

like crystals. These crystals can damage the turf when people walk across the frosty ground. Whenever possible, keep people off frost-covered turf. If you can't prevent traffic, lightly syringe the turf with water to wash off the frost.

Core Cultivation

Unless you address underlying compaction problems, seeding will just be a temporary cure. The stress induced by a hot, dry summer can leave bare or thin spots on compacted areas. The first step is to clean up the field, if you didn't already do it last fall after the football season. Use a mower with a grass catcher or a sweeper, Watson suggests. You want to pick up any loose plant parts (stolons or leaves), organic debris or other trash that may have accumulated during winter months.

There are several aerification methods you can select. Watson recommends waiting until the turf is actively growing before aerating. By using a pressurized water aeration system, you can

Adjust the recommended seeding rates to conform to the density of the existing turf cover. The more established turf there is growing on a field, the less seed you will need.

aerate earlier in the season because this method does not disturb the soil as much.

Core aeration is the best choice if you also plan to seed. "You really want to use hollow tines so you bring up the

cores and use them for improving seed-to-soil contact," says Trey Rogers, assistant professor at Michigan State University.

Rogers recommends using 5/8- to 3/4-inch-diameter tines. You can use a tine harrow or a chain-link fence drag to break up the aeration cores so they may provide a light soil base for the seed to fall upon.

Spring Seeding

If your field has thin to moderate turf coverage, spring seeding can help build the turf stand. If the field is thin to extremely thin, consider sodding.

As a rule of thumb, establishment rates for perennial ryegrasses are five to 10 pounds per 1,000 square feet, two to three pounds per 1,000 square feet for Kentucky bluegrass, and eight to 10 pounds per 1,000 square feet for fine-leaved tall fescue. For the newer seeded varieties of bermudagrass, the estab-

continued on page 22

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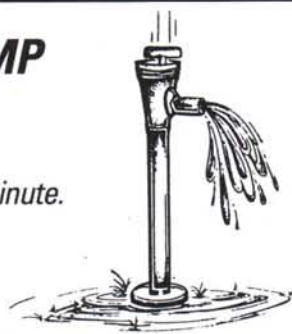


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Spring Help for Turf

continued from page 21

lishment seeding rate is one to two pounds per 1,000 square feet.

Adjust the recommended seeding rates to conform to the density of the existing turf cover. The more established turf there is growing on a field, the less seed you will need.

Seed more heavily with the fine-leaved tall fescues because fescues are slower to tiller, according to Rogers. Therefore, bare spots in a fescue field will be slower to fill in. Rogers recommends seeding fine-leaved fescues in three passes, providing the most uniform coverage. You can mix turf-type tall fescues with five to 10 percent by weight of Kentucky bluegrass to provide additional spreading.

You can use broadcast, drop or slicer/seeder to apply seed. If you are seeding in combination with core cultivation, use either a broadcast or drop seeder. A slicer/seeder will provide a limited amount of soil cultivation.

Rogers recommends applying a starter fertilizer with an NPK of 1-2-1 at a rate of 1/2- to 3/4-pound actual nitrogen per 1,000 square feet. If crabgrass is a problem, look for a starter fertilizer formulation that contains siduron, says Rogers. Siduron is labeled for crabgrass control and won't harm most newly seeded cool season turfgrasses when applied at label rates. Check the label to be sure it won't injure the turfgrass you are seeding.

Topdressing

Topdressing can be part of a spring seeding and cultivation program. After cultivation and seeding, you can apply a light topdressing to help fill in the cultivation holes and provide a growing medium for the seed. Topdressing also helps insulate the growing turf.

"You can topdress in the spring with a mix that contains peat, gin trash, rice hulls, leaves or grass clippings, within the topdressing mix. That will tend to warm the soil. Light sand is beneficial from an insulation standpoint, but it will not retain heat from the sun like the darker peat and composted materials," says Watson.

To apply the topdressing material, you can use either a rotating spreader-type or conventional drop-type topdresser. A rotating spreader-type topdresser applies material by feeding it down from a hopper through a chute to a rotating disk or impeller. The disk or impeller spreads the material in a wide swathe out the rear of the machine. These spreaders are best for making light sand applications quickly with a wide swathe.

