



The Green Sheet

Central Pennsylvania Golf Course Superintendents Association

Volume 26 Issue 4

Founded ~ April 11, 1939

July 2019

The Countdown Begins

July 19, 2019

By Dave Oatis, USGA Regional Director,
Northeast Region

July and August usually bring the toughest weather of the year for golf course superintendents, and the weather pattern now hitting the Northeast qualifies as a potential worst-case scenario event for turfgrass! Under the predicted weather conditions, it is important to avoid as much traffic and wear stress as possible. Consider not mowing greens, perhaps not even rolling and raising cutting heights. Decide how best to handle golf cart traffic. Confining carts to paths or instituting the 90-degree rule may be appropriate. Make sure turf fans are operational if you have them. Remember that syringing may be necessary but it is only effective if there is enough air flow for evaporation. Adding more moisture under hot, humid and stagnant conditions can make things worse.

Let golfers know how important syringing can be under these extreme weather conditions. Encouraging golfers to play earlier is an option some may choose. Prepare your staff for the extreme weather as well. Make sure they pre-hydrate and remain hydrated throughout their shifts. Consider bringing in more staff and give them more frequent breaks.

Here are a few additional recommendations to help get your turf across the finish line:

Play defense:

Most superintendents are on the defensive at this point in the season. This is the time of year when “good ideas” get people in trouble. If you have a good idea, sit down and wait for it to go away! Okay, at least think twice about it. Aggressive action when turf is at its weakest can save it or push it over the edge. Sometimes doing nothing is the best thing to do.

.....Continued on page 2.....

Have a Sun-Safe Summer

May 21, 2019

It's natural to want to get out in the sun during warm summer days. It should also be second nature to take steps to protect your skin from the sun when you go outside.

Ultraviolet (UV) rays – from the sun and other sources like tanning beds – are the #1 cause of [skin cancer](#). Too much exposure can also cause sunburn, eye damage, and premature wrinkles. But shielding your skin with clothing, broad-spectrum sunscreen with a sun protection factor (SPF) of at least 30, and staying in the shade can help lower your risk.

Take these steps to stay sun-safe:

- **Cover up:** When you are out in the sun, wear clothing and a wide-brimmed hat to protect as much skin as possible. Protect your eyes with sunglasses that block at least 99% of UV light. Use a broad-spectrum sunscreen with an SPF of at least 30: Reapply at least every 2 hours, as well as after swimming or sweating.
- **Seek shade:** Limit your direct exposure to the sun, especially between 10 a.m. and 4 p.m., when UV rays are strongest. Avoid tanning beds and sunlamps: Both can cause serious long-term skin damage and contribute to skin cancer.

Choosing the right sunscreen

While you should use sunscreen every day of the year, it's even more important during the summer, when the days are longer, the sun is stronger, and it's easier to spend more time outdoors. When choosing sunscreen, read the label before you buy. US Food and Drug Administration regulations require the labels to follow certain guidelines:

- Choose a sunscreen with “**broad-spectrum**” protection. Sunscreens with this label protect against both UVA and UVB rays. All sunscreen products protect against UVB rays, which are the main cause of sunburn. But UVA rays also contribute to skin cancer and premature aging. Only products that pass a test can be labeled “broad spectrum.” Products that aren't broad spectrum must carry a warning that they only protect against sunburn, not skin cancer or skin aging.
- Choose a sunscreen with a **sun protection factor (SPF) of at least 30**. The SPF number is the level of protection the sunscreen provides against UVB rays. Higher SPF numbers do mean more protection, but the higher you go,

.....Continued on page 3.....

The Countdown Begins.....continued from Page 1

Manage water more carefully than ever:

Virtually every course I visit has moisture meters and most superintendents agree they are one of the most valuable tools yet invented. Double check your units and make sure they're calibrated and equipped with the appropriate-length probes. A 3-inch probe may be misleading if your putting green roots are 1-inch deep. If you don't have GPS-enabled units, get them or put them in the budget for next year. Take your moisture management to the next level by recording moisture levels with the corresponding locations.

Track your grass populations:

Most northern courses have a mixture of *Poa annua* and creeping bentgrass on greens, but there are thousands of biotypes of each. The different species and biotypes all react differently to stress, weather, maintenance practices and traffic. Knowing your grass populations and tracking how the populations change seasonally and annually provides information to help make better decisions. We can't change the weather, but maintenance practices can shift grass populations and it is important to know which species are being promoted. Your maintenance practices are effecting change. Make sure it's the change you want.

Don't starve your turf:

Nitrogen fertility rates for putting greens are like clothing fashion: what's in vogue today will be out of style tomorrow. I once heard Dr. Joe Duich, professor emeritus of turfgrass science at Penn State University, say that, "... turf management is one big pendulum and your goal should be to not get on it!" High nitrogen rates were required to break the anthracnose cycle 10-15 years ago, and the disease hasn't been a major problem at most courses for several years. However, the new "low-nitrogen trend" will breathe new life into a tired disease if we aren't careful. Take a tip from Dr. Joe and don't go too low.

Normally at this time of year we hear the adage, "We just need to make it to August 15!" By then, day length is shorter and nighttime temperatures often are cooler. At least that's the way it used to be. Recently, the seasons and the calendar seem to have shifted. Springs have been colder, and the expected break in late August hasn't been arriving on time. So, the countdown to August 15 is on, but don't plan on the weather letting up then.

<https://www.usga.org/content/usga/home-page/course-care/regional-updates/northeast-region/2019/the-countdown-begins.html>

2019 DSL Nominations

The Board of Directors is seeking nominations for the 2019 Rafferty Award. This award recognizes dedication, leadership and service to CPGCSA and its members.

This award is designed to honor current and former superintendents attaining a minimum of 14 years association membership. This is the number of years Dave was a CPGCSA member. All classes of membership shall be eligible to receive the award although superintendent or retired superintendent nominees will receive favored consideration. The award is dedicated to a superintendent who worked hard for our association. Other classes of membership will not be ignored but must show outstanding dedication, leadership and service.

We have many deserving members. Please return nominations by August 31, 2019.

