>> **SUMMER SOFTBALL CAMP** at the University of Tennessee's Sherri Parker Lee Stadium. Photo taken at the 2011 STMA Regional Conference in Knoxville.

New herbicides for 2012

NEW HERBICIDES are continually being introduced into the marketplace. Many of these new herbicides may benefit sports field managers maintaining cool- and warm-season turfgrass athletic fields. The following information outlines several herbicides that entered the marketplace in 2011 as well as other materials that will be introduced in 2012.

Specticle (active ingredient is indaziflam) is a new preemergence herbicide from Bayer Environmental Sciences that was originally released for commercial sale in 2011. Specticle is labeled for use on warm-season turf at rates of 2.5 to 5 oz/A. This herbicide is not labeled for use on seashore paspalum (*Paspalum vaginatum*); thus, turfgrass managers with seashore paspalum athletic fields (or bermudagrass fields heavily infested with seashore paspalum) should select an alternative herbicide for preemergence weed control.

Research at the University of Tennessee has found that Specticle provides effective preemergence control of crabgrass (*Digitaria* spp.), annual bluegrass (*Poa annua*) and goosegrass (*Eleusine indica*) at lower use rates than traditional preemergence herbicides. Research conducted in 2011 at Tennessee illustrated that Specticle provides postemergence control of non-tillered smooth crabgrass similar to Dimension (active ingredient is dithiopyr). Data also suggest that Specticle provides postemergence control of non-tillered annual bluegrass as well.

Individuals should use caution when applying Specticle to athletic field turf. This herbicide has a longer residual than other preemergence herbicides, which could be problematic in high wear areas. There are label restrictions pertaining to not only overseeding but establishing new warm-season turfgrass from stolons/sprigs or sod. Label restrictions also prevent turfgrass managers from overseeding with perennial ryegrass for 8 to 12 months after treatment with Specticle. Furthermore, the product label currently states that turfgrass managers must delay sprigging or sodding for 2 and 4 months after application, respectively (Anonymous, 2010).

Tribute Total is a new postemergence herbicide from Bayer Environmental Sciences that will be introduced for commercial sale in 2012. Tribute Total will be labeled for use in warm-season turfgrass only. Research at the University of Tennessee has found fall applications of Tribute Total to control dallisgrass (*Paspalum dilatatum*) similar to MSMA. Studies have also shown Tribute Total to be an effective option for yellow nutsedge (*Cyperus esculentus*) and Virginia buttonweed (*Diodia virginiana*) control, as well as annual bluegrass and overseeded perennial ryegrass.

Xonerate (active ingredient is amicarbazone) is a new postemergence herbicide from Arysta LifeSciences that will be introduced for commercial sale in 2012. Xonerate will be labeled for use on mature Kentucky bluegrass, perennial ryegrass (*Lolium perenne*), tall fescue, and bermudagrass (*Cynodon* spp.) among other cool- and warm-season species. Application rates for Kentucky bluegrass, perennial ryegrass, and tall fescue range from 2 to 4 oz/A, while this herbicide can be applied to bermudagrass at rates of 3 to 10 oz/A.

Research at Tennessee has found single applications of amicarbazone to effectively control several winter annual broadleaf weed species at 7.5 oz/A, along with sequential applications at rates greater than 5 oz/A. Tank mixtures of amicarbazone + prodiamine applied in spring have also been shown to provide postemergence control of winter annual weeds and preemergence control of smooth crabgrass.

Xonerate will be marketed for selective annual bluegrass control in labeled cool- and warm-season turf species. Effective control programs may require sequential applications. Sports field managers should apply Xonerate in the spring of the year after annual bluegrass has resumed active growth. Research data in Tennessee and Georgia suggest that fall applications should be avoided. Labeling also restricts Xonerate applications when daytime air temperatures are expected to exceed 85°F.

Studies at the University of Tennessee in 2011 illustrated that a single application of Xonerate plus Tenacity (active ingredient is mesotrione) controlled annual bluegrass similar to sequential applications of Tenacity alone. This concept will be researched in further detail in 2012.

Many of these herbicides will provide athletic field managers with new options for weed control in 2012. Always refer to the product label for specific information on proper use, tank-mixing compatibility and turfgrass tolerance.

