



The Green Sheet

Central Pennsylvania Golf Course Superintendents Association

Volume 27 Issue 3

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June 2020

July Meeting

Carlisle Barracks Golf Course

920 Jim Thorpe Road
Carlisle, PA 17013

Host - Jeff Green

Wednesday, July 15, 2020

Registration - 11:30 AM

Lunch - 12:00 Noon

Golf - 1:00 PM Shotgun

Appetizers/Cash Bar - Following Golf

*There will be a CPGCSA Board of Directors Meeting
at 10:15 AM.*

Superintendent Profile

Jeff Green has been the Superintendent/General Manager at the Carlisle Barracks Golf Course since April of 2015. He has a Bachelors Degree in Turfgrass Science from Penn State University where he graduated in May of 1999. Previous employment includes: Superintendent (11 years) Valley Green Golf Course, Assistant Superintendent (9 months) Lebanon Country Club, Assistant Superintendent (2.5 years) Heatherwoode Golf Club, Ohio and Assistant Superintendent (3 years) Ivy hills Country Club, Ohio. Jeff is married 19 years to his wife Angie and has an 11 year old daughter, Avery. He enjoys playing golf, spending time with family and of course Penn State football.

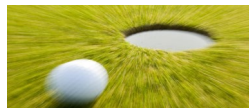
Host Course Profile

The Carlisle Barracks Golf Course is one of the finest in the Cumberland Valley. It measures over 6,300 yards and is a par 72 course. The Carlisle Barracks Golf Course features a modern practice facility that includes a driving range and chipping green with bunker to practice your short game. There is also a fully stocked pro shop with all the latest in golf apparel and merchandise. The golf course is open to the public, but part of the US Army MWR program to provide for the Morale Welfare and Recreation of our Army's soldiers and families. The Carlisle Barracks is part of the United States Army Training and Doctrine command and is the site of the US Army War College. It is also the nation's second oldest active military base.

The Truth About Green Speeds

JUNE 23, 2020 | LIBERTY CORNER, N.J.

By George Waters, USGA



The most important thing to know about green speed is faster does not mean better. (USGA/John Mummert)

Green speed is one of the most sensitive and misunderstood topics in golf. Golfers see lightning-fast greens on television or hear claims about green speeds at a course they admire and think that's an ideal that other courses should aspire to. What they may not realize is that those conditions require significant resources to deliver, may last for only a short period of time, and are not appropriate for the vast majority of golf courses or golfers. There is also a lot of misinformation about green speeds, so golfers shouldn't believe everything they hear from their playing partners or television broadcasters. Here are five things every golfer should know about green speed:

Faster Does Not Mean Better

The appropriate green speed for a particular course depends on the putting green contours, grass type, maintenance budget and skill level of the golfers playing – along with numerous other considerations. Trying to make greens faster than they should be leads to higher maintenance costs, turf damage, lost hole locations, and rounds of golf that are slower and less enjoyable. Sacrificing other aspects of putting green quality in the pursuit of speed just doesn't make sense.

Green Speeds Fluctuate

Putting greens are comprised of living plants that change and perform differently from season to season and even day to day. Temperatures, humidity, rainfall and routine maintenance practices all influence daily green speed. Maintaining the same green speed throughout the year is impossible, and letting a target number dictate management practices is a recipe for damaged greens and undesirable playing conditions.

Green Speeds Don't Travel

One of the most important things to know about green speed measurements is that they should not be used to compare one golf course with another. A green speed that is perfect for one course could be way too fast for a course down the road that has steeper green contours or golfers with different skill levels. There are simply too many variables involved to make reasonable comparisons.

Speed Costs Money

While golfers hear a lot of discussion about courses with fast greens, they don't hear as much about all that goes into providing those conditions. Lower mowing heights, regular

...Continued next page...

President's Message

Green means GO! That is what I have learned from the children's books that I have read over the past few years at least. Unfortunately all of us did not enter the green phase of reopening at the same time, some of us still yet to get there. During this time of fluctuation and inconsistency it is easy to get lost and confused. I hope that you all have been able to continue practicing what you are good at, conditioning turf and leading your team. Most importantly I hope that you have been able to take care of yourself. If not, call me, it is what I am here for!

