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BMPs for water conservation

Fortunately, there are a number of site-specific adjustments in management practices that can be implemented to achieve enhanced water-use efficiency and conservation while maintaining an excellent surface. This environmental best management practices (BMPs) approach can be applied to any environmental issue (Table 1, items 1,2). There is no "silver bullet" management practice that will achieve water conservation, but a number of smaller adjustments combined can result in appreciable water savings while not sacrificing field safety and playability:

Goals. Identify initial and long-term goals relating to the key issues: fostering safe fields and enhancing water-use efficiency and conservation. Goals should be developed and agreed upon by facility management. Short term goals are based on existing infrastructure and equipment, but a longer term plan may include improvements in infrastructure, equipment, or personnel.

Site Assessment. Site-specific management requires site-specific information. Thus, all sites should be intensively evaluated for information that could influence water management. This would include: irrigation audit; intensive assessment of soil physical and chemical properties and spatial variability; subsurface and surface drainage; evaluate potential irrigation water sources; soil and water quality tests. All water conservation practices implemented in the past or current time period should be identified along with estimated cost in money and labor since this information aids in defining what has already been achieved. The latter

Table 1. Key resource information on managing sports fields under drought conditions.

1. Carrow, R. N. 2008. Drought, water restrictions, and community sports fields. SportsTurf, June 2008, p. 8.

2. Carrow, R. N., F. C. Waltz, and K. Fletcher. 2007b. Environmental stewardship requires a successful plan: Can the turfgrass industry state one? Univ. of Georgia, GeorgiaTurf Web Site. http://www.commodities.caes.uga.edu/turfgrass/georgiaturf/Water/Articles/BMS_EMS_Success_Approach_Web.pdf

3. Carrow, R. N. and R. R. Duncan. 1998. Salt-Affected Turfgrass Sites: Assessment and Management. John Wiley & Sons, Hoboken, NJ.

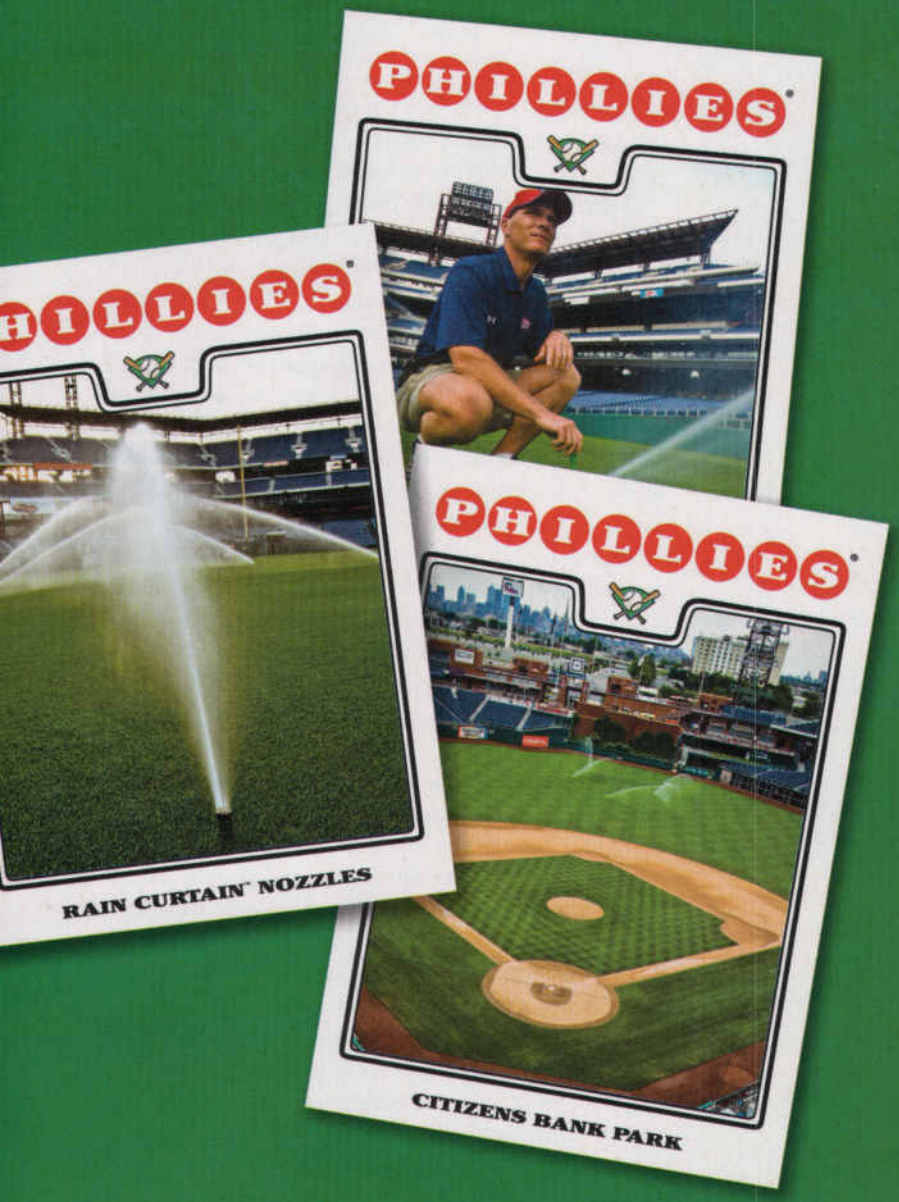
4. Ernst, T. 2006. Managing functional athletic fields. Article in special section on Proactive Water Use for Sports Turf Management. Sports Turf Association. Guelph, ON. http://www.sportsturfassociation.com/Portals/0/pdf/361_1_wateruse.pdf

5. Krum, J. and R. N. Carrow. 2008. Precision turfgrass management and irrigation scheduling. Golf Course Manage. 76(7): in press

6. Landry, G. and C. Waltz. 2008. Water management for sports fields. Univ. of Georgia Extension Service, Griffin, GA. http://commodities.caes.uga.edu/turfgrass/watercon servation/PDF_Files/Article-11.pdf

7. MAV. 2007. Strategies for Managing Sports Surfaces in a Drier Climate. Municipal Association of Victoria – Sports Surfaces Task Force. GHD Pty Ltd, Geelong, VIC. Australia. 121 pages. http://www.cricketvictoria.com.au/files/community/MAV%20Report.pdf

8. McAfee, J. A. 2008. Managing sports fields during drought conditions. Texas A & M Extension Service, Dallas, TX. http://jimmcafee.tamu.edu/CulturalPractice.htm



SHIFT GEARS:

Exceed expectations.

Mike trusts the performance of Rain Bird® Rotors.

"In my opinion, it's everything you'd want in a rotor…extremely uniform nozzle distribution, ease of adjustment, and few if any maintenance issues… it's one great package."

