Physical/Chemical Attributes of Inorganic Soil Amendments

Planning Your 2014 Spray Program

Plus, Introducing Inside — Between the Lines, KAFMO Updates and News
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President’s Update

Happy Spring to All!

The past six months, otherwise known as winter, were great for vacationing and spending time with family and friends, if nothing else. Outdoor projects of any kind were certainly challenging to plow through (that is, if you were able to accomplish anything other than plowing!). Fortunately, spring is upon us, and I don’t know about all of you, but there are few things that I would prefer to have upon me more than spring. Now is not the time to agonize over winter’s misery but rather to reenergize, retool, reload and prepare for the remainder of spring and the summer ahead. Before you lies an unlimited potential to forge new paths and sculpt your professional landscape. In that light, the PTC and I are excited to announce several new paths which we have embarked upon.

First, I am proud to announce an exciting new venture within the pages of this magazine. On pages 18–19, you will find *Between the Lines*, the PTC’s new initiative with the Keystone Athletic Field Managers Organization (KAFMO). For 20 years, KAFMO has epitomized professionalism. Under the leadership of Dan Douglas, KAFMO has been the preeminent partner for sports turf managers throughout Pennsylvania. Together, their efforts have improved the safety, playability and appearance of countless athletic fields. The PTC and KAFMO are proud to bring you current events, updates and relevant news in the field of sports turf. Please enjoy the new *Between the Lines* section.

Second, I would like to update you regarding the management of the PTC. As many of you are aware, I announced in February that the PTC’s executive director, Kimberly Pagett, has unfortunately left to explore new career opportunities. Kim was a crucial component to the PTC’s success over the past four years, and we owe her a debt of gratitude. The board of directors and I thank her sincerely for her hard work and wish her nothing but success in her new endeavors. Although we are disappointed to lose Kim, the board and I are nonetheless optimistically excited for the future. Thank you for your patience over the past couple of months during the transition period. We will be announcing our new partner in the coming weeks and introducing you in person at the next available opportunity.

In closing, thank you for taking the time to read this update. On the precipice of another growing season, the PTC and I will strive to continue serving you and the best of interests of turfgrass managers throughout PA to the best of our abilities. I truly wish you a successful season and look forward to touching base with you soon. May your journey down the path that is 2014 be filled with success and abound with bounty. Fight with vigor, and relief will come. Please do not hesitate to contact me via phone (412-447-4434) or email (jhurwitz@foxchapelgolfclub.com) should the PTC be able to assist you on your journey. Finally, please take the time to share this publication with your friends and colleagues, and thank you for your continued support of the PTC.

Respectfully,

*Jason M. Hurwitz*

2013–2014 PTC President
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Meet Your New 2014 PTC Officers & Directors

At the Golf Turf Conference in November, the following officers and board of directors were elected and installed to lead the Pennsylvania Turfgrass Council for 2014.

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PTC Membership Application

By joining PTC, your club or company, or you as an individual, become part of an organization dedicated to promoting professionalism in all aspects of the turfgrass industry and support of the Center for Turfgrass Science at Penn State.

- PTC provides educational opportunities for practitioners in all turfgrass-related industries;
- PTC provides grants and other support for education and research programs at Penn State University;
- PTC encourages future industry leadership by granting scholarships and awards;
- PTC acts as a liaison for the green industry by promoting open dialogue with government agencies, private institutions, and the general public.

Membership Categories *Check One*

- **Individual** -- for the green industry professional who wants to be part of the Council and support its activities. **$50 annually**

  ![Membership Categories](Image)

- **Sustaining** -- for the business or turf professional who takes an active role in promoting the profession of turfgrass management, professional development, and educational opportunities in the turfgrass industry. **$200 annually**

- **Partner for Growth** -- for the business or club desiring a stronger affiliation with the Council and the Penn State Turfgrass Science Program. **$400 annually**

  ![Membership Categories](Image)

Payment Method

*The membership year is July 1 though June 30.*

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Thank you for your support of the turfgrass industry.

10/5/09
Maintaining healthy turfgrass can be challenging, particularly where recreational use is frequent and intense. While golf course maintenance crews are well versed in setting up their course to distribute play over available surfaces, sports turf managers have fewer opportunities to alleviate concentrated traffic and wear on their fields.

The traditional role of soil is to provide mechanical support, nutrients, water and oxygen to resident plant structures. Intensively maintained turfgrass demands all four of those components, and while dozens of great turfgrass cultivars have been developed through the years, I am unfamiliar with any that don’t rely on the soil to provide the four components listed above.

