▲ **A unique checkerboard pattern** was featured at the Little League Softball World Series at Alpenrose Field in Portland, OR. Photo by Profile Products.

FIVE STEPS to transform your field for tournament time

Editor's note: *Jeff Salem is a public relations associate at Swanson Russell, based in Lincoln, NE.*

Tournament season is supposed to be memorable for all involved, from the teams and players to the parents and spectators who spend an entire weekend, or longer, at the tournament site.

Field managers at any level of play can improve their fields with a few easy steps to ensure that players and spectators are presented with a tournament-ready field that is both presentable and playable.

1. MANAGE YOUR INFIELD SKIN

No tournament is going to give spectators and players the sense of something special if the basics aren't covered. Make sure the base infield soil is maintained effectively by dragging the skin and applying moisture. Prevent a dry, cracked infield by watering deeply in the days leading up to the tournament. Incorporating a calcined clay conditioner like into the infield mix will help to hold moisture, releasing it slowly to create a balanced moisture reservoir in the infield mix, giving your field a consistent level of play throughout the tournament. Applying a topdressing layer before play ensures good footing on the surface and gives you a terrific moisture management tool if rains do threaten to disrupt play. Conditioners also help fight compaction and create a cushioned, playable surface.

Also, make sure there are no holes on the pitcher's mound or batter's boxes. Repair any low spots along the infield that could create unsafe conditions or lead to bad hops during play.

2. ADD A SPLASH OF COLOR

"Making a field pop goes a long way to creating an atmosphere at the ballpark where the athletes and spectators know that this is a special weekend," says Jeff Langner, brand manager at Turface

▲ **Georgia Tech** chose a dyed conditioner to give its field a distinct look. Photo by Profile Products.

Athletics. "Tournament season is a great time for field managers and tournament hosts to give the diamond a look that leaves a lasting impression."

Oftentimes, Langner says, a little goes a long way to creating that visual impact.

For example, while it can create dramatic visual impact to completely change the infield color with a dyed conditioner, a field manager can apply colored particles in select areas only, at a much lower cost. It only takes a few bags of a professional-level infield conditioner applied to the mound and plate areas to help them stand out.

Other aesthetic changes to think about for tournament season include repainting the coach's boxes and the foul lines in the outfield.

3. BETTER THE BASE PATHS

A firm base path means a fast base path, which is a trait of any quality field worthy of tournament play. Top the first and third base paths with calcined clay—about two bags into the top inch of dirt along the paths—and moisten without saturating. Then, roll the paths until they are firm to maintain a safe infield throughout the tournament. Avoid dragging the base paths; instead, hand-rake those areas as necessary, which will keep the infield mix tight.

4. PREP THE SKIN

"Keeping a field safe and playable for the athletes should be first and foremost on the mind of any field manager put in charge of a tournament, even more than aesthetic upgrades," Langner says. "Preparing the field for the elements and ensuring the ball bounces true throughout the weekend are great ways to pulling off a tournament worth remembering."

Proper infield maintenance is critical for quality of play for the players. For starters, fix any low spots in the infield before each day of play. These are more likely to occur near the bases, in leadoff areas and sliding pits. Low spots can be built back up by scraping away any loose material or conditioner; adding infield mix to the low spot (preferably matching the sand/silt/clay content of the base soil); and tamping it firm. Repeat this process until the area is up to grade, and then top with a light layer of conditioner.

Also, be on the lookout for lips, which can create dangerous conditions for the players.

Hand-raking the infield edges will prevent materials from building up in the edges of the turf and causing a lip to form. If infield mix works its way into the turf during routine maintenance or the course of a game, take a broom and sweep all loose materials lying in the turf back onto the skinned surface. Then remove any grass that is swept onto the infield with a rake.

Another option to remove lips is to use a garden hose and high-pressure nozzle and spray the infield mix and conditioner out of the grass back onto the infield dirt. Spray at a 45-degree angle toward the infield while someone else helps to pull the loose material out of the grass, using a hard-tooth rake.

