

President's Message – Spring has Sprung?

As we brace for another summer of agronomic practices and golfer expectations, spring has been anything but normal. Snow, ice, rain and lack of sun are all associated with the winter season, but seem to be carrying into the early part of spring. Before we know it The Masters will have come and gone and the heat of summer will only overshadow the relaxed days of winter!

The VGCSA is also preparing for another year by introducing the new VGCSA Championship held at The Foundry and hosted by Scott Mauldin, CGCS on April 23rd. This event will crown our VGCSA Champion and Runner-up who will qualify for the Virlina Cup this October hosted by our friends from the Carolinas.

This new Championship will also crown an Assistant Superintendent Champion who will also represent the Virginia Team this fall at the Virlina Cup. The remaining qualifier spots will be earned at three Local Qualifying sites designated by the local chapters and selections by our Captain, Jeff



Berg and sponsor Syngenta.

We will also be partnering with Landscape Supply on the BMP Golf Tournament to generate more resources for our BMP program. The Country Club of Virginia has graciously opened its doors on May 13th on the famed River Course. We look forward to another great event sponsored by Landscape Supply and their cast of supporting vendors.

We will also be partnering with the CMAA and NGCOA on a summer education seminar down at the beach at Princess Anne Country Club. Mr. Billy Fuller will be presenting on his time as the Superintendent at Augusta National and Master Planning.

The Nutrient Management Plan deadline is right around the corner in 2017. We hope that you, as your facility manager, are taking the right steps and making plans

to be a part of this mandated program. The two ways to accomplish this goal are to hire a NM Planner to create a NMP for your facility or become a NM Planner and create the plan yourself. The first round of state issued cost share benefits has already started, so please view our website for more details.

I would like to thank VGCSA Board for their work so far this year and look forward to another productive year for our members. I would also like to thank the local leadership who provide education and a platform to create networking opportunities. I would like to thank our partners who provide us with the resources to support our members through a multitude of directives. Finally I would like to thank our members for their support, hard work and dedication to our industry!

Respectfully submitted,



Matt Boyce VGCSA President

Included with this edition of Commonwealth Crier

There are several inserts included with this newsletter. Please take a moment and review important information regarding:

VGCSA Championship • Buy Sod Scholarship

Rounds4Research Donations • Landscape Supply BMP Tournament
Tollie Quinn Tournament

Peter McDonough Receives VAC Award



Peter McDonough, the golf course superintendent of the Keswick Club, has been awarded the Virginia Agribusiness Council's 2013 Agribusiness Environment Award. Council President Katie Frazier presented the

award during the VGCSA's Annual Conference in Fredericksburg, on January 29.

Throughout his career, McDonough has been a leader and advocate for the golf course industry in the Commonwealth. With increasing environmental pressure on the agribusiness industry, he saw a need to document the sound environmental practices that are in place at courses across

the Commonwealth, to not only assist other courses in maintaining their properties in an environmentally friendly manner, but also to proactively document the positive environmental practices that golf courses have already implemented With this goal in mind, Mr. McDonough took the lead in organizing and implementing the development of VGCSA's Environmental Best Management Practices manual.

McDonough has also been very active on many state regulatory and advisory boards, as a member of the Virginia Technical Advisory Committee for the State Emergency Drought Plan, for Groundwater Recharge, and for writing the Reclaimed Water Regulations. He served alongside the Council on the Virginia Agricultural United working group on the Chesapeake Bay TMDL requirements and

served as the voice for golf in efforts to address water quality in an economically feasible manner.

Frazier commented during the presentation, "Peter has provided us all with an excellent example of environmental stewardship and leadership. He has set a high bar of proactive leadership and action for other sectors of the agribusiness industry to emulate." She went on to note, "It is our great pleasure to recognize his contributions to the industry and his dedication to the environment."

McDonough is an active member of the Virginia Agribusiness Council. He is also a member of the Virginia Turfgrass Council, the Virginia Golf Council, the Golf Course Superintendents Association of America. and is a founder of the Virginia Golf Course Superintendents Association.



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2013 VGCSA Event Schedule

2015 40	CSA Event Schedule
April 16 April 20 April 22 April 23 April 25	VTA Meeting, Ballyhack GC LIVE GREEN, Hampton Roads First Tee GWGCSA-MAAGCS Joint Meeting, Norbeck CC VGCSA Championship, The Foundry GC SVTA Meeting, Packsaddle Ridge GC
May 7 May 13 May 15 May 20 May 21 May 23	ODGCSA Tollie Quinn Tournament presented by STI Landscape Supply BMP Tournament, The CC of Virginia Virginia Agribusiness Council Golf Tournament, Viniterra GC TTA Dick Cake Tournament & Virlina Cup Qualifying, Elizabeth Manor G&CC VTA Fundraiser, Hidden Valley CC SVTA Meeting & Virlina Cup Qualifying, Heritage Oaks GC
June 10 June 18 June 28	VGCSA-CMAA-NGCOA Joint Event featuring Billy Fuller, Princess Anne CC, presented by Horizon VTA Meeting, Boonsboro CC TTA Family Night, Norfolk Tides Baseball
July 8 July 16	SVTA Meeting, Loudoun G&CC VTA Go Kart Racing, Virginia International Raceway
August 22 September 17 September 26 September 30	SVTA Meeting, Appleland Sports Park VTA Meeting, Blacksburg CC SVTA Meeting, Spotswood CC ODGCSA Meeting, Glenmore CC
October 14 October 21 October 24	VTA Annual Meeting, The Water's Edge CC VGCSA Joe Saylor Memorial, Kingsmill Resort, River Course SVTA Meeting, Shenandoah Valley GC
November 4 November 5	VGCSA Assistants Forum, site TBA ODGCSA Annual Meeting & Par-3 Shootout, Independence GC
2014	