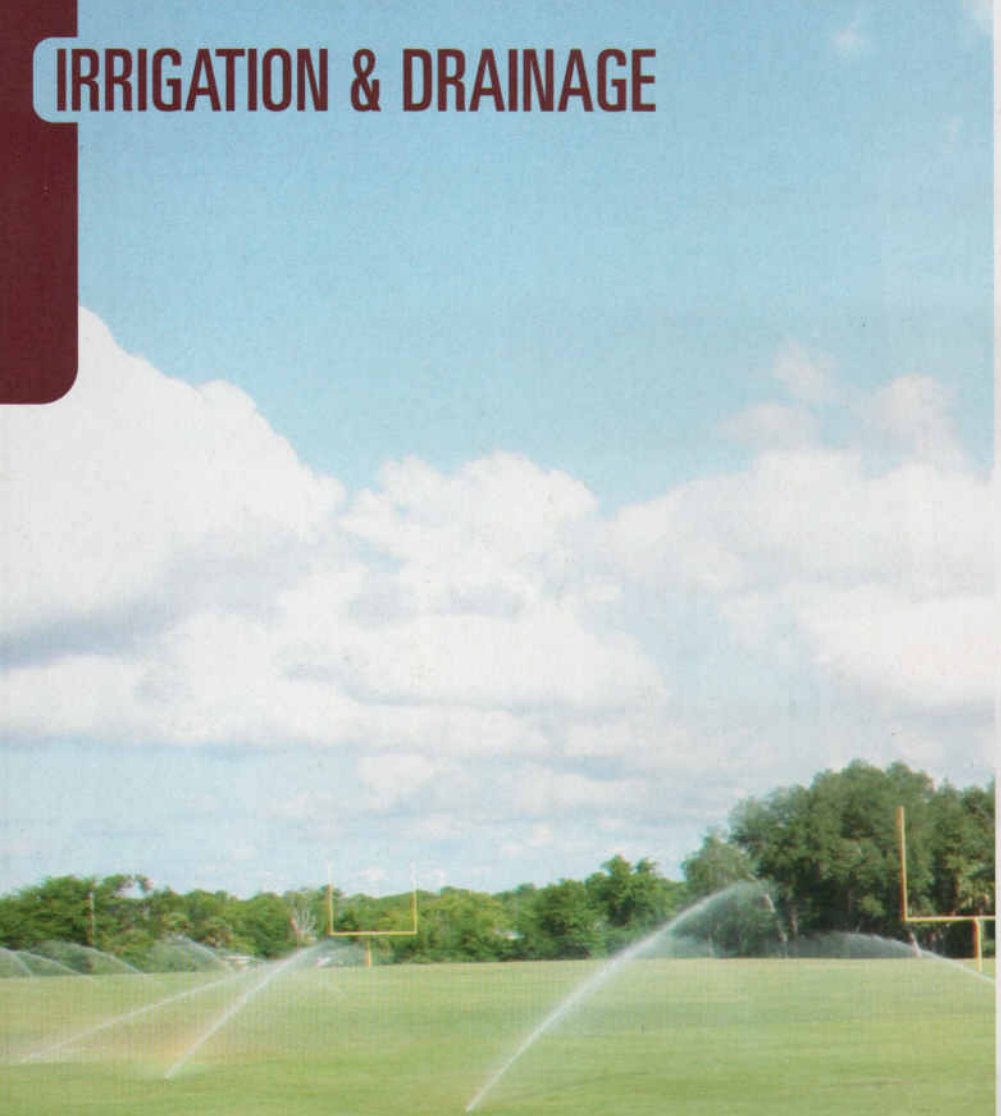
—Mike Boekholder, Head Groundskeeper
Citizens Bank Park, Philadelphia, PA

Whether your field is major league or little league, Rain Bird rotors deliver.

- No brown spots with the efficient, uniform coverage of Rain Curtain™ Nozzles.
- Easy precise adjustment of BOTH arc edges.
- Maximum flexibility with non-reversing full- and part-circle in the same head.
- Low maintenance, vandal and damage resistant design.

For additional product details, consult with your Rain Bird salesperson, or visit **www.rainbird.com/shiftgears.**

RAIN BIRD®



Water conservation should be a whole facility goal and not just on the sports fields

Winter Springs, FL Parks & Rec, courtesy of Chuck Pula

information is an excellent educational process for those that make the financial decisions and this information is valuable when BMPs are submitted to regulatory agencies.

Alternative Irrigation Water Sources. Non-potable irrigation water sources should be explored for short and long term availability. The most common sources would be: reclaimed (effluent, wastewater) water, storm water capture from the site for use in irrigation; drainage water reuse; for large facilities, sewage line mining with an on-site treatment facility to obtain irrigation water; use of saline aquifers not suitable for drinking purposes; and desalination. Once sources are identified, a complete irrigation water quality test should be conducted, especially relative to the presence of total soluble salts, sodium, and nutrient load. In arid and semi-arid regions, it is not unusual for the water from public wastewater treatment plants to have some degree of salt load and sodium. If this is the case, it has significant impact on possible infrastructure and equipment requirements to allow salt management, as well as the future nutritional and soil chemical amendment needs (Table 1, item 3).

Site Design for Water Conservation. This strategy includes initial construction as well as possible infrastructure changes on existing sites and should entail: soil modification to a allow water infiltration (sand capping, adding sand to alter surface conditions, adding organic matter); omitting or limiting irrigation on surrounds of recreational facilities where irrigation is not essential; water harvesting and capture form surrounds for irrigation use.

Irrigation System Design, Installation, and Maintenance. Proper irrigation system design is the most important factor. Without adequate spacing, nozzles, and layout for uniform application of water, the site will either be over-irrigated in areas to apply sufficient water on the drier areas; or there will be adequately irrigated areas with dry, hard conditions in the poor coverage areas. However, remember that soil moisture conditions directly relate to player safety and field playability—it is more that a conservation issue

The irrigation system is the main means to achieve adequate surface conditions in terms of turf conditions and proper soil moisture. Proper installation of irrigation components is the next point and must be followed by good maintenance including rapid repair of leaks. Essentially a good design should be for uniformity of application and flexibility for site-specific application (where water is needed, when it is needed, and at the correct rate). Rain shut-off devices should be used. **Irrigation Scheduling.** Even with a well-designed irrigation system, irrigation scheduling is ultimately determines the quantity of water. To enhance efficient scheduling consider: developing a budget approach to irrigation; using irrigation scheduling tools that are plant, soil, or climatic based methods to estimate when to irriga-

tion and how much to apply. As a side note, my current research is focused on more robust and cost effective means of site assessment of large landscape sites using truckster pulled mobile sensor arrays (determines soil moisture content, soil compaction, and plant stress maps with GPS coordinates that can be used in Geographic Information Systems computer programs for mapping and analysis), determination boundaries of similar site areas (areas that should receive similar irrigation), and science-based means of soil sensor placement (Table 1, item 5).

Selection of Turfgrass. The key selection criteria for athletic field grasses will continue to be tolerance to traffic stresses, adaptation to the mowing height requirements for the sport, and adaptation to the local climatic conditions, and pest tolerance/resistance; however, with the trend toward water conservation, drought resistance (avoidance and tolerance), salinity tolerance, and high temperature stress tolerance (often induced by drought and/or salinity) must be increasingly considered.

