RECOGNIZING AND TREATING DRAINAGE PROBLEMS

BY LUKE FRANK

Weather is fickle, which to most people means it's hard to plan recreational activities. But to a turf manager, it can be a matter of professional life and death. And just as you adjust your management practices for occasional drought, you also must prepare for deluges and even 100-year floods.

Managing a turf site revolves largely around controlling the location of water, be it irrigation or natural precipitation. In fact, oftentimes the two are indistinguishable. If you have drainage problems, one of the first places to investigate is your irrigation system, irrigation scheduling, and cultural practices.

Drainage impostor
Not all drainage problems require drainage systems. Many saturation issues stem from poor irrigation coverage, excessive thatch accumulation, soil compaction created by heavy equipment traffic or sodium buildup, and clay or muck soils with poor hydraulic conductivity.

Even the best irrigation system design cannot deliver 100-percent uniformity. In many cases, a turf manager is lucky to deliver water at 60-percent efficiency rate. That translates to extra watering to provide sufficient moisture to the driest areas of the site.

Poor irrigation performance never should be ignored when investigating a drainage problem. However, if you have about as good a system as you're going to get and there are still drainage problems, consider a few basic turf cultural practices before installing a drainage system.

Drainage problems can be the result of water held above the soil surface by an accumulation of thatch. While some thatch encourages surface resiliency, excessive thatch can lead to serious drainage problems. In general, more than half an inch of thatch accumulation can lead to percolation and runoff issues. In those cases, aerification is the drainage solution.

Poor drainage can be a disaster. What is the root cause of drainage problems? Clearly it depends on the site. The answer to most drainage problems is to install a
herringbone or gridiron system of artificial drainage tubing. Sounds simple, right? You dig the trenches, lay the tubing, backfill the trenches and relax in the shade with a tall, cold glass of lemonade.

Installing drainage systems is a skill few turf managers can master. The first step is not digging the trench. You first must carefully consider the environment and where the water will be diverted. Will it be “contaminated” with fertilizers or pesticides? If so, would it be appropriate to place the outlet of the drainage system on the bank of a pristine waterway?

Ideally, the drainage outlet should be located to place excess flows into an irrigation reservoir, so the water would eventually be pumped back onto the playing surface, where nutrients and pesticides are absorbed or filtered by the turfgrass ecosystem.

The next step is to survey the area and stake the proposed drainage system. Many drainage systems are useless the day they are installed because the mainline runs uphill or across an even grade. Furthermore, if the drainage system must intercept underground water or seepage, stake the drainage system so that the laterals of the herringbone or gridiron run perpendicular to the direction of water flow.

During the staking process, remember also to include several clean-cut openings for the drainage system. These openings will prove invaluable as years pass, providing easy access to the underground drainage tubing when problems develop from tree-root intrusion or silt accumulation.

Now it’s time to dig the trenches, but how deep and wide should they be? Most managers recommend digging trenches 6-8 inches wide and 18-24 inches deep, which conveniently match the dimension of most mechanical trenchers and allow standard 4-inch-diameter tubing to be easily placed in the bottom of the trench.

Drainage tubing comes in many shapes and sizes. It also comes with or without a fabric liner. The most popular form of drainage tubing is the 4-inch-diameter, flexible perforated pipe. It’s flexible and can transport large volumes of water in a reasonable amount of time. And, down the road, it can easily be accessed to clear away clogs.

Before laying the tubing in the trench, ensure the bottom of the trench is covered with 1-2 inches of gravel, to prevent the tubing from resting on the soil and becoming loaded with silt and clay. Double-check the slope of the trenches. To ensure adequate water movement, each trench should have a minimum slope of .5 percent. Generally, a slope of 2 percent will facilitate good movement.

After the drainage tubing has been set, it’s important to anchor it in place by carefully pouring additional gravel on both sides, again to prevent the tubing from becoming plugged with silt and clay.