A conventional drop-type machine uses a conveyor belt to carry topdressing from the hopper through the metering gate to the brush. A high-speed, rotating brush pushes the material down between the turf blades. A metering gate controls the flow so you can apply a sand layer from extremely fine up to 1/4-inch thick.

Whichever machine you choose, apply the mix to lightly cover the seed for a combination topdressing/seeding program.

Pamper the Turf

The best results will come on a seeded field that doesn't have traffic stress. If possible, close the newly seeded fields to vehicular and pedestrian traffic. In the sports areas of many parks, this is not possible.

Rogers suggests changing the field layout temporarily so the area of heavy use is in another section of the field. This shift will give the turf a chance to become established. Once the turf improves, you can return the field to its regular dimensions.

Irrigate newly planted fields regularly, keeping the soil moist until the seed germinates. Then, reduce irrigation frequency and increase the amount, continuing to keep the root zone moist.

Pampering your sports turf in the spring will yield positive results when summer heat stresses the turf. Healthier turf will be in a much better position to withstand summer heat and drought.

Although spring is not the best time to seed cool season turfgrasses, many sports turf managers have no choice. By following these few guidelines, field quality will be noticeably better than without spring seeding. □

LOFT MEMORIAL SCHOLARSHIPS AWARDED



The New Jersey Turf Expo was the site of the ninth presentation of the Peter Selmer Loft Memorial Scholarship Awards.

Eight \$1,000 scholarships were provided based on high academic achievements in turfgrass science. The following students of Rutgers University

received this year's grants: Christopher Boyle, Suichang Sun, Karen Plumley, Victor Nemeth, Mirta Guglielmoni, James Campbell, Lora Betts and Chan Seok Oh.

The scholarship is named for Peter Loft, a leader in the turfgrass industry.

CAL POLY INSTITUTE FEATURES SPLIT CURRICULUM

The Ninth Annual Sports Turf Institute and Grounds Operation Conference has been expanded for the second year in a row. This year's event, to be held at the Pomona campus on March 24, will feature four different educational sessions plus the trade show.

Conference coordinator Dr. Kent Kurtz has added a third and fourth session to provide specialized training for pesticide applicators as well as coaches and athletic directors. The original sports turf session for groundskeepers and the general grounds session added last year will be continued for the ninth annual institute.

"The goal of the institute is to address sports turf management and grounds care from all different perspectives," Kurtz explained. "Twenty different experts will speak during the conference. This is the first year pesticide credits will be available."

Preregistration is available for \$30 per person and includes the conference, show and lunch. For further information, contact Dr. Kent Kurtz, Horticulture Department, Cal Poly University, 3801 W. Temple Ave., Pomona, CA 91768 or call Mary Ann at (714) 869-2173.

ASGCA MEETING

The American Society of Golf Course Architects will have its 46th annual meeting May 3-7 at the Southampton Inn on Long Island, NY.

ASGCA President Tom Clark said that the meeting's professional development seminars will focus on the two most pressing problems facing golf course architects: environmental restrictions and the lack of ready financing.

The first draft of the Society's statement and guide on environmental impact will be presented to the membership for comment and discussion.

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EXPLORING EQUIPMENT

Clean and Cool: The Keys to Keeping Hydraulic Systems Operating

By Don Garner

The requirements for maintaining and servicing dual pump/motor systems have not become widely known or accepted, even though these systems have been around for years.

The first dual pump/motor systems were introduced on riding mowers 18 years ago. Today, many manufacturers are using variations on the technology to provide both walk-behind and riding mowers with smooth-operating drive systems.

A dual pump/motor drive system uses a hydraulic pump and a motor to control each drive wheel. This design provides independent positive power to each wheel, giving the mower zero-turn capabilities, positive reverse and added control.

The two greatest enemies to your dual pump/motor mower are heat and dirt. With proper maintenance and servicing, you can keep your dual hydraulic drive system running cool and clean.

The Maintenance Routine

To keep the system running at the correct temperature, you must maintain the proper fluid levels. Check the hydraulic fluid level every week. Fluid levels should not drop below 85- to 90-percent capacity, otherwise cooling capabilities will be affected.