Additional Management Practices for Water Conservation and Field Safety/Playability. Surface cultivation programs are especially important to capture rainfall, allow efficient irrigation scheduling, and maintain a resilient surface. Deep cultivation programs to promote deep rooting and water percolation are also necessary. On fields receiving soluble salts and sodium via the irrigation water, proper cultivation equipment and programs are even more important since cultivation must be applied more often. Other maintenance aspects to consider are: traffic plan to prevent undue wear and rutting in localized areas; topdressing to level the field and modify surface conditions; promotion of deep rooting by fertilization, liming, etc.; wetting agents; proper mowing height; consider soil modification or sand-capping if necessary.

Maintenance Facility/Buildings and General Grounds Water Conservation Strategies. Water conservation should be a whole facility goal and not just on the sports fields. This includes indoor conservation programs for any office buildings, equipment maintenance, or other facilities whether on the site or at another location but associated with the facility.

Develop Water Plans. The initial level of planning is to develop and implement a formal BMPs water conservation plan for routine conditions. However, this should include specific plans for various levels of drought restrictions that may be triggered by drought conditions. During water restrictions, priority areas for irrigation should be identified both on the fields and for surrounding areas for limited irrigation. Turfgrasses allowed to achieve drought resistance can survive for relatively long period of times depending on the climate. But, minimal irrigation during prolonged drought induced dormancy can extend the life of dormant turf. Re-establishment will certainly require more time, water, and inputs that maintenance for survival.

Another aspect of drought contingency planning is the adjustments to fertilization, pesticide, mowing and other maintenance operations that will be necessary at various water restriction lev-

els; as well as during drought recovery periods. Certainly the time period prior to heavy site use is critical to bring a field up to standard, while during non-use or low use periods inputs can be reduced.

Education. Water conservation is a complicated issue. Educated turfgrass managers are an integral component of BMPs, just as education has been essential in fostering BMPs for water quality protection and in IPM. Formal education and continuing education that relates to enhancing management skills related to water conservation should be encouraged for all staff. Additionally, the sports field manager is often an educator for other audiences concerned with water conservation on sports facilities, such as policy makers, water management authorities, turf management students, site users, crew members, etc.

Monitoring and Modifying Conservation Strategies. Monitoring and plan revision with respect to the initial goals will be an on-going process. But other aspects should be noted as well, such as associated costs in time and money for these activities—including record-keeping and increases monitoring costs. Monitoring a water conservation program may include assessing its success by documenting water use (e.g., by water meters) and relating it to turfgrass performance. Periodic site assessment monitoring can identify leaks, irrigation head malfunctions, design limitations, irrigation scheduling problems or other wasteful water use. Monitoring could include use of instruments to quantity soil hardness or traffic torque estimates.

Assessment of Costs and Benefits for All "Stakeholders." If a BMPs plan is to be submitted to water regulatory or political entities, then this section is important. Assessment of costs and benefits associated with developing and implementation of a long-term BMPs water conservation plan and of the benefits of sports sites is necessary not only for facility planning, but also to demonstrate to regulatory agencies and possible critics of turfgrass sites that substantial effort and cost has been involved in water conservation by the facility. Additionally, the BMPs document is an opportunity to state the benefits of the facility to the local/state area; and to denote potential costs to society when a rigid regulatory (command and control) approach is targeted to the industry. Articles specific to community sports fields related to this topic are found it Table 1 (items 1, 7).

The potential conflict between drought restrictions and community sports fields is likely to be on-going. One essential response by the sports field users and managers should be to foster state or water district BMPs regulations that allow reasonable irrigation on community sports fields for player safety. The second response is to develop and implement site-specific BMPs on the sports facilities to participate in community water conservation efforts and proactively demonstrate a water conservation and sustainable mind-set within our industry. ■

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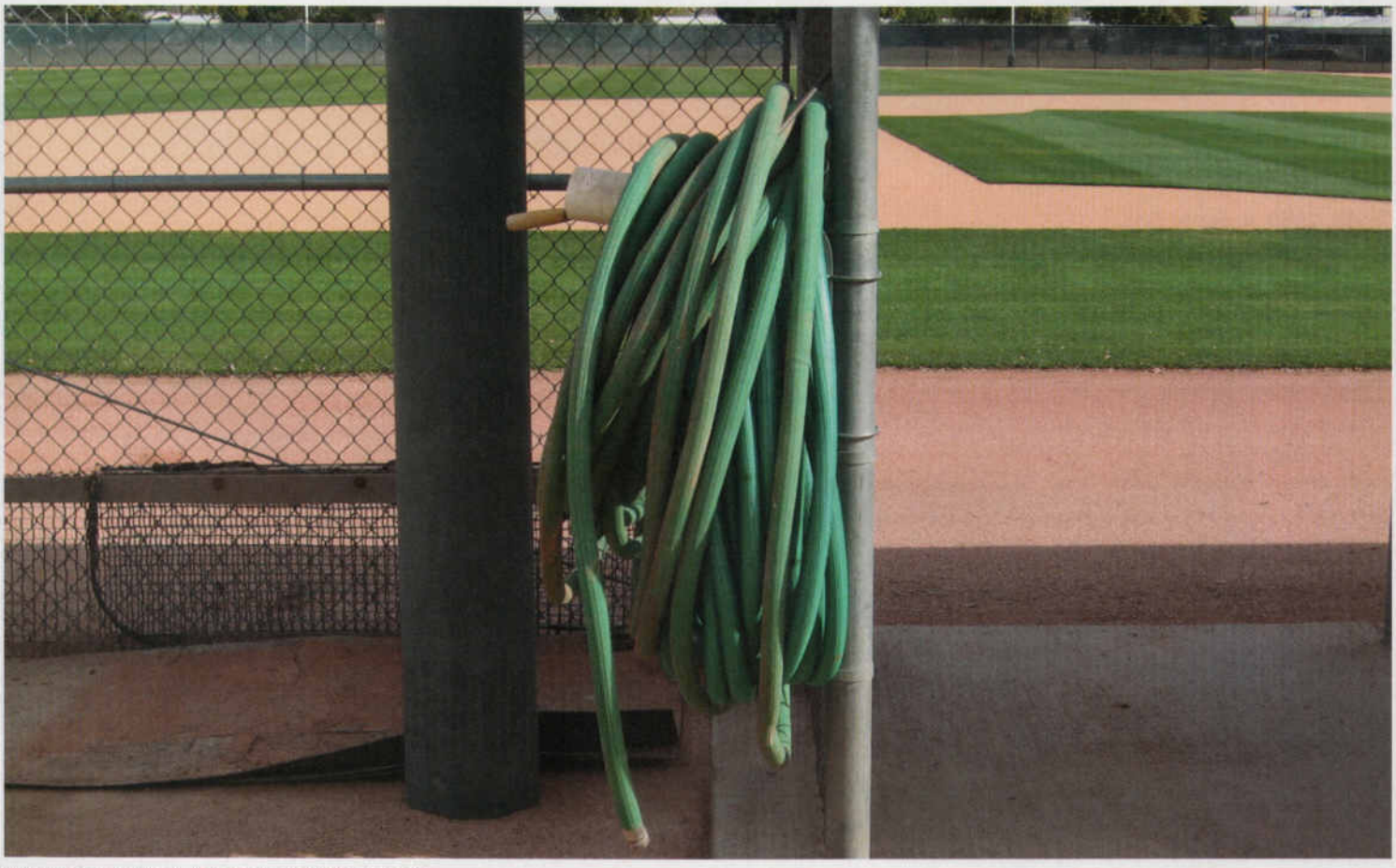


Maryvale Baseball Park, Arizona. Photo by Eric Schroder.