Unfortunately, soil attributes don’t always come grouped in fours. Sandy soils provide ample oxygen, but generally inadequate amounts of water and nutrients. Loams and/or silt loams that initially retain a favorable balance of oxygen and plant-available water are quickly compromised by equipment and foot traffic. Clayey soils may afford excellent nutrient retention, but are poorly drained and susceptible to compaction.

Because the surface of turfgrass rootzones is exposed to intense physical abuse, responsibilities of the manager extend beyond irrigation, mowing, fertilization, painting and pest management. S/he must also monitor soil function and proactively improve its ability to support plant growth. Rootzones must be well drained, yet retain 15 to 30% capillary (water-filled) porosity. They should feature a respectable cation exchange capacity (CEC > 4.0 meq/100 g), but resist compaction in the face of routine traffic and use. Very few soils provide all this support to intensively used turfgrasses in the quantities needed.

Soil amendments are semi-permanent to permanent solids purposefully incorporated into the sand/soil rootzone to foster turfgrass health by providing the important physicochemical properties described above. Their effectiveness depends on existing soil properties, the quantity of amendment added and the depth and/or uniformity achieved during the incorporation or blending process.

Inorganic soil amendments include zeolites, calcined clays (a.k.a. porous ceramics) and diatomaceous earth minerals. Typically mined and processed to sand-sized particle diameters, inorganic soil amendments are readily available throughout Pennsylvania and the U.S.

At this point, many of you may be thinking, “Who cares? Peat mosses and composts also improve these important physicochemical properties of soil. So why would I limit my consideration of soil amendments to inorganic materials?”

Good question. Three mutually exclusive reasons to simply consider inorganic soil amendments follow.

First reason — ease of incorporation

While all soil amendments are effectively combined with sand in the “off-site” rootzone formulation process, inorganic soil amendments are particularly well suited for in situ incorporation. By this, I mean amendment of established and currently maintained turfgrass rootzones. Most inorganic amendments possess a particle density equal to sand, making them heavier than organic amendments like peat moss and compost. This trait facilitates dependable rootzone incorporation and prevents inorganic amendments from floating and/or blowing away.

Numerous publications and case studies report successful incorporation of sand-inorganic amendment formulations into established rootzones by dry injection, drill-and-fill or back-filling of conventional aeration holes. It is important to note that only well-homogenized mixtures of high-quality topdressing sand and inorganic amendment should be incorporated, and these mixtures need only contain a modest amount of inorganic amendment (2 to 20% by volume). Because many inorganic amendments are kiln-dried for package and shipment, managers should thoroughly irrigate immediately...
following their incorporation into maintained fields.

**Second reason — nitrogen and potassium fertility**

As a turfgrass manager, the above header should grab your attention. After all, the two nutrients required by turfgrass in the greatest quantities are nitrogen (N) and potassium (K). Most of the inorganic amendments described here possess noteworthy cation exchange capacities (CEC; 5–100 meq/100 g), and these exchange sites demonstrate unique affinities for potassium (K+) and ammonium (NH4+).

Results of numerous studies report that inorganic amendments improve the fertility of sand rootzones. In an incubation experiment, 1.5% clinoptilolite zeolite (by mass) amendment of sand enhanced retention of ammonium on exchange sites and significantly reduced ammonia volatilization following urea fertilization. Over the 28-day experimental period, the zeolite-amended sand resulted in a 4-fold reduction of gaseous N loss compared to the unamended sand, and a 2-fold reduction relative to sand amended with a fibrous organic amendment.

A column study evaluated leachate from sand columns amended at a 20% (by volume) rate and reported inorganic amendments limited ammonium loss. Drainage from field plots amended at 10% rates (by volume) showed that “phillipsitic” zeolite enhanced phosphate retention. In both studies, nutrient leaching from the zeolite-amended rootzones was significantly less than from sphagnum peat moss-amended rootzones.

Likewise, a column study evaluating diatomaceous earth-amended sand...
(10% volume) or calcined clay-amended sand (20% volume) revealed that both rootzones demonstrated higher adsorption affinities for K+ than a sand rootzone similarly amended by sphagnum peat moss. Moreover, the sand rootzone amended with calcined clay (20% volume) showed significantly greater K retention over multiple leaching events. Relative to organics, inorganic amendments’ affinity for ammonium comprises meaningful agronomic and environmental benefits. This, in combination with enhanced K retention, makes the described inorganic materials particularly unique and well suited for turfgrass rootzone amendment.

