Controlling critters to net more profits

Moles? Geese? Rats? From traps to 'porcupine wire,' here are some control aids.

by James E. Guyette
Contributing Editor

■ Uninvited critters that come a-callin' can wreak havoc on any landscape, golf course or athletic field. Fortunately, innovations abound, giving you an increasing array of impressive tools to bait, trap and exclude unwanted visitors. However, you may find yourself under increasing pressure from customers to do away with any pests in a humane manner.

"Exclusion" is rapidly becoming a technique of choice. This merely involves keeping the animals at bay before they even set paw on the property. (Any landscape manager who's been vexed by a vole can tell you that exclusion is better than trying to rout an already entrenched rodent.)

Fire ants (mound, above) can be terrible pests in the southern landscape. If left untreated, they can injure humans, too (left photo).

Rodent bait stations like this one from Bell Laboratories, are excellent for getting rid of rats and mice.

For larger animal pests, a new line of Get Away repellents from IntAgra Inc. uses all-natural ingredients that repel by both taste and odor without being offensive to humans. It reportedly keeps away deer, rabbits, squirrels, raccoons, dogs and cats. Other manufacturers are nosing into the field with similar products.

Rodents can be a particular concern to homeowners fearful of the much-publicized Hantavirus. Sonic Technology's PestChaser Ultrasonic Rodent Repeller uses a highpitched noise that hurts the animals' ears while remaining un-heard by humans.

The battery-powered, lunchbox-sized Rat Zapper from Agrizap uses a jolt of electricity to dispatch rodents. It is considered humane because death comes quickly.

Traps and poisons were causing adverse customer reaction among the clients of the Morehart Mercantile Corp. outlets in California, so owners Marty and Patricia Morehart switched to the Rat Zapper. "We are rat- and mouse-free, and we have also used the Rat Zapper in our home as well as on our ranch with equal results," they note.

Birds and geese—For Bill Stout, president of Stout's Pest and Weed Control in Mountain View, Calif., birds were a prime source of irritation to his clients. He found that birds stayed away after he affixed stainless steel "porcupine wire"

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from Cat Claw to gutters, chimneys, awnings and wherever else the birds were likely to rest. They are not harmed, yet the sharp spines ruin any roosting plans.

"It's a long-term solution versus the gels that we used in the past," Stout states. "It's good and clean and the people don't notice that it is there," he points out.

Geese that present problems on golf courses can be given the heave-ho by strategically placing a tough netting product from GridTech. Geese use ponds as a source of protection, and when they are denied access they leave.

"When the G-Grid is installed, the geese can no longer get from the water to the grazing site and then back for protection," explains GridTech's Tom Suprock. "They won't be able to see it from the clubhouse because it's virtually invisible, but the geese can see it," he notes. "The geese will swim back and forth for hours looking for a hole in the fence." It irritates the birds and causes them to move somewhere else, Suprock says, noting that the geese netting is considerably more sturdy than standard bird netting used on trees.

His company also markets a similar netting product that is imbedded in the ground to thwart burrowing rodents. It's being used under the runways at O'Hare Airport in Chicago.

Selected landscape-oriented pest control product suppliers

American Cyanamid Co.
Wayne, NJ 07470
(201) 831-3573
fire ant controls

Argizap Inc.
1860 Eastman Ave.
Ventura, CA 93003
(800) 946-7437
electronic pest killers

Bell Laboratories Inc.
3699 Kinsman Blvd.
Madison, WI 53704
(608) 241-0202
rodent control products, tracking powder

Burlington Scientific
222 Sherwood Ave.
Farmingdale, NY 11735
(516) 694-9000
yard animal repellents

Cat Claw Inc.
2710 Bedford St.
Johnstown, PA 15904
(814) 266-5544
(800) 832-2473
bird control wire

Chase-A-Way Inc.
1187 E. 156th St.
The Bronx, NY 10474
(718) 861-0100
(800) 831-4308
personal insect repellents

Ciba Turf & Ornamental
P.O. Box 18300
Greensboro, NC 27419
(910) 547-1160
insecticides, fire ant controls

Cinch Trap Co.
P.O. Box 130
Hubbard, OR 97032
(800) 841-5676
gopher, mole traps

Fas Technologies
1550 Walnut St. #5
Berkeley, CA 94709
(510) 849-4234
biological insect controls

Gempler's
211 Blue Mounds Rd.
P.O. Box 270
Mt. Horeb, WI 53572
(608) 437-4883
trapping equipment, insecticides, rodenticides

GridTech
294 Valley Rd.
Middletown, RI 02842
(401) 849-7920
(800) 959-7920
bird, waterfowl netting

IntAgra Inc.
8500 Pillsbury Ave. S
Minneapolis, MN 55420
(800) 468-2472
animal repellents

R.J. Advantase
501 Murray Rd.
Cincinnati, OH 45217
(513) 242-3300
geese repellent for grass

Sonic Technology Prod.
120 Richardson St.
Grass Valley, CA 95945
(916) 272-4607
(800) 247-5548
ultrasonic pest repellers

Target Specialty Prod.
15415 Marquardt Ave.,
Santa Fe Springs, CA 90670
(310) 802-2238
chemical controls

Valent
P.O. Box 8025
Walnut Creek, CA 94596
(510) 256-2700
ant control products

Wilco
P.O. Box 80664
Seattle, WA 98108
(206) 762-2120
traps and baits

Trapping—To trap pesty animals, "you should be licensed and bonded," according to Jim Williams of Jim's Trapping Service in Sublimity, Ore.

Landscape managers need to make sure they are properly covered for any liability that may arise out of a trapping effort. A neighbor's dog getting caught in a trap meant for a mole, gopher or other pest can be a costly adventure.

Trapping skills are best obtained by hands-on experience, and would-be trappers are urged to attend trapping seminars sponsored by equipment suppliers or extension agencies.

Trapping is not the quickest type of service to offer. "It takes a lot of time," says Williams. It's tough to learn, and it's tough to get the job done correctly—especially if you don't quite know what you are doing. "It's like playing cards; you don't know until it's over whether you've won or not."

When stalking gophers or moles for clients, "I've caught them in a couple of hours and then I've taken a month to catch them," notes Williams. "And when I first did it, I wasn't successful at all. I had a problem with coyotes stealing my traps."

Trapping fees depend on what the market will bear. Some trappers will get a $25 service fee just for setting foot on the lawn, plus $50 for each catch.

"To people who pay $10,000 for landscaping, it's worth it," says Williams, who adds that he receives much less payment for his services in rural Oregon. ("There are a lot of retired people here and I get a lot of fresh vegetables and things.")

Upscale, semi-rural neighborhoods are the best hunting grounds for trappers seeking additional clients, Williams advises. "They go to wealthy areas and the people there don't have the time to catch them—so they'll gladly pay 50 bucks apiece for you to catch them."

Be certain of your marketing region. Williams says that word-of-mouth advertising, plus a business card tacked up on a local store bulletin board, brought him a good amount of calls—yet the area was too widespread to make good business sense. "I didn't want to drive 20 miles to check my traps," he concludes.

Extend power equipment life with year-round maintenance

■ To extend the lifespan of your power equipment, you must treat the gasoline engines with tender loving care—both before bedding them down for the winter and during the busy season.

It's most important to change the oil before storing the equipment for the winter.

"Late fall is the best time to change the oil and check the spark plug to make sure that it will be ready to go in the spring," says James Garthe, instructor in ag and biological engineering at Penn State University. "Don't keep old oil in the engine. Solids, water and acids that have accumulated in the oil over the summer will corrode the engine.

Late fall is the best time to change the oil one last time and check the spark plug.

"Change the oil while it's still warm. Contaminants are suspended in warm oil and will drain out. If you wait until it cools, these materials settle to the bottom of the crankcase and solidify into a thick gum."

If possible, remove gasoline from the tank before storing the mower, either by siphoning or by taking off the tank. Consult your owner's manual to determine the best method.

If you can't remove the gas, put a fuel stabilizer designed for small gas engines in the tank and run the mower for a few minutes before storing it. "A good fuel stabilizer can extend the storage life of the gas by up to six months," Garthe contends.

If you keep the equipment in a damp location, consider coating it with a silicon spray before storing it. The silicon will create a film that keeps moisture out and discourages rust.

Covering the equipment with a plastic tarp also helps keep moisture and rodents out. "Mice have been known to chew wires and other engine parts, and even to build nests in the mower," Garthe notes. A plastic tarp will discourage these pests more than cloth, which mice chew up for nesting material.