Speaking of taking care of yourself, I want to thank those of you that were able to attend our virtual Zoom meeting in conjunction with Darrin Batsky from Bayer. The official title of his presentation was Emotional Intelligence, something that our group is not always very open about. It is an important topic though, especially given the current climate. There is a lot, and I mean A LOT going on in the world right now. Before you can mentally begin to tackle any of that, you have got to get your own mind right. Darrin spoke very well about understanding yourself and how certain triggers, whether they be times of the year, events, or even people can set you down a path of emotions/reactions. Understanding and management of those aspects of yourself can improve your personal life and role as a leader to those that look up to you. Thanks again Darrin!

Regarding grass, there is a little bit of everything right now. We have completed the first third of that timeless annual 90-day period we spend way too much time worrying about. With June in the books, some of us have had too much rain, others not nearly enough. How about weevils, anyone get hammered so far? Poa has certainly thrown me for a loop this year as we experienced what can only be described as a second coming of seedhead. I have heard reports of some pretty bad Take-All-Patch thus far. I know that we experienced some of that in 2019, but not until later in the year amidst a dry spell. Dollar Spot has certainly gotten its act together, and looking at the 7-day forecast, if you are not already covered then that will not be the only disease you may need to fend off.

I feel that these messages have been more of a therapy session than anything else of late, but so be it. I really want to stress that I and the rest of the board are here for you. We are excited to finally hold our first physical event coming up in July at past president Jeff Green's course, the Carlisle Barracks. While some of you may be hesitant to venture out, which is totally understandable, I hope that others will be looking forward to a brief respite. Come out, smack it around and forget about the other "stuff" for a few hours. Hope to see you there, and be well!

Kevin Mark

USGAcontinued from Page 1

topdressing, verticutting and hand watering are just some of the practices involved in maintaining faster greens. In addition, courses that maintain faster greens typically invest heavily in improving putting green growing environments by removing trees and enhancing drainage. The investments required on a daily and yearly basis to deliver faster green speeds are substantial, and beyond the budget of most golf courses.

Speed Can Kill

Periods of high heat, humidity and other environmental stresses can push putting green health close to the edge. Trying to maintain a particular green speed during difficult weather carries a serious risk of causing lasting damage that could negatively impact smoothness and speed for weeks to come. To protect putting green turf, golf course superintendents may raise mowing heights or reduce the frequency of mowing and rolling during stressful weather. These adjustments mean temporarily slower green speeds, but they will help preserve good playing conditions for the weeks and months ahead.

It's easy to understand how golfers can place too much emphasis on green speed. Numbers invite comparisons and faster can easily be mistaken for better. However, if we can keep the big picture in mind and remember that speed is just one of the many factors in putting green quality, we'll save ourselves and superintendents a lot of headaches.

George Waters is the manager of Green Section education for the USGA. Email him at gwaters@usga.org.

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The appropriate green speed for a course depends on putting green design, grass type, golfer ability and other factors. (USGA/Kirk H. Owens)

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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.

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Tough Golf Superintendents Do!

By Linda Parker Posted on June 8, 2020 COVID-19 (Coronavirus)

The COVID-19 pandemic has impacted golf facilities across the country in distinctly different ways. While some golf courses have been forced to shut down, many course operators have found ways to keep the doors open.

This article looks at some of the appropriate and creative strategies golf course superintendents, directors of golf and other course decision makers have deployed during this extraordinary time. While we all long to put the past few months in our rear-view mirror and never revisit them, it's important to salute and share some of the clever tactics savvy golf industry professionals have used to help keep the ball rolling toward the hole.

KEEPING PEOPLE SANE AND ACTIVE

Right now, segments of the golfing population have more time on their hands than ever before. They also have a tremendous need for a healthy mental distraction, physical exercise and a chance to get outside and enjoy sunshine and fresh air. For golf facilities that remain open, operational procedures are atypical at best.

Nevertheless, if your course is even partially operational, know that golfers and communities are benefiting now more than ever from your efforts. Among the strategies that have been put into play at operating golf facilities are

- Suspending caddy services
- Golfers keeping their own score cards, not those of their playing partner
- Closing food service or offering carry-out only
- Removing rakes from bunkers and encouraging golfers to smooth bunker sand with their feet
- Either prohibiting golfers from removing flag sticks (stick stays in the hole no matter where the golfer is hitting or putting from) or eliminating flagsticks from the green entirely
- Changing payment processing by encouraging remote or online payment, even if this method is done by golfers from their phones after they arrive at the course
- Raising the level of the cup with an insert or adding a "bumper" around the hole to eliminate the need for golfers to reach into the hole to retrieve their balls

Across all categories of business, golf included, new protocols and understandings are emerging. For example, players are seeing their scores improve as they hit to a green with no flagstick. By playing the safer strategy of hitting to the middle of the green, golfers are positioning themselves to hole out in fewer strokes than they would have needed playing riskier shots in their attempt to hit closer to the pin.

