

whole job," Mancuso says. "You need to know the elevation and put as many drains in as you can. Don't spare any expense, because it'll save you time and money over the long run."

New Albany Country Club uses regular washed pea gravel under drain tile, then gravel on top. "Some people like to use fabric socks over the tile, but if the fabric clogs up, you have to take it all out," Mancuso observes.

The correct sand

Of prime importance is knowing your suppliers, Mancuso says. "Sand is completely different at every sand plant in the country. Some sand plants are more concerned with the highway market where the big profits are, so they believe that spending a lot of time and money on golf course operations isn't justified.

"There are specific recommendations for golf course sand. You need to identify which sand plants want to work with those specifics; a lot of time those are the plants where the owners play golf."

Color is also a consideration. New Albany's sand is a very pale brown. Some-

'Some people are better at raking bunkers, just like any other job,' says Tony Mancuso.

times you have to take what's available, but remember that most of the cost of purchasing the sand is in the hauling.

Sand should also be free of silt and clay, be easy to install and have the proper particle distribution.

"Our sand is 98.6 percent pure sand, and we can have up to 3% of clay and silt," Mancuso reveals. "For proper particle distribution, you should check the laboratory specifications. We don't like our sand to crust or set up or bury."

Firmness of sand makes a great deal of difference to golfers. "We prefer firm," says Mancuso, "so we chose a sand that was going to be firm. But we leave the top one inch loose."

Grooming

"Hand raking versus machine raking is always a question," Mancuso notes. "Nothing looks prettier than hand raking, at least the green-side bunkers."

A machine can wear out the grass around the bunkers, creating special maintenance chores along the edges, so New Albany crews always hand rake around the

edges. Mancuso also prefers using a clockwise spiral pattern from the edges to the center of the bunker when he must use a machine rake.

Edging is done twice a year using a Redmax reciprocating trimmer.

"We only take off the excess grass on the edge," says Mancuso. "We don't want to change the original dimensions of the bunker, and with a Redmax you can't dig into the soil. With something like a spade shovel, you'll have a tendency to go further out into the soil."

Maintenance employees alternate on and off the

bunker-raking crews. Everyone gets a turn. But when special events are scheduled, Mancuso prefers to choose his more meticulous workers. "Some people are better at raking bunkers, just like any other job," he notes.

To put the final touches on your bunkers, you should remove silt, leaves and debris with a power blower before raking, Mancuso warns. "Silt will reduce the infiltration rate of water in your bunkers. You've got to take the time to get it off there."

Mancuso has been at New Albany Country Club on the northeastern outskirts of Columbus, Ohio, since construction was begun in 1990. Besides the golf course proper, he also oversees maintenance of a huge driving range, two practice greens, a bentgrass croquet court and two bentgrass tennis courts that receive the same maintenance intensity and regime as the golf course greens. □

After all else is done, use a power blower to remove silt, leaves and other light debris.



At Duke: Improved design, same old weather woes

The reworking of the Duke

University golf course

improved play, but changing

weather patterns provoked

lower fertilizer rates and

increased aerification.

by LESLEE JAQUETTE

Better sight lines and reworked fairways made the Duke University golf course faster and fairer, but weather extremes last summer required greens be spoon fed and aerified often.

"The tailor cut a fine suit," is how Rees Jones referred to the Duke University golf course his dad Robert Trent Jones designed in 1957. Seeing it was time for some new "alterations," however, the younger Jones was hired in 1993 to "refine the design."

The reworking cost \$2 million, and was completed over an 11-month period.

Duke superintendent Eric Shields says the renovation was a "wild" experience, and included some major bulldozer work,



The Duke crew usually aerates three greens per day, every four to six weeks.

greens rebuilt to USGA standards and major fairway improvements. Shields, who was then assistant superintendent, was active in the entire renovation.

Inconvenience followed, however, with a month of rain followed by a month of intense heat and dry weather.

Greens...unplugged

Prior to the rework, the greens at Duke were not draining well, and nine of the 18 holes had blind tee shots.

