2014 Disease Year in Review

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Features

8 Upcoming Events
Golf Turf Conference and Regional Turf Conferences

10 Cover Story
2014 Disease Year in Review

14 Recent Event
2014 Penn State Turf and Ornamentals Field Days, August 6–7, 2014

16 Research Summaries
Updates on Research by Penn State’s Turf Team

18 Between the Lines
Updates from KAFMO

Departments

6 Penn State Announcement
7 PTC Membership Application
20 Penn State News
21 Penn State Turf Team
22 Calendar of Events
22 Advertiser Index
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Benjamin McGraw will be joining the Penn State Turfgrass Science program as the new turfgrass entomologist, a position with a joint appointment between the Plant Science and Entomology departments. Ben’s responsibilities will be to conduct research on the ecology and management of turfgrass insect pests and to teach in Penn State’s two- and four-year programs. Ben is looking forward to working with Pennsylvania and regional turf industry stakeholders, and teaching and mentoring both undergraduate and graduate students.

Prior to joining the Turf Science program at Penn State, Ben spent five years as an associate professor in the Golf and Plant Sciences department at the State University of New York (SUNY) – Delhi. At Delhi, Ben was responsible for directing the Golf & Sports Turf Management program and teaching classes supporting the two- and four-year programs. Outside of these duties, Ben maintained an active research program and ran a consulting company developing ecologically based solutions for turfgrass insect pest problems.

Ben grew up in coastal Maine and developed a passion for turfgrass management by playing golf and mowing lawns. He was exposed to entomology while attending the University of Maine, where he obtained a Bachelors of Science degree. After college, Ben worked as a research entomologist for Mycogen Seeds, Dow AgroSciences and AgraQuest.

He decided to enter a graduate program to combine his passions for entomology and turf management. Ben obtained an MS in entomology from the University of Massachusetts – Amherst, working in Dr. Pat Vittum’s lab, and a Ph.D. in entomology from Rutgers University, under the guidance of Dr. Albrecht Koppenhöfer. During his graduate and postgraduate years, he worked on a variety of projects, including cultural and biological control of turf pests, insect and pathogen ecology and insecticide-resistance management. A main focus of his research has been the annual bluegrass weevil (ABW), a severe pest of golf course turf in the eastern U.S. and Canada. His work on ABW ecology and biology has led to a greater understanding of the insect’s behavior and population development, and it has improved cultural and chemical management.

At Penn State, Dr. McGraw’s research will focus on understanding insect ecology and behavior to develop sustainable turf pest-management practices. He will continue to work closely with turf managers to better understand pest issues, provide practical solutions and generate much-needed information on emerging pest issues. Additionally, he is looking forward to working with a diverse team of turfgrass scientists and entomologists, while developing partnerships within and outside of the University to improve our understanding of managing pests in an ecologically sound manner.
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- PTC provides educational opportunities for practitioners in all turfgrass-related industries.
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- PTC encourages future industry leadership by granting scholarships and awards.
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Penn State and the Pennsylvania Turfgrass Council are pleased to announce that the annual Penn State Golf Turf Conference will be held from November 18–20 in the Nittany Lion Inn in State College, PA. The event will include a pre-conference seminar, a job fair, the Turf Club Luncheon, a Happy Hour Reception and multiple educational sessions on a wide variety of topics. The conference will also feature a special “Inside the Actor’s Studio”-styled discussion with golf course architect Bradley Kline, as well as a pre-conference seminar on insect management from Dr. Pat Vittum (University of Massachusetts). Speakers will include Penn State faculty and graduate students and various industry experts. Pennsylvania pesticide credits and GCSAA education points will also be offered.

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Writing a disease “year in review” article is always a difficult thing, especially because such articles are often written before the year is over. This report is no exception.

Disease issues in the Mid-Atlantic area and throughout much of Pennsylvania have again been unusual. The 2013 growing season was marked with a slow spring, a moderate June and three weeks of hot, humid weather that put many turfgrass stands in a tough situation. In 2014, the season was very similar, except that the summer heat never really came.

What was significantly different about 2014 was the severe winter conditions that confronted many turfgrass managers. Many golf courses throughout the northeastern U.S. and throughout much of Pennsylvania were hit with extreme ice and snow conditions that spelled doom for many Poa annua putting greens. For those that apparently made it through the winter unscathed, the cold, wet spring and late freezes put the nail in the coffin in the form of crown hydration.