Mention of trade names or commercial products in this publication is solely for the purpose of providing specific information and does not imply recommendation or endorsement by the University of Tennessee's Institute of Agriculture. For more information on turfgrass weed control, visit the University of Tennessee's turfgrass weed science website at www.tennesseeturfgrassweeds.org. ■

References

Anonymous. 2010. Specticle 20 WSP herbicide label. Bayer Environmental Sciences. Research Triangle Park, NC. Available at: http://www.backedbybayer.com

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Laser grading:
setting your sights on quality

As the demand for quality and playability on sports fields continues to grow, so does the demand for laser grading. Laser grading is establishing surface elevations within a given area using an automated blade control system.

To understand a little more laser grading, you first have to understand a few terms and principles. A basic understanding of the types of lasers also helps.

Laser transmitters come in a number of configurations from simple to more complex. The basic principles are all the same. As a laser transmitter rotates, it sends out a beam of light over an area that is picked up by a receiver. In the process of laser grading, the receiver is mounted on the grading equipment, attached to a mast or pole. The receiver picks up the signal from the transmitter and in turn sends the signal to a control box that simultaneously raises or lowers the grading blade to keep the cutting edge of the blade at a consistent elevation relative to the transmitter beam. Ultimately the established grade will mirror the laser transmitter beam.

The four main types of lasers are the level laser, single plane laser, dual plane laser and cone laser. The area of the laser beam emitted from the laser transmitter is called a plane. The plane is a two dimensional area. Picture a flat sheet of paper. Now picture that sheet of paper as being large enough to hover over the area to be graded. Maybe that's why it's called a plane? A plane has a Y axis and an X axis. The Y axis could be considered one edge of the paper and the X axis could be considered the edge perpendicular to the first.

LASER GRADING

"This is an article I wish was available when I started using a laser."
—Jim Hermann, CSFM

The most basic laser is the level laser. This laser is typically used to document existing relative elevations within an area. This laser is designed to send out a flat "level" beam of light. That is, the X axis and the Y axis are both level creating a level plane above the area being documented.

Example: The laser transmitter is set up in a location within view of the area to be documented. The laser has to be set up in "plane" sight, pun intended. Anyway, the operator uses a grade rod marked off in feet and inches or other measurement such as tenths, meters etc. The grade rod is equipped with a laser receiver. The operator can document the relative elevation at any location within the proposed area. First, he or she positions the grade rod perfectly vertical on that location. Then, by maneuvering the receiver up or down on the grade rod to intersect with the beam sent by the laser transmitter, the operator can read the corresponding measurement on the grade rod; the higher the corresponding measurement, the lower the actual elevation. By documenting the relative elevations over a grid work of locations the operator can chart the surface contours or topography of a given area. Once the operator has done this, he or she can develop a better understanding of water movement and use this information to develop an effective grading plan.

EVERYTHING IS RELATIVE

It is important to note that when documenting relative elevations, these elevation readings are only relative to the height or elevation of the laser transmitter at that time. If the transmitter is repositioned, the operator will come up with totally different readings on the grade pole. To allow for this, a benchmark is established at the time the elevations are documented. A benchmark is a location within plane site of the transmitter that is a permanent elevation such as a concrete pad, footing, or possibly the base of a fencepost. By establishing a benchmark, the operator can reposition the transmitter on a day to day or even year to year basis as long as the elevation of the benchmark doesn't change. By documenting the new reading for the benchmark, the operator can translate the new readings to correlate with those documented in the past.

The benchmark is used as the reference elevation when positioning the receiver on the mast above the laser grading equipment. First the laser transmitter is positioned, turned on and programmed to the desired slop. The cutting edge of the grading blade directly below the receiver is positioned on the benchmark elevation. The receiver is raised or lowered on the mast to intersect with the laser bean. The receiver will remain in this position as long as the transmitter is not repositioned. Whenever the laser transmitter is repositioned, the laser receiver must also be repositioned to correlate with the elevation of the new transmitter location. The same process is carried out to position the receiver correctly when a grade rod is used.

A single plane laser has the ability to slope the Y axis while the X axis always remains level. This creates a flat plane but not a level plane. It is important to note that the terms "flat" and "level" are many times used interchangeably. In reality they can

have totally different meanings.