Applications are included with the July newsletter email or contact cpgcsa@hotmail.com

President
Jeff Green
Carlisle Barracks Golf Course
717-243-3262
jeffreygreen2011@yahoo.com

Vice President
Kevin Mark
Carlisle Country Club
717-243-7569
kem5031@gmail.com

Secretary/Treasurer
Barry Bollinger
Rich Valley Golf
717-691-8805
turfdrpa@yahoo.com

Past President/DSL
Brian L. Ahrens
Reading Country Club
610-779-8888
Brian@readingcountryclub.com

Directors
Cody Frederick
LedgeRock Golf Club
610-777-9890
chody87@yahoo.com

Joshua Hampton
Hershey Country Club
717-508-1772
jghampton@hersheypa.com

George Manos
Lancaster Country Club
717-393-3886
gmanos86@comcast.net

Chris Martin
Crossgates Golf Club
717-872-7415
ckmartin@crossgatesgolf.com

Affiliates
Don Dodson
ddodson392@aol.com

Thomas Mahute
tmahute@fisherandson.com

Executive Director/Newsletter Editor
Wanda S. Fry
717-279-0368
cpgcsa@hotmail.com

PAST PRESIDENTS
George Morris
Ed Tabor
Riley E. Heckert
Richard T. Funk
Harry L. Latschaw
Daniel L. Snowberger
Charles A. Barley
Richard Wilt
Fred N. Baker
Richard J. Suttles
John J. Boyd
Y. Lewis Payson
C. William Black, CGCS
Dwight H. Brubaker
Byron F. Knoll
Michael Wilt
Charles H. Cadiz, CGCS
Kenneth R. Dietrich, CGCS
Michael C. Hair
Cameron G. Henderson
James N. MacLaren
David P. Portz, CGCS
John P. McCormick
David C. Weitzel, CGCS
Fred Heinlen
Terry L. Wueschinski, CGCS
Greg Borzok
Gregory C. Fantuzzi, CGCS
James W. Jones
William G. Wall
Robert Beyer, CGCS
Jeffrey L. Fry, CGCS
John A. Chassard
David M. Rafferty
Anthony P. Goodley, CGCS
Samuel R. Snyder, CGCS
John Dougherty
H. Jim Loke, CGCS
John L. Gehman
Theodore S. Zabrenski
Thomas C. Ocepke, CGCS
Daniel W. Achenbach
William E. Brooks
William P. Ramsey
Faron J. Stoops
John M. Colo
Daniel Brickley
Matthew W. Strader
Stephen J. Ludwig, CGCS
Faron J. Stoops
Barry Bollinger
Rebecca Matis Clark
Alan FitzGerald
Chad Oxenreider
Brian Ahrens

Membership News

The following individual has applied for membership into our association. If there are no written objections within the next seven days, he will be accepted into CPGCSA at the next meeting.

Seth Re Assistant Superintendent
Hanover Country Club Class C

We would like to welcome the following individuals into our association

Tony Gustaitis, CGCS Owner
Classic Turfgrass Solutions Class AF

Matthew Wolfe Assistant Superintendent
Lancaster Country Club Class C

If you know of anyone who is interested in membership into the association, please have them contact Wanda at 717-279-0368 or cpgcsa@hotmail.com.

Please see a list of our Association Sponsors on Page 16.

Please Support Them as they Support Us!

Membership information is also available on the Central Penn website at:
www.cpgcsa.org



We've got EVERY PRODUCT YOU NEED to keep your business GROWIN' ON...

SUMMER SEASON IS IN FULL SWING

ASK ABOUT:

- Topdressing Sand and Blended Sand Mixes
- Bunker Blends and Construction Mixes
- Bentgrass Seed, Ryegrass Seed and Regional Seed Mixes
- Fall Fertilizers
- Soil Amendments

JUST ASK YOUR LOCAL SALES LEADER

Brian Bachman 484-661-6105
bbachman@genesisgreensupply.com

Jim Byrne 717-471-5569
jimbyrne@genesisgreensupply.com

Don Dodson 717-586-9064
don@genesisgreensupply.com

Eric Kline 717-250-3701
eric@genesisgreensupply.com

Paul Wickey 717-439-4441
paul@genesisgreensupply.com

WWW.GENESISGREENSUPPLY.COM | 717-759-8151

follow us [GENESISTURF](#) [/GENESISGREENSUPPLY](#) [GENESISTURFCRASS](#)

Have a Safe-Sun Summercontinued from Page 1

the smaller the difference becomes. SPF 15 sunscreens filter out about 93% of UVB rays, while SPF 30 sunscreens filter out about 97%; SPF 50 sunscreens filter about 98%, and SPF 100 filter about 99%. No sunscreen protects you completely. The FDA requires any sunscreen with an SPF below 15 to carry a warning that it only protects against sunburn, not skin cancer or skin aging.

- **“Water resistant” does not mean “waterproof.”** No sunscreens are waterproof or “sweat-proof,” and manufacturers are not allowed to claim that they are. If a product’s front label makes claims of being water resistant, it must specify whether it lasts for 40 minutes or 80 minutes while swimming or sweating. For best results, reapply sunscreen at least every 2 hours and even more often if you are swimming or sweating. Sunscreen usually rubs off when you towel yourself dry, so you will need to put more on.

Is sunscreen safe?

Some health groups, consumer groups, and environmental groups have raised concerns over ingredients found in some sunscreens and their potential effects on people and nature.

According to Len Lichtenfeld, MD, interim chief medical officer of the American Cancer Society, “The experts who have looked at the data have concluded that the potential risk of not using sunscreen far outweighs the risks of using sunscreen.” Lichtenfeld, who has had skin cancer himself, says he uses sunscreen on his face every day. He recommends people buy and use sunscreens that are sold and marketed in the US because of limited information about the safety and effectiveness of sunscreens produced in other countries.

<https://www.cancer.org/latest-news/stay-sun-safe-this-summer.html>

Annual Bluegrass Weevil Cross-Resistance to Insecticides

Annual bluegrass weevil adults resistant to pyrethroids show resistance to or increased tolerance of insecticides from several other insecticide classes.

January 2019 | Olga S. Kostromytska, Ph.D.; Shaohui Wu, Ph.D.; and Albrecht M. Koppenhöfer, Ph.D.

Editor's note: This research was funded in part by a grant to GCSAA from the Environmental Institute for Golf and by funding from the United States Golf Association.

The annual bluegrass weevil (ABW), *Listronotus maculicollis*, is a serious and expanding pest of golf course turf in the Northeast and Mid-Atlantic regions of the United States and in southeastern Canada. ABW larvae can cause severe damage to tees, fairways, collars and greens. ABW is one of the most difficult turfgrass insect pests to manage in North America because several generations are present in a single year and multiple life stages are present concurrently (and with increasing asynchrony) during the growing season (3).

Chemical control has been an important strategy in ABW management. In the 1980s, pyrethroids started to be widely used because they can effectively control ABW adults, thereby preventing oviposition and subsequent damage. As a result of excessive pyrethroid use, many courses started to observe a decrease in the efficacy of this strategy by the 2000s. Resistance to pyrethroids was first reported from southern New England (5). In a recent survey of the area affected by ABW, insecticide-resistant ABW populations were thought to be present on 19% of participating golf courses across the area and, more regionally, on up to 55% of courses on Long Island, N.Y. (4).