Underhill™

Products that work...smart.™

2008 TURF WATERING PRODUCTS

Underhill™

Underhill, an industry leader in innovative watering products for golf, sports field and other large turf areas, brings over 28 years of know-how in developing our inventory of "Products that work...smart.™"

Magnum™

SOLID METAL VARIABLE SPRAY HOSE NOZZLE

Underhill™ Magnum™ offers true fire-hose quality that holds up to years of rough use. It contains no plastic internal parts to break, stick or wear out. Our unique ratchet mechanism easily adjusts from gentle fan to powerful jet stream and prevents over-tightening damage. Precision-machined, incredibly smooth operation and outstanding distribution patterns make it ideal for high-demand areas like golf courses and athletic fields. Magnum™ is also an excellent equipment wash-down nozzle.

Magnum™ nozzle pictured with 1" brass adapter
(separately on Page 8)

Achieve more efficient spot watering with ™ Turf Stress Detection Glasses

See Page 14

features

- Built for 1" and 3/4" flow rates
- Ultra-durable, fire hose quality nozzle withstands any abuse, feels great in your hands
- Solid metal internal body - no plastic parts to break or wear out. Beautiful, consistent spray patterns for life
- Ratchet mechanism prevents over-tightening damage
- Versatile, multi-pattern sprays...effortless control with hydraulic assist on/off

specifications

MATERIALS: stainless steel, aluminum, TPR rubber
FLOW: 37 GPM at 80 psi
INLET: 3/4" hose thread (1" brass adapter available, see Page 8)

solid metal internal

Won't stick...won't break

ordering

Part # NG450 - MAGNUM Hose Nozzle
Part # A-BA107FM - 1" FHT x 3/4" MHT Brass Hose Adapter

Precision™

SOLID METAL FIXED SPRAY NOZZLES

It's hard to beat a variable spray nozzle for you have this set of hose nozzles precisely engineered for specific watering needs. Millions of soft, uniform droplets provide rapid yet surprisingly gentle water application. From watering fragile seed beds to drenching sports fields, Precision™ spray patterns are designed with ideal flow rates and droplet sizes to offer you the ultimate solution for every hand watering application.
Nozzles so good, spray patterns so patented.

Rainbow™

LOW FLOW RATE: COOLING GREENS, LIGHT PREGAME WATERING OF SKINS, LANDSCAPING
Ideal for watering transplants and seed beds. Excels at lower pressure flows. **15 @ 80 psi.**

Rainmaker™

LOW TO MEDIUM FLOW : SYRINGE AND SPOT WATERING
Perfect for syringing and great for hand watering turf and landscape with 3/4" hose at lower pressures. **23 @ 80 psi.**

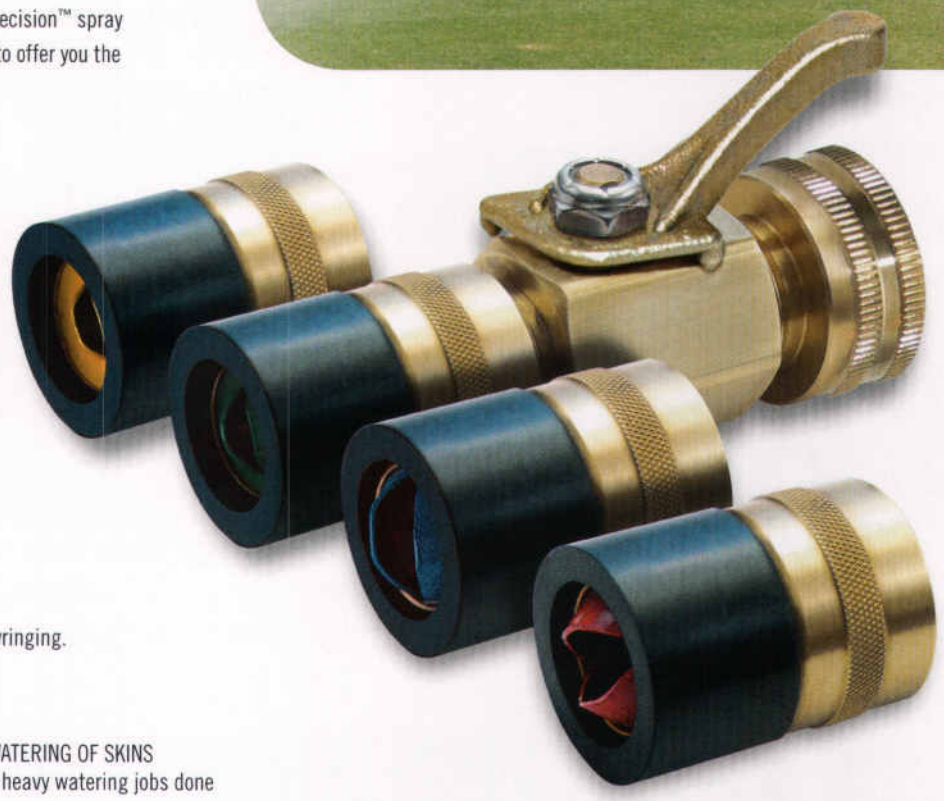
Cloudburst™

MEDIUM TO HIGH FLOW : THE DRY SPOT SPECIALIST
High volume drenching, application of wetting agents, and syringing. Ideal flow rate for 3/4" and 1" hoses. **48 @ 80 psi.**

Cyclone™

HIGH FLOW RATE: HIGH-FLOW WATERING, HEAVY PRE-GAME WATERING OF SKINS
This powerful fan-shaped spray covers a HUGE area and gets heavy watering jobs done quickly. Ideal flow rate for 1" hoses. **50+ @ 80 psi.**

GPM will vary with pressure at nozzle.