The term "level" means that all points within a defined area are at the same elevation, such as the elevations of the water surface on a calm lake. Flat just means flat. A flat surface can extend uphill or downhill, side to side or both. I once made the mistake of saying that topdressing helps to level a soccer field. We all know a soccer field cannot be level. Smooth yes, flat yes, level no.

Many, if not all lasers have a sight, typically on the top of the laser. With it, you can sight along a straight line to establish the X axis. An example would be to set the transit up directly above the apex of home plate and site down a foul line to the foul pole. This line would typically be considered the X axis. With a single plane laser this line (axis) would have to be level. If you want a certain slope perpendicular to the foul line such as toward the dugouts, you could adjust the Y axis to whatever percent slope you want.

Since the laser beam travels 360 degrees in a complete circle, you could mark the proposed elevation at the front of the dugout and also mark an elevation for the pitching area as long as the same slope is desired in both directions. If a different degree of slope is desired, you could readjust the Y axis in either direction. The downhill side of the axis is negative (-)Y and the uphill side of the axis is positive (+)Y.

The only difference between a single plane laser and a dual plane laser is that with a single plane laser, only the Y axis is adjustable. With the dual plane laser, both the X axis and the Y axis are adjustable. So, in the example, if you want a 1% slope (downhill) from home plate to first base you can set the X axis at -1% and if you want a .75% slope (uphill) to the pitching area you can set the Y axis at +.75.

The cone laser creates a conical grade. This transmitter has the ability to bend the laser beam either up or down with the transmitter always being positioned at the center of the cone. A conical grade is used when an infield is graded from a central location between the bases out in all directions, typically creating a grading plan with all the bases at the same relative elevation. With many cone lasers adjusting the X and Y axis can tilt the cone forward, backward, left or right. Adjustments like this may be necessary to match existing perimeter grades.

Laser grading is a combination of technology and operator ability. Never take for granted that because an infield is laser graded that it is graded effectively.

One very important fact to keep in mind is that regardless of how accurately the operator can grade an infield, it is still at the operator's discretion how to set up the laser and how to tie into the existing elevations surrounding the infield. **Laser grading is a combination of technology and operator ability**. Never take for granted that because an infield is laser graded that it is graded effectively.

Of these four types of lasers, due to their versatility, only the dual plane laser or the cone laser is normally used in combination with automated blade control equipment.

Typical laser grading equipment can either be a single mast or dual mast system. A single mast system is the least expensive and has a single receiver typically mounted in the center of the blade. The receiver controls the blade by either lifting the entire blade or lowering the entire blade.

A dual mast system is more expensive and has two receivers with one receiver

mounted on either end of the blade. By controlling each end of the blade individually, a dual mast system can grade in any direction relative to the slope with equal efficiency and accuracy.

Using manual controls on a dual mast system, the operator can go from automatic to manual with either the left or right side of the blade and adjust the blade higher or lower than the elevation determined by the transmitter without leaving his seat. This comes in handy when multiple passes are necessary to reach the finished elevation or when it is necessary to make minor adjustments when matching existing perimeter elevations. Manual overrides are also provided on single mast systems.

A laser receiver can also be used simply as a visual reference when grading an area without the use of an automated blade control system; the receiver is mounted directly over the cutting edge of the skid steer bucket. The receiver has a series of flashing red and green lights that tell the operator if the bucket needs to be adjusted up or down or if the cutting edge is on grade.

Note: individual transmitter functions vary by model and manufacturer.

As they say in the golf industry, "the proof is in the putting." ■

Jim Hermann, CSFM, is president of Total Control Inc. Athletic Field Management, www.totalcontrolinfields.com.

>> **BELOW TOP:** New field in Omaha, Fall 2010.
>> **BELOW BOTTOM:** Werner Park in Papillion, NE, 2011 season.

Building two new fields in 3 years

BEING PART OF A NEW FIELD CONSTRUCTION can be looked at as either a blessing or a curse, however, once you catch the bug and have the opportunity to build one you may want to do nothing more but do it again. I looked at it as a chance to attain the elusive "perfect" field. I know it's impossible and that's what keeps me humble yet coming back for more.