The only adulticide available as an alternative to pyrethroids is chlorpyrifos (Chlorpyrifos, multiple manufacturers), an organophosphate that is less effective than pyrethroids (1, 2) and is troublesome from a toxicological and environmental standpoint. All other alternatives are larvicides, including the diamides chlorantraniliprole (Acelepryn, Syngenta) and cyantraniliprole (Ference, Syngenta), the spinosyn spinosad (Conserve and MatchPoint, Dow AgroSciences), the oxadiazine indoxacarb (Provaunt, Syngenta), and the organophosphate trichlorfon (Dylox, Bayer) (1).

However, according to field studies, the efficacy of most insecticides against pyrethroid-resistant ABW populations seems to be reduced (1, 2). This is not surprising, as pyrethroid resistance in ABW seems to be, at least in part, due to enhanced enzymatic detoxification (6), a rather nonspecific mechanism that breaks down active ingredients before they can reach their target sites in the organism.

Efforts continue in the development of more sustainable management practices, such as plant resistance, biological control and improved ABW monitoring. Meanwhile, careful measures need to be taken to prevent the development of resistance to new chemistries and to synthetic insecticides in new populations, and to effectively manage already-resistant populations. Hence, the main goals of our study were to determine the degree and scope of ABW resistance, determine existing cross-resistance patterns, and confirm laboratory observations under more realistic greenhouse conditions.

Insects and insecticides

Adult ABWs were collected from populations at different golf courses in New Jersey, eastern Pennsylvania, southeastern New York and southwestern Connecticut during 2014 and 2015. Based on a preliminary petri dish test and consistently decreased pyrethroid efficacy as observed by the superintendents of the respective golf courses, the populations appeared to be highly susceptible to pyrethroids at three collection sites and tolerant of or resistant to pyrethroids at various levels at seven sites (see [Table 1](#)).

Adults from the overwintering generation were collected from overwintering sites on golf courses around late October. For two to six months, they were kept in containers on moist sand in an incubator (10 hours light at 43 F [6 C]: 14 hours dark at 39 F [4 C]). Overwintered (collected around late April) and spring-generation (collected around early July) adults were collected from fairways or greens. Before being used in experiments, adults were kept in containers on moist sand in incubators (14 hours light at 72 F [22 C]: 10 hours dark at 57 F [14 C]) for at least one week and provided with cutworm diet and annual bluegrass (*Poa annua*) clippings as food.

Technical-grade active ingredients (a.i.) (> 95% purity) of insecticides from six chemical classes with different modes of action

...continued on page 5....

(Table 2) were dissolved in acetone to be used in topical and feeding assays. In the greenhouse trial, the formulated commercially available products Talstar Pro (a.i. bifenthrin, FMC), a pyrethroid, and Dursban 50W (a.i. chlorpyrifos, Dow AgroSciences), an organophosphate, were used.

ABW susceptibility in topical assays

Topical bioassays with technical-grade active ingredients dissolved in acetone were conducted to determine adult susceptibility to the major insecticide classes used for ABW control. Two susceptible populations (HF, PB) and the seven resistant populations were tested.

Based on preliminary testing, six concentrations per active ingredient were selected for each population. Overwintering generation adults were treated with 1 microliter pure acetone or insecticide solution applied dorsally to the intersegmental membrane between the prothorax and the elytra with a syringe connected to a microapplicator. Treated adults were placed in petri dishes (3.5 inches [9 cm] in diameter) lined with one moistened (1 milliliter tap water/dish) filter paper (10 weevils/dish). *Poa annua* (three sprigs) was provided as food. Dishes were placed in an incubator (16 hours light at 70 F [21 C]; 8 hours dark at 57 F [14 C]).

For each dose of each active ingredient, there were two dishes with males and two with females. Mortality was evaluated at 24, 48 and 72 hours after treatment. Weevils were considered dead if no movement was observed after probing.

No significant differences in insecticide toxicity against ABW males and females were observed, and data were combined for analysis. For bifenthrin, lethal doses killing 50% of the test populations (LD_{50}) ranged from 0.002 (HF) to 0.819 micrograms (LI) per insect, resulting in resistance ratios (RR_{50} s) of up to 343 (LI). (Resistance ratio or $RR_{50} = LD_{50}$ or LC_{50} of resistant population/ LD_{50} or LC_{50} of the most susceptible population.)

Adults from the HF population and the PB (LD_{50} 0.005) and HP (LD_{50} 0.011) populations were highly susceptible to bifenthrin. No control failures have been reported from these three locations, where frequency of pesticide applications was relatively low. Therefore, these populations were used for susceptible contrast in most of our assays to calculate resistance ratios.

Adults from all other locations, where difficulties in controlling ABW with synthetic insecticides had been reported, demonstrated moderate to high levels of resistance to bifenthrin, ranging from an RR_{50} of 31 (GB) to an RR_{50} of 343 (LI). The LD_{50} s for λ -cyhalothrin (0.001-0.363 microgram/insect) were, on average, about half of those for bifenthrin and followed a very similar pattern with respect to resistance levels (RR_{50} s = 18-324) (Figure 1).

The populations that showed resistance to bifenthrin also had significantly higher LD_{50} s for chlorpyrifos (RR_{50} range = 3.3-15.3), spinosad (RR_{50} range = 2.5-7.7) and clothianidin (RR_{50} range = 4.2-9.7) compared with the most susceptible population (Figure 1). However, the RR_{50} s were much lower than for the pyrethroids. The LI population also was clearly the least susceptible to chlorpyrifos and spinosad, but for populations at the other locations, the ranking of resistance levels followed a pattern different from that for the pyrethroids.

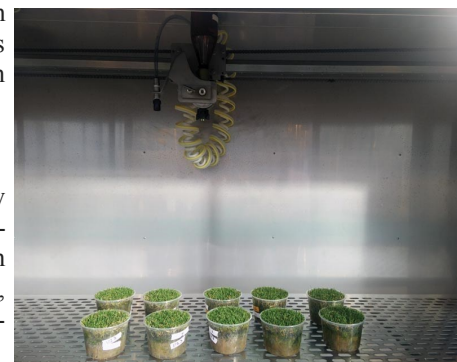
Feeding assays

Mortality from indoxacarb and chlorantraniliprole in the topical assays was too low ($\leq 20\%$) to allow calculation of LD_{50} s. Therefore, feeding assays were conducted to determine resistance levels of ABW populations to these active ingredients. Clothianidin is systemic and has demonstrated higher toxicity if ingested. Therefore, clothianidin, which showed relatively low toxicity in the topical assay, was also included in the feeding assays.

Two susceptible (HP, PB) and five resistant (GB, CN, EW, JC, LI) populations were tested. A small disc (0.16 inch [4 mm] diameter, 0.04 inch [1 mm] thick) prepared from



A microapplicator was used to apply the active ingredients of insecticides in the topical bioassays. Photos by Olga Kostromytska



This sprayer system was used in the greenhouse assays.