Rainmaker™ nozzle pictured with high-flow brass valve and 1" brass adapter (each sold separately on Page 8)

Precision™ nozzles' solid metal construction maintain excellent distribution patterns for life. (Nozzle pictured with high-flow composite and stainless steel valve, sold separately on Page 8)

Part # - Precision™ Rainbow™ Hose Nozzle
Part # - Precision™ Rainmaker™ Hose Nozzle
Part # - Precision™ Cloudburst™ Hose Nozzle
Part # - Precision™ Cyclone™ Hose Nozzle

Part # - Brass, High-flow 3/4" Valve
Part # - Composite and Stainless Steel High-Flow 3/4" Valve
Part # - 1" x 3/4" Brass Hose Adapter

See Page 8

Underhill™

CoolPro™

PROFESSIONAL TURF COOLING NOZZLE

A hot summer day can be murder on your greens. Use too much water and you risk damage to the roots. CoolPro™ is the first nozzle specifically designed for the single purpose of fogging and lightly misting the turf canopy to cool without over watering. And its 25 foot pattern gets the job done quickly.

features

- Patented Precision™ nozzle fogs at 70 psi to deliver a 25 ft. pattern with only 4-6 GPM
- Ergonomic handle/valve provides easy grip and variable on/off control.
- Solid metal design uses zinc, aircraft aluminum and stainless steel for durability.
- 3/4" inlet

Perfect for tournament play, CoolPro™ puts down only enough water to cool the turf canopy. It prevents wilting while maintaining good ball speed on the greens. Not just for golf, either...CoolPro is a great tool for turf professionals who want to protect their grass on hot days without damaging roots.

Clever RollerPro™ gives you a sprinkler anywhere you have a hose outlet.

See Page 5

ordering

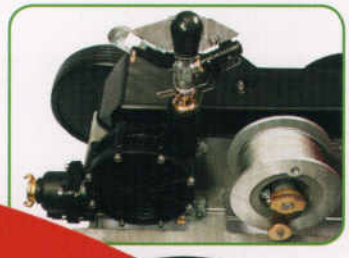
Part # HNC075 - CoolPro™ Hose Nozzle

Tracker™

PORTABLE IRRIGATION MACHINE

The Tracker™ offers a very economical solution for supplementing seasonal watering needs of 1/4 acre to 2 acre areas. It is also ideal for irrigating athletic fields, cemeteries, golf course roughs, or other large areas where an underground system is impractical. Built to last with precision German engineering and high quality materials, this portable powerhouse can irrigate an entire football field in just two passes.

Tracker™ requires minimal labor to operate. Powered by water, it pulls itself along a nylon cable, dragging up to 360 ft. of 1" reinforced heavy-duty hose (sold separately). Each pass irrigates about 2/3 acre per 8 hours of operations.



Precision German engineering, high quality components...built to last!

features

- Adjustable Speed Control: 20-70 ft./hr.
- 360 ft. nylon cable provides maximum irrigated length of 400 ft.
- Standard full or part circle sprinkler (8-15 GPM)
- 70-85 ft. pass width
- Automatic shut-off at end of pass
- Galvanized anchor stake
- Water turbine drive and gear box
- Includes 1" brass quick-connect adapter

specifications

- WEIGHT: 66 lbs.
- SIZE: Length 33", Width 22", Height 22"
- MATERIALS: Aluminum, Brass, ABS

Golf courses use Tracker™ to help irrigate roughs, driving ranges, or supplement watering in other areas where an irrigation system is not available. Tracker's maximum 400 ft. irrigation path makes it ideal for large campuses or corrals and its compact size allows it to operate in narrow spaces such as cemetery rows.

ordering

Part # T-400 - Tracker™ Portable Irrigation Machine

Solid brass one-piece quick coupler valves and valve keys can help you get your Tracker™ set up quickly.

See Page 8

Underhill™

RollerPro™

RollerPro™ works with both 1" and 3/4" hoses and sprinklers using the included adapters. Sprinklers sold separately.

PORTABLE SPRINKLER BASE

The 22" wide stainless steel roller of RollerPro™ provides a stable field position for supplemental watering. Designed for years of hard use, it is ideal for watering dry spots and newly seeded areas.

features

- 22" wide stainless steel roller is weighted to prevent movement during use.
- Standard 1" FHT inlet x 1" female NPT outlet.
- 3/4" inlet and outlet adapters included.

BRASS IMPACT SPRINKLERS

Underhill offers a wide selection of high quality impact sprinklers to top your RollerPro™ portable sprinkler base. Featuring solid brass bodies with stainless steel drive springs and chemical resistant bearing seals, they provide the best combination of durability and value available.

ordering

Part # A-RP221 - RollerPro™

	GPM	Radius (ft.)
Part # SI075F - 3/4" MPT Full Circle Sprinkler	13	57
Part # SI075P - 3/4" MPT Part/Full Circle Sprinkler	11	48
Part # SI100F - 1" MPT Full Circle Sprinkler	23	71
Part # SI100P - 1" MPT Part/Full Circle Sprinkler	23	71
Part # SI125F - 1-1/4" MPT Full Circle Sprinkler	51	96
Part # SI125P - 1-1/4" MPT Part/Full Circle Sprinkler	54	78

Performance data shown at 80 psi. GPM and radius will vary with pressure at sprinkler

For larger irrigation needs (much larger), Mirage™ sprinkler heads have a throw radius up to 164 ft.!

See Page 11

PelletPro™

APPLICATOR GUN FOR SOLID WETTING AGENT TABLETS

We outfitted our heavy-duty surfactant applicator with a high-flow composite/stainless steel valve and a Precision™ Cloudburst™ nozzle to produce the finest wetting agent gun available. The PelletPro™ accepts all wetting agent tablets and is designed to provide powerful, yet ultra-soft spray when watering or applying surfactants to tight, hydrophobic soils.

features

- 48 GPM capability gets the job done faster!
- Ultra Heavy-Duty - brass fittings, aircraft aluminum, stainless steel, and precision engineered glass-filled materials
- Patented Precision™ Cloudburst™ nozzle delivers large droplets in an outstanding fan pattern
- Pellet rotation (1 RPS) evenly dissolves/applies wetting agent tablet

With the included 1" FHT x 3/4" MHT brass adapter, PelletPro™ works with both 3/4" and 1" hoses.

2 products in 1!

Remove the PelletPro™ bowl and you have a superb syringe nozzle combo: the patented, 48 GPM Precision™ Cloudburst™ with our high-flow, oversized handle valve.

PelletPro's bowl, also sold individually, works perfectly as a replacement in-line filter bowl for most spray rigs. Heavy-duty, transparent plastic shows fluids. (No more cracked bowls during winter storage!)

ordering

Part # A-PPWA50K - PelletPro™ Applicator Gun
Part # A-PPB - In-line Filter Bowl and Gasket
Part # A-PPBG - Bowl Gasket

Underhill™

LiquidPro™

APPLICATOR GUN FOR LIQUID WETTING AGENT

When customers requested a liquid version of the PelletPro™, the proven combination of our Precision™ Cloudburst™ nozzle and the high-flow composite/stainless steel valve had us halfway there. We added a chemical-resistant, UV-protected, lightweight siphon/mixing system in between to produce an applicator gun which can cover 1000 square feet in less than a minute. Now, with unmatched speed and uniformity, you can virtually "paint" your turf with liquid wetting agent, fertilizers, and micronutrients. And like the PelletPro, LiquidPro disassembles easily to create the Cloudburst™ High-Flow Valve syringe nozzle.

With the included 1" FHT x 3/4" MHT brass adapter, LiquidPro™ works with both 3/4" and 1" hoses.

features

- Patented Precision™ Cloudburst™ nozzle evenly distributes wetting agent ensuring uniform coverage. Made of aircraft aluminum and stainless steel.
- Lightweight, durable nylon construction weighs only 3 lbs., UV-protected and chemical resistant.
- High-density polybottle has full quart capacity with easy-to-read measurements in fluid ounces and milliliters.
- Needle Valve Metering Chamber- Engineered venturi siphon mixes proper amount of wetting agent into the water flow.
- Pistol grip design with textured handle provides sure grip surface and reduces operator fatigue.

