PLANTING A TREE
_in the_ Lawn and Landscape

The Three Keys
to Successful Sports
Field Management

_Between the Lines —_
Field Safety Update from
Penn State’s Center for
Sports Surface Research
“The Penn State Golf Course Turfgrass Management Program is the foundation of my career as a golf course superintendent.”

Paul Latshaw, MSM, CGCS
Muirfield Village Golf Club

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Greetings PTC members, friends and colleagues! I trust that you have all dug out and dried out from another chilling winter season and your focus is now preparing your golf courses, athletic fields, landscapes, nurseries, parks, arboretums and school grounds for summer’s big venues.

As we are well into the 2016 season, I want to first take a moment to provide an update on the PTC and the accomplishments that we achieved in 2015. Increasing membership, providing exceptional educational learning opportunities and financially supporting green industry peers were the Board’s top priorities. Memberships have grown to over 300 at the conclusion of 2015 with more applications submitted during our winter conferences. Our educational conferences continue to attract hundreds of green industry professionals across the region. All conferences held during the 2015/2016 winter season were well attended and well received. The PTC Board was glad to make a donation to the Dr. Joseph M. Duich scholarship fund, gift $50,000 to the turf project at Penn State and award four student scholarships, two in the spring and two in the fall semesters.

In my most recent newsletter, I encouraged all to utilize our PTC network including members, council and our world class turf team at Penn State to assist in your planning efforts for the 2016 season. My hope is that as a member of PTC you continue to find value in our well-connected network to help you overcome any hurdles that you may face, network and share ideas with fellow peers and to seek leading edge research that benefits the entire green industry.

The PTC has many exciting events and opportunities on the 2016 calendar. If you were unable to attend an educational conference over the winter season, please mark your calendars and attend the upcoming Penn State Field Days, August 10th and 11th held at the Joseph Valentine Turfgrass Research Center.

Finally, please take the time to share this publication with your friends and colleagues. I thank you for reading this update and for your continued support of the PTC. If I or the PTC can help you in any way this summer, please do not hesitate to contact me (610-451-3229 or andrewd@berkshirecountryclub.org) or the PTC office (814-237-0767 or info@paturf.org).

Respectfully,
Andrew Dooley
2015–2016 PTC President
2015 Golf Turf Conference

The 2015 Golf Turf Conference was once again a huge success and continues to serve as one of the best golf turf educational programs in the country. With record-breaking registration numbers, participants learned about many topics from technology to preparing for a Senior Major to dealing with the latest agronomic issues. Dr. Cale Bigelow from Purdue University spoke to a packed room in his pre-conference seminar about annual bluegrass management while Dr. Kevin Frank from Michigan State lead a discussion on winterkill issues that have plagued many golf course superintendents in Pennsylvania for the past two years. In addition to the education, the Pennsylvania Turfgrass Council awarded the George Hamilton Distinguished Service Award to Dr. Turgeon. This year’s conference was a great success thanks to our speakers, our attendees and of course all of our sponsors. We look forward to seeing you November 15–17, 2016!

2016 Western PA Conference and Trade Show

The Western Pennsylvania Turf Conference and Trade Show was on held February 23–25, 2016 at the DoubleTree by Hilton in Monroeville, PA. The location of the conference was changed from its previous location at the DoubleTree by Hilton in Cranberry, PA due to renovation to the hotel and conference area.

The conference consisted of morning and afternoon education sessions for golf courses, athletic fields and the lawn and landscape industry on the first two days. The morning session on the third day was geared toward the golf course industry. Pesticide credits were given in several categories during the education sessions. GCSSA continuing education credits for Golf Course Superintendents were also awarded.

The trade show was held the first two days of the conference. Thirty vendors utilized 35 tabletops to display their product information. The two highlights of the trade show were the Social Reception, sponsored by the PTC, and the Silent Auction. The Social Reception was held at the end of the first day education sessions. The reception gave the vendors and attendees an opportunity to interact in a relaxed atmosphere.

The Silent Auction concluded on the second day of the conference. We thank all those that donated and participated in the Silent Auction with the proceeds supporting Penn State Turf Research.