January 27-30 VTC Conference & Show, Fredericksburg Expo Center

January 28 VGCSA Annual Meeting (TBA) February 3-7 GCSAA Conference & GIS, Orlando

(note: additional GWGCSA & TTA events TBA)

Landscape Supply BMP Fundraiser Continues to Grow

One of the most important events of the year—and one of the most fun – is coming soon! With the unwavering generous support of Landscape Supply, Inc., the Virginia Golf Course Superintendents Association is pleased to announce the 5th Annual BMP Fundraiser Tournament will take place on Monday, May 13, at the famed Country Club of Virginia James River Course in Richmond.

Landscape Supply and VGCSA are thrilled to bring the BMP event to the renowned James River Course and acknowledges the Country Club of Virginia for its generous support.

The Virginia Golf Course Superintendents

Association has published Environmental Best Practices for Virginia's Golf Courses. This comprehensive document provides summary Best Management Practices (BMPs) and accompanying recommendations, specifically adapted for golf courses in Virginia. Combining the results of scientific research with the experience of golf course superintendents and the expertise of other golf industry representatives as well as State regulators, BMP's provide critical information in a number of key areas.

Implementation of BMP's specific to Virginia's environment minimizes nutrient loading to waterways, decreases pesticide

runoff and conserves water while preserving the quality experience Virginia's golfers are accustomed to. Furthermore, the adoption of BMP's—in combination with critical ongoing research directed by VGCSA will help achieve goals established by the U.S. Environmental Protection Agency for the Chesapeake Bay. Ultimately, BMP efforts will help improve the game and make golf even better for our environment. VGCSA is proud to partner with Landscape Supply in this important program, and we encourage everyone to come out to participate in this great event.

For more details and to register, see the brochure enclosed with this newsletter.

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VGCSA Visits State Legislature

VGCSA Government Relations Chair Rob Wilmans led a contingent of Jeff Holliday, Kevin Fortune, David Norman and Elizabeth Manor PGA Professional Dan O'Boyle to the 2013 General Assembly Session in Richmond the third week in February, on behalf of the Virginia Golf Course Superintendents Association.

The group promoted Environmental Stewardship of golf courses and course managers by handing out thumb drives of our BMP document attached to a sleeve of golf balls to all of the Senator and Delegate offices.

The event was a success from both a marketing and regulatory standpoint, by pointing out how golf courses already are taking large steps toward IMPROVING the environment, as well as meeting with government officials and putting a face on the golf course management industry.

Thanks go to Dan O'Boyle and the rest of the committee for their time and dedication to the golf business. The more VGCSA can show government officials that golf courses are a good thing, the less they will feel the need to regulate our industry.

Less regulation equals more affordable and better quality golf!

Did You Know?

In 13 years of VGCSA Championships, only four times has the Champion NOT been Jeff Whitmire or Bobby Friend.

In seven years of the Assistant Championship, there has been a new winner every time.



Jeff Holliday, CGCS displays the BMP document at the State Legislature



VGCSA and ODGCSA Leaders Attend GCSAA Symposium

The GCSAA Chapter Leaders Symposium was held in March at GCSAA headquarters, with Vice President Jeff Holliday, CGCS and Executive Director David Norman representing VGCSA, while Scott Mauldin, CGCS represented Old Dominion GCSA. This annual event provides the opportunity for chapter representatives to network with their peers and gain valuable skills to enhance their leadership abilities.

Highlighting the first day was a curriculum that included presentations on "Running Exceptional Meetings," "Board Leadership—Your Roles and Responsibilities" and "Managing a GCSAA Affiliated Chapter." Mischia Wright of the Environmental Institute for Golf gave an update on successes and future endeavors. Breakout sessions featured "Recruitment/Retention and Providing Value" and "Communications Strategies."

As a side trip, the Virginia contingent was treated to a visit to Allen Field House on the campus of University of Kansas, celebrating basketball legends Wilt Chamberlain, Danny Manning, Coaches Phog Allen, Roy Williams and Bill Self.

The second day featured a captivating presentation by John Jensen, "Organizational Leadership – Being Your Absolute Best – Use Your Influence." Then the group interacted with a Golf Industry Panel, comprised of Ron Whitten (*Golf Digest*), Kim Richey (Kansas Golf Association), Brad Demo (Heart of America PGA Section), Dick Stuntz (NGCOA) and Richard Konzem (GCSAA COO).

"It was an excellent event," said Holliday, "and we were able to network and share ideas, which will help us a great deal in serving our associations."



Scott Mauldin and Jeff Holliday with Old Tom Morris statue outside the GCSAA headquarters building.



Scott Mauldin and Jeff Holliday at Allen Fieldhouse on the University of Kansas campus in Lawrence.

The Foundry to Host Inaugural VGCSA Championships New Event Debuts April 23rd

The VGCSA Championship features the top players of the VGCSA, vying for championships in two divisions, Superintendent and Assistant Superintendent. The Foundry GC in Powhatan plays host Tuesday, April 23rd in this stroke play event. Class A, SM and C are eligible. The top two superintendents and the top assistant qualify for the Virlina Cup.