At Penn State, many of our annual bluegrass research plots didn’t make it. Despite early positive results from incubated samples pulled from under the snow and ice, crown hydration in March resulted in complete death. This presented an interesting start to the season for many.

For those who lost grass, I warned about the challenges that they would face this year going into a “typical” summer with immature turfgrass stands developed from reseeding. Fortunately, 2014 was anything but the typical summer that we’ve all come to fear over the last few years. Instead, timely rains, cool nights and moderately warm (not hot) days meant a relatively easy summer for managing turfgrass. It also, however, brought out a few unusual diseases in full force.

**Yellow tuft**
The wet spring and summer rains created perfect conditions for the not-so-common disease yellow tuft. Caused by the pathogen Sclerophthora macrospora, yellow tuft is commonly found in low-lying areas where water accumulates or sits for extended periods of time. Symptoms include small yellow spots on short-cut stands of turf typically found on golf course putting greens or fairways.

Identification of the disease is accomplished by gently tugging on the yellowed plants. The excessive tillering of infected plants makes them...
easy to pull from the surface in one large clump.

Management of the disease includes improving surface and subsurface drainage to prevent the accumulation of water. When necessary, fungicides commonly used to suppress Pythium (such as mefanoxam and fosetyl-Al) have proven effective.

**Dollar spot**

Not all diseases appearing in 2014 were uncommon. The warm days and cool nights prevalent throughout much of the summer meant that dollar spot was again the number-one disease of the year. Dollar spot, caused by the pathogen *Sclerotinia homoeocarpa* (soon to be renamed), is a foliar disease of numerous turfgrass species. If left untreated, it can cause severe blighting and can negatively affect golf course playability.

Researchers at Penn State have been investigating and fine-tuning management strategies for dollar spot. Results from these studies (and from many more around the country) continue to
show that basic cultural practices can improve control. The use of timely nitrogen applications and summer spoon-feeding programs, the consistent removal of dew and even the rolling of putting greens and new fairways have all proven to reduce the severity of the disease. Despite these and other cultural practices, however, the use of fungicides is generally necessary to reduce symptoms to acceptable levels.

Fungicide applications have unique strategies that go beyond simply applying the products. Product selection, application technology and techniques, resistance management and others all play into how the disease is managed. In addition to selecting an effective active ingredient, turfgrass managers should choose the most effective nozzles (e.g., air induction) and use the appropriate application volumes (e.g., 1 to 2 gallons/1,000 ft²).

Resistance-management strategies for dollar spot can also be chosen to improve control and extend the use of fungicides that have known resistance. Preventive control of dollar spot is the first step in reducing the potential for resistance. By treating the disease when pathogen populations are low, the potential for the development of resistant populations is reduced. Rotation of chemical classes is also a commonly used strategy to delay the development of resistant populations.

**Anthracnose**

Anthracnose, caused by *Colletotrichum cereale*, was also a common stress-related disease of annual bluegrass putting greens in 2014. Symptoms of the disease usually begin as small orange or yellow-colored plants on low-cut turf. As the disease progresses, annual bluegrass plants will die in irregularly shaped patterns. Identification of the pathogen can be made by pulling up individual symptomatic plants, removing the older leaves and finding the black infection cushions at the base of the plant.

Anthracnose management has come a long way in the last ten years, predominantly through the work of a collective group of scientists in a joint research endeavor. The project, known as NE-1046 (previously NE-1023), allowed researchers to focus on areas of anthracnose management in a systematic way that built upon the research by many different labs.

Prior to the research findings from this project, recommendations would have included the avoidance of practices such as sand topdressing and the use of PGRs like trinexapac-ethyl when the symptoms are active. We now know that these practices can actually reduce disease incidence when performed properly. Heavy topdressing applications in the spring that bury the crowns of the plants, followed by routine seasonal topdressing programs to keep them buried, have been proven to effectively reduce disease symptoms. Seasonal applications of trinexapac-ethyl following seedhead-control treatments in the spring to increase plant health have also been shown to reduce the overall severity of anthracnose.

All of these practices have proven not only to reduce the severity of anthracnose but also, more importantly, to improve the efficacy of fungicides. In combination with cultural practices, fungicides and fungicide programs can result in complete or near-complete control of a disease that once seemed impossible to manage.