5. PREVENT RAINOUTS

Summer thunderstorms are a part of life for many regions of the US during tournament season. Unfortunately, that means a lot of rain can pour down on a field in a short amount of time and cause long delays or even cancellations if the proper preparations aren't made before tournament play begins.

Prevent infield puddles from forming by properly grading the infield, taking proper care when dragging the field, and fixing low spots if they form. Again, topdressing with a calcined clay helps soak up excess moisture from a rain event to ensure good footing and prevent delays.

Preventing slick, muddy spots from forming in the outfield grass is important too. Apply a topdressing of soil conditioner like at a rate of 500 pounds per 1,000 square feet to protect the turf in advance of rain. This will help absorb any future moisture on the field while also helping amend the soil long term.

If a storm has already passed through the area, it's not too late to prevent a major delay in play. To clean up puddles in the infield, specially designed drying agents like can be dumped onto the area and raked as needed to eliminate water and mud. In the outfield turf, apply a soil conditioner directly out of the bag into the puddle or muddy area. Allow it to absorb the water and rake the material into the turf and resume play.

Take the time to walk your field and look for any potential hazards before the start of tournament play. Making minor repairs and small improvements can have a huge impact on whether your tournament is fun, safe, and memorable for players and spectators alike. ■

Swanson Russell represents Turface Athletics, which markets among other products Professional Mound Clay, MoundMaster Blocks, Turface MVP, Pro League, Pro League Heritage Red, Champion Brown, Field & Fairway, and Turface Quick Dry.

John Mascaro's Photo Quiz

Answers from page 15

John Mascaro is President of Turf-Tec International

The reason why this sports complex has snow cover on the field on top and not on the field on the bottom is actually not an easy question to answer. The 419 bermudagrass field on the right was overseeded with a specific perennial ryegrass/chewings fescue blend. The field was then topdressed with USGA sand. The remaining 11 fields of the baseball/softball/football complex were not overseeded or topdressed. In addition, all of the complex fields were constructed of the same materials. The sports turf manager thought it odd that the snow melted on the overseeded field some 2 hours earlier than the non overseeded fields. Due to the harsh winter in the Southeast, the turf color on the overseeded field did not come into play. I consulted with Dr. Tom Samples from the University of Tennessee and he suspects that the soil temperature of the overseeded bermudagrass field was higher than that of the dormant bermudagrass field alone (since the perennial ryegrass had probably been transpiring water from the soil before the snow, and the soil was drier). He also continued on that a second consideration would be the greater insulation value due to the increased stand density of the bermudagrass and perennial ryegrass mixture versus that of the dormant bermudagrass alone, causing the quicker snow melt on the overseeded field.

Photo submitted by Bryan M. Farris, Parks & Recreation Supervisor at Ridley Park, Columbia, TN. Dr. Tom Samples, University of Tennessee in Knoxville, TN also contributed to the answer.

If you would like to submit a photograph for John Mascaro's Photo Quiz please send it to John Mascaro, 1471 Capital Circle NW, Ste # 13, Tallahassee, FL 32303 call (850) 580-4026 or email to john@turf-tec.com. If your photograph is selected, you will receive full credit. All photos submitted will become property of SportsTurf magazine and the Sports Turf Managers Association.

Background illustration courtesy of istockphoto.com

SALT SOURCES IN IRRIGATION WATER

Nearly all waters contain trace levels of salts, which dissolve into water as a result of mineral weathering in the earth's surface. In addition, water runoff from urban and agricultural lands during storm and irrigation events can also impact water quality. Salinity, or the presence of salts, within irrigation water can impact plant growth and soil structure. The salinity of water sources vary (Table 1) as do the influence of various trace elements that combine with salts to make up the total salinity or salt presence within your water source.

» **Storm surge related flooding could directly induce salinity problems** in land previously free of such issues via storm water runoff.

The total salinity of a water source is contributed by cations and anions. Common elements that contribute to salinity include calcium (Ca^{2+}), magnesium (Mg^{2+}), sodium (Na^{+}), potassium (K^{+}), chloride (Cl^{-}), bicarbonate (HCO_{3}^{-}), carbonate (CO_3^{2-}), sulfate (SO_4^{2-}), and others.