But what about calcium? Won’t this K retention preference limit adsorption of calcium? Yes, and probably magnesium, too, but only on the surfaces of the inorganic amendment. Organic matter indigenous to all mature rootzones will continue to prioritize calcium and magnesium retention. Furthermore, additions of calcium and magnesium will arrive each and every time the irrigation runs, regardless of where in Pennsylvania your turfgrass lives. On a charge (meq) basis, I estimate 95% of all water used to irrigate turfgrass contains more of either calcium or magnesium than potassium per liter. I predict most liters of irrigation water contain more charges of sodium relative to charges of potassium too. Yet, day in and out, and on a charge basis, turfgrass requires 3x more potassium than calcium, 5x more potassium than magnesium and infinitely more potassium than sodium.

Third reason — mitigation of water repellency

Most inorganic amendments possess extraordinary surface area per unit mass. While well-humified organic amendments, like peat and peat moss, also boast vast surface areas, the surface of inorganic amendments remains comparably more stable and wettable over time. But what does this mean in practice? In maturing turfgrass rootzones, microbial decomposition of plant residue generates hydrophobic compounds. Due to the ample surface area associated with silt- and clay-sized particles, these liberated organic waxes/ acids rarely compromise the wettability of mineral/native soils. However, in sand rootzones with limited surface area, these waxy compounds often manifest into severe soil water repellency. In a sand rootzone incubation study conducted here at Penn State, Dave Moody (MS Soil Science, 2007) reported widely varying degrees of water repellency development over a short period of time (five months). Increasing the amendment of sand by sphagnum peat moss, reed-sedge peat or biosolid compost from 10 to 20% (by volume) consistently caused greater repellency. Even incubation of straight quartz sand and bentgrass roots increased repellency compared to the original sand. The only amended ...
rootzones demonstrating wettability equal to the original sand were the sand rootzones amended by 10 or 20% calcined clay (the only inorganic amendment evaluated in the study). These results show that inorganic amendments provide the microporosity and specific surface area needed to mitigate repellency-inducing contributions of particulate organic matter and adsorbed waxes in maturing sand rootzones.

**What about physical stability, water-relations and cost?**

It is important for any article with the word “attributes” in the title to also address related concerns. This “balanced approach” was the primary justification for my selection of this topic. I believe inorganic amendments are too often the casualty of sweeping generalizations that do not consider the full body of recent research.

Published reports of inorganic amendment physical stability are limited both in number and practical value. Straight samples of inorganic amendments, evaluated by ASTM methods for assessing resistance to weathering or impact/abrasion forces, showed inferior stability relative to quartz sand. However, the value of these results as a surrogate for field stability is debatable. Another study imposed 20 freeze/thaw cycles on inorganic-amended (15% volume) sand rootzones before assessing particle stability. Both studies reported that calcined clay and diatomaceous earth comprised the top-tier of stability (of the inorganic amendments tested), and that the stability of zeolites (numerous types exist) varied by type and source.

Results of published findings on how inorganic amendments influence water relations in amended root zones are mixed. In regard to the physical stability and water-holding capacities of these rootzones, the consensus among turfgrass/soil scientists is that further field evaluation is needed.

Turfgrass researchers regularly cite the high cost of inorganic amendments, relative to organic amendments or sand alone, as the foremost deterrent to their use. Considering my expertise is in agronomy, I prefer to concede such value judgments to the practitioner. I would like to note, however, that several process patents describing conversion of industrial byproducts to zeolitic minerals are currently on file with the U.S. Patent Office. Thus, recent advancements in material engineering may soon make inorganic amendments available to turfgrass managers at lower cost.

**Conclusion**

Selecting the best material to amend a turfgrass rootzone is a complex endeavor. It requires comprehensive assessment of the physicochemical properties of soil/sand to be amended, the candidate amendments and, ideally, the prepared rootzones being considered. As always, analysis and consultation by a qualified soil-testing laboratory are encouraged at each stage of this critical evaluation.
Establishing a preventive spray program is critical to effectively managing diseases on golf courses, athletic fields and home lawns. Although each type of turfgrass used in these three areas has diseases that may be more problematic depending on the height of cut, there are several diseases in Pennsylvania that you can count on seeing each year. Luckily, many of the same fungicides are used for the management of each of these diseases. However, proper rotation of fungicides with different modes of action will ensure healthy turfgrass while reducing the potential for fungicide resistance. Here, we will focus on spray programs for use on golf course turf.