Daily cleaning of the exterior of the cooling tank daily is also critical. The tank is a heat exchanger. A coating of dust or debris on the tank can reduce its ability to cool the fluid.

Contamination is a major cause of pump and motor failure in hydraulic systems. When you add hydraulic fluid, carefully clean the cap and the surrounding area of the fluid tank *before* you take off the cap.

Be sure your hands are clean and the work area is free of dust and debris. The fluid container and its opening also must be free of dirt. New fluid will pass

through the fluid filter before entering the system, removing contamination, but don't trust the life of your components to your fluid filter.

Dirt specks invisible to the human eye can do irreparable damage to a pump or motor due to the tight clearances within components. A grain of sand would be considered a huge piece of contaminant in a dual hydraulic system. You can imagine the debris you could be introducing into the system if you add fluid at a windy job site or leave the cap off the fluid tank for any length of time.

Contamination also can occur when you change the fluid filter. When you remove the old filter, be sure to clean the surrounding area before you put in a new filter. The replacement filter should be a factory-authorized filter. Store new filters in clean, dust-free locations. Be especially careful with filters because debris on a filter will go directly into the pump and motor.

Use only the recommended cooling fluid. Using substitutes can reduce lubricating and cooling performance, resulting in accelerated hydraulic component wear. Cheap or lower grade fluids may not have the proper additives to ensure that the fluid will not degrade and cause damage to the pump and motor.

A thorough check of the hoses also is recommended on a monthly basis. Don't use your hands to look for leaks because pinhole leaks can eject fluid under high pressure, penetrating your skin with toxic fluid. Instead, use a piece of paper or cardboard to run across hoses.

Pay special attention to the hose that leads from the filter to the pumps. If there is a tiny crack or nick in the hose, it will suck air and debris into the system. This certainly will cause poor performance. Any break in the system is an opportunity for dirt to invade.

If you plan to change hydraulic hoses in your own shop, pay careful attention to cleanliness. Clean dirt and grass from

the old hose before you remove it to help keep debris from getting into the system when you remove the hose. Make sure the new hose is absolutely clean and dust free. As a general recommendation, let a trained dealer perform service on the hydraulic system unless you are confident of your abilities.

Performance Expectations

Many of the service problems related to the engine on a dual pump/motor mower come from unrealistic performance expectations. Remember, a dual pump/motor drive system on a walk-behind mower can require up to 45 percent of its available power to drive the pumps and motors at maximum ground speed.

Overtaxing the engine can cause a wide variety of problems resulting from the high levels of heat generated. These problems include increased fuel consumption, failure of electronic components, and considerably more engine wear.

If your engine lugs excessively in certain cutting conditions, this is a sign of insufficient engine horsepower or mowing too fast for existing turf conditions. The rpm will drop, decreasing the mower blades' tip speed. This, in turn, diminishes the quality of cut. The only solution to this problem is to decrease the demands on the engine by cutting slower, or repower the unit with a higher horsepower engine. You can prevent some engine problems on a dual hydraulic motor by choosing the correct engine for the job when you purchase the machine.

With proper preventative maintenance, a dual pump/motor mower will provide commercial cutters with productivity and profitability. You will find following these clean, cool rules brings in cold, hard cash. □

Don Garner is the technical service manager for Scag Power Equipment.

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Lyme Disease: An Occupational Hazard

Outdoor occupations have distinct advantages over office jobs. Most sports turf managers value the outdoor aspect of their profession. They should remember, however, that being outside has certain potential drawbacks. One is being exposed to deer ticks and the disease they transmit, Lyme disease.

Most people associate ticks with wild, unmaintained areas of tall grass, brush, and trees. The incidence of this disease in humans in the Northeast, the northern portion of the Midwest, and northern California reveals that the ticks do infest maintained turf areas where they make contact with their human victims.

The connection between the tick and the disease was first identified in the 1970s in Lyme, CT. Researchers found a high percentage of the people contracting a form of arthritis had pets. Infected tick nymphs and adults hiding in leaf litter or thatch would hitch a ride on a cat or dog then bite humans handling the pets.