NATURAL WEATHER PATTERNS

Salts are commonly found in coastal area soils and water bodies. Fluctuating tides influence fresh surface water sources and soils with shallow groundwater levels. Natural saline aquifers can also be close enough to the surface that it is very tricky to determine proper well depth. Further inland are deeper saline aquifers (commonly found out west) that are used alone, and or blended with fresher water for irrigation purposes.

Rainfall contains few salts, and is nature's way to remediate soil salt accumulation. Humid regions that are inland from the coast, receive plenty of rainfall and thus the soils do not experience any long-term salt accumulation. Arid climates, where evapotranspiration (ET) demand far exceeds rainfall, are another hot spot for salt issues. As water is lost from the soil via ET, the salts accumulate in the soil profile and near the soil surface.

Grasses that naturally grow in arid conditions or in coastal environments are adapted to living under moderate to high salt conditions. For example, bermudagrass, zoysiagrass, and buffalograss all have leaf glands that excrete excess salts.

▼ **Table 1.** Salinity values of various water sources reported for total dissolved salts in parts per thousand (ppt) and parts per million (ppm), and as electrical conductivity (EC) in uS/cm, and mS/cm.

	ppt	ppm (mg/L)	µS/cm (µmhos/cm)	mS/cm (mmhos/cm, dS/m)
Most freshwater streams	< 1	< 1000	100-2000	0.1 – 2.0
Distilled water			0.5 -3.0	0.0005 – 0.003
Water supply limit	0.5	500	782	0.782
US salt concentration limits in drinking water	1	1000	1560	1.56
Melted snow			2- 42	0.002 – 0.042
Typical limit for irrigation	2	2000	3130	3.13
Brackish: mild	1 - 5	1000 - 5000	1560 - 7810	1.56 – 7.81
Brackish: moderate	5 - 10	5000 - 10,000	7810 -15,600	7.81 – 15.6
Brackish: heavily	10 - 35	10,000 - 35,000	15,600 – 54,700	15.6 – 54.7
Sea water	> 35	> 35,000	55,000	55
Brine	> 50	> 50,000	78,100	78.1

Certain regions also experience the opposite of a salinity issue, in that some water sources do not have *enough* salts. Many inland regions of the U.S. have ground and surface water that is so low in salts that remedial actions are needed to alleviate the "salt-less" condition.

Hurricanes and extreme storm events also introduce salts into soil and aquifers. Storm surge related flooding could directly induce salinity problems in land previously free of such issues via storm water runoff. Saltwater intrusion into subsoil and groundwater aquifers can increase when storms produce differential hydrologic heads. Salt removal can occur naturally, aided by rainfall and leaching, but extended dry periods following such storm events often intensify negative salt effects on plants.

Seasonal weather patterns (dry summers) may also induce temporary salt issues. During this period, salts may accumulate in the soil profile if not properly irrigated to leach the salts. Fortunately, this is an issue only in extreme cases, due to the returning rains in fall.

ANTHROPOGENIC SOURCES OF SALTS IN IRRIGATION WATER

Groundwater drawdown by urban and agricultural water use has contributed to saltwater intrusion into the underlying aquifer. Fresh water bodies that are influenced by tides are susceptible to saltwater intrusion occurring further upstream than normal as freshwater uses increase in urban areas. When this water is used for irrigation, it contributes to the salt levels in landscaped areas.