The new stand-alone event allows for a true championship competition with an

individual stroke play format played under USGA Rules. Syngenta is the sponsor for the event, which also serves as a qualifier for the Virlina Cup. The top two players in the Superintendent Division, as well as the Assistant Champion, will qualify for the Cup. Three additional qualifying events will be hosted by TTA, GWGCSA and SVTA/VTA later.

There is a discounted entry fee, thanks to Syngenta's sponsorship. This includes golf,



cart, lunch, prizes and awards party. An entry form is enclosed with this newsletter, or you may register at www.vgcsa.org.

VGCSA Annual Meeting Draws Record Attendance

The VGCSA Annual Meeting was held at the end of January, drawing a record attendance of 176 at Fredericksburg Country Club. In just the second year of the evening format, the event grew by 20%, and a new Diamond Partner Reception was introduced as a prelude to the function.

"We were very pleased with this year's Annual Meeting," said VGCSA President Matt Boyce. "With the VGCSA Awards a part of the evening, it was gratifying to see our award winners receive due recognition from a large contingent of their peers."

This year's award winners were **Dave Harmon** (formerly Golden Horseshoe GC)
for Lifetime Service, the late **Stan Zontek**(USGA Green Section) for Distinguished
Service, **Donna Johnson** (Virginia
Agribusiness Council) for Environmental
Stewardship and **Chantel Wilson** for the
VGCSA Scholarship.

The evening featured an opening reception, a seated dinner, a presentation on the activities of 2012 and plans for 2013, as well as the awards presentation.

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2013 VGCSA Leadership (L-R): Chris Petrelli, Secretary/ Treasurer; Jeff Holliday, CGCS, Vice President; Matt Boyce, President; Jeff Berg, Past President

Landscape Supply was the Presenting Sponsor and Syngenta was the Reception Sponsor. The trolley transportation was co-sponsored by Agrium and Trinity Turf. Other sponsors included WinField and Precision Labs.



Fredericksburg Country Club hosted the 2013 Annual Meeting



Annual Meeting participants enjoy the opening reception.



Now, only from Buy Sod, Champion Dwarf bermudagrass sod will be available in Summer 2013! The exclusive grower and distributor of Champion sod on the entire East Coast, Buy Sod can supply the sod you need, from patching and repairs to complete putting green replacement. Also, if your course is considering a full greens conversion from bent to Champion, you can have us contract-grow your Champion sod, cutting your course's downtime to only 2–3 weeks (compared to 8 weeks for sprigs). Grown on fumigated, 90% sand-based soil that's virtually identical to USGA putting green specifications, our Champion Dwarf will get your greens in Champion-ship quality, without missing a stroke.

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National Golf Day Set for April 16

GCSAA storytellers, members, board and staff will join allied associations as part of the We Are Golf coalition.

National Golf Day Messages

- 2 million jobs makes golf more than just a game for America
- \$76 billion makes golf more than just a game for America's economy
- Did you know you burn 2,000 calories walking an 18-hole golf course? Golf is more than just a game
- \$1.1 billion raised for charity by the @ PGATOUR, another reason golf is more than a game

• Golf courses increase America's green space and benefit the environment, making golf more than just a game

On April 16, 2013, the We Are Golf coalition will be meeting with members of Congress during the sixth annual National Golf Day to share stories and data about golf's diverse businesses, employees, tax revenue creation, tourism benefits, charitable benefits and environmental leadership.

Organizations participating include: GCSAA, PGA of America, World Golf Foundation, Club Managers Association of America, and the National Golf Course Owners Association.

The nearly 2 million U.S. jobs generated by the multi-billion-dollar golf industry, and its vast economic reach, are at the core of We Are Golf's message. Given the scope and pace of federal government activity and the impact on small businesses, the golf industry can play a vital role as policymakers continue efforts to boost employment and get the nation's economy back on track.

Beyond better demonstrating golf's profound economic clout, We Are Golf will illustrate the industry's health and wellness benefits, its unparalleled charitable giving, and its environmental sustainability initiatives.

GCSAA to Hire Mid-Atlantic Regional Rep

The Golf Course Superintendents Association of America (GCSAA) is the process of hiring a dedicated professional to serve as a conduit to the 11 affiliated chapters in Delaware, Pennsylvania, Maryland, District of Columbia, Virginia and West Virginia.

The mission of the position is to work strategically to enhance communication between GCSAA and the chapters to improve the effectiveness of programs and services at the chapter level.

The representative will assist in recruitment and retention of members, work closely with regional allied associations and serve as a regular chapter meeting attendee to assist in providing GCSAA resources to the respective chapters. He/she will also enhance the relationship between chapters and GCSAA through direct engagement with members and regular communication and participation with chapters in the region.

The regional representative is a key component to accomplishing the strategic objectives of GCSAA and affiliated chapters. The representative will be a key facilitator and link between chapters, members and the GCSAA.

Applications closed April 9, and the review process is ensuing. GCSAA's current field staff representatives include:

 John Miller, CGCS, in the Great Lakes region (Kentucky, Wisconsin, Michigan, Illinois, Indiana, Ohio)

- Brian Cloud in the South Central region (Texas, Oklahoma, Arkansas, New Mexico and Louisiana)
- Jeff Jensen in the Southwest region (California, Hawaii, Nevada and Arizona)
- Ralph Dain in Florida
- Kevin Doyle in the Northeast region (New Jersey, New York, Connecticut, Rhode Island, Massachusetts, Maine, New Hampshire, Vermont, Ontario)
- David Phipps in the Northwest region (Alaska, Washington, Oregon, Idaho, Utah, Wyoming, Montana and Colorado)
- Steve Randall in the Central Plains region (Kansas, Nebraska, Iowa, South Dakota, North Dakota, Minnesota, and Missouri).