The attendance for the three days of the Western Conference exceeded 725 people. The site and date for the 2017 conference will be determined and announced at a later date. We thank all that attended the 2016 conference.

2016 Northeastern PA Conference and Trade Show

On January 28, the Penn State University Turfgrass Project and the PTC hosted another popular turfgrass conference at the Woodlands Inn in Wilkes Barre, PA. Attendance topped 290, and vendor support was strong for the event yet again, with over 20 tabletop exhibits. It was nice to see so many Pocono Turfgrass Association members in attendance. The golf session had a great slate of speakers, including Dr. Doug Linde of the Delaware Valley University and Mr. Elliot Dowling of the USGA. PSU faculty also spoke, including Dr. Pete Landschoot, Pesticide Education Program director Dr. Kerry Richards, Dr. Mike Fidanza, and Mr. Danny Kline. A big thanks goes out to all those involved in holding this event. Thanks for all the vendor and attendee support over the years! See you next year!

2016 Big TV Give-Away at Eastern PA Turf Conference

By Mike Fidanza, Ph.D.

On January 5–6, 2016, the Valley Forge Casino Resort, in King of Prussia, PA, again hosted a successful and well-attended Eastern Pennsylvania Turf Conference and Trade Show. Great speakers covered great topics, from Pythium to pollinators, from turf bugs to turf practices, from sports turf management to the turf year-in-review, from pesticide record keeping to pesticide safety, and much more. There was excitement on the Trade Show floor as Lawn and Golf Supply (Phoenixville, PA) and Ventrac (Orrville, OH) oversaw a big screen TV give-away. Thank you to all of our industry partners, sponsors, supporters, speakers, and attendees for making “The Eastern” a big success!

Andy Barone (left) from Ventrac, and the winner of the 55” TV, Brandon Snyder (right). Photo by Bill Corcoran from Lawn and Golf.
Planting a Tree in the Lawn and Landscape

By David Sanford, Ph.D., Associate Professor of Ornamental Horticulture, Penn State University – Berks Campus and Michael Fidanza, Ph.D., Professor of Plant and Soil Sciences, Penn State University – Berks Campus

A typical residential landscape is host to a diverse group of annual and perennial plants, including turfgrasses, trees, shrubs, ornamentals, and herbaceous perennials. Trees being the most long-lived and having a significant impact on the landscape, typically require the most care in selection and proper planting. There are a series of steps or guidelines, therefore, to carefully consider when planting a tree.

(1) Select the right tree for the right site.
What are the environmental conditions at your planting site? For example: shade; poor drainage and excess soil moisture; well-drained and good soil infiltration; good air movement; sandy, clay or loam soil; or front, side or backyard location? How big or small a tree do you want? Remember that over time, a tree will grow and reach its mature size. If you want a tree that doesn’t grow taller and wider than 30’ in height, like a flowering dogwood, then don’t plant an oak that will grow well beyond that size (Table 1).

(2) Don’t forget good pre-planting care.
You just purchased your tree, now what? Until it’s planted, keep the tree in a shaded, cool place, and don’t forget to keep the root ball moist. Handle the root ball carefully to avoid any root injury.

(3) Remove anything attached to the tree’s stem.
Remove any labels, wires, or string attached to the tree’s stem. This may

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**Table 1. Examples of some common trees that are considered favorable for certain environmental conditions in Pennsylvania and the Mid-Atlantic region.**