**Best backfilling practices**

Once the drainage tubing has been anchored, determine whether to backfill the trenches all the way to the surface with pea gravel. If pea gravel is not accessible and larger gravel must be used, the last 2-4 inches of the trenches should be filled with coarse sand.

Your site and practices may lend themselves to backfilling with quality topdressing sand and organic matter, but pure sand should be avoided to prevent rapid turf wilting on top of the trenches.

When filling the trenches all the way to the surface with pea gravel, install a cover over the top where possible to keep loose material in place. If the material is not held in place, it can damage expensive mowing equipment. Choose a cover material that provides support for the turf as it grows over the top of the trenches.

It is always better to leave the trenches open to the surface so that water will quickly enter the drainage system. Soil over the surface of drainage trenches can prevent water from entering the system. When sodding, install numerous surface drain inlets to ensure surface water will enter the drainage system. To keep debris and small animals from clogging the drainage system, cover each surface drainage inlet with plastic grates, where possible.

As a final note on drainage tubing installation, always remember that good housekeeping is the sign of a conscientious worker. When drainage work is being done, the soil removed from the trenches should be placed on plywood or plastic, or into a waiting vehicle.

After the drainage system is installed, the work site should be carefully raked to remove all remaining debris. If sod is replaced on the top of the trenches, make sure it is level with the surrounding area to prevent subsequent mower scalping. Remember that new sod requires additional watering for the first few days of establishment to prevent wilting.

As with any major project on your site, ensure that your equipment, plant material and soil are in optimal condition before embarking on an intensive, intrusive procedure like installing a drainage system. Otherwise you’re spending money and disrupting the site to address symptoms and not the real problem.

Luke Frank is a veteran writer on irrigation subjects. He can be reached at lukefrank@earthlink.net.
Luke Yoder may be in a league of his own when it comes to readying a new baseball field for play. The past three years Yoder has overseen the planning and construction of two of Major League Baseball's newest fields. With the Pittsburgh Pirates from 2000 to 2003, Yoder managed construction of the team's new field at PNC Park, which opened in the spring of 2001. Today, under Yoder's direction, a perfectly groomed and pristine field at San Diego's PETCO Park awaits an April inauguration as the new home of the Padres.

PETCO's field features sod from West Coast Turf that he says contains an ideal baseball field playing surface—Bull's Eye Bermuda overseeded with Chaparral rye-grass. The field passed its first test, as players and coaches participating in light workouts in January created a buzz about the field's condition and playability. "They seem to love it," Yoder said. "They like how the ball plays on the dirt and in the outfield."

The true measure of success, of course, will come once the season gets underway and the players have broken in the field. But immediate and long-term player satisfaction is likely, based on the field construction and maintenance know-how Yoder put to use at PETCO Park that he acquired from talking with peers, visiting other ballparks, and, most importantly, working on PNC Park's new field.

Yoder's experience in field construction at PNC Park drew the attention last year of the Padres during their search for a new director of field maintenance. "My work on the new ball field was a big reason I was brought to open PETCO Park," he said.

His checklist of items to look for during construction of PETCO Park included:
- Checking proper grades and slopes.
- Testing for proper irrigation coverage, adequate pressure in irrigation lines, and positive drainage through drain lines.
- Testing the rootzone for particle size analysis and sufficient percolation rates.
- Checking for compaction on the entire field.
- Assuring quick grow-in and establishment of the turf through the use of proper macro and micronutrients, cultivation practices after the sod is laid, and the application of proper chemicals and fertilizers.

As he planned for construction of both fields, he sought input from other field managers from around the league and visited numerous ballparks. Last year he traveled to Anaheim, Los Angeles, San Francisco, Arizona, and Oakland.

"My visits to other fields in preparing for the new field at PETCO Park helped reaffirm the construction plans that I had in mind," Yoder said. "I did pick up a few new ideas. For example, at Bank One Ballpark in Arizona and in Anaheim they use a new type of warning track material that is dustless. It does not require hand-watering,
which will save us time and keep the seats and fans cleaner before the game when we drag the track.”