The victims would first notice a rash at the bite location. As the disease progressed, they suffered headaches, fever, chills, nausea, fatigue, and pain in their muscles and joints. If untreated, the disease resulted in arthritis, meningitis, cardiac disorders, encephalitis, or facial paralysis. Since antibiotics can cure victims in the early stages of the disease, prompt detection and treatment are advised by physicians.

Summer is the peak deer tick season. Tick adults lay eggs in leaf litter. After hatching, the six-legged larvae seek a blood meal from a human, dog, cat, or other mammal. If the mammal they bite carries the disease pathogen, the tick becomes infected. After overwintering, the larvae become eight-legged, nymphs about the size of the head of a pin. The nymphs seek a spring blood meal before molting into adults, mating, and laying their eggs. It is the victim of this second blood meal that gets the disease. That victim could be anyone working in areas where infected ticks hide.



Deer tick on human skin.

Disease Prevention

One obstacle to detection and treatment is the fact that Lyme disease symptoms mimic other diseases. Even its classic symptom, an expanding lesion or rash, is absent in 30 to 40 percent of the cases. Because the disease is hard to pinpoint, health experts in areas where the disease has been detected emphasize prevention.

Prevention centers around identifying and avoiding infested sites. If a site happens to be a park, golf course, or athletic field, the only practical alternative is treating with a pesticide. Furthermore, the peak season for the tick is also the peak season for recreational facility use.

Other means of protection include wearing protective clothing and applying insect repellent to shoes and exposed skin. Health experts recommend that people who are outside for any length of time examine themselves thoroughly for ticks immediately after returning indoors.

Reducing Tick Populations

Although the deer tick is responsible for 80 to 90 percent of all reported cases, southern and western black-legged ticks have been linked to transmission of the disease in the Southwest and parts of Texas, Oklahoma, Arkansas, and Louisiana.

In 1990, the Environmental Protection Agency approved the registration of carbaryl (Sevin and Sevimol) for control of all three ticks. Tests by the New Jersey Department of Public Health revealed that a June application of the insecticide provided complete control of nymphs within 21 days and an 85-percent reduction in deer tick populations the following spring. A similar test by the New York State Department of Health of a November application showed 99-percent control of adults within 10 days. Rhone-Poulenc entomologist Dr. Jack Boyne says that deer ticks do not reinfest treated areas quickly, therefore, control lasts longer than the actual residual of the insecticide.

The application rate for the carbaryl products is two pounds per acre, a lower rate than needed for other turfgrass pests. Treatments for other turfgrass pests will control deer ticks.

A study by the chemical company established two major misconceptions about the deer tick problem. The first is that the ticks will not infest well-kept lawns. They can and have. Secondly, few homeowners realize that the pest is easily controlled with insecticides. When told of this option, 75 percent said they would have a pesticide applied if they felt endangered by the tick.

Although no means of control can offer complete protection against Lyme disease, insecticide applications, protective measures, and population reduction are critical to disease control. Since sports turf managers may be exposed to tick-infested areas more than others, they should be aware of the disease and know how to control tick populations at their facilities. □

Technical credit: Rhone-Poulenc.

TURFGRASS MANAGEMENT SCHOLARSHIP AWARDED



The Best Sand Corporation of Chardon, OH awarded its second annual turfgrass management scholarship to James Joseph Campion III, a turfgrass management student at Clark State Community College in Springfield, OH. The scholarship covers the cost of tuition and books for the 1992-93 school year.

Campion intends to pursue a career as a golf course superintendent. He was an intern at the Baltimore Country Club in Lutherville, MD, and has worked at the Kittyhawk Golf Course in Dayton, OH, and the National Cash Register course in Kettering, OH.

The Best Sand Scholarship is awarded annually to a turfgrass management student from either Ohio State University in Columbus, the Agricultural Technical Institute in Wooster or Clark State Community College in Springfield.

YOUCHE REMODELING BEGINS

Indiana's Youche Country Club remodeling project began September 5 and will continue until its scheduled reopening in June 1993.