**Miscellaneous diseases**

Other diseases also popped up in small amounts during the season, including red thread on undernourished turf in the spring, brown patch on tall fescue roughs and home lawns, *Pythium* blight in areas that received heavy nitrogen fertilization at inopportune times, powdery mildew in heavily shaded areas and gray leaf spot late in the season on perennial ryegrass used during overseeding.

While some of these diseases were due primarily to the perfect mix of weather conditions, many others were prevalent due to controllable agronomic conditions. We often focus too much on the silver bullets or the things that we can apply (e.g., fungicides) to solve our disease issues. Many times, this approach is taken because of a lapse in attention that should be paid to proper agronomic practices. Things like proper fertilization timings and quantities, adherence to appropriate cultural conditions. We often focus too much on the silver bullets or the things that we can apply (e.g., fungicides) to solve our disease issues. Many times, this approach is taken because of a lapse in attention that should be paid to proper agronomic practices. Things like proper fertilization timings and quantities, adherence to appropriate cultural practices all play a major role in disease management.

While pesticide use is often necessary in many circumstances, the adherence to proper agronomic principles will not only reduce disease severity on their own but also will make those pesticide applications more effective. As you wrap up your season at your golf course or in your LCO business, take a moment to think about areas where you could improve your basic turf practices. Make notes, develop plans and take steps to ensure that you are prepared for 2015. Quite likely, next year will once again surprise us all with an entirely different set of conditions and new set of active pathogens and diseases to manage.
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Recent Event

More than 250 golf course superintendents, sports turf managers, professional landscapers, grounds managers and others interested in managing turf and landscape plantings traveled to the University Park campus on August 6 and 7 to see the latest trends in management and research from Penn State’s College of Agricultural Sciences during Turf and Ornamentals Field Days.

The event took place at the Joseph Valentine Turfgrass Research Center and the Arboretum at Penn State. Participants had the option of either attending sessions on management and identification of ornamental plants or of touring turfgrass research plots. The turf portion of the program included a golf session that focused on disease management, turf nutrition and bentgrass cultivar trials, as well as a sports turf track that covered establishment techniques, warm-season grasses, NFL field assessment and a field-painting demonstration. The lawn care portion of the program dealt with turf cultivar trials, soil improvement with compost, enhanced efficiency fertilizers and microclover studies, as well as turf weed control.

At the end of the day, about 150 participants relaxed at a barbeque at the State College Spikes baseball stadium. Matt Neri and his crew provided equipment for batting practice on Medlar Field.

Penn State Turfgrass Field Days is held every other year, and the next event will be in August 2016.

2014 Penn State Turf and Ornamentals Field Days, AUGUST 6–7, 2014

Above: Dr. Max Schlossberg discusses volatilization research with enhanced efficiency fertilizers.
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Penn State is committed to affirmative action, equal opportunity, and the diversity of its workforce.
At Penn State’s Center for Sports Research, we have several exciting new projects underway, as well as the continuation of other studies. This summer, we installed a new 5,000-square-foot, sand-based research plot area. This area has been sprigged with plots of Latitude 36, Patriot and Northbridge bermudagrasses, along with Zeon and L1F zoysiagrass. Once established, we plan to study wear resistance, rate of recovery, surface stability, divot resistance and traction on these warm-season grasses. We also plan to monitor each cultivar’s cold tolerance and winter survivability.

Our sod study examining the effects of nitrogen rate and topdressing during establishment at the sod farm is into its second year. Our initial results show that lower amounts of nitrogen during establishment produce a stronger, more divot-resistant surface. We also continue to test traction. Our most recent report includes the traction levels of the most popular shoes worn during the World Cup. This report, along with many other research reports, is available on our website: ssrc.psu.edu. During the fall, we will be testing traction levels of this season’s newly released football cleats and adding the results to our traction database, which is also available on our website.