...continued on page 6....

cutworm diet was placed in the middle of each petri dish (3.5 inches [9 cm] diameter) lined with one moistened (1 milliliter tap water/dish) filter paper. Diet discs were treated with 10 microliters of acetone or active ingredient solution in acetone. Ten adults starved for 24 hours prior to assays were introduced per dish. There were three dishes for each of five concentrations (ranging from 0.1 to 30 milligrams a.i./milliliter) of each insecticide for each ABW population. Mortality was assessed at 24, 48 and 72 hours after weevil introduction.

In the feeding assay, chlorantraniliprole was not toxic enough to cause significant ABW mortality even at the highest rates, and the data were thus not presented. Pyrethroid-resistant populations showed significantly increased tolerance to indoxacarb, with the highest RR_{50} for LI (9.7) and the lowest for GB (2.8) (Figure 2). Toxicity of clothianidin was similar to that observed in the topical assay, except that the LC_{50} s at the most susceptible (PB) and most tolerant sites (CN) were three and two times, respectively, higher in the feeding assay than in the topical assay (Figures 1, 2).

Toxicity of formulated bifenthrin and chlorpyrifos in greenhouse assays

Five concentrations of bifenthrin (Talstar, range 0.003-60 pounds a.i./acre [0.003-67.2 kg a.i./hectare]) and chlorpyrifos (Dursban, range 0.003-15 pounds a.i./acre [0.003-16.8 kg a.i./hectare]) were tested against spring-generation adults from two susceptible (PB, HP) and five resistant (GB, CN, EW, JC, LI) populations.

Ten adults were introduced into each pot with *P. annua* established from seed in pasteurized sandy loam soil mixed with sand. After two hours, treatments were applied using a Generation III Research sprayer at a spray volume of 80 gallons/acre (756 liters/hectare). Treatments were lightly watered in with 0.05 inch (1.3 mm) irrigation. Pots were covered with ventilated lids and left in the greenhouse. After 72 hours, pots were submerged in lukewarm water to extract the adults. Three replications were arranged per treatment.

LC_{50} s for formulated bifenthrin and chlorpyrifos were comparable to results obtained in the topical assay with technical-grade active ingredients. Populations HP and PB were highly susceptible. RR_{50} s were the highest for the LI population (503), intermediate for the EW, JC and CN populations (41-63), and lowest for the GB population (7.7). For chlorpyrifos, the LI population had the highest RR_{50} (28), with RR_{50} s for the other resistant populations ranging from 3.9 to 13 (Figure 3).

At the standard field rate of 0.1 pound a.i./acre, bifenthrin provided 60% control of the susceptible PB and HP populations, but only 11% control of the moderately resistant GB population (Figure 3). Even at 3.0 pounds a.i./acre, bifenthrin provided only 42%-53% control of the resistant CN, EW and JC populations and no control of the highly resistant LI population.

Chlorpyrifos provided 73%-89% control of the pyrethroid-susceptible PB and HP populations at the standard field rate of 1.0 pound a.i./acre, but was ineffective (3%-14%) against the pyrethroid-resistant populations except for the JC population (48%) (Figure 3). At 6.0 pounds a.i./acre, chlorpyrifos provided 42%-86% control of the pyrethroid-resistant populations.

Conclusions

This study expanded the geographic range of confirmed pyrethroid resistance in ABW adults from southern New England (5, 6) to include the New York metropolitan area, New Jersey and eastern Pennsylvania.

Moreover, we observed two to three times higher resistance ratios (RR_{50}) and LD_{50} s in the topical assay than had been observed previously (5). The study clearly showed cross-resistance not only within the pyrethroid class, but also to several other chemical classes, albeit at lower levels than for the pyrethroids.

Several of the tested insecticides (spinosad, indoxacarb, clothianidin, chlorantraniliprole) had low toxicity against ABW adults in the topical assay. We suspected that the route of exposure is important for, at least, clothianidin and chlorantraniliprole. Clothianidin and chlorantraniliprole have mostly systemic activity and low contact activity, which could explain their low toxicity against ABW adults in the topical assay. However, even in the feeding assays, toxicity was low for clothianidin and indoxacarb and not significant for chlorantraniliprole. These compounds are recommended as larvicides for ABW management. For a better understanding of cross-resistance patterns with these compounds, larval assays should be developed and conducted.

The study showed that the resistance levels determined using the topical assay under optimal laboratory conditions were consistent with those made under more realistic conditions in potted grass in the greenhouse with formulated products. In the field, several routes of exposure could contribute to the compound toxicity: through direct exposure to the spray or through feeding on contaminated grass. However, insects could avoid the chemicals or could be sheltered in the thatch, which could lead to either overestimating or underestimating resistance levels. Because the conditions in our greenhouse assays were similar to typical field

...continued on page 7.....

exposure, the greenhouse assay should be a reliable validation tool.

The geographically widespread and often high degree of pyrethroid resistance and especially the cross-resistance patterns observed in this study emphasize the need for rethinking ABW management. The limited number of currently available and effective active ingredients — especially adulticides — suggests that heavy reliance on insecticides, particularly broadcast adulticide applications, is not sustainable. Moreover, the efficacy of several ABW larvicides is also reduced, although to a lesser degree (2). Alternative management strategies, such as cultural control and biological control, need to be further explored and adapted to the high standards of the golf course environment.

Funding

This research was funded by GCSAA and supporting GCSAA chapters and associations (Connecticut AGCS, GCSA of New Jersey, Greater Pittsburgh GCSA, Hudson Valley GCSA, Long Island GCSA, Metropolitan GCSA, Mountain & Valley GCSA, New Jersey Turfgrass Association, and Pocono Turfgrass Association), the USGA, the New York State Turfgrass Association, the O.J. Noer Research Foundation, the Tri-State Turf Research Foundation, the Rutgers Center for Turfgrass Science, and the USDA National Institute of Food and Agriculture, Hatch Multistate projects 0206130, through the New Jersey Agricultural Experiment Station, Hatch Multistate project NJ08295.

Acknowledgments

The authors also thank the participating golf course superintendents and their clubs for their cooperation.

This article was based on a paper, “Cross-resistance patterns to insecticides of several chemical classes among *Listronotus maculicollis* (Coleoptera: Curculionidae) populations with different levels of resistance to pyrethroids,” written by O.S. Kostromytska, S. Wu and A.M. Koppenhöfer and published in 2018 in *Journal of Economic Entomology* (111:391-398).

The research says ...

Topical toxicity assay in the laboratory with technical-grade active ingredients and greenhouse tests with formulated products showed a wide range of pyrethroid resistance levels among adults of ABW populations.

Resistance ratios (RR_{50S}) compared with the most susceptible populations were as high as 343 in laboratory tests and 503 in greenhouse tests.

Pyrethroid-resistant adults also showed elevated levels of tolerance to insecticides from several other classes, but their resistance levels to pyrethroids were greater.