<table>
<thead>
<tr>
<th>Tree Species</th>
<th>Size at Maturity (height x width)</th>
<th>Wet</th>
<th>Moist</th>
<th>Dry</th>
<th>Pests / Acid Soil Tolerant</th>
<th>Shade Tolerant</th>
<th>Insect / Disease Tolerant</th>
<th>Native</th>
</tr>
</thead>
<tbody>
<tr>
<td>Swamp White Oak (Quercus bicolor)</td>
<td>50–60’ x 50–60’</td>
<td>G</td>
<td>G</td>
<td>P</td>
<td>Y</td>
<td>F</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Red Maple (Acer rubrum)</td>
<td>40–60’ x 30–50’</td>
<td>G</td>
<td>G</td>
<td>F</td>
<td>Y</td>
<td>G</td>
<td>G</td>
<td>Y</td>
</tr>
<tr>
<td>Heritage River Birch (Betula nigra ‘Heritage’)</td>
<td>40–60’ x 30–40’</td>
<td>G</td>
<td>F</td>
<td>P</td>
<td>Y</td>
<td>P</td>
<td>G</td>
<td>G</td>
</tr>
<tr>
<td>Flowering Dogwood (Cornus florida)</td>
<td>20–30’ x 20–30’</td>
<td>P</td>
<td>G</td>
<td>P</td>
<td>Y</td>
<td>G</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Kousa Dogwood (Cornus kousa)</td>
<td>20–30’ x 20–30’</td>
<td>P</td>
<td>G</td>
<td>F</td>
<td>Y</td>
<td>F</td>
<td>G</td>
<td>N</td>
</tr>
<tr>
<td>Winter King Hawthorn (Crataegus viridis ‘Winter King’)</td>
<td>20–25’ x 30–35’</td>
<td>F</td>
<td>G</td>
<td>G</td>
<td>—</td>
<td>P</td>
<td>G</td>
<td>Y</td>
</tr>
<tr>
<td>Black Gum, Black Tupelo (Nyssa sylvatica)</td>
<td>30–50’ x 20–30’</td>
<td>G</td>
<td>G</td>
<td>F</td>
<td>Y</td>
<td>G</td>
<td>G</td>
<td>Y</td>
</tr>
<tr>
<td>Silver Linden (Tilia tomentosa)</td>
<td>50–70’ x 30–40’</td>
<td>P</td>
<td>G</td>
<td>F</td>
<td>—</td>
<td>P</td>
<td>G</td>
<td>N</td>
</tr>
</tbody>
</table>

G = good; F = fair; P = poor; Y = yes; N = non-native

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**Cover Story**
seem like common sense, but it’s important not to forget this step. If not, a few years from now, the tree can be girdled due to these restricting materials.

(4) **Dig a hole that is shallow and as wide as possible.**

After you have selected the proper tree for the site, and have identified the exact spot the tree will be planted, you can dig the hole. Many times planting holes are not dug wide enough or are dug too deep. You first need to determine where the root collar is located (the location of the first root coming forth from the trunk). The planting hole should be dug no deeper than the distance from the root collar to the bottom of the root ball and in poorly drained sites even slightly less deep. The diameter of the planting hole should be at least twice the diameter of the root ball, and even wider is better, especially in poor soils. It is important that the root ball sits on undisturbed soil so never dig deeper than necessary.

**Don’t forget to remove (5) the burlap, plastic pot, or wire basket the tree comes packed in.**

If the tree is in a container, remove it and examine the root system. If there are spiraling or wrapping roots, these need to be cut to prevent them from causing long-term damage to the tree’s health. Also look for girdling roots wrapped around the trunk and these must be removed or they will eventually girdle the tree. If the plant is balled and burlapped, the tree should be placed into the hole with the basket still surrounding the root ball, and then removed. Sometimes it is difficult to remove the wire basket completely. In such situations you need to remove the top couple rows of the basket so they will not interfere with the tree’s root growth. The lower portion of the basket can remain in the hole to protect the root system. Any twine and burlap should be removed from the top portion of the root ball. There are two types of burlap that are commonly used, one is synthetic and will not decompose so it must be removed from the ball. The natural burlap only needs to be folded down into the hole. Note: if unsure, use a flame to see if the burlap is
synthetic or natural; the synthetic will melt where the natural will burn to ash.

(6) Place the tree into the hole and backfill with native soil. In most situations it is best to backfill with the soil that came out of the planting hole. Roots should readily grow into this backfill and into the surrounding soil during establishment. Only if the soil quality is very poor, and contains high amounts of clay or shale or sand, consider adding some form of organic matter. In this case, add only up to 20% organic matter to the backfill soil.