Our objective was to comprehensively evaluate the influence of coated and/or enhanced-efficiency N fertilizers, by addition of stabilizing agents or biological catalysts, on Kentucky bluegrass vigor/yield, density, color and fertilizer N recovery. Turfgrass canopy density (NDVI) and color (DGCI) were evaluated weekly using multispectral radiometers. Weekly clipping yields were collected, weighed and analyzed for N content. The product of yield and tissue N was used to calculate control-adjusted cumulative fertilizer N recovery. Results indicate significantly greater canopy color/density and N recovery resulted from application of coated and/or stabilized N fertilizers, relative to urea or ammonium sulfate N sources. These described improvements were observed in the five- to nine-week period following application. Field studies currently evaluating fertilizer N loss by volatilization will improve our understanding of N fate following granular fertilizer applications to Kentucky bluegrass athletic field and lawn systems.

Field Evaluation of Controlled-Release and Enhanced-Efficiency N Fertilizer Recovery by Kentucky Bluegrass

Today’s golf course superintendent has become increasingly reliant on formulated, chemically enhanced and/or biologically enhanced nitrogen fertilizers to facilitate nutrient recovery and support vigorous and resilient turfgrass systems. However, the continuously increasing number of “enhanced-efficiency” nitrogen (N) fertilizer products available confounds many superintendents’ ability to make appropriate selections. The same fertilizer selection difficulty is experienced by managers of the estimated 40 million acres of athletic fields, home lawns and sod fields in the U.S.

Our Pennfoot traction tester was used to measure the traction levels of the most popular shoes worn in this past summer’s World Cup tournament. Results can be found on our website (ssrc.psu.edu).
Application of beneficial microbes in combination with host resistance has great potential for environmental stewardship in the integrated management of turfgrass diseases. The gray leaf spot disease suppressive ability of bacterial live cells (Bacillus amyloliquefaciens) and solid-phase extracted (SPE)-enriched surfactin formulation from the bacterium were evaluated.

Root-drench application of SPE-surfactin and live cells of the bacterial strain significantly reduced gray leaf spot incidence and severity. Application of treatments revealed a pronounced multilayered induced systemic-resistance defense response activation through timely and enhanced accumulation of hydrogen peroxide, deposition of callose, and phenolic/polyphenolic compounds, underneath the fungal infection apparatus (appressorium) in the naive leaves that were significantly more prevalent in treated plants than untreated control. Additionally, hypersensitive response-type reaction was also noted. The results indicate that induced resistance activity following surfactin perception may sensitize hydrogen peroxide-mediated defense responses, thereby providing perennial ryegrass with enhanced protection against the gray leaf spot pathogen.

Such cyclic lipopeptide-based formulations, therefore, also hold the possibility of implementation as supplementary measures to control gray leaf spot in other important grass species.

Update submitted by Alamgir Rahman and Wakar Uddin, Ph.D., Professor of Plant Pathology, Penn State University.

Defense-related hydrogen peroxide detection in perennial ryegrass following infection by gray leaf spot pathogen. (A) Hydrogen peroxide in the cell-wall apposition; (B) Hypersensitive-type cell death of the infected epidermal cell of perennial ryegrass leaf blade.
Nearly 50 Keystone Athletic Field Managers Organization members gathered on August 6 at Penn State to learn about the latest research efforts affecting their jobs, as well as have a chance to walk the football field at Beaver Stadium.

Following a complimentary continental breakfast at the Joseph E. Valentine Turfgrass Research Center, KAFMO attendees took the quick van ride across Park Avenue to meet Herb Combs, CSFM, athletic field supervisor at Penn State. As staff painted lines on the college football shrine for a Saturday practice under new coach James Franklin, Combs shared the history of maintaining the Kentucky bluegrass turf, which for many years was the prized darling of retired turfgrass legend Bob Hudzik.

Combs is in his ninth year at Penn State, the last four of which he has been in charge following Hudzik’s retirement. He is responsible for more than 200 acres of grounds and fields at the University Park campus, and he employs seven full-time crew members, including the luxury of one full-time mechanic. There are 19 other student workers (of whom 75% are normally PSU turfgrass students) who work on 20 acres of quality turfgrass, 60 acres of intramural fields and seven synthetic surfaces.

He said only the softball field on campus was built to modern standards of athletic field construction; the current field in Beaver Stadium was built in 1960 with a gravel blanket under 18 inches of native soil, with only a steep crown for drainage. As he put it, “No fancy heating system, no fancy growing medium, no fancy drainage system.” Combs said that legendary coach Joe Paterno wouldn’t allow any changes to modernize the field during his long tenure at the helm, although an irrigation system was added in 2006 to replace water wheels. The field has been re-sodded only four times in the past 35 years, although Combs said the end zones were resodded this year.