Feedback has been overwhelmingly positive from chapters that have participated in the program. They report greater connection with GCSAA, an enhanced ability to use GCSAA programs and services, and access to additional resources to advance chapters in a strategic manner.

Did You Know?

The Joe Saylor Memorial began in 2005 at Kingsmill Resort.

The event returns to its birthplace on October 21, 2013.

Finlen Elected President of GCSAA

Patrick R. Finlen, CGCS, director of golf maintenance operations at the Olympic Club in San Francisco, Calif., since 2002, was elected president of the GCSAA at the association's



Patrick R. Finlen, CGCS GCSAA President

annual meeting Feb. 7 in San Diego, Calif.

Finlen's election continues a busy schedule for him as this past summer he hosted the U.S. Open at the Olympic Club's Lake Course and completed a renovation of its Ocean Course. A graduate of Rockhurst University in Kansas City, Mo., Finlen cut his teeth in the business in Kansas City at Lake Quivira Golf and Country Club, and has stops in Virginia and at the Bayonet and Black Horse Courses in Seaside, Calif. He is a past recipient of the Superintendent of the Year award from the Golf Course Superintendents Association of Northern California. A GCSAA member for 27 years, Finlen is a member and past president of both the California GCSA and the GCSA of Northern California. He is also a past president of the Heart of America GCSA.

Keith A. Ihms, CGCS at Country Club of Little Rock (Ark.) was elected vice president, and John J. O'Keefe, CGCS, director of golf course management at Preakness Hills Country Club in Wayne, N.J., was elected secretary/treasurer.

New Buy Sod Scholarship Program Announced

The 2013 Buy Sod VGCSA Scholarship program was established in 2012 by Buy Sod, Inc. as a means to support the children of qualified golf course superintendents, who plan to attend an institution of higher learning, following graduation from high school.

High school seniors who are the children of Class A or SM members in good standing of the Virginia Golf Course Superintendents Association are eligible for the program.

At the VGCSA Annual Meeting, Buy Sod's John Robertson funded the program with an initial contribution, based on sales to customers in Virginia.

Scholarship winners must enroll at an institution of

higher learning within one year of high school graduation, and the award check will be written to the school/institution.

The VGCSA Board of Directors will be the final authority in the selection process. Awards will be announced by May 15, 2013.

> Applications are now open for this new program, and a form is enclosed with the newsletter mailing and available at www. vgcsa.org.

> Applications must be received by April 22, 2013.

Please send application to VGCSA, 10231 Telegraph Rd., Glen Allen, VA 23059 or dnorman008@gmail.com.

2013 GCSAA Social Event VGCSA-MAAGCS-ESAGCS San Diego, CA

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Plant Health Products:

An overview of how they might boost summer stress tolerance

Erik H. Ervin, Ph.D, Professor of Turfgrass Culture and Physiology, Department of Crop and Soil Environmental Sciences, Virginia Tech



What do we mean by "Plant Health Products"?

Plant health has been the buzz-phrase in turfgrass management, especially golf, over the last few years. Why? Two reasons: First, we are in the post-patent age in terms of pesticide active ingredients, so chemical companies are funding large research and marketing programs aimed at adding value to their branded products. Second, advances in cultivars, mowing equipment, and superintendent expertise have allowed for the maintenance of putting greens that are faster and firmer than ever. Practices such as ultra-low mowing heights and reduced nitrogen and irrigation inputs, may often result in putting green systems that begin to operate with a negative energy balance, especially during the summer. Many plant health products are aimed at improving energy balance while still allowing for optimized putting green playability characteristics. The question is how? In what follows, I review cool-season plant physiologic responses to summer stress with a focus on how a negative energy balance occurs, the natural plant defense systems against such stress, and how certain classes of plant health products may or may not improve stress tolerance.

Healthy turf begins with efficient photosynthesis

Photosynthesis can be said to be the basic plant reaction—producing the chemical energy (carbohydrates) required for all growth and maintenance processes. Anything that interferes with efficient photosynthesis will reduce turf health and ability to deal with stress; anything that favors efficient photosynthesis will bolster turf's health and ability to withstand and defend itself against stress.

Plants consist of millions of cells each of which contains organelles. Each type of organelle has a specific function. For example, chloroplasts capture light energy, the nucleus directs growth, and mitochondria burn (respire) energy to fuel growth. All cells and their organelles are suspended within a water-based solution and are bounded by membranes. The membranes provide structural integrity while allowing substances to diffuse in and out as required for efficient growth and maintenance. Chloroplast membranes contain light harvesting green pigments called chlorophyll. Chlorophyll forms complexes with proteins in the chloroplast's membranes called photosystems. The photosystems capture light energy and turn it

into chemical energy.