Literature cited

1. Koppenhöfer, A.M., S.R. Alm, R.S. Cowles, B.A. McGraw, S. Swier and P.J. Vittum. 2012. Controlling annual bluegrass weevil: Optimal insecticide timing and rates. *Golf Course Management* 84(3):98-104.
2. Koppenhöfer, A.M., O.S. Kostromytska and S. Wu. 2018. Pyrethroid-resistance level affects performance of larvicides and adulticides from different insecticide classes in populations of *Listronotus maculicollis* (Coleoptera: Curculionidae). *Journal of Economic Entomology* 111:1851-1859.
3. McGraw, B.A., and A.M. Koppenhöfer. 2007. Biology and management of the annual bluegrass weevil, *Listronotus maculicollis* (Coleoptera: Curculionidae). Pages 335-350. In: M. Pessarakli, ed. *Handbook of Turfgrass Management and Physiology*. CRC Press, Boca Raton, Fla.
4. McGraw, B.A., and A.M. Koppenhöfer. 2017. A survey of regional trends in annual bluegrass weevil (Coleoptera: Curculionidae) management on golf courses in eastern North America. *Journal of Integrated Pest Management* 8:1-11.
5. Ramoutar, D., S.R. Alm and R.S. Cowles. 2009. Pyrethroid resistance in populations of *Listronotus maculicollis* (Coleoptera: Curculionidae) from southern New England golf courses. *Journal of Economic Entomology* 102:388-392.
6. Ramoutar, D., S.R. Alm and R.S. Cowles. 2009. Pyrethroid resistance mediated by enzyme detoxification in *Listronotus maculicollis* (Coleoptera: Curculionidae) from Connecticut. *Journal of Economic Entomology* 102:1203-1208.

Olga S. Kostromytska is an Extension assistant professor in the Stockbridge School of Agriculture, University of Massachusetts, Amherst, Mass. Shaohui Wu is a postdoctoral researcher in the Department of Entomology, University of Georgia, Tifton, Ga. Albrecht M. Koppenhöfer is an Extension specialist in the Department of Entomology, Rutgers University, New Brunswick, N.J.



GET TOURNAMENT READY.

Discover the difference that next-generation formulations can make in your turf's performance. From the Mid-Atlantic's Green Industry innovators.



ReGENERATE
Advanced Plant & Soil Solutions

PROVEN PERFORMANCE ★ QUALITY FORMULATIONS
BROAD PORTFOLIO ★ BUDGET FRIENDLY
FULLY CHELATED AND COMPLEXED

CONTACT:
THOM MAHUTE AT 717-940-0730



Look Out For Lightning

July 19, 2019

Patrick O'Brien,

USGA Agronomist, Southeast Region



It is critical to evacuate a golf course during dangerous weather conditions.

A massive lightning strike during the second round of the 2019 U.S. Women's Open at the Country Club of Charleston amazed attendees and television viewers with a display of awesome power from Mother Nature. Thankfully, nobody was hurt and play was able to resume later that evening. This incident should serve as a valuable reminder of how dangerous lightning can be on a golf course.

The most important consideration when lightning is in the area is the safety of golfers and staff. Most golf courses have a lightning detection system and sirens to warn people of lightning in the area. Golfers and the maintenance staff should heed those warnings. Trying to complete that last bit of mowing before a storm hits may be well-intentioned, but it is simply not worth the risk and the staff should always put their safety first.

Once a storm has safely passed, it is important to check the golf course for any damage that may pose a safety risk. At the Country Club of Charleston, a large live oak was struck and damaged by the lightning. An arborist was called to make an assessment of the tree and they felt that damage to the tree and its roots made it a safety risk that should be removed. In this case, the resources were available to have the tree removed overnight before the next day's play to ensure the safety of all. Such a quick turnaround may not be possible if a tree is damaged by lightning at your golf facility, but a safe perimeter can be roped off around a damaged tree to keep golfers and staff away from danger. Apart from lightning damage, check trees on the property for broken branches and other damage that may have been caused by high winds.

In addition to serious safety issues, lightning also poses a threat to golf course infrastructure. Lightning strikes can damage irrigation components and disable the system. These issues can be costly to repair and may pose a threat to turf health if the irrigation system cannot be fully repaired quickly. Fortunately, heavy rain often accompanies lightning, so if the irrigation system has been damaged there will likely be some extra soil moisture to tide you over.

Lightning strikes are a serious risk every summer on golf courses throughout the U.S. Golfers and staff at all facilities should be aware of the danger and should always put safety first.

<https://www.usga.org/content/usga/home-page/course-care/regional-updates/southeast-region/2019/look-out-for-lightning.html#returnable>

PERFECT RELEASE OF NUTRIENTS

HELPS PRODUCE
PLAYING SURFACES



WITH IDEAL CONDITIONS



Emerald Isle Solutions™

Count on Emerald Isle Solutions™ for economical liquid fertilizers that deliver results for all playing surfaces. The 18-3-6 and 12-0-12 products are easy to apply and provide a complete micronutrient package, including both quick- and slow-release nitrogen. You'll reduce labor time while achieving the conditions you want — all from a brand you know and trust! Learn more at LebanonTurf.com or call 1-800-233-0628.



Best of All Worlds®



Key Signs and Symptoms of Heat Stroke

Katherine George - Sunday, July 15, 2018

<https://www.activebeat.com/your-health/10-signs-and-symptoms-of-heat-stroke>

Heat stroke is a very serious and potentially dangerous heat injury that requires medical attention immediately. This is the most severe form of heat-related condition that stems from milder illnesses such as heat cramps and heat exhaustion. The medical definition of heat stroke is a core body temperature of 105 degrees Fahrenheit or higher combined with central nervous system complications resulting from overexposure to high temperatures. If you've spent a lot of time in the sun and you're experiencing any of the 14 symptoms below, it's important to seek medical attention immediately.

1. Incredibly Hot Skin

- Incredibly hot, red skin is one of the most popular signs of heat stroke. If your skin is hot to touch and you have a body temperature 105 degrees or higher, you will need to see a doctor as soon as possible. Why does the skin turn red? According to Prevention, it means the body is trying to cool itself down. If you're suffering from heat stroke, your skin becomes red as your body directs blood flow toward the skin. A simple sunburn will also present this symptom (red, hot skin), but the situation becomes dangerous when your body temperature stays higher than 105.
- In addition to experiencing red and hot skin, it might also feel clammy or extremely dry. This will depend more on what type of heat stroke you're suffering from which we'll further explain later on in this article.

2. Dizziness and Fainting

- In addition to an internal body temperature greater than 105 degrees Fahrenheit, dizziness and fainting are the next most common symptoms of heat stroke. These symptoms, along with nausea and vomiting will occur because the body is becoming dehydrated. If you've spent several hours in the sun and you experience this symptom, contact your doctor immediately.