Combs said his is a constant learning curve regarding learning what the various coaches he deals with want. “We keep our heads down and do what we do,” he advised. “You can say ‘no’ three times, but coaches usually eventually spin things to their advantage.”

Combs credited Hudzik as being ahead of his time when many years ago he devised a “drill and fill” program in which the crew used a hand auger, yard by yard, to pull the native soil and then backfill with sand to improve drainage. Combs also said the current popularity of fraze mowing (removing the top 1/4- to 1/2-inch layer of a field to remove problematic materials) was a process begun by Hudzik in the 1980s to incorporate sand into Beaver Stadium’s soil profile. With no verticutter on hand, Hudzik instead used a Jacobsen overseeder after removing the seeding equipment, leaving just the knives to disrupt the turf before putting down the sand topdressing.

The turf is mowed at 1 inch and receives 5 or 6 pounds of nitrogen a year and now features four Toro soil sensors to check moisture levels. Combs tests the Gmax hardness levels regularly to add to the more than 30 years of records that Hudzik kept on all issues relating to the field’s maintenance.

Andy McNitt, Ph.D., the turfgrass science program coordinator, professor of soil science, and director of PSU’s Center for Sports Surface Research, was on the tour and recommended to attendees that to fight layering in the rootzone, “you have to beat it up with
McNitt and Combs also discussed watering fields, and both emphasized that stressing your grass a bit is a good thing. “You want it stemmy and gnarly going into the season,” McNitt said. “A bit of drought stress is okay; then you load it up again with water and let it go awhile again.”

While the slice of turf pulled out of the Beaver Stadium was (see picture) perfect, the same couldn’t be said for the sample that Combs displayed from the soccer practice field across the street. He passed around a chunk from it that he called “adobe,” saying, “Good luck growing grass on that.”

The women’s and men’s soccer practice fields were built on the site of the former baseball field and have internal drains as well as a bit of a crown, and the men’s is tiered a few feet above the women’s, despite Combs having asked that it be built so he could have the teams practice in different directions. These fields are mowed at 1 inch every Monday, Wednesday and Friday.

Combs said that the soccer game field, Jeffrey Field (a few hundred yards west of Beaver Stadium), is now 100% ryegrass at the request of the coach, who said all the European football fields are rye. Previously it had been Kentucky bluegrass. Earlier this year, it had a bad Poa annua infestation that couldn’t be eradicated by pulling the plug because of time. So Combs, 85 days before the first game, applied Roundup, scalped off the turf and put Tenacity herbicide down before seeding the rye.

Research at Valentine

After lunch, the Athletic Field Track attendees toured the sports turf plots at the Valentine Center. McNitt began by discussing research being done on sod production for the National Football League; working with Tuckahoe Farms in New Jersey, McNitt’s goal is to have the sod put in NFL stadiums, often several times during the course of one season, tight almost immediately upon installation. Key to this he said is lowering the use of nitrogen; sod farms naturally like to crank the N to get the grass grown and sold, but research shows that backing off the N after growth creates a stand of grass that can better resist the divoting pressures of the NFL.

McNitt said that although it is counterintuitive, lower mowing heights are more resistant to divoting because though the roots are smaller, there are more of them in the top inch of soil.

For fields that are used a lot more than NFL turf, McNitt recommended putting down 1 pound of N in September but none later in the fall. “You can feed the N hard in the spring but then stop. And keep your mowing heights low throughout the summer. Too many guys let it grow during the summer months and then cut it low when practice starts in August, and doing that risks the ‘triple whammy’ — heat, traffic and the lower height,” he said.

Next Tom Serensits, manager of the Center for Sports Surface Research (ssrc.psu.edu), detailed the field safety program now in place for the NFL. Serensits is one of three testers nationally who traveled to all NFL fields before the season to test the surfaces; these tests are also conducted before every NFL game as part of the league’s effort to reduce injuries, especially concussions. He demonstrated the three tools he uses to test and recommended that attendees start testing and keeping records of their results. “Some administrators have their heads in the sand when it comes to field hardness; they don’t want to know because they are afraid of liability,” he said. “The money you spend upfront on these tools might be worth it because you can show administration through your records that your fields are safe [by NFL standards].”