Here's how it works. Light hits a chlorophyll molecule and causes an electron within chlorophyll to go to a higher energy level. The energy from these excited electrons is then used to split water and release more electrons. These electrons are then transferred through the protein-based photosystems to produce energy in the form of NADPH (nicotinamide adenine dinucleotide phosphate) and ATP (adenosine tri-phosphate). The plant uses this as energy to drive carbon dioxide (CO₂) fixation and produce carbohydrates. Two stress related dynamics in plant physiology are the production of free radicals and the production of antioxidants. Some antioxidants are a type of protein called enzymes, while others are vitamins. Free radicals disrupt key plant functions and one of the key roles of antioxidants is to "deactivate" or "neutralize" these free radicals. Production of free radicals occurs even under optimum conditions – but is significantly higher when conditions for photosynthesis are sub-optimal, such as occurs during summer heat and/or drought stress.

Photosynthetic inefficiency and turf coping mechanisms

Even under optimum temperature, light, and moisture conditions there is waste in the system resulting in inefficiencies and the production of free radicals in chloroplast photosystems. Similar to a car engine, there are a number of toxic chemical emissions or byproducts of photosystem function that the plant must deal with to remain healthy. Under less than optimal mowing height, temperature, light and moisture conditions – the inefficiencies will be greater.

Why do these inefficiencies occur? Photosystems of plants that are completely dependent on a cool-season (or C3) photosynthetic pathway are not immediately capable of using all the excited electrons that are created when chlorophyll electrons are excited by light. Generally, this inefficiency is due to the inability of the enzyme Rubisco to fix enough CO₂ to utilize all of the available light for carbohydrate production. Although Rubisco preferentially fixes CO₂, it also fixes O_2 in a process called photorespiration. As temperatures build and stomatal openings narrow, the internal concentration of O_2 increases relative to that of CO₂, increasing photorespiration and the inefficiency of light capture. The unused excited electrons are either lost directly as heat or as a light emission called chlorophyll fluorescence - or they react with "good" (ground state) oxygen (chemically represented as 3O_2) and form free radicals such as "bad" singlet oxygen (1O2), the superoxide radical (xO_2), and hydrogen peroxide (xO_2).

Chlorophyll fluorescence is a natural phenomenon that is easily measured on turfgrass canopies with a chlorophyll fluorometer and converted to a standard measure in plant physiology called photochemical efficiency. Briefly, the more light being given off (or fluoresced) from the canopy, the less efficiently that light energy is being used by the photosystems to run the photosynthetic reactions and produce carbohydrates. Optimized turfgrass canopies have photochemical efficiencies of about 0.7, while those under stress are at 0.55 or below.

Free radicals, if not quickly converted to water and ground-state oxygen by antioxidants, damage proteins and DNA, bleach chlorophyll, and disrupt membrane integrity. Left unchecked, free radicals can lead to leaf yellowing and plant death. To deal with free radicals, healthy plants have a robust defense system that produces and maintains certain levels of antioxidants to "deactivate" or "neutralize" the damaging free radicals.

This defense system also requires favorable conditions to operate efficiently and can be overwhelmed by stress. Stresses such as drought and heat increase the production of free radicals. And if the plant has low energy reserves, poor access to soil moisture, or damaged root systems it will often lack the ability to increase production of enough antioxidants (which are N and C-rich compounds) to off-set the increase in free radicals. The result is called oxidative stress - a primary factor in summer cool-season turfgrass decline.

Perhaps as you were reading above you thought of a "catch-22": Energy status is naturally low because of higher rates of photorespiration in the summer. Couple this with the need to use more energy to produce more antioxidants to protect itself against summer oxidative stress and it is no wonder that roots decline. Translocation of shoot-produced carbohydrate to roots in the summer comes to a stand-still in favor of protecting the photosynthetic apparatus. Such a negative energy status appears overwhelming; how can any plant health product counteract these processes? We'll get to some answers after a brief review of plant

continued on page 10

Plant Health Products, cont.

hormones and their role in directing energy use and defense response during stress.

Plant hormones and stress responses

Plant hormones can be thought of as the chemical signals that direct energy use and responses to environmental stimuli. The five primary hormones are cytokinins (CK), auxin, gibberellic acid (GA), abscisic acid (ABA), and ethylene. Auxin, CK, and GA are known as growth hormones, while ABA and ethylene are known as stress-response hormones. They can often work to counter-act each other in that shoot tissues with higher levels of one relative to another will result in energy being directed toward one type of growth response over another. Two classic examples come from our use of PGRs. Inhibition of foliar GA production due to trinexapac-ethyl (Primo®, T-Nex®) results in less energy being used for leaf elongation, resulting in greater CK activity and use of some of the conserved energy for enhanced cell division and tillering at the crown. Application of ethephon (Proxy) to Poa in the spring releases ethylene and antagonizes CK action, greatly restricting cell division from the apical meristem and reducing inflorescence development. These hormonal reactions are not simple on-off switches, rather they should be understood as the primary signal telling the plant to turn on a certain gene that then directs the plant to use energy to produce a set of proteins that then result in a particular growth (e.g., leaf elongation) or stress (antioxidants) response to occur.

A final category that needs introduction is secondary plant hormones. For our purposes we will merely introduce one, salicylic acid (SA), better known as aspirin. Its natural production is high in Salix or willow trees, thus the name, but it is produced in most plant species including turfgrasses. A primary role of SA is to induce what is known as systemic acquired resistance or SAR in response to pathogen (e.g., fungi, bacteria, nematode) infection. Infected or invaded cells produce SA which then serves as the genetic signal to turn on localized production of toxic or antimicrobial compounds. The infected leaf cells are killed, along with the invading pathogen, functioning to stop the spread of disease.