Parameter (units)	# of samples analyzed	Range	Average
	ESSENTIAL NUTRIENTS		
Nitrate-N (ppm)	14	6.8 - 18	13.0
Ortho-P (ppm)	14	1.2 - 3.7	2.5
Potassium (ppm)	12	10.3 - 25.0	12.7
Calcium (ppm)	14	42.3 – 70.7	54.6
Magnesium (ppm)	12	3.5 – 4.0	3.8
Sulfate (ppm)	12	26 - 40	30.5
Sodium (ppm)	14	56 – 79	63.4
Chloride (ppm)	14	55.5 – 80.9	66.6
	INDICATORS AND OTHER CONSTITUENTS		
pH	12	6.9 – 7.7	7.2
TDS (ppm)	12	384 - 467	418.8
EC (mmhos cm-1)	14	0.58 -0.73	0.65
SAR	12	1.9 – 3.1	2.3
Bicarbonates (meq L-1)	14	0.01 – 1.80	1.05
Carbonates (meq L-1)	14	0 – 0.33	0.05
RSC (calculated)	12	0.00007 - .008	0.005

▲ **Table 2.** Mineral values in reclaimed water (treated effluent) used for irrigation from the Myrtle Beach Wastewater Treatment Plant.

In the future, reclaimed water (treated effluent) from municipal wastewater treatment plants may become the prevalent irrigation source for turfgrasses and landscapes. Many golf courses already use treated effluent as a primary irrigation source. Large planned communities also use treated effluent to irrigate municipal parks and sports fields, commercial areas, and residential lawns. Examples include Tradition Hilton Head in South Carolina, which uses storm water as well as treated effluent for irrigating turfgrass areas. Treated effluent from the Michelson Water Reclamation Plant in Irvine, California is used to irrigate school playfields, athletic fields, parks and other turfgrass areas. Many ball fields, school yards, and parks in St. Petersburg, FL are irrigated with reclaimed water. Many other examples exist, yet treated effluent is not the most common water source for sports fields. This is primarily due to the lack of infrastructure to pipe treated wastewater to the end user. However, as freshwater demands increase, it is likely that treated effluent will become the MVP in the irrigation game.

One of the main issues with using treated effluent for irrigation is that disinfection residuals, typically chlorinators (e.g. chlorine gas and bleach (sodium hypochlorite)) may remain in treated solution. Low concentrations of chlorine and sodium can be problematic when used to irrigate plants. Emerging water treatment techniques use less of these disinfectants; however, the newer technologies require retrofitting or installation of new infrastructure, and thus are costly and will be implemented slowly. Although treated effluent may have a higher salt content, they typically also have a higher nutrient content, which can (and should) be considered into a facility's fertility program (Table 2). For example, treated effluent from the Myrtle Beach Waste Water Plant (Table 2) will most likely supply adequate levels of phosphorus, potassium, and calcium for maintaining highly managed turfgrass.

Although limited to those areas of the country that receive snow, it is noteworthy to comment on the salts contained in storm water runoff from roads deiced during winter storm events. The most commonly used deicers applied to roads are salt. Salts lower the melting point of water, causing the snow to melt in temperatures under which it would not typically melt. If the storm water runoff from our highway systems drains into a pond used for irrigation, the salts may concentrate over the winter making the water quite salty.

What does this all mean? Knowing your water source(s) is the first step to managing salts. In the next installment of this series, we will investigate what makes salts (or the lack of) such a problem for growing plants. ■

Dara M. Park, Ph.D. is an assistant professor, turfgrass, soil & water quality at Clemson University. Dr. White is the nursery extension specialist at Clemson.

Photo courtesy of GMB Architecture & Engineering, Holland, MI

PRINCIPLES OF DRAINAGE: A BEGINNER COURSE

UNDER NORMAL CIRCUMSTANCES, the drainage for your synthetic field is invisible, at least to spectators and players. And that's the way it's supposed to be. The field should shed water and remain playable. After all, the only way drainage becomes noticeable is if it doesn't work.

Keeping the drainage working well starts with understanding it. And among all the decisions that can be made regarding a field, it's the drainage system that will be one of the most important to its success or failure as a facility.

Sounds dramatic, doesn't it? Consider this: it doesn't matter how great your scoreboard is, how nice the seating is or whether you have a press box if the field isn't draining well enough to be playable. Therefore, the investment in drainage on the front end of the project will allow all those other amenities to be appreciated and admired.