The north nine holes (Holes 4-6 and 12-17) are being remodeled but will be open for play this summer. The south nine holes remain open until August, when they are scheduled for remodeling.

Dick Nugent Associates' design includes adding four new ponds, redoing the fairways in bentgrass, rebuilding four greens, resurfacing all 18 greens, and adding a number of bunkers.

DONATIONS INCREASE TO HOOK KIDS ON GOLF

The PGA Tour announced a contribution increase of \$5,000 to the "Hook A Kid On Golf" program. This brings the total contributions to \$10,000.

"Hook A Kid On Golf" is a national three level development program for children who normally would not have the opportunity to play golf.

The program will expand to 125 sites across the country.

NEW GOLF COURSE

Golf course architect John Stanford and PGA Tour player Ken Greene are collaborating on a golf course design at Hickman Hills Golf Course in Fishkill, NY.

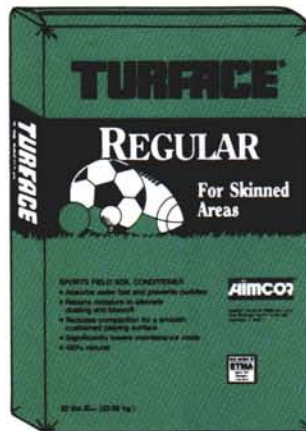
The 107 acres integrates existing areas of ledge rock, preserves much of the hard wood, and is enhanced by a brook that meanders through three of the holes on the front nine.

Stanford has designed courses in the United States, Japan, and the Caribbean Islands.

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EFFLUENT WATER FOR GOLF COURSES

A three year study by the University of Arizona soil scientists indicate that municipal effluent water is suited for use in turf irrigation. At present, only 16 percent of Phoenix golf courses and 29 percent of Tucson, AZ fairways use effluent water.

Most golf courses have their own wells, and irrigation water costs them between \$40 and \$150 per acre-foot. In Tucson, buying effluent costs about \$400 per acre-foot, and using drinking-quality water costs \$440.

Soil scientist Ian Pepper and plant scientist Charles Mancino said that comparing irrigation with effluent and drinking-quality water proved turf quality depended on the amount of water delivered, as well as water quality. Effluent irrigation must be managed differently. Higher levels of nitrogen, phosphorus and potassium in the wastewater can reduce reliance on fertilizer in the summer.

In soil irrigated with effluent, sodium and phosphorus reached levels that warrant different management practices than normal. Reducing phosphorus fertilizer would allow the grass to use the nutrients in the effluent. Applying calcium sulfate or sulfur would reduce sodium in the soil.

Turfgrass turning yellow during the summer may be the biggest problem with irrigating with effluent. Foliar iron applications will take care of the chlorosis, but it is expensive.

Although municipal golf courses may have a problem with expense, resort-owned courses should not.

TURF MANAGEMENT SEMINARS

The National Institute on Park and Grounds Management announced two athletic turf management seminars.

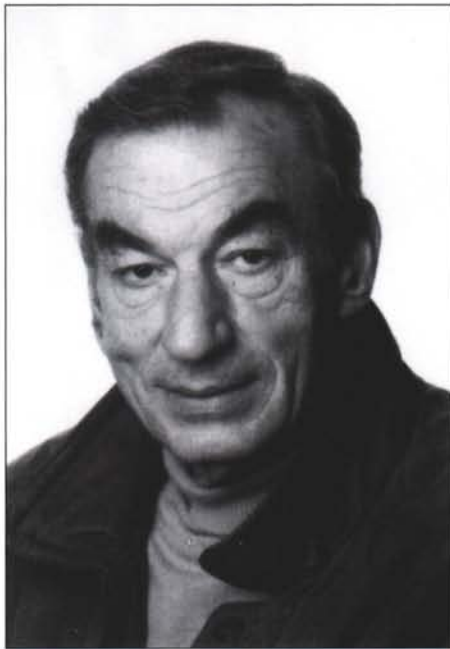
The first will be held March 19-20 in Roanoke, VA. The program includes: "Principles of Athletic Field Cultivation, Mowing and Irrigation;" "Minimizing Pest Damage Through Good Athletic Field Management;" "The Effect of Compaction on Athletic Field Turf;"

"Repair, Renovation or Reestablishment of Existing Athletic Fields;" "Principles of Warm and Cool-Season Turfgrass Fertilization;" and "Factors Influencing Turfgrass Selection For Use on Athletic Fields."