I oversaw the installation of Parkview Field in Fort Wayne, IN (Single A affiliate of the San Diego Padres) in 2008, and then the install of Werner Park in Papillion, NE (Triple A affiliate of the Kansas City Royals) in 2010. Taking care of a 5 or 10-year old field is one thing, that's common, but there's not a text book or established management plan for a new one. The best thing you can do is talk to people who have done it before.

Much like custom building a car before it's rolled off the assembly line, I was lucky enough to be brought on board during the install process and have input, which is often times not the case in the minor leagues. All of a sudden you start thinking about changes you want and not problems you inherited. When it will make your job easier and your crew more efficient, go for it. I'm not talking about asking for heat or an air system, but simple things like quick connect locations, ¾-inch hose connections like I have in my bullpens, or infield and

warning track cutout sizes. We intentionally offset the mound radius and made it larger in Omaha to minimize wear for our extra high school games. It may not be a cure all, but every little bit certainly helps.

Irrigation design is also a key importance. Most designers submit a neutral layout because everyone has different preferences. Head layout is extremely important especially on your infield grass and foul territory because a couple feet from center either way and your cutouts will always be wet. I also try to have the installer keep heads away from player locations to reduce a bad hop but also for maintenance. If I'm resodding or aerifying behind where the second baseman or shortstop plays, I don't want a head right there.

I prefer to manufacture or fix anything we can in-house which means we have a lot of tools and the same goes with our irrigation. Our remote controller for the system is such a time saver for locating heads (especially before aerifying) and running cycles without having to go to our controller located in center field. Along with that are our infield skin zones; I know the coverage is not always perfect, but it has benefits. We use it when the team is out of town to keep moisture in the skin, since the wind can wreak havoc if it dries it out, as well as between lower level games. High school doubleheaders are tightly scheduled and sometimes the only way to water is to turn on those zones for a minute or two; it's better than nothing.

Another thing is to know your material specs put in place by the field designer and to be approachable. Get a feel for how things should look and be installed and go from there. The better relationship you have with everyone involved from the general contractor to every subcontractor, the easier they will be to approach and talk about changes, but keep in mind the domino effect. It's hard to change one thing, whether it's an elevation, home plate diameter or pipe size, without that changing other things down the line, so talk it out with everyone.

Understanding what materials are being installed helps with the design but also the maintenance. My track material on both fields was a higher maintenance crushed lava material. As I came to find out, that meant extra watering and constant grading and dragging to maintain the negative slope for drainage. I understood that early enough and was able to purchase a large enough box grader and laser setup that not only allowed me to constantly work the warning track, but also allowed me to grade my infield skin whenever I needed. This multi-use need helped me sell the purchase to management.

Taking pictures is the single best way to document the install and have some sense of assurance on what's below once it's covered up with sod and clay. I don't love to read, let alone take the time to write, but taking pictures tells a much greater story and says everything without saying anything.

Taking pictures is the single best way to document the install and have some sense of assurance on what's below once it's covered up with sod and clay. I don't love to read, let alone take the time to write, but taking pictures tells a much greater story and says everything without saying anything. It allows you to look back, compare and see many things that may have been missed on installation such as buried valve and drain boxes, head locations, even how the field drained before the sod was laid.

All contractors will tell you "We want you to be happy" or "If you're happy, then we did our job", so make sure you are happy. The potential problem with that is being too nice. Don't settle for "that will do" or "I'll fix it later", it will come back to bite you. I did a terrible job about this on my first field and a little better job (emphasis on little) the second go around. Don't make more work for yourself that you won't have time to perform in the spring. It's under-

>> 2011 CREW for Omaha Storm Chasers. Left to right: Matt Kozeal, Gavin Cordaro, Roger Bettmann, Mitch McClary (head), Noah Diercks (assistant), Andrew Miller, and Troy Lorenz. Intern George Powell is not pictured.

>> **2010 CREW** for Fort Wayne TinCaps, L to R: Adam Basinger, Greg Slee, Keith Winter (assistant), Dave Joest, Mitch McClary (head).

standable that the fine detail work may not be just how you want it, but edging, mound and plate construction, even infield skin grading should all be written in the specs and finished to a game-ready condition.