During the season—The lifespan of a small gasoline engine is also directly related to routine maintenance performed on it during the operating season. A few simple procedures that are easy to perform and take very little time can extend engine life, according to Briggs & Stratton.

A dirty air filter also keeps air from getting to the engine and affects the air-fuel ratio.

Over time, component parts will wear out or need replacing. It is important to use genuine parts. They will help keep your engine in top performing condition.

All gasoline-powered engines require proper fuel and lubrication. They also need air for full power delivery and adequate ventilation to prevent over-heating.

Maintenance tips:

Lubrication—Change oil regularly after 25 hours of operation. Many professionals change oil as often as at the end of each working day. Use a high grade detergent automotive oil—30 weight is highly recommended when operating in temperatures above 40 degrees.

Fill to the proper level indicated in the manufacturer's maintenance instructions, being careful not to overfill. Check oil level every time you add gasoline.

"The wrong oil shortens your engine's life by causing overheating and excessive wear on valve guides, seals and main bearings," warns Garthe. "Use high quality engine oils containing additives that buffer corrosive acids generated during fuel combustion."

Fuel—Use clean, fresh unleaded gasoline. Using lead-free gas slows combustion deposit build-up and contributes to a cleaner environment.

Air—Clean air is needed to mix with gas for optimum combustion and power; it is the lifeblood of engines.

Large capacity pleated paper air cleaners help keep the engine clean. Proven for years in automobiles, pleated paper air cleaners offer small engines unbeatable protection and convenience. And service is a snap: remove and replace just like an automobile air filter. Again, it is important to replace with genuine parts.

"If the air filter is dirty, minute particles of silicon eventually can get into the internal moving parts, wearing them down and pitting them," Garthe notes. "A dirty air filter also keeps air from getting to the engine and affects the air-fuel ratio that governs combustion. The engine has to work harder, wasting energy and fouling the spark plug with deposits."

The oil foam air cleaner also offers good protection. Replace whenever it appears very dirty.

Blower housing—Dirt and debris can enter the engine's blower housing and clog the cooling fins, causing high engine temperatures. If the temperature rises too high, internal parts can be damaged. Prevent grass and debris build-up by removing blower housing and cleaning the area.

Hydraulic seeding: from highways to home lawns

Benefits of this fast, efficient seeding method can be helpful in golf course renovations, too.

by Ron Hall
Senior Editor

■ Hydraulic seeding is the process of mixing seed, fertilizer and fiber mulch with water in correct proportions inside a tank and then spraying the slurry onto a prepared soil surface.

Many landscape contractors refer to the process as "hydroseeding." But like Kleenex and Xerox, two other brand names that came to represent categories of products, the name Hydro Seeder is registered to a specific company, the Finn Corp., which made its first Hydro Seeder in 1953.

Whatever you call it—hydraulic seeding, mulching or grassing—it offers advantages over mechanical seeding in many turf and landscape projects. Hydraulic seeding, say its proponents:

- is faster and usually requires less labor because seed, fertilizer and mulch are applied at the same time. (Other amendments such as lime or biostimulants can be added too.)
- provides a more uniform distribution of seed, fertilizer and mulch.
- usually results in faster seed germination.
- offers a higher grass survival rate.
- reduces soil erosion.
- puts seed in difficult areas like slopes, berms, and ditches.

Hydraulic seeding reportedly gained its

Hydraulic mulchers available to the green industry

COMPANY	MODELS	FEATURES
Badger Associates 1108 Third Ave. New Brighton, PA 15066 (800) 822-3437	Turbo Turf: 8 different size units ranging from the HS-50, 50-gal. skid-type unit, to the HS-1600-ZX, 1600-gal. unit.	The HS-1000-XPW 1000-gal. poly tank, skid-type system; 16 hp B&S Vanguard or Kohler Magnum engine with electric start; 4" x 4" high-volume centrifugal pump; 100 ft. of 1¼" ID hose, hose holder and five nozzles.
Bowie Industries, Inc. P.O. Box 931 Bowie, TX 76230 (800) 433-0934	7 different model sizes ranging in working capacities from 250 gals. (the "Baby Bowie") up to 3,000 gals. (the "Bowie Imperial 3000")	Victor 1100 Hydro-Mulcher with 1125-gal. tank (steel plate with epoxy resin coating on inside); Wisconsin W4-1770 air-cooled engine; 2300 STD Bowie pump; enclosed shredder bar; 2 agitators to keep slurry homogenous.
Easy Lawn Inc. 543 Shipley St. Seaford, DE 19973 (800) 638-1769	2 models: HD6001-60 with 600-gal., polyethylene tank and the HD3002-30 with a 300-gal. polyethylene tank.	Spray range of 100 ft.; the HD3002-30 gives about 4,000 sq. ft. coverage; the HD6001-60 about 8,000 sq. ft. coverage; multi-tube jet agitation; 100 ft. of clear braid hose; manual hose reel with greaseable ball bearing swivel.
Finn Corporation 9281 LeSaint Drive Fairfield, OH 45014 (513) 874-2818	7 models with working capacities from 250 gals. to 3,000 gals; most popular models the T90 (800 gals.) and T120 (1,000 gals.)	T120 Series II Hydroseeders feature new in-line clutch/pump assembly ("Clump") that boosts hp and rpms, increasing application distance 20% while also allowing use of bulkier materials; powered by diesel Kubota 1703; discharge distance for both is 180 ft.
Reinco Inc. P.O. Box 512 Plainfield, NJ 07061 (800) 526-7687	Full complement of Hydrograssers ranging in size from HG-5H with a 500-gal. working capacity to the HG-30GX with a 3000-gal. working capacity.	Model HG-10GXA with 1000-gal. working volume; 130 feet spray range; air gap fill; double-valved fill pipe for hands-free filing; exclusive Tilt-Load fiber feeder and mulch grinder; 35-hp air-cooled gas engine; dual agitation system with "Hydro-Jets" and paddle mixers; stainless steel nozzles.
TGMI, Inc. 11074 Ashburn Ave. Cincinnati, OH 45240 (800) 241-8464	Aqua Mulcher 400, 400-gal., portable unit will hydromulch 4500 sq. ft.; (also a distributor for Bowie units).	All steel construction; paddle agitation; hydrostatic agitator drive; centrifugal pump; clutched pump drive; steel tank with epoxy interior coating; spray distance 90 ft. from end of hose (190 ft. total).
The Broyhill Co. Box 475 Dakota City, NE 68731 (402) 987-3412	The Turfseeder with a 150-gal. poly tank and the Turfmaker with a 200-gal. steel tank.	The Turfmaker: mechanical agitation; Bowie positive displacement pump with Honda engine; clear-water hose flush system; bale loader, hose reel for transportation and hose storage; two nozzles.

first commercial use when the Connecticut Highway Department outfitted a tank with a recirculation-type agitation system and applied a slurry of grass seed and peat moss to slopes in the 1930s, says Walter Reinecker, Reinco Inc. A landscape architect in West Virginia saw obvious advantages to use the concept in his hilly state too, explains Reinecker.

But hydraulic seeding didn't really gain widespread use until America's highway-building frenzy began just after WWII.

Large hydraulic seeders were used to seed mile after mile of highway roadsides, including areas that would have been impractical, or even dangerous, to seed mechanically. They saved untold expense and labor because they could spray thousands of square feet in minutes.

America's highway-building era is basically over, but uses for hydraulic seeding—if not the size of the projects themselves—continue to grow, particularly for landscape contractors and for golf course seeding and renovation. While soil reclamation and erosion control remain the two biggest markets for hydraulic seeding, landscape contractors now regularly use it, often for areas as small as individual home lawns. Golf courses and sports turf, particularly football and soccer fields, can benefit from hydraulic seeding too.

Smaller is better—Recognizing this trend, several manufacturers entered the market with smaller, less expensive units about a decade ago or less.

Ray Badger, Badger and Associates, New Brighton, Penn., says landscape contractors even using smaller hydraulic mulching units can cut their labor costs compared to mechanical seeding. "And a lot of times they can charge a premium for hydraulic seeding," he points out.

Established companies like Finn, Reinco and Bowie expanded their lines, offering products that are more suited and affordable to the landscape market, too.

Cost is obviously a consideration, but a landscape contractor should focus primarily on productivity, says Walter Butman, the Finn Corp. Does the hydraulic seeding unit possess sufficient capacity and power to most efficiently perform the tasks that the contractor is planning for it?