"Rees Jones' philosophy was simple," says Shields. "Make the course easier to drive off the tees and more difficult on the greens."

A legion of bulldozers recontoured half the fairways and most of the greens. According to Shields, fairways were ditched out because players could not see landing areas or the greens. Some areas were recontoured to be eight to 10 feet lower, and embankments were added.

On number 11, the green was brought forward close to the water haz-



The goal of the Duke renovation was to repair poor greens drainage and have a course that meets modern standards.

LANDSCAPE Bookstore



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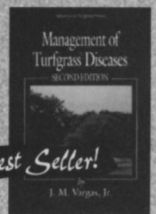
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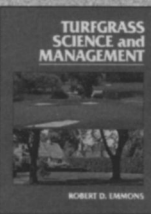
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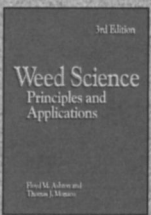
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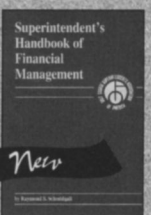
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Shields: aerification reduces algae growth.

ard to make it a more challenging hole.

The renovations have helped to speed up play. A full round takes four and a half hours, with 8- to 10-minute tee time intervals.

Lower fertilizer rates

The weather of the summer of 1995 inspired Shields to fertilize more often, but at lighter rates.

Normally, he says he would fertilize in the spring and fall with no nitrogen in the summer to avoid stimulating roots during the hot, humid summer. Now with sand greens, Shields and his crew have learned that improved drainage can also mean poor nutrient retention. To counter this situation, he plans to apply fertilizer every two weeks, with a quarter pound of nitrogen, and a potassium spray fertilizer in between.

A mid-range fertilizer helps lower maintenance costs. Fans on four holes were run for 24 hours during the heat wave to flush out the stagnant air. This year, Shields was to install fans on four additional greens.

Shields analyzes turf tissue samples monthly, to learn which nutrients might be deficient, and finesse the course through summer.

A side effect of heavy rain followed by a heat spell is algae, which developed on several greens. Because the algae cuts off airflow to the rootzone, Shields has moved to aerifying the greens more often than normal, every four to six weeks, using increasingly smaller tines as summer approaches.

He also uses the Toro Hydroject aerator to aerate without disrupting the turf surface.

The Duke crew usually water aerates three greens per day, so that any one green is aerified every two weeks.

Shields has not identified the source of the algae, but notes that the aerification schedule has kept algae growth to a minimum.

His plan is to strengthen turf health to the point that infestations of this sort are unable to take hold.

Few instructions

Shields manages his staff of 10 with a great deal of flexibility. They know the course so well he doesn't have to supervise very much. He trusts them to do their jobs. He also encourages staff to play golf because he feels they learn to appreciate the course from every perspective.

"I'm lenient, but when it's time to get things done, we all turn out and meet that expectation," says Shields. **LM**

New industry consultant

Charles B. "Bud" White, long an agronomist with the USGA Green Section, now has his own turfgrass consultation company to provide technical and managerial assistance. Also a past national manager of agronomic services for Toro, White will be involved with domestic and foreign projects. Total Turf Services, Inc. is headquartered in Watkinsville, Ga. Phone number is (706) 769-4570. □

Athletic field review

The Sports Turf Managers Association (STMA) has published its fourth annual issue of *Sports Turf Topics*, a compendium of STMA articles. The nearly 40 articles, written by STMA members, have appeared in major green industry journals. To order, call (800) 323-3875. □

GCSAA posts agenda

The Golf Course Superintendents Association of America has proposed a legislative and regulatory agenda for the 1996-97 fiscal year. Federal concerns include the Worker Protection Standard, Environmental Protection Agency, and Americans with Disabilities Act issues. State level topics include pesticide posting and notification and state preemption of local regulation of pesticide and hazardous chemical use, worker safety, wetlands and environmental quality laws.