- Adjustable metering dial offers 10 additive settings including "Water Only."
- Metering dial can be removed to prevent tampering with a predetermined setting.

2 products in 1!

The Precision™ Cloudburst™ nozzle and high-flow valve can be quickly assembled to create a powerful, 48 GPM syringe nozzle.

Save time by bringing plenty of wetting agent, fertilizers, and micronutrients to the field all at once with our 6-pack of polybottles.

ordering

Part # A-LPWA50K - LiquidPro™ Applicator Gun
Part # A-LPWAB-6 - 6-Pack of 32 oz. Polybottles

Accessories

EVERYTHING YOU NEED...WHEN YOU NEED IT

At Underhill™, we specialize in unique "products that work...smart." But that doesn't mean we don't also supply those in-between and accessory items that everyone needs. And with Underhill, you know you're getting the highest quality and great value.

high-flow valves

SOLID BRASS
- 3/4" hose thread inlet/outlet
- up to 50 GPM

Part # CV075H

COMPOSITE / STAINLESS STEEL
- 3/4" hose thread inlet/outlet
- oversized handle
- up to 55 GPM

Part # A-BV77FM

swing joints

- heavy-duty
- 12" arm length

Part # SJ-100N12 - fits 1" inlet sprinklers, NPT thread
Part # SJ-125A12 - fits 1-1/4" inlet sprinklers, ACME thread
Part # SJ-150N12 - fits 1-1/2" inlet sprinklers, NPT thread

waterproof wire connectors

Part # DBY

Direct Bury Splice Kits are real time saver: the insulator tube is pre-filled with silicone grease and there's no clamping tools, no waste, no mess. Just quick and reliable underground splices...for irrigation and landscape lighting applications using 12-18 gauge wire. Each kit includes 25 tubes and 25 yellow caps.

universal replacement valve lid

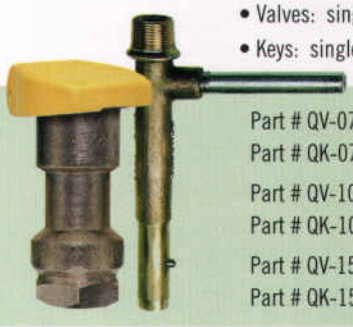
- Fits all 6" to 7" round valve boxes
- High strength material
- UV resistant
- 10 year warranty

Part # VL-06

hose adapters / quick-connectors

Part # A-BA107FM - 1" FHT x 3/4" MHT
Part # A-BA107MF - 1" MHT x 3/4" FHT
Part # A-BQ7M - 3/4" Quick-Connect, male end
Part # A-BQ7F - 3/4" Quick-Connect, female end
Part # HN-075W - replacement washer, 3/4" hose

1-piece quick coupler valves & keys



- Valves: single slot, solid brass, yellow vinyl cover
- Keys: single lug, solid brass shaft

Part # QV-075R - valve: 3/4" FPT inlet
Part # QK-075 - key: 3/4" MPT x 1/2" FPT outlet
Part # QV-100R - valve: 1" FPT inlet
Part # QK-100 - key: 1" MPT x 3/4" FPT outlet
Part # QV-150R - valve: 1-1/2" FPT inlet
Part # QK-150 - key: 1-1/2" MPT x 1-1/4" FPT outlet

hose swivels

- solid brass

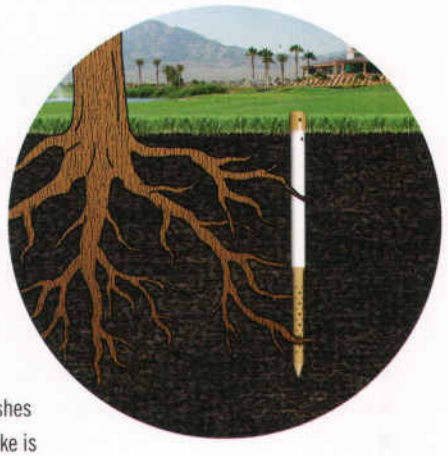
Part # HS-075 - 3/4" FPT 3/4" MHT outlet
Part # HS-100 - 1" FPT x 3/4" MHT outlet
Part # HS-101 - 1" FPT x 1" MHT outlet

Measure pressure at the sprinkler with HeadChecker™

See Page 12

Underhill™

DeepDrip™



TREE WATERING STAKES

DeepDrip™ stakes allow you to water and fertilize your trees at the roots, encouraging deeper roots and healthier trees. Water gets underground fast, so you can water for shorter periods and enjoy considerable water conservation. They also help to aerate the soil with oxygen, and you can add fertilizer into the shaft to direct nutrients to the root zone. These versatile stakes are designed to work with a hose or automatic landscape drip systems, and come in three sizes. The 14.5" unit is ideal for small trees and shrubs with shallow roots, like rose bushes and ornamental trees (or in commercial use for trees still in boxes). The 24.5" stake is well-suited for most other tree varieties except for palm trees and similarly deeper rooted trees, which will benefit from the longer 36" stakes.

The DeepDrip's reinforced tip and cap are made from ABS and the upper shaft is made from Schedule 40 PVC. Multiple holes in the bottom half of the spike, internally covered by a mesh filter, allow water to flow out but keep dirt from getting in and clogging the tube. The UV-protected cap acts as a reinforced cover when pounding the stake into the ground, keeps debris from entering the shaft and holds a 1/4" drip line/emitter securely in place. By inserting a screwdriver through the two holes at the top of the upper shaft, stakes can be easily pulled up to remove/reposition or rotated to deter root invasion.

DeepDrip™ watering stakes can be installed during or after tree planting. Once in, you have instant access to the root system for fertilizer delivery or to set up deep automatic drip watering.

ordering

Part # A-DD14 - DeepDrip™ 14.5" watering stake
Part # A-DD24 - DeepDrip™ 24.5" watering stake
Part # A-DD36 - DeepDrip™ 36" watering stake

MicroEase™

MICRO-IRRIGATION KITS

Convert your current, inefficient irrigation system into a highly effective, low-maintenance, water-saving drip system. MicroEase™ kits can connect to a water faucet, existing sprinkler system or 1/2" riser. This provides efficient, low volume irrigation ideal for golf clubhouse surrounds as well as other shrub and planter areas.