(7) Do not fertilize for 1–2 years. Also, do not cut back the crown of the tree. For the first and second years, trees need to put their energy into developing good roots so it is best not to fertilize newly planted trees during this time. High fertility levels during tree establishment will often just stress a tree, as it will stimulate top growth rather than root growth. Also limit any pruning to just correcting structural problems or to removing broken or damaged branches. Over pruning will stimulate top growth and further stress a newly planted tree.

(8) Water. It is essential that you don’t forget to water the newly planted tree. This may seem like common sense, however, watering newly planted trees is the number one issue when it comes to survival and success. The amount and frequency will depend on the type of tree planted as well as the soil type at the planting location. A container grown tree will often require more frequent watering than a balled and burlapped tree. Sandy soils will require more frequent watering than heavier clay soils. The tree should be watered at planting and throughout the first growing season up to the time the ground freezes. A minimum of 1” of rain per week is required. When
supplemental irrigation is required to meet the tree's needs, a good rule of thumb is to provide 2 gallons of water for each inch of trunk diameter measured 6” above the root crown. Water slowly so the water reaches the roots that are 6–12” below ground.

(9) Mulch.
After watering, probably the most important thing you can do for your newly planted tree is to apply a layer of organic mulch at a depth of 2–4” over the entire tree’s root zone area. Avoid the ‘mulch volcanoes’ and keep all mulch back and away from the trunk by a couple of inches. A layer of mulch will reduce soil compaction, keep mowers and trimmers from damaging the trunks, and help maintain soil moisture. Additionally a large mulch area will reduce grass competition, which will enable a tree to establish itself faster.

(10) Wrap and stake — but only if necessary.
Trunk wraps should only be used if necessary. Some thin-barked trees may need winter sun protection for the first year. Also if deer rubbing is a problem in the area, utilizing one of the plastic, expanding tree wraps may provide some protection. Most trees do not need staking or support after planting. Staking can interfere with the tree’s normal development if done too tightly and can girdle the trunk if left on too long. If trees are planted on slopes, in windy locations, have poor root systems, or have dense leaf canopies, you may need to stake the tree for one year.

In conclusion, selecting the ‘right tree’ for the existing conditions and installing the tree by following proper planting techniques will help you to avoid extensive maintenance issues and serious problems later. The long-term life of a tree is often determined by the proper selection and planting decisions made at the onset and as it settles into its new home.

The three keys to successful sports field management: DRRAINAGE, DRRAINAGE, and DRRAINAGE!

By Andrew McNitt, Ph.D., Professor of Soil Science, Penn State University

Is it surface water or subsurface water. Surface water is defined as water that falls on a slope, runs down hill, and then collects in low areas because the percolation rate of the soil is low. Surface water drainage issues are the most common on sports fields. Subsurface water is due to a high water table and discussion of such is beyond the scope of this article.

So if someone has a surface water problem like that pictured in Figure 2, it seems like their first approach is often to dig a trench, install 4 inch corrugated PVC pipe, wrap the pipe with gravel, and maybe a geotextile fabric, and then backfill the last 6 or so inches with soil so they can grow grass (Figure 3). This process might help at first but soon that soil over the trench is again compacted and water only enters the pipe when the soil is completely saturated. When not completely saturated, but still really wet, water would prefer to move around the trench. See the video http://bit.ly/1TPKcMr at time 21:39.

The best way to drain surface water is to move it off the surface with slope. That’s why we crown fields. Remember, you want your high-wear areas to be high and dry. Don’t lean a field from left to right as shown in Figure 4. Water that falls on the upper sideline will have to move the entire way across the surface. The high wear areas will quickly become a quarter inch lower than the surrounding areas, hold water, and the field will look like the one shown in Figure 5.

You want to move the water the shortest distance possible and keep your...
The highest wear areas (between the hash marks) high and dry. Its amazing how mediocre the maintenance can be on a field with a strong crown and the surface can still perform well (Figure 6). On the other hand, it doesn’t matter how many resources you throw at a poorly drained field—it typically performs poorly.

