Trends

in water management for sports turf

With water use being so important to all sports turf managers today, we asked Douglas W. York, president of Ewing Irrigation, for some advice on using the resource efficiently.

SportsTurf: What are the recent trends in water management that sports turf managers can use to their advantage?

York: With the water scarcity issue beginning to have a widespread affect on sports turf managers across the country, we're witnessing a steady migration toward water-efficiency. Many professionals have been embracing water-efficient technologies and practices for some time; others are unsure where to start, or how to integrate some of these technologies into pre-existing budgets.

There are a wide variety of solutions currently available to help:

- Water-Efficient Sprinklers. In smaller areas and on sidelines, opt for more efficient irrigation heads, many of which are easily adapted to existing systems. Rotator-style heads offer better distribution uniformity and can save up to 30% of overall water usage.
- "Smart" Controllers. Smart controllers rely on weather or soil-moisture data to control irrigation system run times automatically.
- ET Controllers. Evapotranspiration or "ET" controllers gather and use information from local or on-site weather sensors to control run times automatically, ensuring plant material receives the required amount of water while reducing overwatering and runoff.
- Moisture Sensors. These subsurface devices placed directly under the rootzone are among the most easily applied water-saving technologies. These sensors communicate with an irrigation controller to shut down the irrigation system when sufficient moisture is detected in the soil.
- Low-Volume "Drip" Irrigation. Drip irrigation systems apply water directly to the surface of the soil above a plant's rootzone, minimizing evaporation and maximizing the plant's ability to directly absorb water—requiring less water overall. Drip irrigation is ideal for landscape beds that may be adjacent to your fields.
- Fertilizer Injection Systems (Fertigation). Traditional fertilizer programs require the use of "extra" water during the application process to ensure that the fertilizer penetrates the soil layer. During the process of fertigation, liquid fertilizer is directly injected into the irrigation system, making it easier for nutrients to infiltrate a plant's rootzone, therefore eliminating the need for watering above and beyond the irrigation system's scheduled program run time. This process also eliminates the extra labor required for the "watering in" period for new fertilizer applications.

ST: What cultural practices can they follow that will assist in managing water better?

York: Sports turf managers should contact a Certified Landscape Irrigation Auditor to perform a water audit on the site. The audit process will reveal any inefficiency contained in the irrigation system, provide him or her with an accurate assessment of the system's distribution uniformity, and identify opportunities for improvement.

ST: What products are on the horizon that will further improve sports turf managers' ability to manage water?

York: With rigorous testing protocols—such as those set forth Irrigation Associations Smart Water Application Technologies (SWAT) and the Environmental Protection Agency's WaterSense program—manufacturers are investing in improvements to existing technologies. We can expect to see continued development in weather-based controllers and soil moisture sensor technology. Drought-resistant turfgrass varieties represent another area of exciting research being conducted across the country.

ST: Any thoughts to help managers battling tight budgets?

York: Propose a test site. If you are responsible for managing multiple complexes, or are managing a large complex with several zones, identify a single site or zone for testing. It is typically easier for a sports turf manager to approach his or her supervisor to request funding for a small "test" area than to retrofit or rebuild an entire complex.

Conduct a little research, and locate a case study for a site with similar conditions where true water savings was successfully demonstrated using your desired technology. Present this as a basis for starting your own test site.

Before you begin, have an irrigation audit performed prior to making any changes to the system in order to set a benchmark for the selected site or zone. Then implement the technology for an appropriate testing period. The data mined from the testing period will be your best weapon in combating financial resistance, especially if you compare your site's potential water savings over time with the initial cost of the upgrades. ■

Thanks to Lacy Ravencraft, public relations manager for Ewing, for conducting this interview on our behalf.

On cultural practices

Mike Tentis, Ewing's National Product Manager for Turf Products & Erosion Control, had the following comments to offer regarding cultural practices:

In addition to the water-efficient technologies above, sports turf managers are also opting for slow-release fertilizers. Slowly-available fertilizers, which are typically coated with plastics, resins or sulphur, have lower salt indexes than other quickly-available nitrogen fertilizers. These "coated" nitrogen products do not need to be watered in as heavily as non-coated products.