Bob Person, president of TMGI, Inc., Cincinnati, advises contractors to compare the construction (stainless or plastic tanks) of comparably sized units and operating features. He says units with identically sized tanks may have different capabilities. This may be most obvious when it comes to the amount of mulch they can hold and dispense. This often determines the success or failure of a seeding project, particularly if environmental conditions turn against the contractor.

Cost is obviously a consideration when buying, but you should focus primarily on productivity.

Person likens it to buying a pickup truck. Although the bed size of, for instance, a Ford pickup is the same for half-ton, three-quarter-ton and one-ton models, the work capacity of the one-ton model is obviously much greater than the other models.

That's why each contractor must review the type and size of the projects that they plan to use their units for, and then carefully check their requirements against each unit's suitability. All manufacturers provide literature that outlines the capabilities of their hydraulic seeders, but prospective buyers shouldn't be afraid to ask questions. Nor should they hestitate to gather information about the costs of hydraulic seeding. Again, manufacturers can help.

Reinco, for instance, offers a free publication titled "Hydrograssing and Power Mulching Cost Analysis." It details the current methods available for hydrograssing, explains the positives and negatives of each, calculates the cost per square foot and suggests the best available process for a variety of applications. Charts and tables are included, along with an overview of machine selection.

Equipment options that make the seeding process easier include electric hose reels, extension hoses, mulch shredder bars and accessory nozzles.

Established manufacturers in the hydraulic seeding market also offer mulch spreaders, crimpers/discs, tack applicators (Reinco), and an AEM Spreader to transport and place large quantities of bark mulch, compost or similar product (Finn).

Affordable liability coverage

If you have liability insurance, don't assume it's the best you can get. And don't assume that high premiums are unavoidable.

by Bess Ritter May

■ Premiums for most small businesses have risen drastically in the past few years. If you need affordable liability insurance, you have to know how to choose an agent, company and policy. The organization and safety conscious nature of your company also count. Here's a look at the key points to consider when buying liability coverage.

Agents and brokers—Agents represent one company, whereas brokers represent many companies which offer different types of coverage at different rates. Choose a broker carefully. You don't want a broker who will pressure you into purchasing coverage you don't need. Nor should you choose a broker who "churns" or "clean sheets" applications.

"Churning" occurs then the agent or broker urges a client to drop a good policy to earn the broker a substantial first year commission.

Other unacceptable practices include the "buy now because you may not be able to get such a great policy later" argument, and doubletalk whenever you question policy specifics.

What you should know—Exactly what is covered? Details include: medical payments, product liability, advertising liability, personal injury, contractual liability.

Insist on a "certificate of insurance" from the broker. This is a type of broker's malpractice insurance. It guarantees that if he or she fails to follow through on a binder or omits some critical detail concerning your coverage in their report to the insurer, you can collect through your broker's insurance.

Insist that the agent/broker inspect your entire business premises, including the basement, storage areas and parking lot. Do this before buying, so inspectors can identify hazards and explain how correcting them can bring a lower rate.

Items of concern can range from the lack of fire detectors in storage areas to potholes in the parking lot.

Insurance inspectors will also offer advice concerning common sense safety practices such as clean, dry floors.

The lawn care industry has a feature most other business don't have: the use of pesticides. Be sure to state—at the time of application—exactly how the chemicals you use are stored and applied. Describe the expertise of the employees who do this work. When you obtain approval from the carrier, you won't be surprised to learn later that a claim is not going to be honored.

"Self insure," by assuming part or all of the smaller losses. Most insurers like this because it can cost them as much as $500 or more to process a $100 claim.

Cancellation clause—Check your new policies cancellation clause. This is vital since some companies will actually drop clients who file too many unprofitable claims or transgress in some other way that causes a profit loss for the company.

Insurers do not have to give you a reason for cancelling after as little as five days' notice. So negotiate that clause before you buy, and bargain for time. You will need it to line up new insurance.

Be sure your liability insurance is written so that limits apply on a "per claim occurrence" basis. If you are found responsible for an "incident" which results in the injury of more than one person on one occasion, and are insured on a "per claim" basis, the company is liable for all resulting injuries which occurred at the time. Under a "per occasion" arrangement, the company will guarantee only one payment regardless of the number of persons injured.

Be sure that all workers know and understand the terms of your liability insurance. Post a copy in a prominent space and mark in red all claims which might nullify or reduce your coverage. Insist that all incidents be reported promptly. Delegate all such matters to one competent employee.

Employee ignorance of the policy terms or an error in reporting could someday result in bankruptcy.

Don't make enemies—Always be courteous to everyone on the payroll or to anyone who may visit the premises, and to all business associates, and avoid arguments. You never know when a misunderstood word or deed will escalate into a serious complaint involving your liability insurance that might have been forgotten with softer treatment. Insist that all employees develop the same gentle attitude. Be gentle in your treatment of them as well.

With your attorney's help, write up a list of steps you will have to take in the event of a claim. This is done to sure the company will not put you off or invoke a "reservation of rights" clause in order to deny protection.

One example is the requirement of most companies that prompt notice be given on any claim or even on some unusual circumstances which might result in a claim. Check with your attorney again before actually filing for a claim, especially if it is a big one. The insurer is bound to look for loopholes.

—The author is a freelance writer based in Philadelphia.

When accidents happen...

1. You should have a first aid kit ready. Always replenish first aid supplies as needed. Keep the physician and emergency aid number on the cover of the kit. Store it in a handy place.

2. Establish a simple accident report form and make a number of copies. Keep them with your first aid kit. Include:

- ❑ name, address and phone number of your company
- ❑ name, address and phone number of the injured person/persons
- ❑ date and time of injury
- ❑ name, address and phone number of closest relative
- ❑ description of accident, and signatures, addresses and phone numbers of all witnesses.

3. Don't panic, even if the injury is serious. Do not move the patient. Cover with a coat or blanket and try to keep onlookers away.

4. Even if the injury is relatively minor, keep the the injured person in a quiet area and apply first aid.

5. Delegate one person to call 911 or send for a doctor/ambulance/

6. Complete your prepared accident report while waiting for medical help.

If the injured person refuses, make a note of this.

7. Call the insurance company or broker at once and submit your completed and signed report.

—B.R.M.

Athletic turf management: WORKING SMARTER

by Steve and Suz Trusty

■ Sports participation in the U.S. is booming at every age and skill level, requiring more athletic fields that can withstand longer hours of use.

With minimal staffing and limited budgets, athletic turf managers must work smarter to accomplish more with less.

The good news is: they're doing it.

A core of intelligent, well-educated, highly-trained athletic field managers combine the science of growing grass and the art of maintaining sports turf to grow safe and aesthetically pleasing playing areas. And they willingly share their knowledge and expertise.

"The sports turf industry is going great guns," says George Toma, turf consultant for the National Football League and former grounds manager for the Kansas City Chiefs.

"What we need to do first is look at the construction of fields. Quality construction is the key to a good field. Contractors have to be honest and do a good job. The agronomists have to do their job and be honest. The soil testing laboratories have to be honest and assure the entire field will be put in with the specified rootzone mix. Close, honest attention to detail is vital at each step of the construction process. The groundskeeper needs to be involved from day one. Poor natural grass installations are a real concern."

Toma believes owners of professional teams should pay as much attention to the playing surface as they do to the players' other amenities, such as training areas and salaries. And, says Toma, grounds managers need to be paid a higher wage.

"I'm all for players making good money," says Toma, "but we can't forget where the game is played. The playing field needs to be number one."

Partnering—Toma also says training in turfgrass management should be a priority. More professionalism, says Toma, is needed.

Dr. Gil Landry, extension turf specialist at the University of Georgia and immediate past president of the Sports Turf Managers Association, believes the industry is on a steady rise, due to better trained and more experienced people.

"Exposure to premium fields, on site or via TV, is one of the reasons for the heightened awareness of sports turf facilities, and I think that's going to continue," says Landry.

"STMA is also moving ahead, but we need more involvement from individuals, organizations and corporate entities, and more financial backing to accomplish our goals."

Landry adds that the association would like to develop relationships with associated green industry organizations.

Toma: Make education a priority, continue to raise level of professionalism.

Information is shared freely within the industry, says Mary Owen, extension turf specialist at the University of Massachusetts. "The industry is in a very positive state of change, an upsurge of positive activity. The networking opportunities are tremendous, and everyone seems to be coming together to make things happen. It's not just people wanting to help, they're eager to help."

Owen says field managers are trying to learn from each other, and are always looking for new products and procedures to help them get the job done.

"There's a higher level of professionalism," says Owen, " both in how the industry conducts itself and in how it's viewed."