A similarity he discovered among these ballparks that helps set them apart is the sod. Bank One, Dodger Stadium, and Edison Field were voted by the players as having some of the best-quality fields in the league, according to a Sports Illustrated survey last year. All fields feature similar grass varieties of sod from West Coast Turf.

PETCO Park’s blend of Bermuda and rye will offer a dark, blue-green color, medium texture for enhanced playability and greater shade tolerance, Yoder said. It is designed to provide a durable field that requires less maintenance. For example, Yoder noted that the Bull’s Eye Bermuda’s medium texture blades require less fertilization and less mowing.

West Coast Turf installed 103,000 square feet of the sod in September. The sod came directly from the company’s sod farm in Palm Desert, CA.

Maintenance practices for the turf during the season will be based on appearance, soil and tissue tests, and the amount of clippings that are harvested. Yoder will topdress with sand, aerify, verti-cut, fertilize, apply pesticides, and irrigate the field as needed. He will irrigate about once a week until the season and the summer arrives, when the field will require water almost daily.

Two factors will help Yoder in his efforts to maintain an exceptional field: San Diego’s year-round mild climate and the fact that the Padres will not have to share the field with the Chargers. “Not sharing the field means less maintenance. The outfield won’t be in as rough a shape as it was at Qualcomm Stadium when the football team played there. No matter how hard you try, you can only do so much as a groundskeeper to adequately prepare a baseball field after a football game,” Yoder said.

Yoder added that special events might take place in the future at PETCO Park. If so, he would consider having to re-sod the field as needed.

In other maintenance practices on the field, the turf’s rootzone consists of a soil mix of 90 percent sand and 10 percent peat moss to help enhance drainage and nutrient-holding capacity.

The infield clay around the base path is conditioned with Surfase Pro League, while the pitcher’s mound and home plate includes MoundMaster Blocks. Both are incorporated in the soil to help prevent compaction and improve moisture absorption.

“We will almost always hand-water the infield skinned areas,” Yoder said. “We are constantly monitoring moisture in the clay, as moisture is the key to a good playing infield skin.”

The Padres home opener at PETCO Park is slated for April 8 against the Giants. However, the inaugural baseball game will be March 11, when San Diego State plays host to a collegiate tournament.

Nathan Odgaard is an associate with Swanson Russell, a marketing communications firm in Lincoln, NE. He can be reached at nathano@sramarketing.com.

---

I started using Roots 1-2-3 in 1995 to increase my turf grass root development and was immediately pleased with the results. I was excited in 2000 when Roots came out with Roots Turf Food 15-3-8, which combined the same bio stimulant with a high quality slow release fertilizer. I apply 3/4 lb of Nitrogen every 5 weeks throughout the summer for vigorous root development without excess top growth. It works well with the liquid 1-2-3. Roots keeps my field looking the best it can be.

Connie Rudolph, CSFM
Head Grounds Keeper,
St. Paul Saints Baseball Club

---

Novozymes Biologicals, Inc. www.novozymes.com
5400 Corporate Circle, Salem, VA 24153 1-800-342-6173

Circle 130 on card or www.oners.ims.ca/2908-130

20 March 2004

SPORTSTURF • http://www.greenmediaonline.com
DRY LINE MARKER

The Beacon Streamliner 35 dry line marker features a handle that easily collapses to 29 in., a molded plastic hopper with a semi-transparent cover for monitoring material, and a variable chalk-flow control delivering 2 or 4-in. lines.

For information, circle 056 or see www.oners.ims.ca/2908-056

TORO IRRIGATION RETRO-LINK

The new Sentinel Retro-Link upgrade kit for the MC Plus and Dial Series controllers from Toro provides the water conservation features and benefits of a Sentinel Central Control system at a greatly reduced cost.

The Sentinel Retro-Link kit is for system owners who wish to have the benefits of central control without the significant cost of replacing their existing control product. In addition to central capability, the Sentinel Retro-Link kit provides flow sensing, ET gauge or rain sensor capabilities, as well as two-way, handheld or remote functions.