Paying closer attention to cultural conditions will ultimately help the sports turf professional manage water resources more effectively.

• A strong foundation of regular aerification and topdressing, with both porous calcined clay products and organic matter such as compost, will help make the medium that the roots are growing in more able to withstand the effects of drought.

• Heavily compacted soils cause rooting to diminish and thereby minimizes the roots' ability to access water deep in the soil profile.

• There is a fair amount of research that shows that turf cut higher—such as two inches from the soil layer instead of one inch—is better able to access water deeper in the soil profile, as the rooting depth is correlated to shoot height. This, however, pose a challenge on sports fields of course.

• Have a soil sample analyzed by a testing laboratory. The process is fairly inexpensive and will help the sports turf manager determine his or her site's balance of nutrients, which is an essential piece of information when making the appropriate selection and application of fertilizer.

• Adding mulch, pine straw or other amendments helps the soil hold water and nutrients, enabling plants to grow deep roots and resist disease.

Maintenance guidelines from the STC, Part I

As synthetic turf's popularity increases, it's important to know the value of proper synthetic turf maintenance. Putting time into your field, even for a couple of hours each week, will keep it looking well-manicured, and more importantly maintain its safety characteristics, and add to the field's longevity. The following is an edited version of the Synthetic Turf Council's (STC) Maintenance Manual, published in 2007. The second half will appear in the August issue.

Maintenance of an infilled synthetic surface is essential. While the maintenance and upkeep of an infilled synthetic surface is considerably less than other designs, it must be properly applied. The basic behavioral characteristics of synthetic turf systems must be understood because they dictate the maintenance required.

In developing these guidelines, the Synthetic Turf Council has considered and incorporated, where applicable, the field experience of its members and other qualified entities. They stress that the provider of the syn-

Turf grooming brush

Synthetic turf rake and brush

thetic turf system and the owner must agree on the need for maintenance.

These guidelines provide the end-user/owner/client with a means of realistically evaluating the maintenance that is recommended for a synthetic surface, based on its intended use. Routine maintenance, as well as periodic intense maintenance, is essential to the life and performance of the infilled synthetic surfaces.

By definition synthetic turf fields are, in essence, a system that provides a synthetic playing surface, cushioning, drainage, and a properly prepared base. Routine maintenance, as a practical matter, is primarily applied to the top surface where the action takes place and where it is most conspicuously observed.

Maintenance should be performed by personnel trained and knowledgeable about the specific ingredients/materials of the specified/installed system and the equipment properly used for field maintenance applications. Such personnel should be prequalified as to their expertise and knowledge of the process. When such qualified personnel can be identified, they are customarily employed by the facility management, or outsourced by facility management to a maintenance subcontractor, or contracted by the provider/manufacturer of the system.

It is the intent of this Guideline document to augment the maintenance instructions provided by the manufacturer and/or initial provider of the system. In the event that manufacturer/provider instructions are provided, a review of these provisions should be made and their effect on warranties understood. Any conflict should be corrected between the parties in order to prevent the voiding of the warranties provided.

This Guideline also serves to provide an understanding of the minimum requirements by owners of a field or those who have been given the responsibility for the maintenance. It serves to make all parties to the system aware of the

important role proper maintenance plays in achieving the overall performance of the synthetic turf system.

Maintenance is vital if the surface is to maintain its appearance and to provide consistency of play, permeability, and longevity. The basic objectives of effective maintenance are that:

- the playing surface is kept clean; airborne contaminants are removed;
- the playing surface remains level and of consistent texture so that it gives a true and predictable performance;
- the infill materials are evenly distributed;
- the effective drainage of surface water is maintained throughout the life of the field's surface;
- the system does not become over compacted and hard;
- the facility is consistently attractive and well-kept.

Identify your system. The specifics of the synthetic surface, fiber, infill, construction, play lines, and any other basic elements or unusual features must be accurately identified so that the appropriate maintenance regimen can be applied. Your system provider should be the source for this info.

Fibers vary in length, thickness, and density depending upon the performance requirements of your synthetic turf system. Long pile systems may be filled with a combination of sand and rubber granules, rubber granules only, or a combination of other specialty materials in order to meet the predetermined performance criteria. The sand material used as infill should be rounded to sub-angular and silt free.