One question is how much of a crown is required? I use the adage I got from Dr. Norm Hummell… “one percent is not enough.” I agree. I think you should shoot for at least 1.5%. Realize that the soccer coaches will push back on the crown. They prefer a flat field. There has to be some compromise. The soccer coach likely can’t look at a field and tell you whether it’s a 1% or 1.5% crown. They just remember that field we’ve all seen where you can only see the players on the opposing sideline from the waist up. Take a group out to a field that only has a 1% slope. Tell them it’s a 1.5% slope, and then build to a 1.5% slope, because by the time it’s built they won’t remember what the first one looked like.

If you’re going to backfill with soil, don’t bother with under-drains. In this case they are a waste of scarce resources. Eighty percent of your compaction happens in the top 3 inches of the soil. Once that surface becomes compacted, little water will travel through the soil and into the pipe. You may want to provide some collectors along the sidelines, well out of play but drains under the field itself are not effective at removing surface water if the surface of the trenches are backfilled with soil. This also applies to installing drain pipe or gravel below the skinned section of a baseball or softball infield. Water will not move through the infiel material at a rate sufficient enough to drain surface water. Thus your under-drainage will be ineffective.

While regrading, and likely resodding, are the best way to drain surface water, slit trenching can be effective if installed correctly and properly maintained. Many brands exist and while I will list a few (Sand Grid, Water Wick). There are many effective brands not listed.

There are several key points that will help make these systems effective. First, the slit or trenches must be backfilled with a quality USGA spec. sand or other coarse aggregate all the way to the surface.

Second, the trenches must be installed perpendicular to water flow, not parallel. Notice in Figure 7 that the workers are installing the trenches across the field. Since this field had a slight crown, these trenches are being installed parallel to water flow and this limits interception of water. While an endzone to endzone design might be preferred, we would allow the herringbone system shown with collectors running up the sidelines.

Third, there needs to be an outlet. The water needs somewhere to go. Just putting sand in a hole in the ground won’t make the hole drain. Without an outlet the hole will fill up with water. Figure 8 shows a 2-inch corrugated pipe being installed in one direction. This pipe connects to a collector that either daylights or is connected to a storm water system.

Lastly, and this one seems to be missed the most, you have to maintain these open drain lines. If you aerate and drag the cores back into the turf, you will eventually clog the sand or coarse aggregate and lower its drainage potentially. If you do nothing, decayed thatch, dust, and other plant material will eventually clog the sand. In fact, if you are going to install a slit drainage system, I strongly suggest you immediately begin a sand topdressing program and any time you aerate, harvest or pick up the cores and fill the holes with USGA sand. Again, you may want to refer to the link on sand cap systems provided above.

So, there are no shortcuts. Establishing a strong crown and likely resodding is the best long-term solution for your surface drainage issues. One quick hint: if you are going to regrade, mix in some high quality compost (you can find info on high quality compost at ssrc.psu.edu under the resources link). If you want to move onto a much higher level of maintenance, field care, and hopefully higher field quality, think about a sand cap installation with some type of open coarse aggregate drainage. bit.ly/1T6D7bq
Research Summaries

Genetic Diversity and Host Adaptation of the *Sclerotinia homoeocarpa*

Our research has focused on detection methods and genetic diversity of the pathogen causing dollar spot of turfgrass, *Sclerotinia homoeocarpa*. Detection methods for both conventional and quantitative PCR have been validated. The genetic diversity of isolates of *S. homoeocarpa* collected in the Eastern U.S. has also been a major focus of my research. My findings have concluded that there are two genetically distinct types of isolates causing dollar spot of turfgrass: Type I and Type II group isolates. Type I isolates are predominately composed of isolates collected from cool-season, or C3 turfgrass hosts. Type II isolates are collected solely from warm-season or C4 host species. This is consistent with recent literature, though prior work concluded this phenomenon was restricted to Florida and surrounding states. However, areas in the transition zone where the two host types are often grown in conjunction (i.e. bermudagrass fairways and bentgrass greens) have yielded some very intriguing results. Host types are often located within several yards of one another, and the pathogen appears to have a “preferred” host type in areas found throughout the transition zone. Instances in my research have shown this occurs as far north as Virginia. As a result, I have investigated the ability of these isolates types to incite disease on the alternate host type from which they were collected to determine if these isolates are host specific or host adapted. In the absence of the “preferred” host, isolates of *S. homoeocarpa* (regardless of group type) incite disease, and this suggests that *S. homoeocarpa* is host adapted (meaning it is not specific to a particular host type). Preliminary inoculation studies have shown that C3 isolates cause a greater amount of disease on bermudagrass, than they do a preferred cool-season host such as creeping bentgrass. These findings are significant, as the movement of bermudagrass continues a trend further north. Implications of this movement may result in increased dollar spot of bermudagrass than observed in southern states. For more information contact Brian Aynardi at baa5001@psu.edu or Dr. Wakar Uddin at wxu2@psu.edu.