For information, circle 072 or see www.oners.ims.ca/2908-072

ROUNDUP READY WEBSITE

The Scotts Company has added a Roundup Ready bentgrass site to www.scottsproseed.com. The addition includes background on the concept of Roundup Ready bentgrass, technical issues surrounding it, answers to frequently asked questions, research results, and approval process information.

For information, circle 075 or see www.oners.ims.ca/2908-075

You’re Always Ahead of the Game with a COVERMASTER® Raincover...

"Very good... Highly recommended..."

wrote Dunham Wright, Facilities Supervisor, Northeast Louisiana Univ., Monroe, LA

Dunham’s comments confirm what we hear from the many groundskeepers who use a COVERMASTER® raincover to keep their fields dry and ready for play. Call us and we’ll gladly tell you more.

The COVERMASTER® Advantage...

- Superior in strength and UV resistance
- Outstanding heat reflective properties
- Light weight - easy to handle
- Widest materials for least number of seams
- Largest choice of weights and colors
- Backed by truly dependable warranties

CALL TOLL FREE 1-800-387-5808 covermaster.com

COVERMASTER INC., 100 WESTMORE DR. 11-D, REXDALE, ON, M9V 5C3 TEL 416-745-1811 FAX 416-742-6837

http://www.sportsturfmanager.com • STMA

Circle 131 on card or www.oners.ims.ca/2908-131
Airlessco FIELD STRIPE piston powered airless striper/sprayers are capable of spraying undiluted paint at up to 3000psi to put down solid straight lines on sports fields and spray paint field stencils, backstops, buildings, or cover graffiti. With models starting at $1795, their flexibility makes them a smarter investment for universities, schools, parks departments, and sports programs.

FIELD STRIPE+™ from $2595™

FIELD STRIPE+™ couples our proven “LP” series piston powered paint pump, a dependable Honda engine, clutch actuated paint system, and electronic pressure controls. Delivers paint for striping or spraying with a professional airless spray gun at up to 3000psi. LP pump features Airlessco’s patented triple-life packing system which results in reduced maintenance, lower operating costs, & longer equipment life. Rated to paint 1700 gallons per year.

FIELD STRIPE PRO from $4595™

FIELD STRIPE PRO has striped stadiums hosting events from Pro Football to Womens World Cup Soccer. With 1.5 gallon per minute spraying at up to 3000psi, it supports two spray guns capable of laying down a 24" wide stripe in one pass. Combine the power to paint or stripe with any coating with our patented micro adjustable front swivel wheel with “Radius Memory”, and you can stripe rings around the competition. Rated for 5000 gallons per year of use, it offers perfect balance and easy rolling. It’s also the most user adjustable stripper available today.

MULTI-INSECTICIDE

FMC’s TalstarOne multi-insecticide is labeled for lawn, ornamentals, trees, and general pest control applications. Controls chinch bugs, mole crickets, leaf-feeding caterpillars, mites, mosquitoes and fire ants. Has no odorous or plant-damaging solvents. FMC/800-321-1362

For Information, circle 070 or see www.oners.ims.ca/2908-070

WHITE MARKING PAINT

Game Day 8090 Ultimate White Athletic Field Marking Paint is a new product by Suntec Paint that is specifically developed with the needs of the sports turf professional in mind. This paint is very highly pigmented with concentrated amounts of titanium dioxide and optical brighteners to give an extremely brilliant white finish. The pigment loading contains no calcium carbonate, eliminating a limestone buildup on the field and drastically reducing settling after mixing.

Suntec Paint/232-370-3421

For Information, circle 054 or see www.oners.ims.ca/2908-054

CUSTOM COMMAND

Toro’s Custom Command 36- and 48-station controllers now have optional hand-held remote for programming and maintenance convenience. New features mean you can conduct irrigation checks, make changes, and operate the system without opening field satellite enclosures. Remote also acts as a 2-way voice radio.