The first fungicide that most superintendents reach for is chlorothalonil (Daconil Ultrex, Quali-Pro Chlorothalonil, Manicure). Not so fast! While chlorothalonil is a multi-site contact fungicide, its use is limited by regulations in many states, including Pennsylvania. So, this year when planning your spray program, perhaps considering some other fungicides in conjunction with, or in place of, chlorothalonil will pay future dividends. Applying chlorothalonil at the low label rate in a tank-mix with various fungicides is a great way to start!

Typically in Pennsylvania, the first diseases to appear after turf greens up will be dollar spot, pink patch and red thread. Applications with the low label rate of Daconil Ultrex (chlorothalonil at 1.7 oz./1,000 ft²) may be rotated in with site-specific fungicides such as Chipco 26GT or Quali-Pro Ipro 2SE (iprodione), Insignia SC (pyraclostrobin) and Banner MAXX (propiconazole). All three fungicides have a different mode of action, and an alternation would be highly effective not only for dollar spot but also for other turfgrass diseases such as anthracnose or summer patch, if you are managing Poa annua putting greens.

If you’re looking for something new to control dollar spot, several compounds are fresh on the market. Emerald (boscalid), Chipco 26GT (iprodione) and Banner MAXX may be the norm, but a new SDHI compound, Xzemplar (fluxapyroxad), provides outstanding control of dollar spot, but it is specific to dollar spot. Another popular and effective multi-site product is Secure (fluazinam). It doesn’t stop there; Quali-Pro (QP) Enclave is a pre-mix product (chlorothalonil, iprodione, tebuconazole and thiophanate-methyl) that provides very good control of a number of diseases throughout the season and is enhanced with the addition of fosetyl-Al (Chipco Signature).

One fungicide many superintendents may overlook is CIVITAS ONE, which is a mixture of isoparaffin mineral oil (CIVITAS) and a pigment (Harmonizer). It provides very good control of dollar spot when mixed with the low label rate of Daconil Ultrex (1.7 oz./1,000 ft²) and applied preventatively on a 14-day rotation. Additionally, the incorporation of a foliar urea fertilizer, Primo Maxx and a phosphite material has been shown to further improve disease suppression, while also providing improved turfgrass quality throughout the growing season. It may not keep dollar spot away all season long, but it...
is an effective means of management before you have to bring out the “heavy hitters.” The great part about CIVITAS is there are no resistance issues.

Anthracnose has always been a particularly difficult disease to manage with fungicides. However, our research trials have shown over the last few years that tank-mixing and alternations between fungicide groups works the best. Tourney (metconazole) and Medallion (fludioxonil) both provide good control of anthracnose. Adding Daconil Ultrex (chlorothalonil) as a companion fungicide to most tank mixes has been shown to improve disease suppression, and rotations between these fungicides and chlorothalonil (as well as applying some foliar nitrogen to the tank) have always shown to be beneficial in our ongoing fungicide trials. Other products that have demonstrated an effective means of disease suppression in our research trials are QP Enclave mixed with QP Fosetyl-Al, Disarm C (fluoxastrobin + chlorothalonil) and Torque (tebuconazole).

Numerous products in our annual fungicide trials have provided excellent control of brown patch, including Chipco 26GT (iprodione), Insignia SC (pyraclostrobin) and QP Enclave. Additionally, a new product, Lexicon Intrinsic (fluxapyroxad + pyraclostrobin), provides excellent control of both dollar spot and brown patch, as does its predecessor, Honor (boscalid + pyraclostrobin).

Several products will keep the dreaded Pythium foliar blight away, led by the gold-standard Segway (cyazofamid). However, tank mixes of numerous fungicides at the low label rate — including QP Mefenoxam, Subdue MAXX (mefenoxam) and Insignia SC (pyraclostrobin) tank-mixed with CIVITAS ONE and Chipco Signature at the 2.0 oz./1,000 ft² rate — also provide a great method of control.

If you have perennial ryegrass fairways or rough, you should closely monitor weather conditions and leaf wetness duration in order to spray preventively for gray leaf spot. Heritage (azoxystrobin) is a good choice, but resistance to gray leaf spot has been observed. Other good choices are preventative spray applications of Daconil Ultrex (chlorothalonil), Insignia SC (pyraclostrobin) and Torque (tebuconazole). Whichever product you decide to spray, make sure to apply it before disease occurs, or you might be overseeding soon!