In other GCSAA news, golfer Ben Crenshaw has been chosen as the next recipient of the association's Old Tom Morris Award, to be presented in February, 1997. □

Golf & wildlife manual due

The United States Golf Association reports that a new book on wetlands management should be published in early 1997. Donald Harker and Gary Libby, environmental researchers in Frankfort, Ky., were awarded a grant from the USGA to write the booklet, with the working title of *Wetlands Manual for Golf Courses*. The illustrated booklet will contain narrative, drawings, case studies and key restoration techniques to help golf course superintendents understand wetlands, and create programs to create, conserve and manage them. The manual is part of the USGA's Wildlife Links program to investigate the relationship between golf and wildlife. □

Jim Tielke, vice president of ice melter sales for **IMC Vigoro**, says the company is ready for winter, with plenty of ice melter products. "The professional side of snow removal is an extremely large market" says Tielke. "Throughout the snow belt, there is a tremendous amount of competition for landscapers." For those fortunate to land some good accounts, says Tielke, "ice melter can be an absolutely marvelous off-season effort." The Winter Haven, Fla. com-

pany's *Safe Step* is kinder and gentler to the turf, shrubs and trees that surround walkways.

Textron, Inc., parent company of Jacobsen, has acquired **Bunton Company**, makers of lawn-care equipment for landscape management professionals. "By combining [Jacobsen and Bunton], we will be able to build upon Bunton's established products and distribution channels in the commercial arena by leveraging

Jacobsen's leadership position in the golf market," says Herb Henkel, president of Industrial Products for Textron.

The Toro Company reports it will buy the **James Hardie Irrigation Group** for \$130 million, a move Toro believes will help its positioning as a "cost effective competitor" in the turf irrigation market. JHI provides irrigation products to residential and commercial markets.

Husqvarna has again desig-

nated October as Chain Saw Safety Awareness Month. "We're pleased to have been the first chain saw manufacturer to introduce this special way to highlight key safety messages so critical to our customers," says Husqvarna President David Zerfoss.

RohMid L.L.C., a joint venture between **Rohm and Haas Co.** and **American Cyanamid Co.**, has named John H. Thomas, Ph.D., as manager of the company responsible for marketing the new turf insecticide, RH-0345. The product controls grubs and other soil-borne pests in turf by interfering with insects' normal molting processes. The product is expected to be approved in 1997.

The 10th Annual **John Deere** Team Championship Golf Tournament finals will be held at Pelican Hill Golf Club, Newport Coast, Calif., Nov. 14-17. The tournament is meant to recognize the importance of the people who make up a golf course management team.

Cargill intends to acquire the North American salt production, processing and marketing assets of **Akzo Nobel Salt, Inc.** The companies say they expect to finalize the deal by the end of the year. "This represents an opportunity for Cargill to serve customers' needs worldwide with greater value and a broader spectrum of products," says Charles L. Sullivan, president of Cargill's Salt Division. **LM**

Info center

VIDEOS AND LITERATURE FOR THE GREEN INDUSTRY

BEARD'S NEW BOOK...The "Color Atlas of Turfgrass Diseases" by Dr. James B. Beard is available beginning next month through Ann Arbor Press, P.O. Box 310, Chelsea, MI 48118; phone (313) 475-8787 or (800) 858-5299. The book has more than 450 unique high-quality color photos. Completely rewritten from an earlier book sold in Pacific Rim countries, the book includes all major turf diseases worldwide. Cost is \$79.95.

INSECTS, TOO...The all-crop quick reference Insect Control Guide can be purchased for \$49.95 from Meister Publishing Co., 37733 Euclid Ave., Cleveland, OH 44094; phone (800) 572-7740. The guide puts product specs at your fingertips in a dictionary-type format. It is edited so you can use the indexes to quickly find data, products (by common and trade name) and definitions.

ANSWERS FOR CUSTOMERS...Responsible Industry for a Sound Environment (RISE) has a new brochure to help lawn care operators better answer customer questions about pesticides. The brochure includes easy to explain information about the EPA regulatory process, pesticide testing, Integrated Pest Management and how pesticides enhance the quality of life and the environment. To receive the free brochure, call RISE at (202) 872-3860; or write to RISE at 1156 15th St., NW Suite 400, Washington, D.C. 20005.