Update submitted by Brian Aynardi, Ph.D. Candidate, and Dr. Wakar Uddin, Professor, Department of Plant Pathology and Environmental Microbiology, Pennsylvania State University

2015: The Year of Certified-Organic Product Evaluations

Increasing demand for field research that assesses turfgrass nutritional efficacy of certified-organic fertilizers and soil amendments reflects a growing interest in sustainable turf management methods among US consumers, clients, and governing agencies. While the USDA developed the organic standards, the non-profit Organic Materials Review Institute (OMRI) reviews fertilizer, pest controls, and numerous other inputs proposed for use in certified-organic production and processing. The extensive list of allowable fertilizers and amendments includes (but is not limited to); animal manures, hydrolyzed fish products, spent mushroom media, composts, black gypsum, and molasses; as well as zeolite, gypsum, azomite, limestone, potassium salts, and langbeinite that have been mined from natural deposits. The certified-organic soil fertility and nutrient management standard requires use of plant and animal materials to maintain or improve soil organic matter while preventing contamination of crops, soil, or water by nutrients, pathogenic organisms, heavy metals, or residues of prohibited substances. Despite the uncertainty to which this objective is readily achieved by inputs that often require greater application rates relative to conventional materials, field evaluation of allowable materials is a welcomed new component of turfgrass nutrition research at the Pennsylvania State University.

Update submitted by Max Schlossberg, Associate Professor, Turfgrass Nutrition, Center for Turfgrass Science, Pennsylvania State University
Congratulations to the 2016 graduating class of the two-year Golf Course Management Program!

- Matt R. Accardi
- Kyle J. Basehore
- Michael N. Bornstein
- Cory R. Bostdorf
- Nicholas R.B. Connolly
- David J. Cox
- Dylan R. Creighton
- John P. Falvey
- Kaegan M. Horvat
- Tyler M. Jackson

Congratulations to the 2016 graduates of the Penn State Turfgrass Science Program!

- Christopher J. Larson
- John P. MacPherson
- Luis Martinez
- Brígido B. Miguel
- Jeremy A. Nicholas
- Jonathan P. Pitoniak
- Robert J. Sicinski
- Ryan M. Wilkinson
- Brian M. Woods

Penn State Turfgrass Science Students took first in the 4-yr and second in the 2-yr division in the 11th annual STMA Student Challenge in San Diego, CA on January 21, 2016. Thirty-two teams competed in this year’s Student Challenge. The awards are presented in partnership with the SAFE Foundation and Hunter Industries and supporting sponsor Ewing. Through the generosity of SAFE, the Student Challenge provides the winning two-year team and the winning four-year team each with a $4,000 grant to fund a practical learning lab at their college or university. See the previous blog posting (http://www.personal.psu.edu/asm4/blogs/pennstateturf/2010/01/psu-turf-students-renovate-local-little-league-field.html) for information on how the students used past winnings.

Dr. Ben McGraw is in charge of training the students. The teams start in September and meet two evenings per week to study such things as irrigation, calibration, turfgrass and pest ID and control. Varying turfgrass professors, staff, and industry representatives provide guest lectures. “The students put in a lot of their own time. They are very dedicated and work very hard and I give them all the credit,” says Dr. McGraw.