Dollar spot will likely persist into October, and applications of the products listed earlier will help. This time of the year is a great time to fertilize during this time of the year, as it is imperative to get as many carbohydrates to the crown and roots as possible. But, do not be too liberal with the quick-release nitrogen, or you may find yourself with a lot of top growth when the cold weather hits. This flush of growth may promote the onset of several winter diseases.

Pink snow mold and gray snow mold are both winter diseases, but pink snow mold does not need snow to occur. Rather, frequent freezing and thawing cycles are optimal for this disease. Management of both can best be accomplished with tank mixtures that include several different modes of action, particularly where snowfall may persist for longer periods of time. Gray snow mold occurs in the same locations year after year, so make sure those areas are sprayed before the first snow. Whenever snow melts, be diligent, and make another fungicide application before the ground is covered again.

Regardless of what products you utilize in planning your spray program, always remember a few key strategies: know the biology of the pathogen, rotate fungicides with different modes of action to reduce the onset of fungicide resistance and tank-mix products to get the best out of each chemical. Finally, do not forget about the importance of your cultural practices, as they are a key component of your disease-management program.
Greg Fantuzzi, Certified Golf Course Superintendent, Carlisle Country Club, received the Dr. George Hamilton Distinguished Service Award on November 13, 2013, at the Penn State Golf Turf Conference in University Park. As the Pennsylvania Turfgrass Council’s highest individual honor, this award is presented to individuals who have exhibited outstanding service to Pennsylvania’s turfgrass industry.

Greg has a long and distinguished record of service to the turfgrass industry in Pennsylvania. He began his career shortly after graduating from Delaware Valley College with a B.A. in Agronomy. Greg served as assistant golf course superintendent at Lehigh Country Club under Marty Nadenichek for three years before accepting his current position as golf course superintendent at Carlisle Country Club in 1980. Through leadership roles with the Central Pennsylvania Golf Course Superintendents Association (Director, 1982–1985; Vice President, 1986; and President, 1987) and the Pennsylvania Turfgrass Council (board member, 1996–2012), he helped advance the science of turf management and helped promote professionalism in the industry. Greg also played an important role in planning programs for the Western and Eastern Pennsylvania Turfgrass Conferences for many years, serving as co-chair and eventually chairman of the Eastern Conference through 2012. Through his dedication and support of Council activities, Greg helped raise hundreds of thousands of dollars for turfgrass research at Penn State.

During the award ceremony at the Penn State Golf Turf Conference, Greg stated it was a privilege and honor to have been associated with the Pennsylvania Turfgrass Council, and he expressed thanks to fellow volunteers for giving their time and energy to help with advancing the turfgrass industry. He also thanked his family for all their encouragement and support.

In 2004, the Pennsylvania Turfgrass Council announced the Distinguished Service Award would be renamed to memorialize Dr. George W. Hamilton, Jr., a professor in turfgrass management at Penn State, who died after a courageous battle with cancer. Greg exemplifies the spirit of this award and Dr. Hamilton’s passion for advancing education in the turfgrass industry. The membership of the Pennsylvania Turfgrass Council and the Penn State Turf Program congratulate Greg Fantuzzi on being recognized for his service and accomplishments.
Eastern Pennsylvania Turfgrass Conference • JANUARY 7–8

By Mike Fidanza, Ph.D., Penn State University

Once again, Darin Bevard (Senior Agronomist, USGA Green Section, Mid-Atlantic Region) kicked off the conference with the “Year in Review,” which included a discussion of the year’s turfgrass problems and superintendents’ creative solutions. Arron McCurdy, currently golf course superintendent at Metedeconk National Golf Club (Jackson, NJ), provided a recap of the successful 2013 U.S. Open at Merion Golf Club (Ardmore, PA). Beasley Reece, sports anchor for Philly CBS 3 and former NFL player, delivered a motivational keynote address. Earthworms were a big problem for many golf courses, so Dr. Dan Potter (University of Kentucky) provided a historical review and potential solution for earthworm castings on tees, fairways and putting greens. Dr. Micah Woods, from the Asian Turfgrass Center, talked about minimum levels for sustainable nutrition (MLSN) guidelines. For more detailed information on MLSN, visit www.asianturfgrass.com. Penn State’s Dr. Andy McNitt talked about drainage, which was a big problem during the wet, soggy summer of 2013.

Many other excellent speakers were on the program, and the Silent Auction was re-charged this year, thanks to co-chairs Damon DiGiorgio and Ryan Davidheiser, and committee members Carey Bailey, Charles Soper, Karina Guzman and the famous Pinki! The conference was held on January 7 and 8, at the Crowne Plaza in King of Prussia, PA.

