and Toro, VanDeValk says.

"The students will learn how to troubleshoot equipment problems, how to calibrate sprayers, do reel sharpening, and how to establish a preventative maintenance program," he says.

The college recently offered a week-long golf course mechanics school for 30 members of the Golf Course Mechanics Association from golf courses throughout New England. The school covered a wide variety of topics — from diesel engines to carburetion, electrical and hydraulic systems troubleshooting, reel grinding,



SUNY Cobleskill student Jason Burroughs grinds a bedknife from a reel unit on a Neary grinder. Photo courtesy: Larry Abrams.

and irrigation equipment maintenance.

Lucas, who attended the school, says the school was "better than I had expected. The instructors were top notch; they're true professionals in the business of teaching."

He adds, "The way the technology in our industry has changed in the last few years has compounded our need to update our knowledge of the equipment. The sophistication of that equipment has grown to a point where we need the education in order to maintain it properly."

Says Lucas, "It's a great advantage for us to have a place like Cobleskill Col-

lege that's so well stocked in their equipment. It's overwhelming what they [the equipment engineering department] have available, as well as the information and the technology. It's all there, and it's impressive."

Ensuring that up-to-date equipment is available for the turf and grounds equipment technology program is a major goal of the college's agricultural engineering faculty.

"Our facilities here are a major factor in what we can offer students who enroll in the program, especially the level of testing we can do with the latest diagnostic equipment," says VanDeValk. "We're better equipped than most equipment dealerships are in terms of the number of tools we have for student use and the number of pieces of diagnostic equipment, anything from hydraulic testers to battery-load testers to fluke meters, air tools, pneumatic tools and reel grinding equipment."

Those who would like further information about SUNY Cobleskill's associate degree in turf and grounds-care equipment technology should contact Professor Lawrence VanDeValk, Agricultural Engineering Department, SUNY Cobleskill, NY 12043. □

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