Penn State was able to take 16 students to the National STMA Conference in San Antonio due in large part to the generosity of the Pennsylvania Turfgrass Council and the Keystone Athletic Field Managers Organization both of which donated funds toward the student’s travel expenses. Students were able to take advantage of many activities specifically geared to them including a student forum, student lunch, and many educational sessions.

Congratulations to the 2016 recipients of the Penncross Bentgrass Growers Association Scholarship:
- Rob Sicinski (Cert. 2016)
- Cory Bostdorf (Cert. 2016)
- Kyle Basehore (Cert. 2016)
- Ryan Wilkinson (Cert. 2016)
- Matt Accardi (Cert. 2016)

Congratulations to the 2016 recipients of the Penncross Bentgrass Growers Association Scholarship:
- Kyle Basehore (Cert. 2016), recipient of the 2016 Zimmerman Memorial Award.
- Kyle Basehore (Cert. 2016), recipient of the 2016 Joseph M. Duich Scholarship.
- Rob Sicinski (Cert. 2016), recipient of the 2016 Outstanding Student Alumni Award.
- Cory Bostdorf (Cert. 2016), recipient of the 2016 PA Turfgrass Council Scholarship.
- James Beebe (Cert. 1995) was just elected to the Canadian Golf Superintendents Association board of directors.
As we all know, injuries are an unfortunate part of sports. However, a proactive approach to field safety can help minimize injury risk. Routine surface hardness testing, maintenance practices, educating trainers and parents about the importance of shoe selection are all things that we can do to provide the safest fields possible. Because at the end of the day, the safety of the athletes using our fields is our number one goal.

We asked Tom Serensits, manager of Penn State’s Center for Sports Surface Research, for the latest news on the field safety front:

**KAFMO:** What are the current recommended practices to test for field safety?

**Serensits:** Most of the field safety testing is related to surface hardness. A field safety testing program starts with routine Gmax (hardness) testing. For synthetic turf, measuring infill depth is also an important test since it is closely related to surface hardness. If infill depths are low, there is a better chance surface hardness may be an issue. Turf manufacturers can give field managers the target infill depth range for their particular system. Once infill levels drop out of the target range, more infill should be added. Special attention should be paid to high-use areas and inlays for both Gmax and infill depth testing. Also, field inspections are important since they help identify playing surface hazards. The Sports Turf Managers Association has produced several videos on how to conduct a proper field inspection (see www.stma.org), and STMA also makes available field inspection checklists.

**KAFMO:** Is there any way to test for field hardness without a Clegg or ASTM machine?

**Serensits:** Both devices are ASTM machines. The Clegg test is described in ASTM F1702. The other device, known as the F355 device, is described in ASTM F355 and the testing procedure is described in ASTM F1936. While not directly measuring surface hardness, routinely measuring infill depth on synthetic turf fields can typically alert the field manager if hardness may be an issue. We know that infill depth is correlated to Gmax. So, if infill depths fall below a field’s target range, some of the cushioning is lost. At this point, it is best to have a Gmax test performed. If infill depths remain in the target range, more time can likely be scheduled between Gmax tests.

For natural turf fields, we know dry, compacted soil produces high Gmax levels. Routine core cultivation and other management practices that reduce soil compaction and promote healthy turf are the best ways to manage hardness.

**KAFMO:** Regarding your research, what kinds of cleats are recommended for specific types of surfaces?

**Serensits:** We do not recommend specific cleats. We have tested 40+ cleats on synthetic and natural surfaces. The results can be found at http://plantscience.psu.edu/research/centers/ssrc/traction-database. In general “aggressive” cleat patterns tend to stick in the turf more, which can put more stress on lower extremities.