Sod is down, the infield is graded and mounds are built so now what? Depending how far along your budgeting and equipment process is this becomes a great time to get a feel for the field and equipment. If possible have everything lined up and see if it's possible to have the field handed over that fall. This is a great time to get a relationship with equipment dealers, demo their equipment and see what you like. It is also time to begin your fertility and fungicide program and get a feel for the products and the field.

All of this being said, don't lose sight of one of the most important areas of the whole job, the maintenance shop. By this time I'm sure your new home has been promised for completion 2 months ago, but keep at it. Many times the importance of this area and the timeframe it's needed in is overlooked. Just like irrigation is needed before sod is laid, the maintenance shop is a key part for prepara-

>> **OPENING DAY** in Fort Wayne, April 7, 2010.

tion, organization, and storage before the season.

Attic stock materials may be built into the specs but storage of them is not. The last thing you want is $5,000 of loose materials sitting outside on a construction site getting contaminated. Plenty of work will need to be done come spring time and the last thing you will want is a disaster of a shop and materials when games start in the spring.

I faced this in Fort Wayne when the shop was promised in November and we finally were able to move equipment in 2 days before the team came into town in April for workouts. You make do, you get by and hopefully if there is a next time you've learned the importance like I did this time in Omaha. Everything goes so much smoother and more efficiently when you have organization, no matter what the setting is.

There will always be challenges on every field, new and old, but the more you know about your field the better prepared you can be to keep an issue from turning into a disaster. Relationships are key in this industry and just about everyone is willing to talk and help out, as long as you are willing to ask. Don't make that the hardest part. ■

Mitch McClary is head groundskeeper for the Omaha Storm Chasers.

Sports turf management sustainability in the transition zone

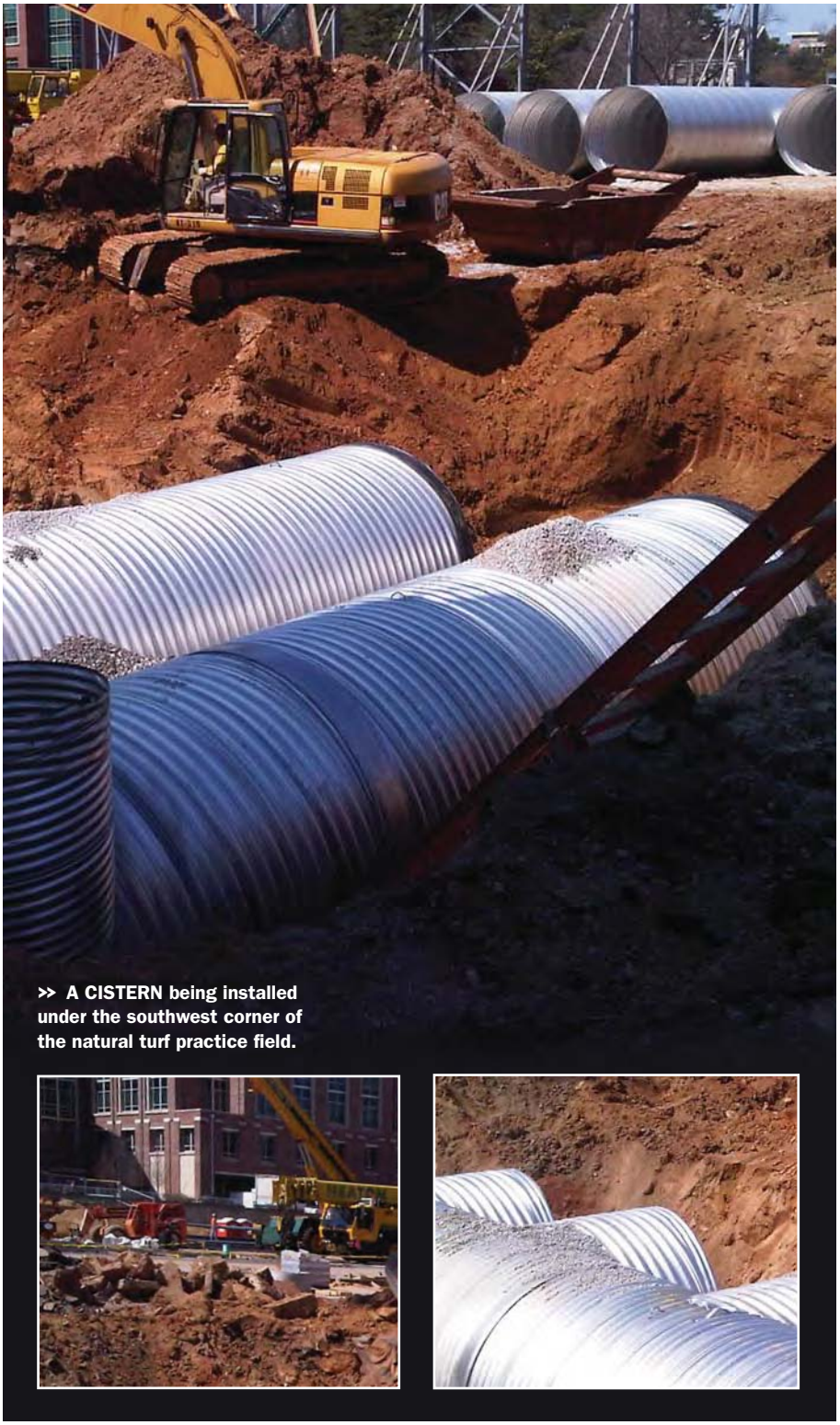
SUSTAINABILITY in sports turf management is a topic that covers a vast amount of territory, and can be as complex as an in-house biodiesel production facility or as simple as recycling cardboard. Both are steps in the right direction, but how can we improve?