Serensits also demonstrated the safety testing tools for synthetic turf and shared information on how the CSSR is researching how different cleats affect rotational (the kind that creates injuries) traction on synthetic and natural turf. McNitt added an interesting point on how their research has shown that there is actually higher traction on wet surfaces vs. dry surfaces.

Other research on synthetic turf has revealed that nothing has been found to cool the surfaces and that it is the fibers that get hot too, not just the infill material. McNitt said not to believe the hype of any “cooling” products being marketed now. “Watering doesn’t cool the surface for long,” Serensits added. “The water drains through the top layer, as it should, and that’s the only layer that matters for heat.”

The tour moved to plots where the effects of overseeding rates and species on wear resistance and turf cover in-season are studied, as well as the effects of mowing heights and mowing frequency. McNitt said one thing is for sure: if you mow once a week, try to mow twice; if you mow twice, try for three times to strengthen your stand of turfgrass. To see the details of these studies, visit http://plantscience.psu.edu/research.

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Research at Valentine

After lunch, the Athletic Field Track attendees toured the sports turf plots at the Valentine Center. McNitt began by discussing research being done on sod production for the National Football League; working with Tuckahoe Farms in New Jersey, McNitt’s goal is to have the sod put in NFL stadiums, often several times during the course of one season, tight almost immediately upon installation. Key to this he said is lowering the use of nitrogen; sod farms naturally like to crank the N to get the grass grown and sold, but research shows that backing off the N after growth creates a stand of grass that can better resist the divoting pressures of the NFL.

McNitt said that although it is counterintuitive, lower mowing heights are more resistant to divoting because though the roots are smaller, there are more of them in the top inch of soil.

For fields that are used a lot more than NFL turf, McNitt recommended putting down 1 pound of N in September but none later in the fall. “You can feed the N hard in the spring but then stop. And keep your mowing heights low throughout the summer. Too many guys let it grow during the summer months and then cut it low when practice starts in August, and doing that risks the ‘triple whammy’ — heat, traffic and the lower height,” he said.

Next Tom Serensits, manager of the Center for Sports Surface Research (ssrc.psu.edu), detailed the field safety program now in place for the NFL. Serensits is one of three testers nationally who traveled to all NFL fields before the season to test the surfaces; these tests are also conducted before every NFL game as part of the league’s effort to reduce injuries, especially concussions. He demonstrated the three tools he uses to test and recommended that attendees start testing and keeping records of their results. “Some administrators have their heads in the sand when it comes to field hardness; they don’t want to know because they are afraid of liability,” he said. “The money you spend upfront on these tools might be worth it because you can show administration through your records that your fields are safe [by NFL standards].”

Serensits also demonstrated the safety testing tools for synthetic turf and shared information on how the CSSR is researching how different cleats affect rotational (the kind that creates injuries) traction on synthetic and natural turf. McNitt added an interesting point on how their research has shown that there is actually higher traction on wet surfaces vs. dry surfaces.

Other research on synthetic turf has revealed that nothing has been found to cool the surfaces and that it is the fibers that get hot too, not just the infill material. McNitt said not to believe the hype of any “cooling” products being marketed now. “Watering doesn’t cool the surface for long,” Serensits added. “The water drains through the top layer, as it should, and that’s the only layer that matters for heat.”

The tour moved to plots where the effects of overseeding rates and species on wear resistance and turf cover in-season are studied, as well as the effects of mowing heights and mowing frequency. McNitt said one thing is for sure: if you mow once a week, try to mow twice; if you mow twice, try for three times to strengthen your stand of turfgrass. To see the details of these studies, visit http://plantscience.psu.edu/research.
Dr. Al Turgeon RECEIVES AWARD

Penn State Professor Emeritus of Turfgrass Management Al Turgeon was recently awarded the Dubin Pioneer Award. The Dubin Pioneer Award recognizes current or former University faculty, staff and technical service employees who have distinguished themselves through extraordinary service to advance the Outreach and Online Education vision at Penn State. The recipients have made significant contributions through their work, either within Outreach and Online Education or in their respective University units.

The Award honors the memory of Dr. Samuel Dubin and his family. Dr. Dubin was an international expert in the field of retraining. He retired as Professor Emeritus of Psychology and established the Lydia and Samuel Dubin lectureship series at Penn State.

Dr. Turgeon is being recognized as the first tenured faculty member to accept the challenge of teaching online at Penn State. He continues to teach online courses in the Turfgrass Management Programs offered through the Penn State World Campus.