**KAFMO:** What are you working on now at the Center for Sports Surface Research?

**Serensits:** We continue to test traction of new shoes as they come on the market. We are also evaluating and testing some of the “cold-tolerant” bermudagrasses such as Latitude 36 and Northbridge. We also continue to test multiple characteristics of synthetic turf such as surface temperature, traction, soccer ball roll/bounce, and surface hardness. We just wrapped up a graduate student study on preparing sod for in-season sod replacement (see www.sportsturfonline.com for an article on this study). ☺
Managing Surface Hardness

Natural turf, off-season.
Natural turf, off-season. Hollow-tine core cultivation (aerification) reduces soil compaction, a significant contributor to high Gmax. Large diameter hollow tines (up to 3/4”) at close spacing (1 to 2”) have the greatest effect. Field managers typically combine core cultivation, fertilization, and seeding. It is critical to allow for enough recovery time following this practice before the field used. A quality compost can be spread across the field before core cultivation. This typically produces a further reduction in surface hardness. Spread compost to a 1/4” depth and core cultivate to mix the compost with the surface layer. Compost should be tested before use to determine its quality. Compost should not be added to engineered sand-based rootzones.

Natural turf, in-season.
Less aggressive aerification procedures using small diameter solid tines (such as needle-tines) can provide temporary Gmax reductions without reducing surface stability. However, care must be taken as aggressive procedures will destabilize the surface, creating potential safety and playability concerns. Dry soil conditions can produce high Gmax levels. Proper soil moisture should be maintained.

Synthetic turf—measuring infill depth.
“Infill” is the material that fills the area between synthetic turf fibers and typically includes a mix of sand and crumb rubber. The infill absorbs impact energy and provides surface cushioning. Infill depth can be measured using an infill depth gauge that can be purchased for less than $30. These gauges are also known as fireproofing depth gauges. The target infill depth range for each field should be obtained from the turf manufacturer. Special attention should be paid to inlays, painted areas, seams, and high-use areas. If the infill depth is below the minimum amount, infill should be added by spreading a small amount, then brushing/dragging the material into the turf and repeating as often as needed. Monitoring and adding infill when needed routinely may prevent the need to outsource large-scale infill additions in the future. Proper infill depth also helps prevent premature breakdown of synthetic turf fibers.

Synthetic turf is not maintenance-free. Routine maintenance helps reduce surface hardness and should be performed according to turf manufacturer recommendations.

See these 2 documents:
http://plantscience.psu.edu/research/centers/ssrc/documents/gmaxnatural.pdf
http://plantscience.psu.edu/research/centers/ssrc/documents/gmaxsynthetic.pdf

Nancy Bosold Named Fowler’s Founder Award Winner

At KAFMO’s 20th Athletic Field Conference, held outside of Harrisburg February 19, Nancy Bosold was awarded the organization’s highest honor, the Fowler’s Founder Award for her service to KAFMO and the Pennsylvania turfgrass community. Bosold, who retired from the Penn State Extension program last year, was a long-time KAFMO Board member and spent more than 20 years educating the state’s turfgrass managers through field days, site visits, and other education opportunities.

The Fowler Founder’s Award is named after Don Fowler, former Penn State Extension agent who is credited with organizing the group of individuals who formed KAFMO. The award itself is one of Fowler’s worn-out work boots that has been bronzed and signifies the hard work and determination demonstrated by its recipients.

Three Win Field of Distinction Recognition
Dave Anderson, KAFMO Board member and chairman of the Fields of Distinction Award program, presented three winners at the Conference: Pacer’s Park, Marywood University, Rob Galdieri, turf manager; “Fritz” Miller Memorial Field, Lebanon, Gene Long, turf manager; and Gillespie Field, Moravian College, Randy Haffling, turf manager.

Waddington/Harper Scholarship
Scholarship chairman CJ Lauer named Devon Carroll, working two jobs as she studies turfgrass at Penn State, winner of KAFMO’s Waddington/Harper Scholarship. The program honors Dr. Donald Waddington and the late Dr. John Harper, former Penn State turfgrass professors.

KAFMO Donations
KAFMO donated $2,000 to support Penn State’s teams at the Student Challenge competition at the national Sports Turf Managers Association meeting. One 4-year PSU team won the competition, and one of the 2-year teams finished runner-up.

KAFMO also donated $4,000 to Penn State’s turf program, $1,000 to STMA’s SAFE Foundation, and $1,000 to the Pennsylvania Turfgrass Council.

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