"We're still behind the golf course industry, but we're growing and improving in all areas," says L. Murray Cook, stadium man-

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ELSEWHERE

New golf course a dream come true, page 6G

Natural/synthetic turf field works, page 8G

Getting by on rationed water, page 12G

Irrigation contracts start with safety, page 14G

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ager for the city of West Palm Beach, Fla.. "For a time, the sports turf industry was stagnant, but in the last five years we've made improvement."

The right stuff—The future for athletic field management may be bright, but it will dim quickly if it doesn't continue to recruit the right people into the profession.

"It's especially important that we keep many intelligent, energetic young people coming into the profession," says Mike Schiller, assistant superintendent of parks for the Schaumburg, Ill. Parks District.

"This new crop of individuals has both the personal resources and the desire to make a difference," says Schiller. "While they're tackling their job responsibilities admirably, we need to get them involved with STMA to ensure future growth."

Some suggest that by viewing the relationship between athletic field managers and industry suppliers as a "partnership," ideas and cooperation will help the industry prosper.

"The sports turf industry is developing rapidly and should be seen by industry companies as a viable, professional entity and as a growth opportunity," says Gary Lindquist, manager of market development for John Deere Company's Commercial Mowing and Utility Vehicles Division.

Deere, according to Lindquist, has reorganized its internal business groups to better focus on the various segments of the commercial market.

"The future of improved sports fields is positive," says Eugene W. Mayer, training and technical support manager, The Scotts Company, and commercial vice president of the Sports Turf Managers Association.

"Athletic field usage is increasing and so is new construction and renovation of fields," says Mayer. "But equally important is the increasing awareness of participants, administrators and groundskeepers that better quality and safer playing conditions are possible on all levels of play by using specifically-designed turf products correctly and employing better field management practices."

Managers 'feel the heat'

■ Much of the athletic turf industry was in a "heated" state this summer, thanks to tropical July and August weather. Consequently, managers had to divert their attention from planned projects to restore dying turf.

"Turf disease hit this summer," says **Dan Marseglia,** outside maintenance foreman for the Cheshire Public Schools, Cheshire, Conn.

Marseglia had to manage summer patch and pythium, which he thinks was brought about from the high humidity followed by a dry spell. Marseglia suspects the fungi might have had a chance to incubate, what with the extra irrigation.

Which raises the question: which is worse, no turf or diseased turf?

Mark Lamneck, manager of intramural fields and irrigation, Ohio State University, blames the weather for some dollar spot and turf rust problems. "We're putting down a 21-3-21 (fertilizer)," to bring the turf back," he reports. "We'll review the fields then we'll decide to what extent we'll have to overseed.

If we do overseed, which I think we will, we'll probably use straight ryegrass for quick growth."

Marseglia—as do many athletic field professionals—manages multiple fields, seven to be exact.

Lamneck reports the university is building a massive, 14-field/8-diamond facility to handle lacrosse, soccer and football.

Operations the size of Marseglia's rely heavily on a team attitude and department cooperation.

"I think you need a 'marriage' between the grounds maintenance department and the athletic department," says Marseglia. "Then the coaching staff; and it continues to the athletes and the administrators understanding your needs, you understanding their needs.

"Then there's the community at large, and the general public. If I need volunteers, they're there."

Lamneck credits his success to his being able to set priorities, and to "dedicated people who are willing to communicate effectively; and a well-trained staff."

Terry Dale Meyer, park services manager for the City of Olympia Parks and Recreation Department, Olympia, Wash. believes budget support is an essential. Meyer says he's "maxed out" in terms of the athletic field supply and demand ratio. Meyer tends 12 fields, which are used for softball and baseball, so it's a relief to have the money at hand.

"They give us what we need," Meyer says. "If they ever give us more fields, they'll have to give us more money to maintain those, but right now we don't have any more fields."

Some of that money went for a new irrigation system, installed in September. Employees are kept happy by a progressive policy for part-timers.

"We increase payroll or benefits (for part-time workers) the same as our cost-of-living increases for our full-time," Meyer says.

Some departments have to contract work out to landscapers to make ends meet. Marseglia doesn't have the personnel or equipment for every job, so he contracts out some seeding, fertilizing, aeration, turf renovation and ball diamond rototilling.

Marseglia believes "attitude" is important if a crew wants to get any work done.

"I would rather have an individual who does not know anything (about the industry) and likes to work outside; that's half the battle. If they're conscientious on top of that, I just feel I have a gold mine. I will painstakingly teach that individual, and it's usually very rewarding."

"Everybody is going back to grass from AstroTurf," says **Mike Hess**, grounds manager for Georgia Tech Athletic Association, Atlanta.

The stadium at Georgia Tech now surrounds a natural grass field of Tifway 419.

"I've seen a trend in soil amendments," adds Hess, who is trying an amendment called Rebound, which consists of finely chopped rubber particles

"In anticipation of the 1996 Summer Olympics, we're redoing the track and renovating the coliseum. The stadium is smack dab in the middle of what will be the Olympic Village."

—James T. Holter & Terry McIver

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Setaria viridis

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PTO-953

Circle No. 104 on Reader Inquiry Card

Living a dream

Veteran superintendent James Baran helps shape a new public course in northern Ohio.

by Ron Hall
Senior Editor

■ James Baran, CGCS, is living a golf course superintendent's dream even as he works about 12 hours each weekday and another eight hours each Saturday.

Baran's helping supervise the building of the Eagle Creek Golf Club in Norwalk (pop. 17,000) in north central Ohio. He does it with a grin because Eagle Creek will be his to maintain when it's opened to the public next June.

He doesn't mind putting in so much effort now. It will mean a better golf course, and fewer maintenance headaches in the years to come.

He realizes that often—too often—a superintendent is brought in after a new course has been built. Not at Eagle Creek, though.

"I've always been hired to handle problem golf courses and to solve someone else's problems. Now I get to start from scratch," he says, his gaunt face covered by an enormous smile.

It's mid-August and the shocks on his four-wheel-drive Chevy pickup (his "office on wheels") are shot. They've been insulted by too many ruts in the 220 acres that, Jim predicted, will be one of the best 18-hole public golf courses in Ohio.

"This course is going to have a variety of types of holes. It'll have open holes, holes along wetlands, and holes that play out of the woods," says Baran. "It will be a golf course where your wife can play off the front tees and enjoy it, and a real good golfer can play the back tees and get a different look and be challenged, too."

This particular afternoon, 12 workers, two full crews, from Golf Tech & Design, Omaha, Neb., lay wire and plastic irrigation pipe. They can work as fast as the property is shaped.

They're installing a computerized Toro LTC irrigation system with a double row of heads down each fairway, about 500 heads in all. Baran says he'll spend many winter hours programming the system. He's not displeased with the thought.

For easier mowing, Baran designed wider aprons between greens and bunkers and reduced the steepness of some slopes.

Baran says Eagle Creek progresses at breakneck speed, at least when the weather cooperates.

That's partly because several of the project's partners—specifically Bob and Ken Bleile and Mark Schaffer—own and operate construction and excavating companies, respectively.

At one time, in fact, 13 dozers crawled over and pushed the property into distinctive features. They were joined by four track hoes, three rubber-tired front-end loaders and and a host of dump and pan trucks.

The project is also progressing well because golf course architect Brian Huntley took advantage of the existing terrain. The property is mostly former farmland and woodlots. Three small creeks run through it.

The owners, Norwalk Golf Properties Inc., wanted to build the course in about six months; they're going to be close. By mid-August they were only six days off schedule in spite of weekly thunderstorms.

Baran anxiously counts the days until he can seed. Then comes 90 turf-growing days before the course is ready for play. He would like to get most of the growing days yet in 1995.

"I'm looking forward to the grow-in. The course will finally start to look good when everything starts to turn green," he says.

The fairway leading to hole No. 4 in mid-August, prior to seeding with Penneagle.