AT TOURNEY TIME...Here's where some of your golf customers might be getting their ideas. "Tournament Tips," published by Golffhouse, offers dozens of tips of how to plan, organize and run a golf outing. Includes information on small local events to major corporate outings. Price is \$29.95 plus \$4.95 s&h. To order, phone (800) 832-5457.

ON SOILS..."Soil Organic Matter: Analysis and Interpretation" summarizes in 67 pages the current methods of testing for soil organic content, test interpretation, and using results to modify recommendations for field use. Published by the Soil Science Society of America. Price is \$24. For members, the first copy costs \$20. Order from SSSA HQ Office, 677 South Segoe Rd., Madison, WI 53711-1086; fax orders to (608) 273-2021.

New ice melters protect against corrosion



IMC Vigoro, maker of Safe Step brand ice melter, offers two premium formulations for what the company calls "unprecedented protection against the damaging effects of refreezing and corrosion."

Safe Step Plus 20 and Safe Step Ultra 100 are

formulated with calcium magnesium acetate (CMA), a biodegradable chemical deicer first identified by the U.S. Federal Highway Administration as an environmentally sound, low-corrosive alternative to rock salt.

IMC Vigoro reports that these Safe Step formulas are the only commercially-available granular ice melter products to include CMA at effective concentration levels.

Safe Step Plus 20, a potassium chloride-based ice melter, is blended with a 20 percent concentration of CMA, for effective ice melting capability below 0° F, and corrosion reduction of 70 to 80 percent over rock salt. Safe Step Ultra 100 contains 100 percent CMA. According to the company it will not harm vegetation or drinking water supplies.

For more information on Safe Step products, call IMC Vigoro at (941) 294-2567 and mention LANDSCAPE MANAGEMENT, or

Circle No. 292

Four deicers for upcoming winter

Cargill makes four different deicers for different weather conditions.

Magna Melt is a magnesium chloride-based deicer that melts in temperatures up to -26° F. Dyna Melt is solid sodium chloride and magnesium chloride combined with a powerful corrosion inhibitor that melts up to 0° F. Glacier Melt is crystalline solid sodium chloride combined with magnesium chloride that leaves no residue and melts below 0° F. Winter Melt's screened crystals of sodium chloride melt best above 5° F.

More information can be obtained by calling (612) 742-6000; say you saw it here, or

Circle 293

Easy way to lay mulch

Rexius Forest By Products has a new truck-powered, remote-controlled material blowing system called the Express Blower.

Developed for landscaping and erosion control, the system



can blow any organic material up to 35 or 40 lbs. per cu. ft. with a particle size of approximately 3 inches and less. This includes decorative bark, sawdust, wood shavings, compost materials and wood mulch. Rate of application is 55 cu. yds. per hour. A 340-foot hose is included with the blower.

To learn more about Rexius products, phone (800) 285-7227 and say you saw it in LM, or

Circle 294

Metal buttons can serve as mini database to track production

A Touch Memory information Button (TMiB) from Agricultural Data Systems that can be attached to virtually any object can provide users with mobile databases.

In the golf/landscape industry, the buttons are being used to track time and attendance of workers, track total time on individual tasks, track vehicle and tool maintenance, and schedule future preventive maintenance, track work in progress, and track route efficiency.

Working in conjunction with the TMiB is the TouchProbe data collector (shown in photo), which can read information from, or write to the buttons. It is available with either 32K or 128K of internal memory.

For more information, phone (714) 363-5353 and mention LANDSCAPE MANAGEMENT, or



Circle 295



No salt in this melter

Melt Man Plus is a revolutionary new ice-melting product that contains no rock salt, yet quickly melts snow and ice at temperatures below 0° F.

A combination of three proven, fast-working ingredients, Melt Man Plus comes in 18- and 40-lb. bags. The product is marketed by Lange-Stegmann.