The second seminar is in Providence, RI, March 23-24. The program includes: "Turf Breeding for Athletic Fields in the Nineties;" "How Do I Know What Grass I Have?;" "Endophytic Grasses for Reducing Insect Damage in Sports Turf;" "Environmental Impacts of Turf;" "Nitrogen Use and Efficiency in Managing Athletic Field Turf;" and "Weed Management in Sports Turf."

Contact the National Institute on Park and Grounds Management, (414) 733-2301, for information about either seminar.

DUICH JOINS TEE-2-GREEN



Dr. Joseph M. Duich has joined Tee-2-Green Corp. as a technical advisor and consultant. The retired Penn State turfgrass science professor assisted professor H.B. Musser in developing Penncross creeping bentgrass, released in 1955. He later developed Penneagle and PennLinks creeping bentgrass.

As a consultant and technical advisor, he will address golf course superintendents' questions and management practice inquiries concerning the "Penn Pals" creeping bentgrasses.

NEW MANAGER FOR TURF-SEED

Russell Hayworth joined Turf-Seed, Inc. as southwest marketing manager. He will be marketing all Turf-Seed varieties and blends, including Citation II, Quickstart, Charger, and the "Penn Pals" creeping bentgrasses. He will also be involved with new product development and testing.

Hayworth attended Oregon State University and was involved in Oregon grass seed production for 10 years. For the last four years, he marketed turfgrass seed in Southern California and Arizona.

MONSANTO CONTRIBUTES TO GCSAA SCHOLARSHIP AND RESEARCH

The Monsanto Agricultural Company of St. Louis presented the GCSAA Scholarship and Research with two gifts totaling \$10,000.

Half of the contribution will be used for general support of education and scientific programs operated by the GCSAA.

The remainder will be included in the Chet Mendenhall Memorial Fund, named after a founding member of the GCSAA.

The contribution renewed Monsanto's charter membership in the Platinum Tee Club, the premier support group for GCSAA S&R.

FORTRESS COURSE TO OPEN

The Fortress, the only golf facility in Frankenmuth, MI, is scheduled to open in July. It was designed by Dick Nugent Associates and is owned by Zehnders, who also own an independent family restaurant.

The Fortress is located on the site of a nine-hole public course. The existing holes were torn out and replaced with a 6,820 yard, par 72 course in the style of a prairie links.

The Fortress reflects characteristics of golf's early Scottish origins where wind is always a factor, and the holes play through and around fescue covered mounds to well guarded, sectioned greens.

ROOKIES

PRODUCT UPDATE

CURBING AND MARKERS

Oly-Ola Recreational Edgings, Inc., a subsidiary of Oly-Ola Sales, Inc., developed Safety-Edg curbing and Safety-Line marker for the athletic, parks, and recreation industries.

Safety-Edg is a flexible, low-maintenance landscape curb for playgrounds, walking trails, bike paths and other areas where safety is needed.

Safety-Line markers are designed to replace chalk lines on outdoor athletic fields, such as baseball, soccer, softball, volleyball courts and golf course driving ranges.

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TURF SWEEPER



The Sweep Star turf sweeper has a single, five-foot-wide, floating reel, and pliable serrated rubber fingers for removing leaves, clippings, and heavy, wet loads. The hydraulic control system, sepa-

rate from the drive train, raises and dumps up to a height of six feet. The rolled steel hopper has a capacity of three cubic yards.

The sweeper is powered by a Kohler 23 hp, four-cycle engine and has a Kubota 19.5 hp water-cooled diesel powered option.

SMITHCO NEWS

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DEBRIS RAKE

The debris rake can handle small debris, such as pine needles, in bunkers, on fairways, in the rough and around the clubhouse.

The rake has a 20-inch wide cast aluminum head with tempered steel wire teeth. The five-foot handle makes it easy to get into hard to reach places.

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