Plant health products: A review of possible benefits

Groups 1 and 2: Phosphites and Pigments

We begin with one of the original plant health products, Signature®, a combination of

fosetyl-Al (a phosphite fungicide) and a blue-green pigment (Stressgard®). Phosphite (PO_3) fungicides and fertilizers have been documented to protect against moderate pythium blight pressure via SAR. Foliar uptake of the phosphite, PO_3 rather than normal phosphate (PO_4), sends a stress signal through the plant resulting in the systemic production of higher levels of antimicrobial compounds called phytoalexins. These compounds do not directly kill the fungi, they merely deter or slow infection. If pythium pressure gets high enough, the "naturally-induced" tolerance provided by the phosphite is overcome and a stronger pythium fungicide is required.

There is an energy cost to the plant to produce the antimicrobial compounds caused by repeated phosphite application. This is where the pigment comes in. Virginia Tech and Rutgers research has shown that pigment application (every 7 to 14 days) blocks UV light (a huge contributor to free radical production), resulting in a greater maintenance of chlorophyll and carotenoid pigment levels. More pigments for light absorption translates into slight increases in net photosynthesis (energy gain) and turf that maintains greater color and density under heat stress.

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Group 3: Turfscreen®

Turfscreen contains the same ingredients as common sunscreen, titanium dioxide and zinc oxide; it also contains a blue-green pigment. These compounds are very effective absorbers of UV light; they work on us to not allow high free radical production in our skin that can destroy cells and cause sunburn. Adding in the pigment, as above, should result in similar positive results. Some contend, even, that the resulting whitishcast to the turf could result in lower mid-day canopy temperatures. Virginia Tech putting green research in summer 2012 revealed no canopy temperature differences when blue-green pigments were compared to Turfscreen and the untreated control. More detailed research regarding effects of Turfscreen on photosynthesis and other physiological responses is needed.

Group 4: Daconil Action®

Daconil Action is a new product out from Syngenta combining chlorothalonil with acibenzolar. Acibenzolar has been shown to be a successful salicylic acid mimic working to induce SAR and antimicrobial compounds within the plant. Kansas State research reported that acibenzolar applied alone on a 14-day interval resulted in 26 to 38% less dollar spot than the control. Virginia Tech research has shown that pre-treatment with salicylic acid prior to heat stress improved tolerance by temporarily boosting antioxidant levels. New research comparing acibenzolar to salicylic acid for improved heat tolerance is warranted, along with research regarding any role it might play in prevention or alleviation of the bacterial decline complex.

Group 5: Insignia®

Insignia (pyraclostrobin) is a broad-spectrum strobilurin fungicide that research at multiple universities has shown to have plant health benefits. Repeated applications have been shown to slow down respiration (less energy loss) and result in boosted antioxidant content under heat and drought stress. Interesting also is the finding that the active ingredient naturally degrades to the amino acid tryptophan which is the precursor to the plant rooting hormone, auxin. Thus, University of Tennessee research reported increased Penn A1 root mass following three (14-d interval) applications under mild drought stress when compared to the untreated control and azoxystrobin.

Given these possible benefits of repeated Insignia use, why not use it as a base in your seasonal fungicide program? Because pathogen resistance to strobilurins has already been reported. A better approach may be to use it twice in the spring as a pythium root dysfunction (P. volutum) preventative with the

thought that it may be increasing rooting and pre-stress conditioning your greens for the summer. Rotate off Insignia for 6 to 8 weeks then consider 1 or 2 later summer applications.

Group 6: Humics and Auxin

Stable fractions of organic matter, mainly from leonardite soft brown coal, called humic and fulvic acids (HA and FA) are common ingredients in many biostimulant fertilizers. These organic compounds are excellent chelators, holding micronutrients in solution in the container, spray tank, and soil. Thus they function to improve plant micronutrient uptake. Another important plant health function is that they mimic the effects of auxin to promote root growth and drought tolerance. Research at Virginia Tech comparing foliar application of HA to a synthetic auxin (IBA) demonstrated similar rooting increases of cool-season grasses when these two compounds were compared to the untreated. In fact there are turf-labeled products that contain synthetic auxin (IBA). It is important to apply these compounds prior to summer stress so that extra rooting can occur before the plant is in an energy-depleted state.

Group 7: Seaweed extracts and Cytokinins (CK)

Look at the ingredient list of almost any biostimulant and you will see seaweed extract (SWE), seaplant extract, or kelp extract. Primarily these extracts come from using potassium hydroxide in warm water to break down the tissues of Ascophyllum nodosum or N. Atlantic rockweed. Along with HA, why is SWE so often found in biostimulants? Early research (1990's) by Schmidt at Virginia Tech indicated that repeated monthly application of SWE resulted in boosted antioxidant levels in leaf tissues, less loss of root viability and improved drought and heat tolerance. But we did not understand why. My research in the 2000's revealed that SWE is naturally high in cytokinins (CK). When we compared the natural amount of CK present in SWE to the application of a synthetic CK, we were able to show similar increases in antioxidant levels, roots, and overall heat tolerance.

What is special about the role of CKs in summer stress tolerance? First, apart from their role in cell division to bring about new tillering and inflorescence development, CKs are known as the stay-green hormone. When high levels of CKs are present in leaf tissues they turn on the production of antioxidants which then function to stabilize chlorophyll and allow longer term photosynthetic energy production during stress. CKs are produced in

new, actively growing roots and move upward to perform their antioxidant function via the transpiration stream. Summer root decline severely reduces CK levels being delivered to shoots from roots, so supplementation via SWE application prior to, and during, summer stress can function to boost levels and slightly improve stress resistance. Interestingly, our research has shown that combing HA and SWE in your spray program can provide better plant health effects than using either alone.