Toro Irrigation/800-664-4760

For Information, circle 059 or see www.oners.ims.ca/2908-059

SOFTBALL INFIELD SURFACE

Hilltopper Infield Mix is the waterless premium soil compound that incorporates a combination of long lasting polymers and coatings with natural clay, sand and crushed stone mixes to produce a flexible yet stable all weather surface for today’s best performing softball infields.

Stabilizer Solutions/602-225-5900

For Information, circle 055 or see www.oners.ims.ca/2908-055

SPORTSTURF • http://www.greenmediaonline.com
**LINES FOR LIFE**

No more painting or chalk-marking baseball foul lines! Save money, time, and crooked lines with PermaLine, the patented permanent marking system for natural grass athletic fields. A 5-year warranty covers premature wear/UV with an expected life span of 10-15 years.

PermaLine/866-546-3787
For information, circle 074 or see www.oners.ims.ca/2908-074.

---

**LARGE LINE MARKER**

The Fastliner Line marking system by Broyhill is for athletic fields, streets, and parking lots. The Fastliner mounts onto most popular turf utility vehicles and performs at speeds up to 15 mph. A new 25-gal. tank ensures the same consistent paint application via a 12-volt diaphragm pump.

Broyhill/800-228-1003 ext. 34
For information, circle 065 or see www.oners.ims.ca/2908-065.

---

**PERMANENT MOUNDS, BATTERS' BOXES**

Partac/Beam Clay has available permanent pitchers' mounds and batters' boxes for rec fields. Bury 2 in. below the surface and eliminate holes to give a feel of properly packed clay. On-deck circles and fungo pads also available.

Partac/Beam Clay/800-247-2326
For information, circle 060 or see www.oners.ims.ca/2908-060.

---

**JAR-TOP VALVE**

Rain Bird has a new JTV valve, designed to provide easy-to-handle, reliable valves for light commercial applications. The JTV features a one-piece threaded bonnet design that can be twisted off to easily access and maintain the unit.

Rain Bird/626-812-3816
For information, circle 068 or see www.oners.ims.ca/2908-068.

---

**YOUR “ONE-STOP SOURCE” FOR AMERICA’S BASEBALL & SPORTS TURF SURFACES & SUPPLIES!**

Used by over 100 pro teams! Plus 8 of the last 10 World Series champs, over 700 colleges, and thousands of towns & schools worldwide!

800-247-BEAM
908-637-4191 / FAX 908-637-8421
Regional infield mixes & warning tracks blended for every state & climate from over 20 bulk plants nationwide!

“The best infield mix I’ve ever used!”
— GEORGE TOMA

---

**Work Smarter**

THINK REELCRAFT

Visit us in booth #7141

Wind Things Up With Reelcraft

Contact the hose reel experts for water when and where you need it!

800-444-3134
Product Info Ext. 7335
www.reelcraft.com

Circle 134 on card or www.oners.ims.ca/2908-134

---
Safety for players is your number one concern. Instead of ending up with turf that looks like it's been ground up and spit out, build lush springy turf from the ground up with LAUNCH® Biostimulant.

LAUNCH® combines the best of Gordon's FOCUS® and BOV-A-MURA® into one powerful formulation that encourages strong healthy roots, increased density and wear resistance. When used regularly, it also encourages quick germination, vigorous establishment and the rapid recovery of damaged sports turf, from soccer and football fields to golf greens and fairways.

- Latest surfactant technology for maximum soil penetration
- Ideal for seeding, sodding, sprigging and hydroseeding
- Contains humic, fulvic acid extract and kelp extract
- Enhanced with deodorized dairy manure slurry base
- Root and foliage uptake

An Employee-Owned Company

LAUNCH®, Focus and Bov-A-Mura are registered trademarks of PBI/Gordon Corporation. Information regarding biostimulants can be seen on our web site.