3. Extreme Fatigue

- Spending a day in the sun can be exhausting at the best of times, however, if you're experiencing some of the other symptoms on this list along with extreme fatigue, it may be a sign of heat stroke. If this is the case, it's always best to seek medical help, just in case your heat exhaustion has progressed into heat stroke.

4. Nausea

- Nausea is another indication that your heat exhaustion has progressed into heat stroke. A constant nauseous or uneasy feeling in your stomach (especially combined with dizziness) may mean your condition is worse than you initially thought. Drink lots of water to help treat the nausea and, as always, contact your doctor for assistance.

5. Vomiting

- Feeling nauseous is one thing, but actually vomiting is another. If your nausea has progressed into vomiting, this is a definite sign of heat stroke and it's critical that you seek medical attention immediately. Drink as much water as possible on your way to seek help.

6. Heartbeat

- A rapid heartbeat after spending time in the sun can be an indication of a serious problem. The heart begins beating faster when it's put under stress. The heart becomes stressed in intense heat because "it needs to pump harder and faster to make sure your body's natural cooling systems are working to keep your temperature balanced," says Prevention. If you or someone you know begins experiencing any of the symptoms on this list, as well as a rapid heartbeat, you will want to make sure you get checked out immediately. When it comes to the heart, you don't want to take any chances.

7. Mental Confusion

- Individuals who have heat stroke often feel dizzy but mental confusion is also a popular symptom. If you're having difficulty thinking, remembering or focusing, it may be an indication that you're suffering from heat stroke. According to Prevention, mental confusion is a common side effect of exertional heat stroke because it "throws your central nervous system symptoms out of whack, so a lack of coordination, confusion, aggression, or the inability to walk are huge red flags." The source also goes on to explain that it might look something like a concussion. The person is awake and seemingly okay, also known as "lights are on, but nobody's home." A good way to test whether this is happening is to ask them questions and see if they can answer appropriately. If not, contact your doctor or seek medical help as soon as possible.

8. Seizures

- Seizures are a very serious (and very dangerous) symptom of heat stroke that requires immediate medical attention. This symptom often presents itself abruptly and offers few warning signs. If someone you know has suffered a seizure, get them to the hospital as soon as possible.
-

9. Lack of Sweating

- We've included lack of sweating and sweating profusely as two symptoms on this list, but how can that be? In order to understand this, you have to learn about the two different types of heat stroke: traditional and exertional heat stroke. Traditional comes on gradually and is more common among the young and elderly who cannot maintain their internal body temperature. In opposition, exertional comes on suddenly and is more often seen in people who workout or play sports in extreme heat.
- If a person is suffering from traditional heat stroke, they will not sweat. This is because when a person spends a long period of time in the heat, their body stops trying to regulate its core temperature. Because the body's way of regulating its temperature is through sweating, the body will stop producing sweat.

10. Sweating Profusely

- In opposition to traditional heat stroke, exertional heat stroke causes people to sweat profusely. Because this type of heat stroke comes on more suddenly, the body doesn't have time to adjust to the heat and stop producing sweat like it does with traditional heat stroke.
- "I'll commonly hear people say, 'I know it's not heat stroke because they are still sweating' and that's not true," says Luke Pryor, PhD, ATC, CSCS, the director of elite athlete performance at the Central California Sports Sciences Institute, who also researches the effects of heat on athlete safety and performance. He went on to tell prevention: "With exertional heat stroke, many times we see the individual well before they've 'cooked' themselves and the body is still trying to thermoregulate [maintain its core internal temperature]. If anything, you're actually going to see the individual sweating profusely."

11. Severe Headache

- If you've spent time in the sun and you're experiencing a severe headache, you may be suffering from heat stroke. It's common for individuals to have a slight headache after spending time outdoors in the summer, especially if you haven't been drinking an adequate amount of water. A severe headache combined with at least one other symptom on this list is an indication you need to seek medical attention immediately. "This symptom is typically due to dehydration, or the overall impact heat stroke has on the central nervous system," says Prevention.

12. Increase in Body Temperature


- When it comes to heat-related illnesses, the best way to determine what's going on is through a body temperature reading. The Center for Disease Control and Prevention (CDC) lists 103 degrees Fahrenheit or higher as a sign of heat stroke. It's important to note that even though checking body temperature is a good sign of heat stroke, be on alert for other symptoms.
- On the flip side, if someone is experiencing other symptoms on this list, but measuring with a lower temperature, you should still work toward cooling them down and getting them medical care. "Someone might have a body temperature of 106, but if you get an oral temperature, they might only be 100 degrees," warns Pryor while talking to Prevention. "You might think they're just a little warm when, in fact, they're hot."

13. Shallow Breathing

- WebMD and Mayo Clinic both list rapid, shallow breathing as another scary symptom of heat stroke. If this happens, be sure to remove any heavy or tight clothing they are wearing and call 911 immediately.

14. Loss of Consciousness



- Loss of consciousness is uncommon, but could occur in a severe case of heat stroke. It's listed as one of the more serious and very real symptoms associated with heat stroke. It's important to note that this symptom could go hand in hand with mental confusion since Healthline lists "loss or change in consciousness" as one of the main symptoms. Be sure to call 911 immediately if someone loses consciousness due to any heat-related illness, or begins vomiting, or having seizures.



The fungicide that holds strong for many moons.

Introducing Posterity® fungicide, the most active SDHI in the turf market that elevates the control of key diseases including **dollar spot** and **spring dead spot**. Posterity delivers power that lasts, holding stronger for up to **28 days** of dollar spot control, and setting a new standard for spring dead spot control. With Posterity, you can manage the toughest and most prevalent diseases with confidence.

Visit GreenCastOnline.com/Posterity to learn more.

#Time4Posterity

©2019 Syngenta. Important: Always read and follow label instructions. Some products may not be registered for sale or use in all states or counties. Please check with your local extension service to ensure registration status. GreenCast® Posterity®, the Alliance Frame, the Purpose Icon and the Syngenta logo are trademarks of a Syngenta Group Company. All other trademarks used herein are the property of their respective company. 9LGG00526 03/19



FROM INDUSTRY STAPLES TO THE LATEST INNOVATIONS,

Walker Supply Inc. has the quality products
you need and the local expertise
you desire in a supply partner.

FERTILIZER PESTICIDES SOIL AMENDMENTS SEED POND PRODUCTS ICE MELT



WALKER SUPPLY INC.

ROBINSON, PA | LANCASTER, PA | NORRISTOWN, PA | PITTSTON, PA

800.792.5537

WWW.WALKERSUPPLYINC.COM



Growing Greens

The Growing Greens program was started by Cushman in the 4th quarter of 2016. This pays the CPGCSA \$50 for every car purchased or leased from their Hauler line of vehicles. In the roughly 2 ½ years since it started Cushman has written checks to the CPGCSA for a total of \$2,350 for deliveries made prior to the end of the first quarter of 2019.