Northeastern PA Turf Conference and Trade Show • JANUARY 30

By Andy McNitt, Ph.D., Penn State University

The Pennsylvania Turfgrass Council and the Penn State University Turfgrass Project once again hosted the Northeastern PA Turf Conference and Trade Show in Wilkes Barre, PA, this past January 30.

Attendance was up! Approximately 80 more individuals attended this year compared to last year, with nearly 300 registering. Our exhibitor number stayed steady at 24. While this event has always been supported by the Pocono Turfgrass Association, it was good to see so many landscapers and grounds keepers this year.

This year’s educational program was highlighted by disease talks from Dr. John Kaminski, a review of the U.S. Open at Merion by Mr. Darin Bevard of the USGA and talks on irrigation water quality and pesticide safety by Dr. Peter Landschoot and Mr. Jeff Fowler, respectively. Mr. Danny Kline and Dr. Gary Moorman rounded out the program with two presentations each on plant insect problems. Last, but never least, Dr. Mike Fidanza spoke on sustainable turf and turf weather issues.

If you’ve never been to the Northeastern PA turf conference, it’s held at the Woodlands resort. It’s a comfortable atmosphere at a reasonable price. Come and join us next year. For the complete program see: http://paturf.org/events/view/11

Western Pennsylvania Turfgrass Conference and Trade Show

FEBRUARY 25–27

The Western PA Turf, Landscape, and Ornamental Conference and Trade Show took place on February 25–27 at the Four Points Sheraton in Mars, PA. Our speakers this year included Dr. Michael L. Agnew, Ms. Susan Boser, Mr. Chris Brown, Mr. Chris Ecton, Ms. Sandy Feather, Mr. Jeff Fowler, Mr. Neil Gartland, Mr. Keith A. Happ, Mr. Greg Hoover, Dr. David R. Huff, Mr. Steve Jacobs, Dr. Albrecht M. Koppenhöfer, Mr. Steve McDonald, Dr. Andrew S. McNitt, Dr. Gary W. Moorman, Mr. David Sines, Mr. Keith W. Smith, CFP, and Dr. Wakar Uddin.

New to the conference this year was a reception in the trade show area after Tuesday’s sessions. Also new this year was a Wednesday Business session that offered information geared to help with financial, business and customer service for those in the turf, ornamental and landscape industries. We also held our traditional trade show, featuring a wide range of vendors and products.

Combined, we had more than 40 Pennsylvania pesticide update credits available in categories 6, 7, 9, 10, 23, Core and PC. Additionally, GCSAA update credits were provided.
Weed and PGR research team is already in full swing, preparing for the 2014 research season. We are working on some unique demonstration areas for our PSU Field Days on August 6 and 7 this year. Be sure to save the dates, and plan to attend. We will have some of the newest material to be labeled in the near future for you to see. As always, we have a wide spectrum of crabgrass, broadleaf weed and annual bluegrass research again this year for you to visit. Hope to see all of you at Field Days, if not sooner.

Update submitted by Jeffrey Borger, Instructor in Turfgrass Management, Penn State University.

The summer of 2014 is shaping up to be another busy one for the Penn State Entomology research project. We will once again be completing research on the annual bluegrass weevil, white grubs, billbugs and cutworms. We are looking at several protocols involving both curative and preventive control measures against these troublesome insects. White grubs were a huge problem last fall on home lawns, athletic fields and golf courses. Black turfgrass Atentius grubs also seemed to make a comeback in 2013, and we look forward to working with this insect as well.

Annual bluegrass weevil continues to be the top damage-causing insect that we face in the Northeast. This year, we will be looking at several preventive and curative protocols. We will also take a look at a problem that we have seen more and more the last two seasons. We have found places where the adults were controlled very well in the spring (all applications were made at the right time, extensive monitoring was done, and no adults were found after Memorial Day). But then, all of a sudden, the problem came back from out of nowhere in August. We want to study this phenomenon.

Update submitted by Danny Kline, Research Technologist in Turfgrass Entomology, Penn State University.
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KAFMO President’s Message from Dan Douglas

The Keystone Athletic Field Managers Organization started growing roots 20 years ago. The seed was planted when a couple of guys got together to talk about athletic field maintenance, and that conversation grew into a chapter of the national Sports Turf Managers Association with more than 350 members.