Brillion seeders, in 10-foot swaths, will go in two directions to seed the fairways in Penneagle creeping bentgrass. Roughs get a mixture of Kentucky bluegrass, perennial rye and fine fescues. The fairways and roughs will need between 12,000 and

continued on page 14G

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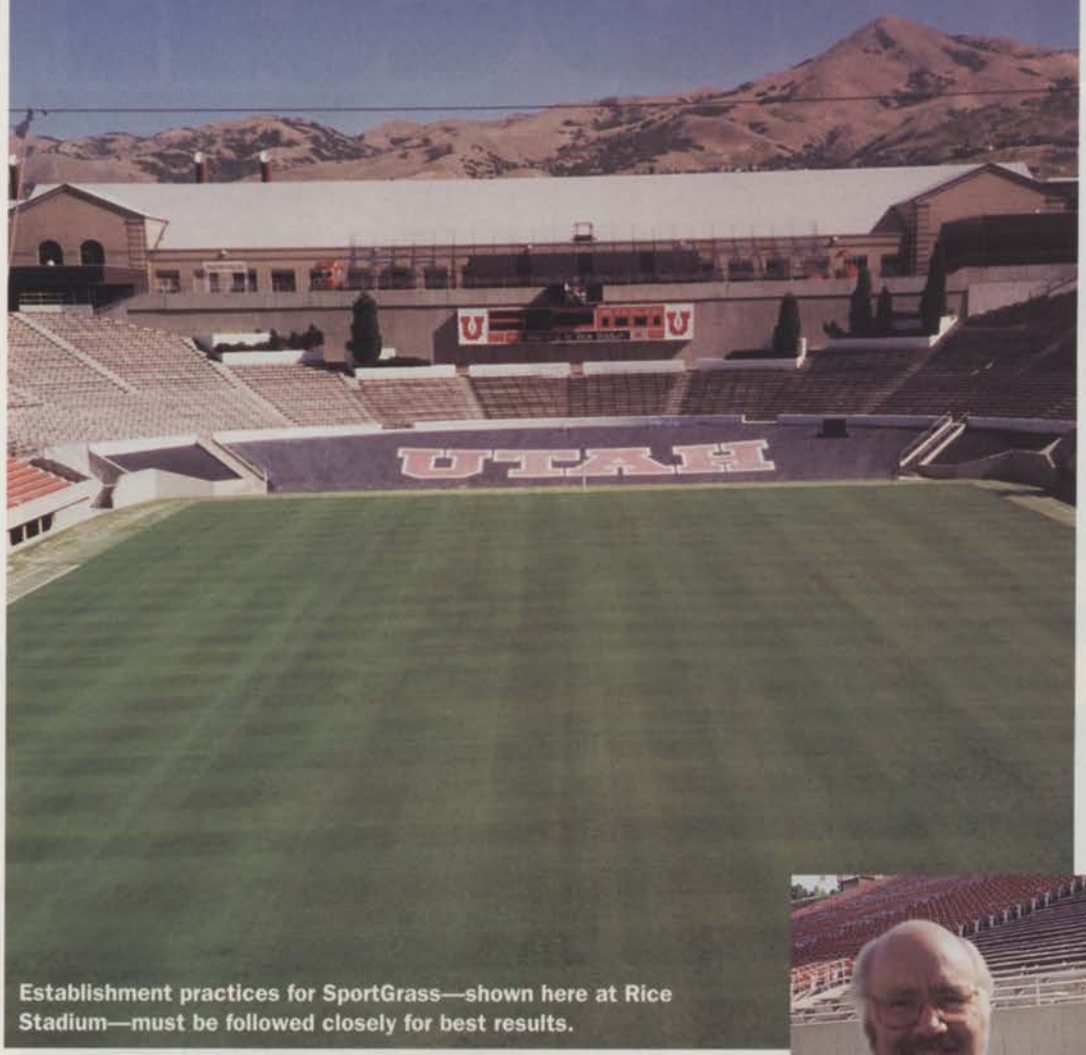

Establishment practices for SportGrass—shown here at Rice Stadium—must be followed closely for best results.

SportGrass is possibly the next step beyond total artificial or all natural turf fields. It gets a passing grade in Utah's Rice Stadium.

by Terry McIver
Managing Editor

■ Proponents from both the artificial and natural turf camps will be thrilled with the latest ally in athletic turf surfaces: SportGrass.

The invention of sport field expert Jerry Bergevin, president of Turf Systems International, SportGrass consists of natural grass grown into a synthetic matting. Grass grows down through the synthetic backing and in-between fibrulated synthetic strands, which protect the crown and roots of the plant.

The result is a surface with the playability of natural grass and the wear resistance and durability characteristics of synthetic turf. The natural turf cushions the impact of sports activity, and the artificial turf and matting below act as an anchor to reduce—if not eliminate—divots.

SportGrass is available as sod, or it can be established on site, as it was late this past summer at the University of Utah's Rice Stadium, the first major SportGrass installation in the U.S.

Brian Nelson, director of buildings and grounds at the university, says the field has held up "extremely well" after practices and two full games. A pregerminated ryegrass mix was used to fill in minimal wear areas—which the company says should be expected—but Nelson reports there were "no divots whatsoever."

SportGrass needs five to six weeks to establish, after which the grass has grown above the height of the plastic blades, and the roots have formed a mass of interconnecting fibers in the soil.

Synthetic secret— The key to field stability seems to lie in the type of synthetic material used. SportGrass uses Desso DLW synthetic turf, manufactured by Desso DLW Sports Systems, Int., headquartered in Germany.

Bergevin, left, and Eric Chapman, turf nutrition expert who consulted on Utah SportGrass project.

"SportGrass is basically the same material as a sand-filled synthetic turf. All we've done is modify the material," says Bergevin. The artificial turf is made out of polyethylene, which is softer than polypropylene or nylon, and has a more

grass-like feeling.

"The fiber is thicker," says Bergevin, "and I don't allow them to use the secondary latex backing because that makes it impervious (to air and water and gas exchange)."

"SportGrass is stabilized horizontally and vertically, which is very important," says Gundolf Becker, U.S. marketing manager for Desso DLW.

"SportGrass is stabilized horizontally

UCLA's David Ashman: likes the 'instant playability' of SportGrass.

by the backing," explains Becker, "to distribute the load. Vertically, it's stabilized by the fibers."

Bergevin says SportGrass fields are compatible with a Prescription Athletic Turf system or any other viable field construction, provided there is good drainage.

Short growing season—Bergevin realizes that playing on a newly established field is not always the best treatment for tender young seedlings.

"Generally," he admits, "you like to have a full growing season. But it will survive fine as long as they don't play on it too much. The second season it will be great."

In addition to regular watering, SportGrass control product applications can be made as with standard turf fields.

"We're still doing a lot of testing," says SportGrass Marketing Manager Donny Jones, who adds that he's had inquiries on how SportGrass can be used at golf driving ranges and in tee boxes. "It's working well in high traffic, walk-off areas" on test golf areas, says Jones.

"We're almost there for tees, but the main focus is ball fields."

Natural grass the choice of the pros

■ Maybe now the proponents of artificial turf will listen.

A recent survey by the NFL Players Association of professional football players revealed something many turf managers already knew: players don't like artificial turf.

Survey results, released earlier this year, say 85 percent of the 965 players who answered prefer to play on natural grass. Seven percent preferred artificial turf and eight percent had no preference.

And come contract time, 70 percent said that the home field surface was either very important or somewhat important in selecting the teams they would consider signing with as free agents.

The three stadiums most preferred by the players: Tampa Stadium, Joe Robbie Stadium and Sun Devil Stadium in Tempe, Ariz.

The three least preferred playing surfaces are found in Three Rivers Stadium in Pittsburgh, Philadelphia's Veterans Stadium, and Riverfront Stadium, Cincinnati, Ohio.

Other results of the survey:

- 93 percent of NFL players believe artificial turf is more likely to contribute to an injury than a natural grass field.
- 96 percent believe artificial turf causes more soreness.
- 91 percent believe artifical turf is more likely to shorten their careers.
- 90 percent believe artificial turf is more likely to worsen their quality of life after football.
- 54 percent identified an artificial turf injury they suffered that they believe would not have happened on grass.

Sodded variety—Three thousand square feet of SportGrass sod were recently installed at a UCLA practice field. Dave Ashman, facilities director, is most impressed with SportGrass's "instant playability."

"The sodded material gave us such an advantage because you didn't have to wait to get on it," says Ashman. "It gives the team a competitive advantage and gives them a safe environment. It may not be the final answer, but it's very close."

Bergevin cautions against thinking of SportGrass as a "perfect" natural turf, but he says it still is subject to the pests which plague normal turf, but without the problem of root-feeding insects.

"It's still 100 percent natural turf," reminds Bergevin, but he adds that he doubts pest problems will appear in the same degree of severity as they can on a field that does not have the artificial underbelly.

Air conditioned—An added feature of the Rice Stadium field is the SubAir cooling system. Developed by Augusta National superintendent Marsh Benson, SubAir picks up cooler air from the tunnels below the stands and blows it through the subsurface drainage system to oxygenate and cool the turf.