The biggest mistake many field owners make is cutting corners on drainage. Why? Because, to return to an earlier point, drainage is invisible. But how invisible is it really? When drainage isn't adequate to the amount of rainfall or watering the field gets, it means that water ultimately remains on the subgrade instead of moving away from the field. Over time, this can and will cause the subgrade to become unstable and allow the base to move. It may even allow water to back up through the base and onto the surface, washing out the infill or stretching the carpet.

And at that moment, the field owner won't be cherishing the money he or she saved by not installing adequate drainage.

To facilitate discussions with your drainage designer, you can estimate the amount of water your field will need to handle with the following formula:
Length of the field in feet x width of the field in feet x .623 gallons = gallons of water produced by 1" of rainfall

There are a number of options for drainage on the market. Ultimately, the system chosen will depend on several factors:

- the specific use or uses of the field
- the local climate
- the availability and cost of materials
- the quality and characteristics of local stone
- the financial resources and commitment of the owner
- time constraints for field construction, and
- the annual amount and intensity of rainfall, local codes and regulations regarding storm water management.

FIND A GOOD PARTNER

If you find the array of options confusing, arrange for assistance. A design professional who understands field construction and who has worked with drainage for synthetic fields can understand the issues and help devise a plan that works in your situation. The professional will specify pipe diameters or the sizes of flat drains, location and distance of laterals, collection systems and storm sewer tie-ins for the drainage system.

To facilitate discussions with your drainage designer, you can estimate the amount of water your field will need to handle with the following formula:

Length of the field in feet x width of the field in feet x .623 gallons = gallons of water produced by 1” of rainfall

Note: Drainage products are rated by gallons of flow per hour.

There are various types of subsurface drainage systems used with fields. One type consists of flat drains, 6”-18” wide and 1”-2” thick, with or without a wrapping of filter fabric, placed horizontally on the subgrade in a diagonal, herringbone pattern.

Because synthetic turf fields drain quickly and have the potential to capture significant amounts of water, internal drainage lines usually can be placed farther apart (15’ to 25’) than for natural grass. However, the closer the lines are placed, the more quickly the field will drain. Closer drain line spacing will cost more.

The rate of drainage also will depend on the depth of the subgrade and the slope of the drains, usually .5% - 1%. The deeper the drains are placed, the slower the initial response time. Ideally a sports field, particularly synthetic turf, will be used only for sports; however, if you are aware that other activities will take place, and if these have the possibility of puncturing or damaging the turf, make sure the builder knows that the drainage system must be deep enough to protect it from potential damage.


Photo courtesy of Stantec Sport, Boston, MA

> **Stone and sand can function as a filter** to remove those particles and prevent them from entering the drainage system.

An alternate system uses perforated pipes, 4” - 10” in diameter, laid in a diagonal or herringbone pattern 10’ – 30’ apart. Pipes must be sized and spaced correctly by the design professional, depending on the amount of water they should be expected to handle. These perforated pipes are laid in trenches, surrounded by filter fabric and clean stone or coarse sand.

Whether using flat drains or traditional drainage pipes, water flowing into the drainage system can carry with it silt or clay particles or other contaminants. Therefore, it is important to surround the drainage pipes with clean stone (without silt or clay contamination) or coarse sand. Stone and sand can function as a filter to remove those particles and prevent them from entering the drainage system.

Photo courtesy of Medallion Athletic Products, Inc., Mooresville, NC


Photo courtesy of Lone Mountain Contracting, Inc., Bosque Farms, NM


Photo courtesy of Rettler Corporation, Stevens Point, WI


Photo courtesy of Rettler Corporation, Stevens Point, WI

Slope is another essential aspect of good drainage. Both flat drains and trench drains are sloped to the outside edges of a rectangular field. The drains should extend 10' – 15' beyond the sidelines themselves to an area where the water is deposited in perimeter collector pipes. Depending on the grading plan, the amount of water to be moved and other factors, intermediate collector pipes also may be included in the drainage plan. This is something your design professional can also decide.