Kurt Beatty (Cert. ’10) is currently employed as the first assistant at Green Brook Country Club in North Caldwell, New Jersey.

Tyler Bloom (BS ’09) transitioned into golf course superintendent/property manager at Sparrows Point Country Club in Baltimore, Maryland, on July 21.

Mike Cocino (BS ’14) is now the second assistant at Bidermann Golf Course, in Wilmington, DE.

Josh Cook (MS ’08) hosted the U.S. Senior Open at Oak Tree National in Edmond, Oklahoma.

David Fairbank (Cert. ’59), now retired as a golf course superintendent, is working at the Shenandoah Valley Golf Club in Front Royal, Virginia, on the maintenance crew (he just can’t get away from golf after all his years as a superintendent).

Jordan Gleim (BS ’13) is currently with the New York Jets football team.

Tim Huber (Cert. ’07) worked at Sand Ridge Golf Club in Ohio until 2010, when he moved to Houston, Texas, where he is now a superintendent at the Club at Carlton Woods, growing zoysiagrass and loving it!

Rick Pagett (BS ’94, MPS ’13) has been managing the Penn State Golf Courses since 2007. He also assists in teaching the two-year-program students Business Management and the PGM students Introductory Turfgrass.

Trey Palmer (BS ’14) now owns and operates Palmers Turf Nursery in Dunlap, Tennessee. He grows zoysiagrass and fescue sod in the Nashville, Knoxville and Chattanooga areas.
Calendar of Events

**November 18–20**
Penn State Golf Turf Conference
Nittany Lion Inn
State College, PA

**January 6–7, 2015**
Eastern PA Turfgrass Conference and Tradeshow
Valley Forge Conv. Center
King of Prussia, PA

**January 13–16, 2015**
STMA Conference and Exhibition
Denver, CO

**January 29, 2015**
Northeastern PA Turfgrass Conference and Tradeshow
Woodlands Inn and Resort
Wilkes Barre, PA

**February 10–12, 2015**
Western PA Turf, Ornamental and Landscape Conference
Four Points Sheraton
Mars, PA

**February 16–19, 2015**
TPI International Education Conference and Field Day
Omni La Costa Resort & Spa
Carlsbad, CA

**February 21–26, 2015**
Golf Industry Show
Henry B. Gonzalez Convention Center
San Antonio, TX

Advertiser Index

- Aer-Core, Inc................................. 9
  www.aer-core.com
- Ardington Grinder Products ............ 3
  www.reelgrinders.com
- Bromm’s Lullaby Farm .................. 23
  www.brommslullaby.com
- Central Sod Farms of Maryland, Inc. 23
  www.centralsodmd.com
- Covermaster, Inc. ......................... 7
  www.covermaster.com
- CoverSports USA ......................... 17
  www.coversports.com
- East Coast Sod & Seed .................. 23
  www.eastcoastseed.com
- Ernst Conservation Seeds .............. 21
  www.ernstseed.com
- Fisher & Son Company Inc. ............. 5
  www.fisherandson.com
- FM Brown’s & Sons ....................... 23
  www.fmbrown.com
- Forse Design ............................... 9
  www.forsedesign.com
- George E. Ley Co. ...................... 23
  www.gelsgolf.com
- Irrigation Technical Service Company ... 9
  www.irtch.com
- King Sports Turf ......................... 9
- KWMI / K & W Products, Inc. ....... Inside Front Cover
  www.KWMequipment.com
- Lebanon Turf ............................. Back Cover
  www.lebturf.com
- Medina Sod Farms, Inc. ............... 20
  www.medinasodfarms.com
- Pennsylvania State University ....... 15
  www.psu.edu
- Quali-Pro .................................. 13
  www.quali-pro.com
- Seedway, LLC ............................ 21
  www.seedway.com
- Shreiner Tree Care ...................... 23
  www.shreinerthecare.com
- Smith Seed Services .................... 23
  www.smithseed.com
- Sunburst Turf Solutions ............... 22
  www.sunburstturf.com
- Tomlinson Bomberger .................. 23
  www.tbil.com
- TurfTime Equipment .................... 23
  Turftimeequip.com
- Walker Supply, Inc. .................... 23
  www.walkersupplyinc.com
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