Want more information? Phone (314) 241-9531 and mention LM, or

Circle 296

Good on slopes

The exclusive patented design of the Kut-Kwick SlopeMaster allows safe mowing on slopes of up to 40 degrees, the company says.

This extra-heavy-duty commercial mower traverses and turns on the slope for efficiency and to prevent erosion, Kut-Kwick officials contend.

The mower is equipped with a 24 hp engine and a choice of 60- or 72-inch deck.

To learn more, phone (800) 248-5945 and tell them you saw it here, or

Circle 297



Control rootzone temperatures

The BioTherm TurfTemp heating turf system is becoming more popular at golf courses nationwide. Its all-inclusive Heat Module Enclosure creates the optimum rootzone temperature and heating efficiency, according to BioTherm Hydronic of Petaluma, Calif.

For more information, phone (800) 438-4328 and mention LANDSCAPE MANAGEMENT, or

Circle 298

Manage now available in Calif.

Manage herbicide has received regulatory approval in California, so it is now approved for all major U.S. turf markets.

Manage selectively controls purple and yellow nutsedge in warm- and cool-season turfgrasses.

For more information, phone (314) 694-2789 and tell them you saw it in LANDSCAPE MANAGEMENT, or

Circle 299

Handle cold temps, hard snow

Husqvarna Forest & Garden's model ST926EC snow thrower is built to withstand some of the coldest conditions and to power through the hardest packed snow.

The dual-stage snow thrower has a 9 hp engine, a clearing width of 26 inches and a Shift-on-the-Go drive system. Besides a remote control chute deflector, the ST926EC also has a light kit, making snow removal as easy at night as during the day.

For more info, phone (704) 597-5000 and say you saw it in LANDSCAPE MANAGEMENT, or

Circle 300



Compact snow-blower moves 37 tons/hr.

The H5622TA is the newest addition to Honda's self-propelled snowblower line. Powered by a Honda 5.5 hp OHV commercial-grade engine, the compact two-stage machine offers a 22-inch snow removal path, track drive, two forward speeds and reverse all-gear transmission.

The chute adjusts easily and will discharge up to 37 tons per hour to a maximum distance of 46 ft. Also standard is three-position height adjustment. A 12-volt, 50-watt light kit is also available.

For additional information: phone (770) 497-6000 and mention LM, or

Circle 305

[PLANT DIAGNOSIS]

Two months ago, we asked readers what problems they've had the hardest time diagnosing. Diseases seemed to be the most frequent response.

The best diagnosticians and horticulturists learn something new every time they go on a landscape, it has been said. If such is the case, there's a lot of learning going on in the green industry on a daily basis.

Art Snarzyk, for instance, once thought a problem with some brown turf was a disease, only to find out it was an insect problem.

"I had previously diagnosed and treated fusarium blight symptoms in late summer," Snarzyk wrote, "only to find grubs feeding in these areas in later months."

Snarzyk of Turf Specialists, St. Peters, Mo., changed his approach not much later.

"I now have customers begin intensive irrigation programs and I recheck the turf. Water



Fusarium blight appears as completely killed circles in bluegrass turf. It attacks the root, crown and leaf.

keeps the grubs near the surface where they can be detected if present."

Walter C. Chastain of Gibbs Landscape in Smyrna, Ga., had a similar problem on the



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 **The National Arbor Day Foundation**



If grubs are killing the turf, they'll be easy to find once you pull back a section of turf.

2.5-acre fescue lawn at the main entrance to the Ravinia complex in Atlanta.

"Over a three-day period in May of this year, 90 percent of the turf lost all color," writes Chastain. "Irrigation was running at 100 percent, and no disease was present. It is a Class A+ property, a six-figure yearly contract and a big-time stress factor."

What did he do? He sought help.

"We conducted a soil profile diagnosis. It indicated extreme compaction. So we used a soil-injected 'Grow Gun' application of a special polymer and microbial spores on a 24-inch grid. Now, at the end of August, the turf is beautiful."