The list of courses that have participated in the program and taken a delivery prior to the end of March 2019 is as follows:

Grandview G.C.	Hershey C.C.	Country Club of York	West Shore C.C.
The Bridges G.C.	Carlisle Army Barracks	Corey Creek G.C.	Out Door C.C.
Fairview G.C.	Willow Hollow G.C.	Hidden Valley G.C.	Penn National G.C.

If anyone has any questions about the program please contact Chris Grasmick at 717-752-0135

**Bill Mast**Cell: 610-608-8319
bmast@aer-core.com**Steve Thompson**Cell: 610-972-5933
sthompson@aer-core.comOffice: 610-327-3390 • Fax: 610-327-0581
1486 S. Hanover St. • Pottstown, PA 19465 • www.aer-core.com

Specialized Turfgrass Services

Top Dressing
Sandmaster Drainage • Drill & Fill
Deep Tine (Solid & Coring) • Traditional Shallow Coring
Fairway Aeration with Clean-Up

Unraveling the Genetic Basis for *Poa annua*'s Extreme Adaptability

By Chris Benson and David R. Huff

Department of Plant Sciences, Penn State University

Pennsylvania Turfgrass Council Magazine, Spring 2019, Volume 8, No. 3

The greens type *Poa annua* breeding project at Penn State began in 1994, and through its focus on collection, selection, and evaluation, has developed superior cultivars of greens-type *Poa annua*. Production of elite cultivars is constrained by non-Mendelian inheritance of the dwarfism phenotype in the absence of extensive management practices during seed production. A likely contributor to *Poa*'s extreme adaptability and phenotypic plasticity is its polyploid origins. It has been demonstrated that *Poa* undergoes tremendous chromosomal rearrangement upon whole genome duplication post-polyploidization (Koshy 1968; Mao and Huff 2012). Fitting with its chromosomal versatility and reluctance to produce valuable seed through traditional breeding, our preliminary experiments suggest that *Poa annua* can pass on memory of environmental conditions to its offspring via epigenetic mechanisms. Our current project is focused on developing novel breeding methods based on epigenetic memory and transgenerational inheritance that we believe is rampant in this unique system. Using our discoveries, we will screen genomic loci that are critical for greens-type stability and enhanced stress tolerance. Ultimately, we plan to release elite and stable varieties of *Poa annua* for commercial use on golf course putting greens that will aid golf course superintendents and architects in establishing and renovating greens of high-quality, stress-tolerant, and cost-effective *Poa annua*.

https://theturfzone.com/ptc/?ascat=72&sub=issue&issue_id=2311&rti=true

Fines for Blowing Grass Clippings onto the Road? It Could Happen

Teresa Boeckel, York Daily Record
May 10 2019

"... there are warnings that go out almost every day," said Lettice Brown, the City of York's storm water management coordinator

It's a familiar scene every spring: Someone is mowing a lawn and discharging the grass clippings right out onto the road. "I've been places out in the country where you can't see the road, it's on the road that heavy," said Stan Firestone, who was mowing a neighbor's yard in West Manchester Township on Thursday. Firestone said he tries to mulch the grass, which is good for the lawn. He knows to not send it out into the street. Blowing grass clippings onto the road is dangerous to drivers and harms local storm sewers and aquatic life. In addition, state law could be changing, hitting residents in their wallet if they do it.

Here are five reasons why you shouldn't send those clippings onto the road:

It's illegal

Yes, it's illegal in some municipalities. Manchester Township, for example, has an ordinance that prohibits residents from sending grass clippings out onto the street and not cleaning it up afterwards. Those who do not comply eventually could face a fine of \$600. David Unger, codes enforcement officer for the township, said it has never gotten that far. In the City of York, grass clippings in the street fall under the "illicit discharge" ordinance, and the fine could go up to \$1,000 per violation, said Lettice Brown, the city's storm water management coordinator. She has not given a citation for grass clippings. Municipal officials say they do receive some complaints about people mowing grass and blowing it onto the street, and they try to handle it in an educational manner. Brown said she has informational door hangers that are placed on the doors or mailboxes of violators. She takes note of the address when a resident is warned, and if another violation is seen, it could result in fines. "There are warnings that go out almost every day," she said.

It creates a roadway hazard

A worker takes great care in clearing out excess grass, May 8, 2019. (Photo: Cameron Clark, York Daily Record)

Grass clippings scattered into the roadway create a hazard, Northeastern Regional Police Sgt. Arthur Archambeault said. When the clippings are wet, they become slippery, like ice. Motorcycle riders, for example, could crash if they hit the brakes or turn the wheel, Archambeault said. Dry grass clippings present a different kind of hazard for riders, said Bob LeGore, a longtime motorcycle rider from Conewago Township, Adams County. They can blow up into a rider's face. "It's dangerous both ways — dry or wet," he said. "It's not something to be made light of."

Pa. law could be changing

State Sen. Camera Bartolotta, R-Washington County, plans to introduce legislation that would make it an offense statewide to blow the grass clippings into the roadway, according to a news release. The clippings would be treated as rubbish, similar to household waste, glass or wastepaper, deposited onto the roads, the release states. Residents who violate the law could face a fine on the first offense. It would range from \$50 to \$300. Subsequent offenses would include fines of \$300 to \$1,000, the release said. Bartolotta plans to introduce the legislation in recognition of Motorcycle Safety Awareness Month. "It's real easy to fix: Discharge your grass in," said John Kruger, state legislative coordinator with the Alliance of Bikers Aimed Toward Education.

Grass clippings clog storm drains

After cutting the grass, a worker makes sure to clean off the West Manchester Town Center parking lot, May 8, 2019. (Photo: Cameron Clark, York Daily Record) Another big concern for municipal officials is that the grass clippings will wash into storm drains. Grass clippings, along with other debris such as trash and leaves, can cause storm drains to clog, and intersections could flood when it rains, Brown said. Clogged drains also can cause water to back up into basements of homes and businesses. "It's a ripple effect, if you will; many things can happen when our system is clogged or just simply inundated, as we found out last summer," she said. Some people have taken the bag catcher off the back of their mower and dumped the clippings directly into the storm drain, Archambeault said.

It hurts aquatic life

Freshly cut grass sits on the side of Colony Road in West Manchester Township, May 8, 2019. (Photo: Cameron Clark, York Daily Record) Municipal officials also are concerned about what goes into the stormwater system, especially as regulations associated with the Chesapeake Bay continue to tighten at the state and federal levels, said Timothy James, manager of Manchester Township. Those grass clippings eventually could reach waterways and add excess nutrients, which could affect aquatic life, said John Repetz, a spokesman for the state Department of Environmental Protection. And it's true to some extent that it does affect the Chesapeake Bay, said B.J. Small, a spokesman for the Chesapeake Bay Foundation. "When grass clippings make their way into the stormwater system, they may be carrying fertilizers and other polluting lawn additives with them," he said. "Nitrogen that is beneficial to lawns is a product of the clippings, and that nitrogen can get into local storm systems, streams and rivers."