Certainly the public is looking at all areas of industry and demanding more environmentally friendly methods of doing business. Ironically, many environmental activists have targeted the turf industry, especially golf, as enemies of the environment. However, as sports turf managers, this push toward sustainability is an opportunity for us to promote our industry and show that we were green before Green was cool.

For example, the October issue of *SportsTurf* magazine had in informative section on storm water management. A simple shift in perspective could view sports turf managers as protecting 2.8 million acres of *filter media* rather than contributing to 2.8 million acres of runoff-producing development.

One of the hottest topics in the world of sustainable agriculture/turf is water usage. Unfortunately, many people in the transition zone have come to view a green field during the summer as quite possibly a bad thing because of the water required to maintain that field. The reality is that the water used to maintain a field is paying dividends by providing erosion control (as mentioned above), a carbon diox-

The reality is that the water used to maintain a field is paying dividends by providing erosion control (as mentioned above), a carbon dioxide scrubber, an oxygen producer, and last, but not least, a venue for entertainment.



>> A CISTERN being installed under the southwest corner of the natural turf practice field.

ide scrubber, an oxygen producer, and last, but not least, a venue for entertainment.

That being said, there are things that we as an industry can do to become even better stewards of the environment, and hopefully begin to change public sentiment about what we do. Start by following BMPs for water management. Also, consider reducing the input to common areas and some fields that may not be your highest profile sites. Install basic controls that stop irrigation due to rain. This last one should be a no brainer at this point, but recently I witnessed an athletic site being irrigated in the rain. Ouch. Consider stepping up to a central control type system that can both help you water most efficiently and also closely monitor usage.

Another idea is to incorporate plant growth regulators (PGRs), specifically trinexapac-ethyl, into your maintenance program. The use of PGRs is widespread in the golf community; however, there has been more hesitancy to embrace this family of chemicals in the sports turf world. This is certainly understandable as wear patterns in golf and sports are vastly different. Further complicate this with tiny grow-in windows (specifically from overseeding stress/damage) and the idea to use something that "slows" the plant down is counterintuitive.

The reality is that trinexapac-ethyl reduces the plants' vertical growth and elongation while promoting turf density and turf quality by stimulating growth of other plant parts such as stolons, rhizomes, tillers and roots. These deeper roots and denser turf can reduce water usage by up to 25%.

A growing trend among colleges and some school sites is to build water retention sites that collect water from a variety of sources including air conditioning condensate. Last summer at Georgia Tech we installed a third such system on our athletic properties. The campus has also installed several cistern systems and plans to expand the use and installation of them as part of the Institute's larger initiative to strive for LEED certification on all new construction. The concept is quite simple in that a site collects water in anything from tanks to ponds and then uses a pump to irrigate with the collected water.