The rubber granules used as infill material are typically styrene butadiene rubber (SBR) or ethylene propylene dien polimerisat (EPDM.) The granules must be clean and metal free. Combinations of sand, rubber or other suitable materials in various combinations must be capable of meeting all the guidelines and environmental requirements at the installation location.

Tufted is the most commonly used process by which the fiber yarns that form the pile are inserted into a previously prepared blanket-like primary backing. Woven is the process where the surface is composed of interlacing sets of continuous yarn while knitted means the yarn fibers of the pile are tied to the backing which was simultaneously constructed in the same over and under, criss-cross process.

The permanent play lines defining the field of play can be tufted into the surface backing or are an integral part with the surface, having been inlaid or cut into the surface with designated colors. Temporary play lines are painted onto the surface but require frequent attention, repainting, or repair to maintain their appearance. Frequent inspection is recommended.

Maintenance procedures. These processes will help assure continued performance of the system as specified in relation to the declared purpose and use of the synthetic turf surface.

Airborne pollutants such as leaves and other debris should not be allowed to remain on the surface for any length of time. If not removed, they will migrate into the system, forming a drainage inhibition within the surface that can reduce drainage.

A wide soft broom can be used for removing the surface debris. A mechanical leaf sweeper or special vacuum cleaner that does not remove the fill can speed up the operation. Such equipment must be well maintained and carefully operated to avoid contamination or physical damage to the surface.

Proper grooming "freshens" the synthetic turf surface appearance and is crucial to help prevent the premature deterioration of the performance characteristics, appearance, and drainage properties. Mechanical grooming can accelerate the process when the proper equipment is chosen and operated by skilled personnel.

Drainage is essential to effective maintenance. It is possible that the bed of infill material serves as a filter. Infill can unavoidably retain inert particulate matter conveyed or blown onto the field or carried by rainfall or other air contaminants. By moving and re-leveling the upper layers of infill, mechanical grooming can delay the timeline when problems may begin to occur in the normal course of use, which could reduce the drainage process.

Accumulation of unwanted or foreign materials is inevitable. Too much grooming, or the negligence of grooming, can affect the long term turf performance, even if such does not appear in the short run. Should a contaminant have growth potential, the species and its eradication agents should be carefully identified and removal should be immediate before serious infestation occurs. Equipment designed for that specific purpose must be operated by killed personnel who have precise knowledge of its effects. Routine maintenance can reduce the long term effects of any external contaminants, making such occurrences almost a non-issue.

It is important that the synthetic turf pile is maintained vertically. Regular brushing is an important function that must not be overlooked or neglected. The surface should be brushed in a number of directions, alternating the direction in consecutive activities, but generally in the direction of the individual panels to avoid crossing over the main seams.

Equipment selection. Turf and maintenance equipment manufacturer's advice should be sought when considering any type of maintenance operation and the use of any equipment or procedures not recommended by the manufacturer of the system. The objectives of the maintenance process must be understood. No two machines will operate to the same degree of efficiency and effectiveness. The condition of the surface will also affect the operation of the equipment. Both conditions should be evaluated.

Most maintenance equipment utilizes a brush or brushing action. It is critical that the type of brush used does not abuse the condition of the surface. Drag brushes behind the power unit are normally not recommended because they tend to flatten the pile and generate the need to implement the cleaning operation twice or more unnecessarily. If drag brushes are to be considered, a test strip should be used to determine whether or not the effect and process of those brushes are desired. Brushes that have a rotary action in a horizontal position in front of the pile unit are preferred since they agitate the blades of the synthetic turf. The simultaneous vacuuming action should remove the undesired pollutants and debris.

Power brushing equipment may agitate the infill to various degrees. The type of brushing, vacuuming, de-compacting, and final grooming should be relevant to the end result. The objective of each grooming routine should be determined prior to initiating the selection of the maintenance equipment, i.e., stand up of the pile and clean or level the infill within the pile; provide uniform performance characteristics; etc. ■

This information provided by the Synthetic Turf Council, www.syntheticturfcouncil.org.