Much like our organization, KAFMO’s newsletter, Between the Lines, has evolved over time. What began in 1999 as 4 pages of black-and-white copy and business-card-size advertisements became 16 pages of color photos, articles and advertisements of various sizes when the newsletter became a magazine in 2008. With this issue of Pennsylvania Turfgrass, Between the Lines continues its evolution.

The Pennsylvania Turfgrass Council and the Penn State Turf Team have supported KAFMO from our beginning. Pennsylvania Turfgrass has proven to be an excellent conduit for research results and technical information provided by Penn State. KAFMO will now be a part of this excellent publication with the opportunity to share what’s happening in the organization and highlighting the efforts of our membership. KAFMO’s reach will spread beyond our modest membership to now connect with thousands of turf professionals in Pennsylvania and beyond.

I’m excited about this enhanced relationship between KAFMO and the Pennsylvania Turfgrass Council (full disclosure: I’m on the board of directors of both). The more we share information among all aspects of the turf industry, the better professionals we all become. This magazine brings the whole green industry of Pennsylvania closer together.

As the great Steven Tyler of Aerosmith said, “If you have a candle, the light won’t glow any dimmer if I light yours off of mine.”

The Keystone Athletic Field Managers Organization was formed in 1994 by a small group of individuals who were concerned about the quality of the athletic fields in Pennsylvania. In 1997, KAFMO became incorporated as a chapter of the Sports Turf Managers Association. Today, KAFMO is over 300 members strong, and each individual is committed to enhancing the professionalism of athletic field managers in the Keystone State. This commitment leads to more respect for your organization and better career opportunities.

Any individual, institution, organization, vendor or supplier who has sincere interest in athletic field maintenance is welcome to become a member. From high school, collegiate and professional athletic facilities, to parks and recreation departments, municipalities, educators, youth leagues, contractors and commercial vendors, our membership base is made up of a broad range of individuals who pool their knowledge and experience together for the good of our craft and to increase awareness of their professionalism.

Annual KAFMO events include the Athletic Field Conference in February, a Summer Field Day and the KAFMO Cup Golf Tournament in October. Various other KAFMO-sponsored events are conducted throughout the state every year. Members also receive SportsTurf and Pennsylvania Turfgrass magazines.

To become a member, visit www.KAFMO.org.
Representatives from the York County Solid Waste Authority and Hopewell Township recently accepted the annual “Field of Distinction” award from KAFMO for dedication to maintaining and providing safe, playable conditions for the users of the Hopewell Area Recreation Complex (HARC) fields. The award was presented at the 18th annual KAFMO Athletic Field Conference in Grantville.

HARC is a 200-acre site located within a 308-acre footprint comprising the now-closed York County Sanitary Landfill. Originally, the township wanted to develop a golf course and wildlife habitat with recreation areas, but funding never materialized. So, in 2005, the Authority board voted to invest more than $1 million to build a recreation complex and wildlife habitat. The site now features a multi-use field, a softball/baseball field and a practice field, as well as an established wildlife habitat, youth playground and tot lot, and 2½ miles of mowed-grass walking trails.

The Authority owns and maintains HARC, and Hopewell Township is in charge of operations. The Township and the Authority worked together to develop the site’s features. Patricia Schaub, Hopewell Township manager, says, “We believe these fields are distinctive because a site that was once considered a community liability has been converted into a community asset.”

Richard Hazenstab, coordinator of operations & environmental programs for the Authority, comments, “The site experiences heavy community use, especially on the playing fields. Because of this, maintaining a quality turf is a challenge, but a strong working relationship between the Authority, Hopewell Township, the coaches and Heritage Lawn & Landscape Care has enabled us to create a turf that is both safe and beautiful.”

Thirty-four years ago, Congress enacted the Superfund law in response to the threat of hazardous waste sites, typified by the Love Canal disaster in New York and the Valley of the Drums in Kentucky. In 1983, the U.S. EPA designated 135 unlined landfill acres in York County as a Superfund site. These acres were closed in 1997, and a remediation system was installed to treat contaminated water and shrink the footprint of contamination.

During construction of the sports fields, a gas-collection layer was placed at least two feet below the playing fields, directing landfill gas to a vent located away from the fields. This gas-collection layer also works as a water-drainage net that infiltrates water through the upper soil layer and to the collection layer, which drains to the surface at a point away from the fields. The site’s fields are built on top of the closed landfill and were raised above the existing surface with imported clean fill.