PRO KIT (faucet connection)

CONVERSION KIT (sprinkler/riser connection)

ordering

Part # ME-SS-PK - MicroEase™ Pro Kit with spray spikes (25)
Part # ME-8SS-PK - MicroEase™ Pro Kit with 8-stream spikes (25)
Part # ME-SS-SCK - MicroEase™ Conversion Kit with spray spikes (9)
Part # ME-8SS-SCK - MicroEase™ Conversion Kit with 8-stream spikes (9)

Gulp™ Series

WATER REMOVAL SUCTION PUMPS

Whether you need to remove water from sprinklers and valve boxes or displace gallons of standing water in the field, the Underhill Gulp™ series of water removal hand pumps has the right tool for the job. Constructed from heavy-duty, corrosion-proof materials, these pumps are self-priming and easy to clean. The Gulp Syringe™ and Gulp™ are ideal for carrying on maintenance carts for small, routine needs. For larger water removal jobs, BigGulp™ pumps a gallon of water in only four strokes and SuperGulp™ can move 16 gallons of water in one minute.


SuperGulp™

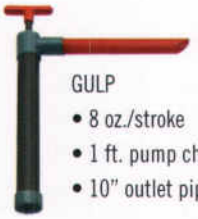

BigGulp™


Gulp™


Gulp™ Syringe

SUPER GULP
- 16 GPM pumping capability
- 4" dia. x 2 ft. pump chamber
- 3" dia. x 3 ft. outlet hose
- 3" dia. x 7 ft. outlet hose

BIG GULP
- 35 oz./stroke
- 3 ft. pump chamber
- 36" or 72" outlet hose



GULP
- 8 oz./stroke
- 1 ft. pump chamber
- 10" outlet pipe

GULP SYRINGE
- 8 oz./stroke
- 1 ft. pump chamber
- 11" outlet tube

Use the BigGulp™ Riser Attachment to help prevent mud and rocks from entering the pump chamber.

ordering

Part # A-G12 - Gulp™
Part # A-G12S - Gulp™ Syringe
Part # A-G3636K - BigGulp™ with 36" outlet hose
Part # A-G3672K - BigGulp™ with 72" outlet hose
Part # A-G2484 - SuperGulp™ with 84" outlet hose
Part # A-G01 - BigGulp™ Riser Attachment

Underhill™

Mirage™

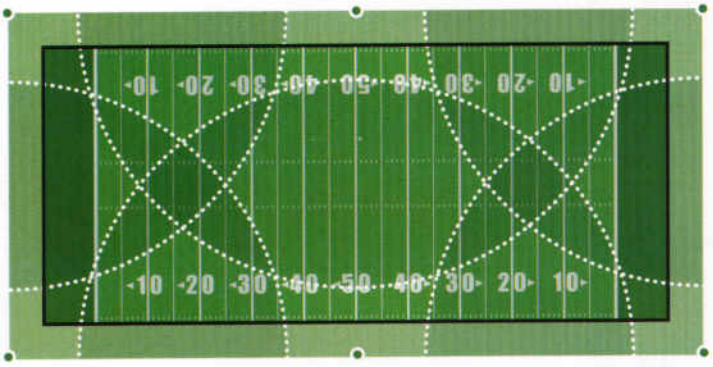
HUGE THROW, HIGH-PERFORMANCE SPORTS TURF SPRINKLERS

Underhill Mirage pop-up turf sprinklers, featuring precision engineering and huge throw radius, are often installed completely outside the area of the playing field. Employing precision German engineering in design and manufacture, Underhill offers the finest large turf sprinklers in the world.

M-160: With its powerful 164 ft. throw radius, the Mirage™ M-160 is a worldwide favorite for cooling and cleaning synthetic sports fields, dust control and irrigation. Featuring ultra-precise rotation speed adjustment, these piston-drive cannons get the job done quickly and efficiently.

M-125: A very impressive long-throw sprinkler in its own right with a 125 ft. radius, the M-125 is designed for installation in artificial turf fields, or in the out-of-play areas of natural turf fields.

M-115: Best noted for the extra large 4" (101 mm) deep sod cup cover which holds a 9" (220 mm) diameter section of natural grass, the M-115 provides excellent protection for athletes. Perfect in combination systems with the M-125 installed at the field perimeter and a minimum number of heads (two or three M-115) in the playing field itself.



Incredible but true: with its 164 ft. throw radius, the Mirage M-160 can shower a regulation size footbal field using only 6 heads!

model selection guide

	M-115	M-125	M-160
Max Radius	125 ft. (38 m)	125 ft. (38 m)	164 ft. (50 m)
Valve Type	In Head or Block	In Head or Block	Under Head - Extra
Lid Cover	Sod Cup - Natural Grass 4" (101mm) Depth 9.5" (242 mm) Diameter	7" (180 mm) Diameter	15.6" (395 mm) Diameter
Typical Applications	Artificial Turf: Play and Sideline Areas Natural Turf: Sidelines	Artificial Turf: Play and Sideline Areas Natural Turf: Sidelines	Positioned at Sidelines: Artificial Turf Cooling Natural Turf Irrigation
Field Usage Examples	All Sports	All Sports	Football, Soccer, Race Tracks
Nozzle #s (mm)	7, 8, 9, 10, 11, 12 13, 14, 15	7, 8, 9, 10, 11, 12 13, 14, 15, 16, 17.5	16, 18, 20, 22, 24, 26
Pop-Up Height	4" (99 mm)	4" (99 mm)	2 3/4" (70 mm)
Arc	30 - 360 degrees	30 - 360 degrees	30 - 360 degrees
Trajectory	22 degrees	22 degrees	23 degrees
Rotation Speed			Precision Adjustable 100-240 seconds
Inlet (Specify)	1 1/2" (NPT or BSP)	1 1/2" (NPT or BSP)	2 1/2" F side outlet (NPT or BSP)
Height	17.7" 450 mm	17.7" 450 mm	23.6" 600 mm

ordering

Part # M160-FP - Mirage™ 160 full/part circle
Part # M160-EP - Mirage™ 160 full/part circle, with 3" electric valve
Part # M125-EF - Mirage™ 125 full circle, valve-in-head
Part # M125-EP - Mirage™ 125 full/part circle, valve-in-head
Part # M125-BF - Mirage™ 125 full circle, block
Part # M125-BP - Mirage™ 125 full/part circle, block
Part # M115-EF - Mirage™ 115 full circle, valve-in-head
Part # M115-EP - Mirage™ 115 full/part circle, valve-in-head
Part # M115-BF - Mirage™ 115 full circle, block
Part # M115-BP - Mirage™ 115 full/part circle, block

HeadChecker™

NOZZLE DISCHARGE PRESSURE GAUGE

HeadChecker™ combines a solid brass Pitot tube and a liquid-filled 160 psi gauge to create a handy tool for measuring nozzle discharge pressure. Assuring correct pressures is essential to maintaining highly uniform irrigation systems. The 160 psi gauge can also be used separately to measure pipeline pressure.

ordering

Part # A-HCGPK - HeadChecker™ 160 psi gauge and Pitot tube
Part # A-PG160L - Pressure gauge only
Part # A-HCP - Pitot tube only

Underhill™

2Wire™

AFFORDABLE, VERSATILE IRRIGATION CONTROL

With over 150,000 field successes, Underhill™ 2WIRE™ irrigation control systems are a proven leader in converting controllers like the Hunter® ICC to the simplicity and low cost of two-wire technology. Installation is a breeze with our handy programmer, and after your system is in, you'll enjoy reduced maintenance costs and unbelievably easy system expansion (just splice into the control line and add a decoder). Add the Hunter® IRC remote control and you've created the ultimate (and most affordable) way to syringe anywhere on your field at the press of a button.