Leslie Wing, grounds supervisor at Central Washington University, Ellensburg, Wash., had problems with fairy ring.

"When I started here, the grounds crew tried everything to get rid of the fairy rings on the infield of the varsity baseball diamond, to no avail," he writes. "They had even tried some detergent to help the water penetrate the area."

"So back in my memory, I pulled out a fact that the rings never cross and if they do cross or get too close to each other, then they die out."

"So if you take part of one colony and put it into another colony, they will wipe each other out. Hey—don't laugh!"

"At the start of baseball season, we cut out the sod and replaced the sod and I took chunks from each of the several circles and traded them around. We now have no fairy rings two years later. Try it if you like; it certainly costs less than fungicides."

For their cooperation, each of the three people mentioned here will get official "Landscape Management" caps.

Events

OCTOBER

All month: Golf Course Superintendents Association of America has series of one- and two-day seminars in many U.S. locations. For information, phone: (800) 472-7878.

16-20: International Turf & Ornamental Distributors Association annual conference, Naples, Fla. Phone: Jim Hartnett, (313) 331-7739.

19-21: American Society of Landscape Architects annual meeting & Expo, Los Angeles. Phone: (202) 686-2752.

23-24: Western Nursery & Garden Expo, Las Vegas. Phone: (800) 517-0391 or (916) 567-0200.

26: Women in Horticulture Conference, Seattle, Wash. Phone: Kim Hayes, (206) 367-1836.

27-30: National Institute

on Park and Grounds Management conference and show, Minneapolis, Minn. Phone: (414) 733-2301.

NOVEMBER

17-21: Green Industry Expo, Cincinnati (Ohio) Convention Center. Phone: (770) 973-2019.

17-21: ALCA Landscape and Grounds Maintenance Conference, Omni Netherland Plaza Hotel and Cincinnati (Ohio) Convention Center. Phone: (800) 395-2522.

17-21: PGMS Annual Conference, Westin Hotel at Fountain Square and Cincinnati (Ohio) Convention Center. Phone: (410) 584-9754.

17-21: PLCAA Annual Conference, Hyatt Regency and Cincinnati (Ohio) Convention Center. Phone: (800) 458-3466.

'REAL WORLD' I.P.M. WORKSHOPS

LANDSCAPE MANAGEMENT's "Practical Turfgrass IPM" workshop is scheduled for early February in the Columbus, Ohio area. The workshop is designed to give front-line managers the knowledge they need to understand and implement "integrated pest management" at their sites.

Run by "real world" turf managers and IPM implementation specialists, workshop attendees will gain:

- understanding of what Integrated Pest Management is, and isn't;
- how IPM techniques are relevant to a turfgrass management environment;
- how those techniques are implemented to control weeds, insects and diseases.

Interested turf managers may call (800) 225-4569 x709. More details on the workshop will soon be available in future issues of LANDSCAPE MANAGEMENT.

LANDSCAPE Bookstore



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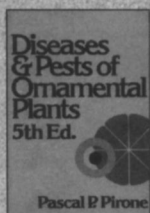
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by David V. Alford

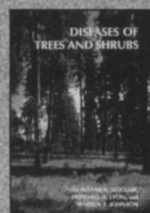
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by Pascal Pirone

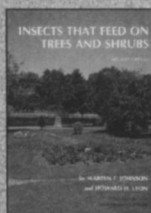
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by Wayne Sinclair, Howard Lyon
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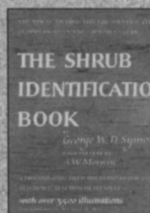
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Insects that Feed on Trees and Shrubs

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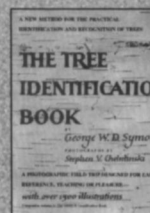
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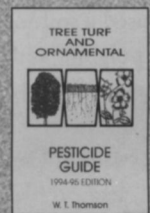
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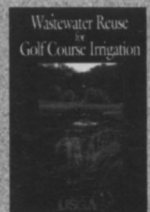
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