The system installed at Georgia Tech's practice field in the summer of 2011 is 280,000 gallons and collects water from the 93,000-square foot roof of the Brock indoor practice facility, the 75,000-square foot natural grass practice field adjacent to the building, and the surrounding hardscape (see photo). Interestingly, the cistern at this site is also tied to a campus cistern that collects condensate water from the Ford Environmental Science & Technology Building. Due to this cistern's central location, it is able to provide irrigation water for the track, practice football, and baseball fields. The other two cistern systems are located at Grant Field (stadium football) and the Shirley Clements Mewborn softball field.

Although the water retention concept is quite simple, the reality is a bit more complex. If your facility is looking at installing a cistern system, be prepared to do some homework and provide some data about your specific needs to the system designers. Some obstacles to potentially overcome is how to provide water for small volumes from either a garden hose or small ornamental spray zone all the way up to a multiple rotor zone with heads capable of irrigating at 25gpm+ each.

Also, prepare for the inevitable—running out of water and/or system failure—in which case you will want a readily available back up water source. Be aware that any weakness in your current system may be quickly exposed when dealing with fluctuations with pump driven water if previously on a city source. Do not forget to alert your user groups to the change over from city water to city cistern water, which should be generally good public relations.

Obviously, there are multiple benefits from a cistern system, but it will not be without expense and some of your time as well. They do bear some monitoring compared to a city supply. This is especially true as you are learning/debugging the system, but eventually this will level out. In the long run it is likely that your initial installation expense and maintenance expenses will be offset by the savings in city water.

CARBON FOOTPRINT

If water usage is a hot topic in the world of sustainability, then fuel usage and carbon footprint is certainly a close second. There is only a limited amount we as sports turf managers can do about this until more advanced technology is available. In the meantime, we can make sure our equipment is properly maintained and running efficiently. Once again, consider the use of PGRs. As mentioned above, the water savings from improved rooting and density could be enough to encourage the use of a PGR, but what PGRs are really most known for is their ability to reduce mowing. There is the po-

>> THE NEW INDOOR FACILITY, the baseball field, Rosebowl football practice field and, in the far back behind the blue wall, the track. All of these can now be watered from the cistern system.

tential for a substantial amount of savings in both labor and fuel by mowing 2-3 times a week rather than daily, to say nothing of the reduction in emissions.

From personal experience, we were having some stress on our fields due to clean-up passes occurring with regular daily mowing. When we got on a Primo program, it allowed us to skip some clean up passes and thereby reduce the mechanical stress on the turf caused by frequent mowing. I will also admit that I was skeptical at first of using a PGR, but have now incorporated them into our agronomic program. Finally, consider ways to potentially reduce the maintenance to non-essential or common areas.

A much more dramatic approach to the fuel and emissions issue is to use bio-diesel. Many equipment manufacturers are offering machines that are bio-diesel ready, making it easier to transition into this fuel source. Westminster Schools here in Atlanta has taken bio-diesel use to the next level by producing their own fuel from cafeteria waste oil. Not everyone will have the capability or even a cafeteria on their site from which to make fuel, but it is a sign of the good things that are happening in our industry to make our green industry greener.

My personal favorite sustainable turf management practice is to simply recycle all the cardboard I come in contact with, even if it was not generated by me or my department. Sure it takes a few more minutes to break down a box and transport it to a recycling area especially when the convenience of a dumpster is all around, but it is the right thing to do. I like to follow a similar practice with pallets. More than likely, there is someone in your area in a ratty truck that will gladly collect them. Not only will you have recycled your pallets, you will have provided for someone willing to go out and do some work. Another idea is to collect your pallets in-house and take them in on a rainy day. Divvy up the money among the crew or have a pizza party, whatever. Recycling triple-rinsed empty 2.5g containers is yet another simple but helpful and smart sustainable way to practice sports turf management.

These last ideas are neither radical nor glamorous, but they do make and impact and most importantly, anyone can do them. Ultimately, to practice sustainable turf management does not require a fancy cistern watering system or a bio-diesel producing facility. It does require some common sense and a little effort. ■

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