Group 8: Amino Acids

Amino acids are the building blocks of proteins. They are the direct product of nitrogen assimilation and can become depleted under low-N fertility programs or just due to summer stress. Considerable energy is required to produce amino acids and then to combine those to make complex proteins that have many stress-defense functions. Supplementation of amino acid levels via foliar applications is a suggested approach to improve health of plants experiencing energy depletion. Penn State research reported improved photochemical efficiency and overall heat tolerance due to sequential foliar applications of an amino-acid based product. Recent Virginia Tech research has shown greater maintenance of chlorophyll and tiller density, relative to an equivalent rate of ammonium-sulfate based N, under moderate drought stress on a sand-based putting green.

Although these responses may be due to getting the plant into a more positive energy state, there are a number of amino acids or derivatives that function as direct osmoregulators or dehydration avoidance compounds. These compounds, proline and glycine-betaine in particular, often increase naturally by 10-fold in the cells of drought-tolerant plants. They function to increase cell sap concentration, not allowing as much water loss from the cell so that normal protein functions within the chloroplast can continue.

Conclusions

Yes, the subject of plant health products is complex and confusing! My hope is that I have been able to explain some of the complexity and provide some "food for thought" as you evaluate all of these product groups. Many have something legitimate to offer and it is no wonder that the spray tank often ends up with 3 or more products in it! In the end, however, please remember that none of these ingredients are silver bullets. Focus first on excellence in your mowing, fertilizing, watering, cultivation, topdressing, and primary pest control programs, then look to plant health products to get to the next level.

Monday: The bank's Scramble. Thursday: Member/Guest Tournament. Guess you are fertilizing Wednesday. Sure hope your distributor has it all in stock.

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News from Local Associations

ODGCSA News

The ODGCSA began 2013 by hosting two concurrent educational opportunities on the morning of January 28th prior to the VTC Conference.

Our next function was a joint meeting with the TTA held at Kingsmill Resort with Andrew Green as the speaker, followed by golf.

We finished off the first quarter of the year with our social "March Madness" held at Champps in Richmond and Buffalo Wild Wings in Williamsburg.

Our president, Scott Mauldin, represented the ODGCSA at the Leadership Conference sponsored by the GCSAA in March.

The BIG news from the ODGCSA is our Tollie Quinn golf tournament coming up on May 7th at The Williamsburg Club. If you haven't heard we are going to a new format this year. The tournament is changing to a best-ball format with numerous prizes and fun for all. This year's event will

NOT be the qualifier for the Virlinia Cup but will continue to be sponsored by Smith Turf and Irrigation.

Our entire schedule for 2013 can be found on the VGCSA website.



Dan Taylor, CGCS ODGCSA External Vice President

TTA News

What a difference a year has made in Tidewater!! This week a year ago we had mowed fairways multiple times, ryegrass was in full throttle mode, and the entire course was greening up. This year the word is dormant. Courses that went with early aeration have had to contend with highs in the 40s and below freezing lows. A nice shot of snow the last week of March was like the cherry on top of the cold wet spring sundae.

The Association kicked off the year running with three events in the first three months of the year. January brought hockey night at a Norfolk Admirals Game, always a well-attended event.

In February, Mark Ross at Virginia Beach National hosted the first meeting of the year. The speaker was Dr. Jerome Blackman, MD, a Professor of clinical psychiatry at EVMS. Dr Blackman spoke about stress in the workplace and at home. His talk was one of the most interesting in recent memory and a great change of pace from the usual turf topic.

March brought us back to Kingsmill Resort and host superintendent Ted Smith. The speaker was Andrew Green from McDonald and Sons. Mr. Green gave a great presentation on top ten courses in the US. Everything from the history of golf, architecture, layouts and course maintenance were covered in an enjoyable format laced with lots of great photos of renowned courses.

The next event will be the annual Dick Cake Tournament held at Elizabeth Manor Golf and Country Club. This year the event will serve as a qualifier for the Virlina Cup Team and is on May 20th with an 8:30 shotgun start.

We hope to see our members participate in the first VGCSA Championship at the Foundry as well as the annual Landscape Supply BMP Tourney at Country Club of Virginia.

This summer we will hold a TTA night at a Norfolk Tides baseball game, and then the annual OBX trip in September.



Rob Wilmans
Elizabeth Manor Golf and
Country Club
External VP-Tidewater
Turfgrass Association

VTA News

It has been an interesting couple of months for Southwest Virginia weather wise. We had 70 degrees in January, followed by flooding, and wrapped up with constant wind and snow flurries. The daffodils that emerged in February are still waiting to bloom. Just as it looks like the weather is going to break, winter manages to regain its stronghold.

During this time of year, things are typically quiet on the association front. The officers met earlier in the year to finalize the schedule for the coming year. Some of the highlights are, The Annual Robert Ruff Sr. Memorial Golf Tournament and Fundraiser which will be held on May 21st at Hidden Valley CC in Salem.

We will wrap up our season in October at the beautiful Water's Edge Country Club on Smith Mountain Lake. The full schedule is posted on the calendar link at vgcsa.org.