1-800-821-7925  www.pbigordon.com

MARKING PAINT
Pioneer says its Quik Stripe is the brightest aerosol field marking paint in the industry because it is fortified with Halogen 2000 and OPTIWITE optical brighteners. Product comes in aerosol cans that pop into the Quik Stripper machine for clean lines. Won't harm turf. Pioneer Manufacturing/800-977-1500
For information, circle 062 or see www.oners.ims.ca/2908-062

LINE STRIPER & SPRAYER
Tru Mark's Model E-100 lets you line foul lines, home plate, paint a field stencil, and spray fence lines and infields. The integrated spray boom accessory ensures precision application of pest controls, fertilizers, and fungicides. Easy attachment and four quick release spray tips spaced at 16 percent means quick set up, 100 percent coverage, and low wind drift. Tru Mark Athletic Field Marker/800-553-6275
For information, circle 058 or see www.oners.ims.ca/2908-058

PISTON POWER
Airlessco's Field Stripe has "Slow Stroking" piston powered airless spraying that eliminates paint dilution. It's small, compact, and the reversible REV-TPiT makes it easy to use. Multi-use capability can make it easier to get budget approval for purchase. Airlessco/800-854-6786
For information, circle 078 or see www.oners.ims.ca/2908-078

LINE MARKING SYSTEM
Supaturf's Topline line marking system includes lightweight machines and purpose formulated paints that make great lines on both turf and infields and eliminating painting and chalking lines. The TXE/Stadia package allows significant savings over aerosol, the Easymix/Stadia package is self-mixing and self-cleaning. Supaturf/800-838-7622 code 95
For information, circle 064 or see www.oners.ims.ca/2908-064
**MAINTAIN MOUND SLOPE**

Beacon's Mound Slope Gauge is perfect for a coach or groundskeeper who must build or maintain a mound slope. Made from one-piece heavy-duty aluminum, it includes metal ruler for measuring mound slope drop and bubble level for proper leveling.

Beacon Ballfields/800-767-5985
For information, circle 061 or see www.oners.ims.ca/2908-061

---

**STRIPING MACHINE**

Newstripe has a new Fielder XL field striping machine that costs less than $2K. Key features include 4-hp Honda engine with oil alert, 2.7 cu. in. cast iron piston compressor, and adjustable 2.6 in. bi-directional spray head for even coverage in one pass.

Newstripe/800-424-6706
For information, circle 063 or see www.oners.ims.ca/2908-063

---

**BATTING TUNNELS FOR HIRAM BITHORN**

BP International (BPI) recently manufactured two specially designed batting tunnels for Puerto Rico's Hiram Bithorn Stadium, current home away from home for the Montreal Expos. The tunnels are 13 x 18 x 90 feet and are fenced in and covered with windscreen to minimize outside distractions.

"Knowing the kind of high quality major league baseball that was going to be played at there," explained Dennis Carrigan, president of Equipex International, Inc., the company responsible for upgrading the field for the 2003 season, "we wanted the facility to be top notch in all particulars. The batting tunnels have a clear cover for daytime use, they are waterproof for use in all weather.

BP International/800-767-2255
For information, circle 069 or see www.oners.ims.ca/2908-069

---

**YOUR ULTIMATE SPORTS TURF TOP DRESSER**

The Mete-R-Matic XL makes top dressing simple and fast.

The new Mete-R-Matic XL, specifically designed for sports turf, features the same technologies that made the Mete-R-Matic III the leading top dresser on turf. The patented Chevron belt allows you to accurately and evenly distribute material, regardless of moisture content. The ground drive system assures that your material will be spread evenly, regardless of vehicle speed. Plus, the XL features a larger, 2.25 cubic yard hopper so you get the job done fast. For more information, a demo, or to learn more about top dressing, call 1-800-679-8201.

Mete-R-Matic XL FIELD STRATEGY

The Mete-R-Matic XL is specifically designed for sports turf application. The greater capacity hopper allows it to make fast, full passes up and down across a football field, so you end up at the loading end — right where you started. This saves valuable time during the busiest times of the year, increasing your efficiency.

1655 101st Avenue NE • Minneapolis, MN 55449-4420 U.S.A. • (763) 785-1000 • Fax (763) 785-0566 • www.turfco.com

Circle 138 on card or www.oners.ims.ca/2908-138