Eric Chapman specializes in nutrient movement through sand-based profiles. He's consulted with Bergevin during the Utah SportGrass establishment phase, and gives the field high marks.

"There would never be a need to aerifiy if you maintain an aggressive verticutting and thatch control program via nutrition, catching clippings and irrigation," says Chapman.

Verticutting is advised at the rate of four to six times a year.

"There may be some management changes in water use because the mat actually provides a barrier against evaporation," suggests Chapman. "It may be that this field uses less water in the long run because of that barrier to evaporation."

Early fertility program—Chapman explains that during establishment a granular fertilizer was used, one that contained a bit more soluble nitrogen rather than than a full-blown slow-release product.

"It's a young field," reminds Chapman, "and in sand-based situations, the microbial activity needed for breakdown of slow-release materials isn't there yet. So we're using more of quick-release fertilizer for now. They'll be able to use a blend of nitrogen that has more slow-release as the field ages."

Optimum playing height for SportGrass is one-and-a-half inches.

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The new 2653A is designed to accept both the standard John Deere 26-inch cutting units available now, as well as the new 30-inch versions coming later in 1995.

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Your worst nightmare: *'no more water'*

by Leslee Jaquette

■ Affected profoundly by a drought plaguing the Pacific Northwest, Washington state's top-rated golf course suffered at the hands of the El Niño weather pattern over the past two years.

Enduring a second hot summer in succession, Semiahmoo Golf and Country Club, located near the Canadian/U.S. border in Blaine, Wash., has had to pull the plug on watering. Beyond implementing a carefully orchestrated hand-watering campaign, Semiahmoo—rated three years in succession best course in Washington State and the 18th best resort course in the country by *Golf Digest*—has few major problems.

Superintendent Vance Much explains that last summer's drought was so severe that the City of Blaine turned the taps off for more than 30 days. The longest dry spell lasted 15 days, during which the city could spare no water for golf course maintenance.

While the Inn at Semiahmoo and its contiguous development own a three million gallon reservoir, the course still had to ration its allotment throughout the worst of the drought.

"We were forced to irrigate just the greens," says Much, who sighs when he recalls the over-abundant standing water during last February's rains. "We hand-watered first the greens, then the tees and lastly the fairways."

While he admits to a certain level of anxiety over the health of the ever-browning course, Much notes that he was in an even greater sweat the preceding summer. During his first year as superintendent, the drought of 1994 produced tremendous stress. Fortunately, he learned that while little rain may leave the course ravaged, the grass makes a sound comeback given the moderating temperatures and inevitable rains of fall. In the end, Semiahmoo lost little turf.

Vance Much: 'A calendar doesn't dictate when we spray. We use slow-release fertilizers when our test sites indicate the need.'

Dry conditions give the ball more roll, and—as Much observes—"thirsty grass

tries harder." Forced into dormancy early, the grass sent down some deep roots that have served well for survival again this year.

Still, "it's been a labor intensive situation but good because we only put water where its needed," says Much. "Spot watering forces us to be practical."

Less is better—When water isn't the issue, Much's golf course maintenance team of 20 focuses on the care of a basically healthy course. Few pests prowl the rolling fairways and roughs, though crews spot-treat for the European crane fly in January and February on two of the resort's 150 acres.

Disease is also minimal, so the staff does not apply preventive controls. Instead, they prefer to scout test greens daily. If fusarium shows up in the fall, they will spray in order to prevent it from flourishing in the cool, wet weather. However, if it gets spotted in dry weather during the spring, the maintenance crew pretty much ignores the fusarium, preferring to let the sun run its course.

The crew uses organic fertilizers on demand as opposed to a schedule. "A calendar doesn't dictate when we spray," says Much. "We use slow-release fertilizers when our test sites indicate the need." Even then, Semiahmoo's crew restricts itself to light, frequent applications on greens, using 1 lb. of nitrogen every two weeks, supplementing with organics to reduce leaching.

In keeping with the course's status as a member of the Audubon Society Cooperative Sanctuary Program, crews spray no closer than 10 feet from all waterways.

Back to nature—Probably the biggest success of the Arnold Palmer-designed course is its commitment to returning land to the wild. Several years ago—before the course was Audubon certified—it demanded wall-to-wall maintenance. It was a labor-intensive, manicured course. Since then, approximately 1/10th of the course's area has been returned to natural grasses, wildflowers and reforestation.

In addition to attracting increased wildlife, this change decreases maintenance in terms of mowing and watering. Following program guidelines, Much saves up to 40 percent in chemical costs because they only spray once in the spring.

"The wild areas lend maturity to the course," he adds. "In some areas it looks like its been here 100 years."

Much notes more deer wander the course as well as increased numbers of bald eagle nest in course trees. Canada geese, great blue herons and skunks continue to maintain habitats in the wild sections of the course.

More than 300 native trees including western cedar, western hemlock, Douglas fir and assorted maples have been planted at Semiahmoo.

Over the past few years, the maintenance crew as well as landowners have put in about 50 birdhouses. Bats living in bat houses placed under the eaves of the pump station on hole No. 6 eat 3,000 mosquitos per hour, according to Much.

Interestingly, it wasn't the geese, skunks or bats that caused problems this spring. No...it was a lone mother redwing blackbird. Much says the female reportedly attacked several golfers when they approached her nest near the 18th green. "Someone said she even drew blood," reports Much.

Observing the birds' territoriality, Much called the Audubon Society for advice. Experts suggested the mother needed about a month to raise her young. Lo and behold, right on schedule, she desisted her aggression.

"We just sat it out and hoped no one got hurt," says Much with a smile.

More than 300 native trees including western cedar, western hemlock, Douglas fir and assorted maples have been planted to replace those removed for development and to augment the natural surroundings. These trees plus wildflowers and sequoias work well in this climatic area that receives 20 percent less rain than Seattle.

Despite the fact that Much's energies are focused around 70 percent administrative and 30 percent on the course, he inspects the course every day. In keeping with his philosophy to be visible and involved, he mows occasionally, even on rainy days.

"I like to be out there working," reflects Much. "In fact, I'd love to be out there all the time!"

DREAM *from page 6G*

14,000 lbs. of turf seed, he estimates.

Baran and his crew will seed tees and greens themselves with Providence bentgrass. They'll use walk-behind units. "We don't want the bentgrass seed to get into the roughs," says Baran.

Baran is a native of the Cleveland area. He spent five years as superintendent of Wooster Country Club, also in Ohio. He's worked 28 years on golf courses, and 18 years as a superintendent since graduating from Penn State University.

Baran joined Eagle Creek in March, just after the irrigation pond had been dug and land clearing began.

He'd been hired, at least in part, because course architect Huntley of Canton, Ohio, recommended that Norwalk Golf Properties hire an experienced superintendent prior to construction. The company, made up of 19 Norwalk-area investors, acted.

That was just one of several long-range adjustments that the owners made after starting the project.

"As the project proceeded, the owners made a decision that they didn't want just another public golf course. They wanted the best public golf course they could build," says Baran.

For instance, the owners had initially planned to save four holes of an existing nine-hole golf course on the property and add them to 14 new holes.

But Baran argued that the character of the new and old holes would be too dissimilar. Also, since the old greens were built on mounded native soil decades ago, Baran predicted never-ending maintenance problems.

Instead, he's building all 18 greens similarly, using about 5,700 tons of greens mix (85 percent sand and 15 percent peat).

Another positive change, said Baran, was allowing bentgrass, rather than Kentucky bluegrass, fairways. Baran said he'll be able to mow the fairways at a half inch or less, and golfers will appreciate the difference.

Among the other inputs offered by Baran included widening the aprons between bunkers and greens to better accommodate mowers, and reducing the steepness of some slopes, again to facilitate mowing.