An irrigation installation featuring the powerful Mirage™ sprinklers (see page 11-12) and 2Wire decoders becomes an on-demand syringing system with the Hunter® IRC remote control.

Offering powerful control in a small package, decoders quickly install anywhere along a 2WIRE™ path. No grounding is required other than proper grounding at the controller. One decoder per station controls one or two valves per station.

Setting up stations is a breeze with the Portable Programmer

ordering

Part # TW-TK-DEC-1 - Decoder with 4 waterproof connectors
Part # TW-ICC-48 - ICC Decoder Module
Part # DEC-PROG-115 - Portable Programmer for TK-DEC-1 Decoders, 115V
Part # DEC-PROG-240 - Portable Programmer for TK-DEC-1 Decoders, 240V

Nastek™

EARLY STRESS DETECTION GLASSES

Disease, drought and weed invasion are plant and turf killers. But by the time you see them it can be too late. Nastek™ glasses, with stress detection technology developed by NASA, lets you "see into the future" to identify problems 2-10 days before they are visible to your naked eye. Keep your turf and vegetation healthy BEFORE serious problems arise.

HOW DOES IT WORK? Dying vegetation signals distress with changes in how it absorbs and reflects sunlight. The earliest signals occur at the outer limits of the human visual spectrum, and are rendered invisible compared to the predominant middle wavelengths. Nastek™ Early Stress Detection Glasses filter the overpowering light in the center so that the fringe spectra, which show early plant stress, become visible!

STRESS DETECTION GUIDE

fusarium patch

pythium blight

yellow patch (rhizoctonia)

brown patch

anthracnose

get a jump on **broken or poor-performing sprinklers**

highly efficient **spot watering** saves time and labor costs

poa grass invasion identified BEFORE it takes over

superior **weed location** and spraying saves time and money

Nastek™ Deluxe Edition includes shatterproof polycarbonate stress detection lens in "Aero II" frame, cleaning cloth and case, plus a FREE sun protection lens.

Nastek™ Standard Edition includes shatterproof polycarbonate stress detection lens in sport frame and lightweight case.

Nastek™ Clip-on glasses include shatterproof polycarbonate stress detection lenses and hard clamshell case.

ordering

Part # NG650-01 - Nastek™ Deluxe Edition Kit
Part # NG655-01 - Nastek™ Standard Edition
Part # NG670-01 - Nastek™ Clip-on Lenses
Part # NG680-TS - Nastek™ Digital Camera Lens

Document your findings with the Nastek™ digital camera lens. It's how we took the photographs on this page!

Underhill™

20505 Crescent Bay Drive
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Managers Association
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Kansas City, MO 64141

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Home phone _____ Work phone _____ Cell phone _____

Fax _____ Email _____

Signature _____

Direct Supervisor Name _____

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
❑ Chapter Dues (contact headquarters for amount) Chapter name) _____	$_____
❑ Contribution To SAFE Foundation (research, education and scholarship):	$_____
Total Amount Enclosed:	$_____

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

"I know I am a better sports turf manager because of this association. As sports turf managers, we take the challenge seriously to make our fields the best possible for the next game. The resources I have access to through STMA helps me do it."

— Bob Campbell, CSFM
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2/2007

STMA members lend a hand after TORNADO

STMA Iowa Chapter members work with students from Kirkwood Community College to fill divots. Turf industry business from Iowa and Minnesota have donated seed, sand, compost, mowers, equipment, bases, materials, and anything else that was needed to get the fields back in shape. All photos by Chandler Minner.

By Eric Schroder

In a minute and a half, the history of Parkersburg, IA changed forever May 25. Six people died from injuries sustained when a confirmed "Enhanced Fujita Scale" EF5 (wind speeds of more than 200 mph) tornado struck the town. At least 70 injuries were reported, and two-thirds of the town was turned into rubble. Nearly 200 homes were destroyed, the roof was taken off the high school, the gym was destroyed, and the football scoreboard was found 100 miles away. The tornado was reported to be about a mile wide and was the second deadliest on record in Iowa.

Dr. Dave Minner of Iowa State said bowls of peanuts were still on the bar at the local golf course and a golf club clock was still ticking after the tornado but the front door blew a hole through the back wall of the building.

The visitor half of the scoreboard; the other half ended up 100 miles away in Decorah, IA.

STMA Field of the Year Expands!

Do you have a field that is home to sports other than football, baseball, softball, and soccer?

If so, STMA and the 2008 Field of the Year sponsors encourage you to apply for the NEW STMA Sporting Grounds of the Year! STMA also is seeking applicants for football, baseball, softball, and soccer fields of the year. Awards may be presented at the Schools and Parks, College and University, and Professional levels.

The deadline to submit an application is Wednesday, October 15, 2008.

For more information on the Field of the Year program or to get an application, go to www.STMA.org, call Patrick Allen at STMA at 800.323.3875, or send an email to pallen@STMA.org.

STMA would also like to thank the 2008 STMA Awards Sponsors for their generous support of the program:

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Above: Two thirds of Parkersburg, IA was leveled by an F5 tornado that was nearly a mile wide.

Above: All of the structures, fences, light standards, and press box around the softball and baseball fields were destroyed. The flying debris left gouges and divots nearly a foot in the ground.

Chris Schlosser, head sports field manager for the Iowa Cubs and his assistant, Casey Scheidel, brought their crew to Parkersburg and rebuilt the mound and home plate area. Then they returned home the same day to sandbag as the Des Moines River was in the stadium parking lot and just about to enter their field.

Parkersburg has a long and proud school athletics tradition. The district's high school football program is noted as one of the top in Iowa, and amazingly, boasts four current National Football League players as alumni. This from a school that averages having fewer than 250 students a year! During Friday night games the town shuts down and everyone attends. As soon as it was possible after the storm, a team of more than 50 members from the Iowa chapter of the Sports Turf Managers Association (ISTMA) met in Parkersburg, determined to get the town's athletic fields ready for play as soon as possible.

Half the football field scoreboard was found more than 100 miles away.

Led by Joe Wagner, city parks manager from Iowa City, and Dr. Dave Minner from Iowa State, the team of volunteers came from as far as 200 miles away and spent 2 days cleaning and rebuilding the football field. Chris Schlosser and his crew from the Iowa Cubs rebuilt the pitching mound and home plate areas of the baseball field.

"Coach Ed Thomas, who normally mows and irrigates the football field himself, lost his home and a neighbor to the tornado," Minner said. "But 4 days after the storm he declared, 'We are going to have a football season'."

Coach Ed Thomas meets with Joe Wagner, Iowa STMA past president, and Dr. Dave Minner. Thomas said having a football season would be an important symbol of rebuilding and gaining some normalcy in Parkersburg.

Wagner said one of the first things the citizens did after the tragedy was form two rows, shoulder to shoulder, and on their hands and knees went the length of the field and back again, picking debris out of the football field's turf. "The community of Parkersburg is passionate about their football," he said.