Both the Pennsylvania Department of Environmental Protection and the EPA had to approve the recreation site plans, and great care was taken before and during construction to ensure that the integrity of the remediation system and the management of landfill gas would not be disrupted by construction. The Authority continues to monitor landfill gas while maintaining the site.

The Authority also worked with the PA Game Commission to develop what is now one of the region’s largest contiguous grasslands habitat. Despite its being delisted as a Superfund site, it is still heavily monitored by the EPA and the state Department of Environmental Protection.

The Authority is working to develop public-education programming to expand its outreach to school and civic groups at the landfill and to highlight alternative power and the “recycling” of the landfill into a community asset.
Penn State Turfgrass Science Students Perform Well in STMA and GCSAA Competitions

A total of 22 Penn State Turfgrass Science students competed against students from universities across the country in the Sports Turf Managers Association (STMA) Student Competition and the Golf Course Superintendents Association of America (GCSAA) Turf Bowl. Competing in teams of four, the students completed comprehensive exams, which included sections on turfgrass and pest identification, pest management, soils, fertilization and irrigation.

This year’s STMA Student Competition was held in January at the STMA Conference in San Antonio, TX. While the cold weather made it difficult for the students to enjoy San Antonio’s famous River Walk, the teams competed well and brought home a top-ten finish.

In the GCSAA Turf Bowl, held in early February at the Golf Industry Show in Orlando, FL, the team of Alexander Bonini, Michael Gurcsik, William Ellinger and Christopher Marra captured third place, which included a check to the turf club for $1,000. The other Penn State teams also performed well against the more than 70 competing teams.

STMA and GCSAA team members included Kyle Patterson, Michael Gurcsik, William Ellinger, Christopher Marra, Nick Tristani, Eddie Harbaugh, Jordan Gleim, Anthony Schleifer, Evan Fowler, Rob Nese, Thomas Goyne, Alexander Bonini, Alex DeHaven, Kevin Rogers, Mike Cocino, Dan Tuck, Cody Woods, Kyle Krause, Blair Somerville, Collin Harley, Josh Dixon and Spencer Murphy.

Special thanks to the Keystone Athletic Field Managers Organization (KAFMO) and the Pennsylvania Turfgrass Council for helping support student travel to the conferences.

Penn State’s 3rd-place-winning team at the GCSAA Turf Bowl in February 2014. Photo courtesy of GCSAA.

Penn State Turf Updates

Aaron Archambault (Cert. ’13) is currently working at National Golf Links of America in Southampton, NY.

Kurt Beatty (Cert. ’10) just accepted a First Assistant position at Green Brook Country Club in North Caldwell, NJ.

Darin Davis (Cert. ’91) is currently the Golf Course Superintendent at Olde Florida Golf Club in Naples, Florida. He is a past president of the Everglades GCSA, the Florida Turfgrass Association and the Florida GCSA.

Kyung Han (B.S. ’08, M.S. ’12) is currently working for Moghu USA as a PoaCure Development Manager.

Matt Rayman (B.S. ’98) is now the Territory Manager at Walker Supply, Inc.

Chase Rogan (B.S. ’07, M.S. ’11) is now the Mid-Atlantic Field Rep for GCSAA. He lives in Pittsburgh with his wife and dog.

Kevin Sheaffer (B.S. ’10) is currently working for Dow AgroSciences in recruitment and talent development.

Brian Stiehler (B.S. ’01) is now at Highlands Country Club in Highlands, NC.

Jordan Williams (B.S. ’09) is currently the Assistant Superintendent at Saucon Valley Country Club in Bethlehem, PA.
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Paul Latshaw, MSM, CGCS
Muirfield Village Golf Club

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Penn State is committed to affirmative action, equal opportunity, and the diversity of its workforce.
Dispersion is only part of our story

**Stress Protection:** Delivers stress-buffering biostimulants which help the turf grass plant achieve optimum performance by preparing it for the inevitable onset of stressful conditions. Turf treated with these biostimulants will outperform untreated turf in overall quality and playability during stress conditions.

**Sea Plant Kelp Meal:** Utilizes sea plant kelp meal with multiple L-amino acids that the turf plant absorbs for healthy growth during stressful conditions. When sea plant treated turf is under stress the following changes occur; root length and mass increases, chlorophyll content increases and the turf plant’s photosynthetic rate and capacity remain stable.

**Humic Acids:** Employs a high-quality humic acid that serves as a soil microbial stimulator and organic chelator for today’s high sand content putting greens where organic matter is often extremely low. This organic biostimulant improves the turf plant’s overall ability to take up nutrients for a longer period of time.