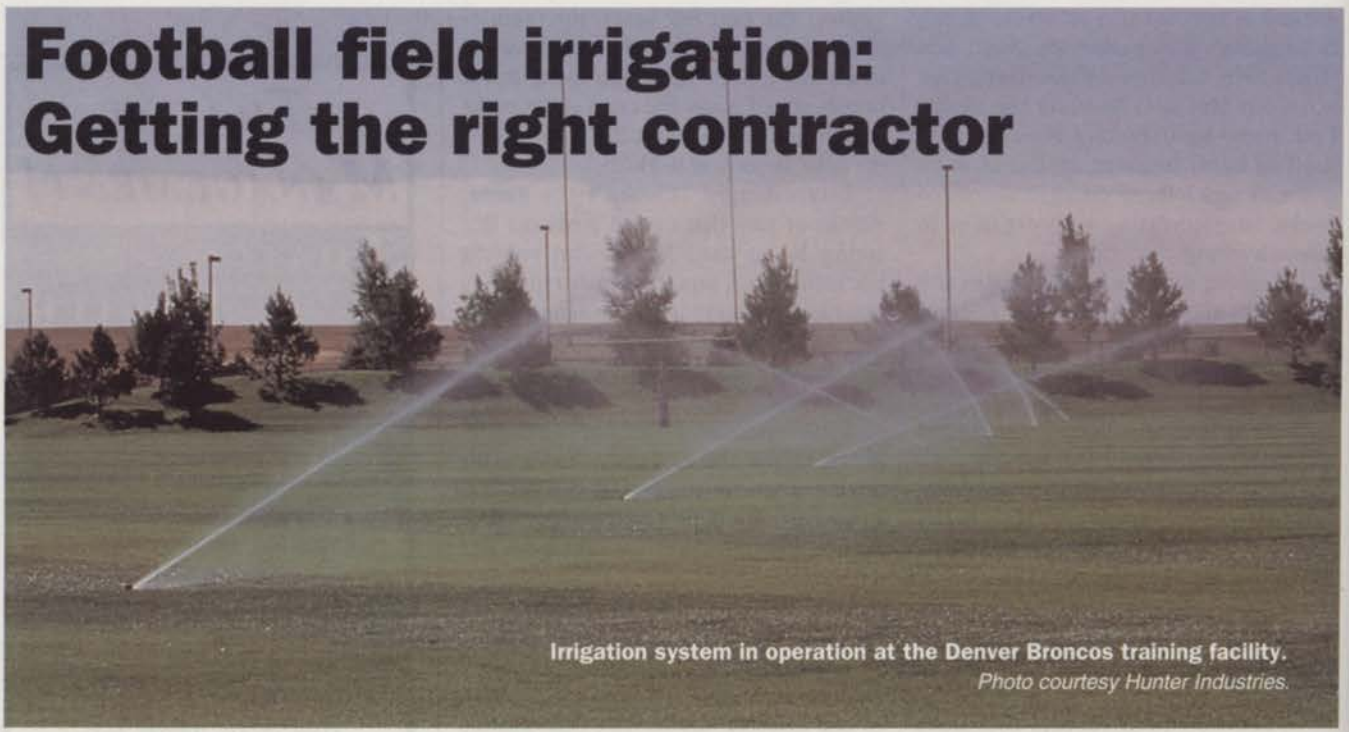
Baran credited the course owners, including director of golf Gary Wilkins, for their willingness to make tough financial decisions to build an exceptional public course. For 22 years, Wilkens served as both superintendent and golf professional at the original nine-hole course.

But maybe the toughest decision the owners made was to reduce the number of residential housing lots they would sell adjoining the course.

"I said we needed more room for the golf course," says Baran. "The golf course really is the number one priority at Eagle Creek."

It's no wonder Baran smiles so easily.

Football field irrigation: Getting the right contractor



Irrigation system in operation at the Denver Broncos training facility.
Photo courtesy Hunter Industries.

by Dan Almond

■ Football fields are the workhorses of sports turf, subject to wear and tear by "really big," determined athletes, often during unfavorable weather conditions. The irrigation systems of these fields simply must be safe, efficient and durable.

The first step in an irrigation project is selecting an experienced contractor who understands that the main focus is athlete safety.

Ideally, you should be involved from the beginning. It's more efficient for the contractor to work through key points of design, component selection, installation and maintenance with the person who will be controlling the system. At the end of the project, the contractor should supply you with a copy of the working design and the system design "as-built," showing exact placement of all components, includ-

continued on page 16G

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FOOTBALL *from page 14G*

ing any alterations from the original design.

Certain factors must be known prior to design:

- the soil profile;
- the water source, quality and usable pressure;
- how turf will be established and restored;
- whether chemigation or fertigation capability is desired; and
- any constraints on water use.

If you have past experience with irrigation systems, your preferences also should be discussed up front.

Frequent, open communication is vital. Typically, an experienced irrigation contractor and an experienced sports turf manager will parallel each other in ideas. If you have concerns, the contractor should encourage you to visit another installation, or at least talk with another facility manager using a similar system.

Heads—The basic football field irrigation design uses a five rows running parallel to the length of the field. One row (or zone) is placed along each edge of the field, with three rows within the playing surface. Because so much of the game is played between the hash marks, this system configuration allows for individual zone control within that segment of the field.

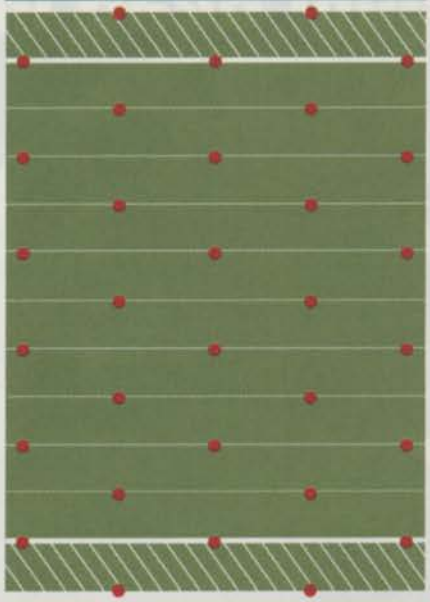
Individual heads are equally spaced along each row. The spacing is determined by the effective length of the watering stream (or throw) produced by each head. Generally, the effective throw of one head will reach to the head next to it (head-to-head coverage). By designing the layout with each head offset from the heads in the rows that parallel its row, a triangular pattern is created. In effect, each head then produces head-to-head coverage with four other heads. This layout should provide uniform watering, even during varying wind conditions.

The degree of flexibility required will help determine installation needs. For example, irrigation heads may be installed with triple swing joints, allowing movement from side to side and up and down.

Irrigation heads should be selected based upon their performance record under conditions matching those of the field—and above all—for their safety. The smaller the surface area (diameter) of the head, the better. In addition, rubber covers minimize injury potential.

The soil profile helps determine head selection. Sand-based fields require heads that perform well in sand, with the ability to withstand the abrasion that will occur. Different types of heads will be needed for native-soil or amended-soil fields, again selected specifically for proven performance and durability within that soil texture and structure.

Typical Football Field Irrigation



(Red dots indicate irrigation heads)

Head selection is also influenced by the water source, pressure and quality. Each head requires a specific level of water pressure (such as 50 pounds per square inch or psi) to produce the desired throw. The designer will need to know where the water supply will enter the facility and whether there is a master water line from which water will be channeled to the field (generally through a two- to three-inch pipe), or if there is a separate, dedicated water line for the field. If water is fed to the field from a master line, other demands on the water which could affect the static water pressure and available gallonage must be determined.

Heads should be placed with the rubber cover even with the soil surface of the field, allowing for a "pop up" capacity of at least four inches to rise far enough above the turf surface for efficient coverage. On new, seeded fields, it is recommended that each irrigation head be surrounded by a 24- to 36-inch "donut" of erosion control fabric or sod to prevent erosion around the head until the seed is established.

Other components—All of the valving for each irrigation zone is then located off the playing surface in an enclosed plastic box. There may be one basic valve box, or a valve box for each zone. Generally, the valve box or boxes are placed off the back of the end zone; in a stadium, between the end-zone and the facility wall.

Valve boxes may be buried two to three inches below the soil surface and covered with sod, or placed level with the soil surface and covered with artificial turf. This allows access to the valves within the boxes, yet helps the boxes "blend" with the surrounding turf and creates a safe, protected surface.

Typically, quick coupling devices also will be provided, especially in cold climates where they are used to blow out (or winterize) the system. Some systems will include rain shut-off devices to interrupt pre-programmed irrigation cycles in response to natural rainfall.

The clock and other "weather critical" control features will be housed in a protected box or building. The type and design of these components will vary with the complexity of the system and the preferences of the system operator.

Water quality also is important. A city water source with a high alkaline level may produce residue build up that could hamper system operation. With a non-potable water source, irrigation valves may require internal "scrubbing" components to remove contaminants that could clog heads and nozzles.

The heads, nozzles and irrigation clock must be capable of meeting requirements.

If the system will be used to inject fertilizer or other chemicals, the valves selected must resist corrosion and the clock must provide sufficient control capabilities.

Though budget limitations are considered in system design, it's important to use the best materials for the project. The initial cost differences will be recouped many times over by increased efficiency and lower maintenance.