THE COLOR YOU WANT. THE CONTROL YOU NEED.

With Appear® II fungicide, you get an enhanced formulation that delivers a deeper, more natural green color, control of three additional diseases and improved suspension.

For recommendations on tank-mix partners, labeled diseases and trial data, visit GreenCastOnline.com/ApearII



syngenta.

© 2019 Syngenta. Important: Always read and follow label instructions. Some products may not be registered for sale or use in all states or counties and/or may have state-specific use requirements. Please check with your local extension service to ensure registration and proper use. Appear®, GreenCast®, the Alliance Frame, the Purpose Icon and the Syngenta logo are trademarks of a Syngenta Group Company.



@SyngentaTurf
#Time4AppearII

Summer on the Golf Course: What to Expect

July 9, 2019

Liberty Corner, N.J. By George Waters, USGA

Summer is prime golf season for many of us, with long days and warm temperatures providing plenty of opportunities to get out on the course. For superintendents, delivering the best playing conditions possible during this busy season involves a delicate balancing act between the demands of play and the impacts of harsh summer weather.

Here are a few things every golfer should know about summer playing conditions:

Consistency can be hard to come by

While many golf facilities strive to deliver peak playing conditions during the summer, periods of high heat or humidity can disrupt those plans. During stretches of extremely hot weather, it is often necessary to adjust maintenance practices to give grass the best chance of remaining healthy. Raising the height of cut on putting greens or mowing them less frequently may temporarily slow down green speeds, but it can help prevent damage that the greens may not fully recover from for weeks.

USGA Video:

[“Fore the Golfer: Managing Summer Heat Stress on Golf Courses”](#)



It can be challenging to maintain healthy turf and consistent playing conditions during extreme summer weather. (USGA/ Steve Boyle)

Rain, rain, go away!

Unfortunately, strong storms are common throughout much of the U.S. during summer. A storm can bring a round of golf to an abrupt end and can also disrupt playing conditions for days afterward. Bunker washouts are among the most noticeable impacts in the aftermath of a storm and they can be time-consuming and expensive to repair. Wet weather can also limit golfer and maintenance traffic, which disrupts mowing operations and causes cart restrictions. Many golf facilities are renovating bunkers and in-

....continued on Page 16.....

Summer on the Golf Course: What to Expect ...continued from page 15

stalling drainage to minimize the impact of storms, but rainy weather will always require golfers to have some patience before things get back to normal.



Improving drainage in and around bunkers reduces wash-outs and minimizes the impact of storms on playing conditions.

Sometimes putting greens need a breath of fresh air

Venting aeration is a common practice at many golf courses during the summer months. It involves creating small holes or slices in the putting surface to encourage air and water movement. Venting promotes healthy roots by increasing oxygen in the soil and it can help dry out wet putting greens. This process may occur every few weeks during the summer, and while it looks disruptive as it's being done, you will hardly notice any impact on green speed or smoothness.



Fans help to cool putting greens during hot weather and reduce disease issues by drying turf leaves and soil.

Minor disruptions make a big difference

During summer, it's not uncommon to encounter members of the maintenance staff using sprinklers or hoses to water key areas of the golf course. You may also find fans running near some putting greens. Playing from an area that's been freshly watered or listening to a large fan whirring while you line up a putt may be a little bothersome, but these minor disruptions can make the difference between grass living and dying during the stressful summer months.

There will be a lot of great days for golf this summer, and there will also be times that test the patience of golfers and superintendents alike. Extreme weather will inevitably impact the golf course and the best thing we can do as golfers is to be understanding and patient until normal conditions return.

<https://www.usga.org/content/usga/home-page/articles/2019/07/summer-on-the-golf-course--what-to-expect.html>

TURF EQUIPMENT AND SUPPLY COMPANY

One Team, Many Solutions

Your full line vendor for Golf Commercial Equipment and Golf Irrigation.

www.turf-equipment.com
800.827.3711

TORO Count on it.

June Golf Results - Country Club of Harrisburg



1st Place -
John Chassard
Bill Brooks
James Dennison
Andrew Harrison

2nd Place-
Thom Mahute
Jon Cuny
George Manos
Matt Wolfe

3rd Place
Steve Ehrhart
Brendon Clark
Rebecca Clark
Aaron Schroeder

YOUR FULL-SERVICE TURF MANAGEMENT PARTNER

Helena is your full-service turf management partner and offers a wide range of innovative products, including nutritionals, wetting agents, pest control products and more.

To achieve the quality you desire, contact your local Helena representative or visit HelenaProfessional.com.

Mike Sushine
(484) 624-2208
SushineM@HelenaAgri.com



People...Products...Knowledge..

Always read and follow label directions. Helena and People...Products...Knowledge... are registered trademarks of Helena Holding Company. © 2019 Helena Holding Company. HPG0419P

VENTRAC

Compact Tractors

Request a Demo Today!



Lawn and Golf supply co., inc.

More Than the Logo!

Turf Management • Debris / Snow / Ice Removal • Soil / Site Preparation
Specialty Attachments • Multi-Purpose Vehicles • Pre-Owned Equipment
Golf Course Supplies • Equipment Service • Seed, Fertilizer / Chemicals
Government Contracts • Financing Solutions • Parts & Service



Equipment, **PARTS, SERVICE** and Over 80 Years of Experience!
www.lawn-golf.com 610.933.5801 647 Nutt. Rd. Phoenixville, PA 19460

June Golf - Closest to Pin

© 2019 PGA of America. Photo: Justin S. Johnson. www.pgaphotos.com



2 **Andrew Harrison**
#6 **Lee Kozsey**
#10 **Aaron Schroder**
#12 **Jon Cuny**
#16 **Lee Kozsey**

Thanks to Scott Fischer and his staff at
Country Club of Harrisburg
for providing us an amazing June Golf Meeting!

Platinum Sponsor

Fisher & Son Company , Inc.

Gold Sponsor

Lebanon Turf
Turf Equipment & Supply Company

Silver Sponsors

Aer-Core, Inc.
Ewing Irrigation
Genesis Green Supply
Helena Agri-Enterprises, LLC
Lawn & Golf Supply Co.
Syngenta
Walker Supply, Inc.

Corporate Sponsors

Andre & Son Inc.
Bayer
Davisson Golf, Inc.
Earthworks Natural Organic Products
Finch Services, Inc.
FMC
Grigg Bros.
PBI Gordon

2019 Meeting Schedule

September 18th
Huntsville Golf Club

October 21st
Moselem Springs Golf Club



The Green Sheet

1314 Porter Avenue
Scranton, PA 18504
cpgcsa@hotmail.com
www.cpgcsa.org