Most baseball or softball fields include intermediate collector pipes starting approximately halfway up the sideline and running parallel to the centerline. It is also possible that football or soccer fields may include intermediate collector pipes depending upon the grade of the subbase, the amount of water expected, how quickly the field must be available after rain and other factors. These intermediate collector pipes as well as the drainage pipes move the water to perimeter collector pipes. From there, the water moves to a disposal site such as a storm drain or catch basin.

Most of the projects being designed today for synthetic turf consist of a "drainage layer" of stone (typically 6" to 8" deep) under the entire field to move water vertically as well as horizontally. Even without any piping, the slope of the subgrade and field will move water in a positive direction through the "drainage layer" of stone and along the designed slope. Perforated and sloped piping of any sort will make this more efficient and will move water more quickly to the established collection/exit points.

Though synthetic turf fields drain well, site drainage on areas adjacent to the field is still necessary in most cases. Where areas around the field naturally slope and drain toward the field or where existing pavement or structures such as bleachers drain onto the field, storm water can carry suspended silts and other solids onto the field impacting drainage and performance. Additionally, excess storm water draining onto the field may overtax its vertical drainage and impact play. Finally, synthetic turf fields will not drain vertically when frozen.

For all these reasons, it should be the goal of the drainage plan that the only water handled by the field drainage is from rain or direct irrigation. (In other words, the field should not be receiving runoff from the bleachers, dugout, track, any buildings or adjacent structures). Your design professional can provide information on site drainage, including interceptor drains, catch basins, retention ponds and the harvesting and dispersing of storm water. ■

Mary Helen Sprecher is a free lance writer who wrote this article on behalf of the American Sports Builders Association. ASBA is a non-profit association helping designers, builders, owners, operators and users understand quality athletic field construction. ASBA offers the publication, "Sports Fields: A Construction and Maintenance Manual," which discusses, among other topics, sustainability in the construction and maintenance of synthetic fields, as well as synthetic turf recycling. For information, visit www.sportsbuilders.org.

Membership Application

SportsTurf MANAGERS ASSOCIATION

Experts on the Field, Partners in the Game.

Fax to: (785) 843-2977

Or mail with payment to:
Sports Turf
Managers Association
P.O. Box 414029
Kansas City, MO 64141

Name ____________________ Title ____________________

Employer/ Facility ____________________

❑ Business ❑ Home

Address ____________________

City ____________________ State __________ Zip __________

Home phone ____________________ Work ____________________ Cell ____________________

Fax ____________________ Email ____________________

Signature ____________________

Direct Supervisor Name ____________________

New Members*

As a new members, you receive a FREE conference registration, value $375, to be used within 3 years! Just indicate your status on the conference registration form.

Did someone refer you to STMA? We would like to thank them, and reward them with an STMA $100 voucher.

Person who referred you:

____

Facility name:

____

*Not been an STMA national member since 2000. New student and affiliate memberships do not qualify for the free conference registration. However, all members are eligible to receive the $100 voucher for referring a new qulaifying member.

Membership Category:

❑ Sports Turf Manager	$110
❑ Sports Turf Manager Associate* (Additional member(s) from the same facility)	$75
Please select the primary facility type where you are employed: ❍ Professional Sports ❍ Higher Education ❍ Schools K-12 ❍ Parks and Recreation	
❑ Academic	$95
❑ Student (verification of enrollment)	$25
❑ Commercial	$295
❑ Commercial Associate* (Additional member(s) from the same commercial company)	$75
❑ Affiliate (Person who is indirectly or on a part-time basis, involved in the maintenance/management of sports fields)	$50
❑ Retired	$50
❑ Chapter Dues (contact headquarters for amount) Chapter name) ______________________________	$_______
❑ Contribution To SAFE Foundation (research, education and scholarship):	$_______
Total Amount Enclosed:	$_______

Payment Method:

❑ Check ❑ Money Order ❑ Purchase Order #:__________________

Credit Card: ❑ Mastercard ❑ Visa ❑ American Express ❑ Discover

Name on Card ____________________

Card #: ____________________ Exp. Date: __________

Signature: ____________________

*There must already be a national sports turf member from your facility or commercial member from your company before you may sign up in the Associate category.