Expect the irrigation contractor to provide a one year warranty on materials and the system. Individual components may carry a longer, manufacturer's warranty. The contractor also should help facility personnel establish a connection with a local distributor source, when possible. Finally, keep communicating. If problems arise, find out why and reach a workable solution.

—Dan Almond is a landscape architect for Randall & Blake, Inc. (RBI), a multi-discipline design-build company with branches in Litttleton, Colo.

TECH CENTER

Too much salt for your grass?

by John Schmitz

■ More and more golf courses and other public recreation sites today are facing a serious health problem: too much salt in their diets, most of it coming from treated wastewater used for irrigation.

One prescription for the dilemma is to use salt-tolerant grasses. Another is over-irrigation, which some say flushes the offending salts away from the turf and root-zones.

A number of grass seed companies are researching salt-tolerant grasses. One of the first to address the dilemma is International Seeds, Tangent, Ore. What prompted the research, says senior seed research scientist Steve Johnson, were complaints from golf course superintendents.

Non-tolerant grass shrivels up and dies when exposed to salty water, says Johnson. Groundsmen and landscape managers can't mistake it for disease because the discoloration doesn't occur in patches, he notes.

In the summer of 1993, ISI began a program to identify grasses that can withstand the devastating effects of inorganic salt-laden effluent from such sources as municipal sewage treatment plants and local factories. To date, ISI has analyzed some 20 cultivars for their capacity to grow in salty environments. So far, the variety showing the most promise is a slender creeping red fescue marketed as Marker by ISI.

Ancestors to the variety actually came from grass growing on and around Dutch dikes, which thrive in salty, ocean air. The variety is also used extensively for roadsides in the Midwest, where a lot of salt is used during the winter.

Dr. Eric Nelson, director of turfgrass research and product development at Medalist America in Albany, Ore., says that the use of effluent on golf courses and other public reaction spots is definitely a trend.

"You'll see more recycling of water as treatment processes become better."

Nelson says that one benefit of using treated wastewater on turfgrass is that the plants are able to use the nitrogen and phosphorus, whereas the dumping of that same treated water in streams or oceans is harmful to fish and humans, as well as being against the law.

Different species of grass react differently to high salt concentrations, says Nelson. Some simply exclude salt from being taken up by plant roots while others can either exude it after being taken in or store it away from plant cells. Those plants having low tolerances for salt will become stressed and unable to take up water efficiently and eventually die.

Medalist America's Fults, an alkaligrass developed by Colorado State University, is being used successfully in mixtures for roadsides which are subjected to salt during and following snow storms. The variety was also used to seed a golf course in Chicago with a heavy amount of imported sewage sludge in its topsoil.

Nelson says that Fults will actually "fade" and become "non-competitive" without a certain amount of salt pressure. The variety grows best in slightly basic soil with a pH of around 8.0, he says.

Dr. Leah Brilman, research director for Seed Research of Oregon in Corvallis, says that extensive studies done at the University of Arizona show that "the turfgrass commu-

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International Seed's Steve Johnson with some of the grasses ISI's looking at for their salt tolerance properties. These particular grass varieties are being considered for grass tolerance analysis, even though they're growing under normal conditions rather than being subjected to salty water.

ELSEWHERE

Finding 'quality' water for your grass and plants, page 21

Soil: the source of turfgrass life, page 23

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SALT *from page 17*

nity" can actually clean effluent water, "so by the time it goes through the turfgrass and works its way down to the aquifer it's pretty much cleaned up of all the things that people don't like. Turf is a great cleaning mechanism for water."

Although effluent can provide beneficial nutrients to grass plants, you must keep regular tabs on the amount of nitrogen being supplied, says Brilman. "You have to be careful you don't over-fertilize because you're essentially fertilizing with nitrogen and phosphorus every time you water."

Brilman says that salty effluent can become even more of a problem and adds more stress to plants as the water evaporates off and leaves behind a salt crust. The cure for this, especially in well-drained soils, is a healthy irrigation program that tends to keep the rootzone flushed.

In many grass species, the relationship between salt tolerance and drought tolerance is similar, says Brilman. "What you have is the water wanting to leave the plant instead of come into it. So, very often if you can identify a plant or group of plants with good drought tolerance, such as the alkaligrasses and some of the fine and tall fescues, often they will have pretty good salt tolerances.

"We have some things that show good salt tolerance but I won't say that's what we were breeding for," says Brilman. "When we were looking for drought tolerance, we got salt tolerance with it."

Seed Research of Oregon is trying to identify good salt tolerators. It's screening germplasm from species that grow in salty environments, such as near seashores. Also being looked at are "new" species of grasses, which Brilman explained as being other species of grasses that potentially could have good salt tolerance but haven't been looked at for their turf potential. "Any new varieties that look promising may be crossed with existing varieties having other characteristics we want," she says.

For the past five years, Cactus Seed Co. in Arizona has been working with a promising salt-tolerant grass for use on the fringes of turfgrass areas. "It's very, very salt tolerant," says vice president and general manager Ernie Milner of a grass he calls "Salt Grass." Samples of the grass were brought to Milner by two Tucson seed breeders who specialize in developing salt-tolerant grain and vegetable seed for use in places like Saudi Arabia. Milner has been able to identify the male and female grass plants and cross them to produce seed.

Salt Grass, which can be irrigated with ocean water, could be released next year, says Milner. It's presently being "bumped" in a small production field about 45 miles east of Yuma.

Milner says the grass, which is a bunch type that grows upright and spreads by sending out rhizomes two or three feet underground, is able to use the beneficial components of salty water while depositing the salt itself on the leaves. "It would make a good reclamation grass or contrast grass and requires very little maintenance. It only grows 18 inches high."

Plant breeder Crystal Rose Fricker of Turf Seed, Inc. in Hubbard, Ore. says that even effluent with low salt concentrations can become a problem over time. "It may seem okay in the beginning," she says, "but as you water, the salinity builds up in the soil over time, so it gets hotter and hotter and hotter, starts burning the grass."

This burning action actually attacks the grass in two places: above ground where the freshly mowed tips of the plant are exposed to the salt, and below ground where the roots can't take in needed water because of the presence of salt.

Managing effluent use should be guided pretty much by both the level of salt in irrigation water and the type of soil, particularly drainage characteristics, says Fricker.

Seabreeze, a slender creeping fescue, and Dawson are the most salt tolerant of all cool-season grasses tested by Turf Seed, says Fricker. This September, Tee-2-Green will be releasing Seaside II, a Penn State-developed creeping bentgrass ideal for fairways, she adds.

Irrigation systems fight sodium build-up

■ Landscape managers make informed purchasing decisions when they understand irrigation options and how they relate to a system's primary role. One of the effects of proper watering is a reduction in sodium build-up in the soil.

Soil composition—"The primary purpose of an irrigation system is to maintain the viability of your plant material," says Bud Knowles, president of Wolf Creek, a Rain Bird distributor in Dayton, Ohio.

For a healthy turf—and satisfied customers—sufficient water must reach the roots of the grass. That is, it must infiltrate the soil well. The irrigation system regulates infiltration by controlling salinity and bicarbonate levels as well as the Sodium Absorption Ratio, or SAR.

"An important factor is being in tune with what the plant and soil requirements are," says Bruce Funnell, specification manager at Wolf Creek.

- **Salinity.** Salts slow infiltration and keep water from plant roots. If water is applied too conservatively, it will aggravate the problem. When this happens, even less water penetrates the salt barrier. With less water flushing out excess salts, salinity will increase. Plants won't get enough water, and turf will die.

"All salts cause an imbalance in the water in the membrane of the plant cells," says Gil Landry, extension turfgrass specialist at the University of Georgia. "Then the plant can't take up sufficient water."

The most common solution is leaching. That is, applying sufficient water each irrigation—being careful not to over water—so that enough nutrients reach all plant roots.

- **Sodium Absorption Ratio.** Sodium causes a problem when more than 160 mg/l is in the water, or if the SAR of the water is greater than six. The common result is plant stress.

"Many people use a non-ionic material like gypsum, which is calcium sulfate," Landry says. "The calcium displaces the sodium on the exchange complex, and the sodium can then be leached out as sodium sulfate."

- **Bicarbonates.** "Bicarbonates can cause calcium and magnesium to precipitate," Landry explains. "That brings about an increase in sodium."

High bicarbonates initially cause pooling. If this occurs, and soil extracts have high electrical conductivity, further testing should determine if bicarbonates are the problem.

The ultimate effect on the turf is the death of the plant. One solution, Landry says, is to apply enough fresh water to leach the nutrients below the root zone.

—James Holter