This year, the qualifying process for the Virlinia Cup has changed. On May 23rd Heritage Oaks Golf Course in Harrisonburg will host a regional VTA/SVTA qualifier. The low round posted for the day will represent the VGCSA in the event this coming fall. Next year the joint qualifier will rotate to a location within the VTA footprint. Qualifying will also take place on April 23 at the VGCSA Championship at The Foundry Golf Club.

I would like to take this opportunity to thank Mark Cote for his service over the past two years as the External VP to the VGCSA and President of the VTA. He will not be too far removed as he will still serve the VTA as Past President. I hope everyone was able to take a little time for themselves and their families over the winter months. Even though the weather in this part of the state does not feel like it, spring and the busy season are just around the corner.



Bill Keene Blacksburg Country Club VTA External Vice President







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News from Local Associations

News from the GWGCSA

By the time you're reading this we will probably be in the full swing of summer-like weather and to be honest, I wouldn't mind a little right now. Looking outside on March 25 there is a nice two inches of fresh snow on my greens rather than a covering of freshly pulled aerification cores. "Global Warming", I could use a little! On top of that, my March Madness brackets are doing miserably while Van Fleet and Furlong are charging to the front.

Last year at this time we were handwatering and trying to keep up mowing the roughs. I was also scrambling to get out pre-emerge before the crabgrass started to germinate. This year I'm at only 12 growing degree days through March and wondering if it will be May before I'll be putting out my proxy/primo application. Northern Virginia is one strange place.

With nothing getting done outside, this is a good time to reflect back and to look forward to 2013. The Greater Washington membership is strong due in no small part to the efforts and representation of Jeff Van Fleet as our retired external vice president. Jeff, you've left some pretty big shoes to fill and I will do my best to continue the work you have started.

For 2013 we have many good events planned and look forward to some learning opportunities as well as a chance to socialize

play a little of the game which we spend so much time preserving.

I am excited about the opportunity I've been given to serve and to give back to the organization that had done so much for me. To all of you in the Greater Washington, please do not hesitate to contact me with input or concerns that you have for the state board.



Shawn Gill GWGCSA External Vice President

SVTA Update

Spring has officially arrived in the Shenandoah Valley, although you would not have known it by the snow on the ground the week before Easter! In 2012, we had temperatures in the 80s and this year, we were lucky to hit 50. We had our biggest winter snowfall events in March. The three late spring storms brought 24+ inches to the Valley making it difficult to get much done on golf courses to prepare for the spring.

Front Royal even made national headlines when the Weather Channel

broadcasted live from the Holiday Inn at Blue Ridge Shadows in March. Front Royal was considered the bull's eye for the Storm! So last year, March was one of the warmest on record and now March of 2013 ended as being one of the coldest and snowiest!

The SVTA had their first meeting on March 28th. It was great to get out and see everyone. The SVTA has an exciting meeting schedule and speakers planned for 2013! We hope everyone can come out and join us. Remember, coming to local

meetings is a great way to keep up with local and state issues. We all need to come together and support Turfgrass in Virginia!

I hope everyone has a great spring and I hope that the spring temperatures remain into the summer!



David Lewallen SVTA External Vice President

Rounds4Research Gears Up for 2013 Auction - Please Donate a Foursome

Welcome to Rounds 4 Research, an innovative program aimed at generating resources to fund research and help ensure golf's future. The premise is simple: Golf facilities can support the effort by donating rounds of golf for two or four or "stay and play" packages and other items that will be auctioned off online to generate funds for turfgrass research. Rounds 4 Research is administered by the Environmental Institute for Golf and presented in partnership with the Toro Co. The EIFG is the philanthropic organization of the Golf Course

Superintendents Association of America.

The VGCSA is featuring a research auction for the eighth consecutive year, with

proceeds going to the BMP Fund, currently in the Water Quality Monitoring phase. All VGCSA rounds are slated to be auctioned in tandem with this year's US Open and Father's Day, running June 6-16, 2013. Accordingly we are now soliciting donated rounds. We already have a good start of rounds donated in advance last year as follows:

Broad Bay CC • Elizabeth Manor G&CC
Foundry GC • General's Ridge GC
Goodyear GC • Hanover CC
Ingleside Resort • Keswick Club
Lake Monticello GC • Loudoun G & CC

Salisbury CC • Spring Creek GC

Westham GC • Wintergreen Resort

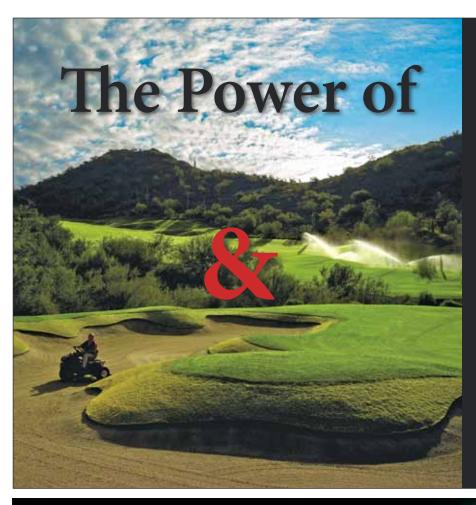
We are asking all Virginia clubs to please donate one or two complimentary foursomes of golf (including cart)



to be auctioned to benefit our research fund. In order to allow time to prepare for the auction, please donate by April 30, 2013.

A donor form is included with this newsletter mailing, or you may donate online at www.rounds4research.com.

Please make sure you designate that proceeds benefit the Virginia GCSA.



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