Phone: 800-323-3875 www.STMA.org

Tools & Equipment

For more information on these and other products, please visit *www.greenmediaonline.com/productportal.*

New mower from Masport

The Rotarola from Masport is a 21-inch aluminum deck mower with a rear roller specifically designed for mowing at lower heights and striping. Cutting range with this mower is ½" to 2¾" and the whole machine is set with a single handle height of cut adjustment lever. The solid rear roller leaves a crisp stripe behind for a dynamic finish. The Rotarola combines the quality cut and clean stripe of a reel mower with the ease of use and low maintenance of a rotary. It is powered by the Briggs and Stratton 850 Pro Series 190cc engine and features a rear collection bag, adjustable wheel bearings and an upturned and padded handle.

Seago International

Companion fungicide has easier packaging

Companion is a very unique product formulated to fight a broad range of soil and leaf fungal disease. It has been called by leading researchers the most consistent and reliable biological on the market. Protecting the contents; packaging has always been an important part of our quality control, making sure that Companion gets to our customers in good condition, and remains so. Our NEW packing does just that and more! A new ROYAL Blue bottle protects the product from UV light, and the industry favorite design, an F-style handle, is easy to use and pour, making it the perfect packaging choice. The heavy HDPE material will survive the toughest handling and worst storage conditions. It's available in 4 different package sizes, so that it meets the needs of both smaller and larger users. And don't forget our larger 30 gal drum quantities for our larger end-user.

Growth Products

New design for utility carts: OxCart

A next-generation utility cart designed to move heavy loads with a riding mower, OxCart is now available for turf professionals. Featuring an innovative, exclusive power-assist lift, OxCart reduces dumping effort by up to 90 percent. The only cart dynamically tested by an independent certified lab to three times the capacity of typical dumpcarts, OxCart offers durability, greater safety and dramatically increased ease of use. Other innovative features include: run-flat tractor-grade turf tires to move heavy loads rut-free; an offset dump pivot, eliminating harsh and abrupt dump release caused by heavy loads shifting; and a full mandrel bend steel axle support to provide high clearance and super strength to hold and move heavy loads

OxCart

New approach to ejecting geese

Rather than resorting to drastic means to protect their playing fields and campuses, a growing number of athletic directors and groundskeepers are fighting back with an eco-friendly, EPA-approved goose repellent called FlightControl Plus. This spray-on solution is odorless, waterproof, and does not harm humans or vegetation. It uses an environmentally safe compound called anthranquinone formulated by Arkion Life Sciences. "FlightControl Plus continuously protects playing fields from geese because it gives geese a stomach ache, teaching them to avoid treated grassy areas the way you would avoid a restaurant that gave you a bad case of stomach upset," explains Joseph Tortola, founder of Northeast Ohio Geese Management. "The treated grass looks different to them so they avoid it on sight."

Arkion Life Sciences

Netafim USA unveils new smart irrigation controllers

Developed exclusively for Netafim by Tucor, the Netafim Landscape Controllers (NLC) are powerful, multi-function landscape controllers expressly designed to maximize the water efficiency of any landscape, while reducing the time, labor and costs incurred when expanding a system into new areas of the landscape. Setting a new precedent for landscape water-use efficiency, the NLC controllers determine the unique watering needs of a specific landscape by incorporating both historical and current weather data as well as real-time data from soil moisture sensors that monitor the amount of moisture available to plants in each zone.

Netafim

Replace mass with science in turf base system

UltraBaseSystems Champion is a patented STRUCTURALLY engineered sub base replacement system used for the installation of any synthetic turf. Our panel is designed to dramatically reduce the need for extensive site preparation both indoors and outdoors, creating a base structure capable of supporting enormous loads while greatly improving impact requirements. The results are a SAFER playing surface. High flow volumes both vertically and horizontally are achieved with UBS Champion creating a system capable of rapidly directing rainwater away from the turf and the players. Replace mass with science. Measuring 5.44 sq feet, the same area as the UBS Standard panel yet weighing 40% less, this .75 inch panel is built for strength and priced to impress.

UltraBaseSystems