Now, doesn't this observation make you wonder if golfers will recall and apply this insight after flagsticks are returned to the game?

KEEPING FACILITIES SAFE AND STAFFED

While some golf courses are disinfecting golf carts between each use, others have removed carts from the equation entirely. Many facilities have reported that for every cancelled tee time by a golfer disgruntled by playing without a cart, there have been plenty of takers to grab the tee time.

Frequently, video meetings are the new normal for vendors and superintendents and for superintendents and their crew. Sometimes, simply staggering work schedules or enforcing social distancing and personal sanitation guidelines has been sufficient to keep golf course workers on the job and courses maintained.

Overall, superintendents have excelled in educating their staff to sanitation best practices, implementing steps to prevent or limit the spread of the disease in the workplace and monitoring their employees. But there's been no shortage of new legal and human resources requisites to consider.

Rules governing sick leave, time off, OSHA regulations and other employee and labor practices in the face of COVID-19 differ from guidelines a superintendent typically follows. Both the National Association of Golf Course Owners and the USGA have done an excellent job of compiling on their websites, relevant and timely updates regarding these and other related regulatory changes.

NO ONE WOULD CALL THIS BUSINESS AS USUAL

From maintenance crews to golf operations to vendors and contractors, everyone in the business has been looking for ways to get the job done, maintain the course and ideally, provide opportunities for play, while adhering to local, state and federal guidelines. Not only has the COVID-19 situation translated to a diversity of operating approaches from one part of the U.S. to the next, it has also required superintendents and other decision makers to demonstrate contortionist-like flexibility with work

Tough Golf Superintendents Do!....continued

plans fluidly changing from week to week and, sometimes, day to day.

As the American Society of Golf Course Architects Past President, Dr. Michael Hurdzan pointed out, “A golf course is a living organism that must be continually fed, watered, groomed, treated for pests and nurtured whether there are golfers or not.”

In a Twitter chat involving ASCGA leadership, ASGCA Executive Director, Chad Ritterbusch, responded to the comparison of the present-day situation with the economic crisis of 2008. Ritterbusch observed, “Those (course managers) who used the circumstances twelve years ago to plan ahead tended to do best coming out of the volatility. Travel and other aspects may be affected now, but the best courses (existing and potential) will talk about options with their architects and other team members.”

Although the word “unprecedented” seems to crop up in every newscast or article published about the pandemic, what is, in fact, truly unprecedented is the response by the U.S. government and the American people. Both the Small Business Administration (SBA) and the banking industry have made generous and easy-to-obtain business loans available.

The CARES ACT resulted in direct payouts to individual and families and unemployment insurance has been paid almost without question, in many cases even going to independent contractors and the self-employed. Beyond this first tier of support, golf course operators and superintendents are finding additional dedicated resources to help them get through these difficult times.

Vendors and contractors, in some instances, have given away business referring prospective clients to other sources that may be geographically closer to the golf course and, under present circumstances, a more logical or affordable choice for the superintendent. Industry-wide, companies, organizations and individuals have stepped up generously to help one another in ways that genuinely deserve to be called “unprecedented”.

FOUR CENTURIES LATER, MAYBE LONGER

Over the past twenty years, the golf industry has weathered 9-11, the economic downturn of 2008, and so many hurricanes,



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Tough Golfcontinued

floods, fires, droughts and blizzards we have all lost count. More importantly, since at least the seventeenth century and perhaps much longer ago than that, the game of golf has survived wars, pestilence, plague and the most dismal events in human history.

Golf is both a business and a passion. Like other businesses, it will be as resilient as the dedicated workers within it. Golf course superintendents already know that their job has always been both a marathon and a sprint. They know that they support one of man's most treasured passions and that while tough times don't last, inevitably, tough golf course superintendents do.

Linda Parker has been writing professionally since the 1980s. With clients in finance, sports, technology, change enablement, resorts and nonprofit global initiatives, Linda helps organizations communicate their stories in meaningful ways to the people they most want to reach. She has authored, ghostwritten or contributed to more than a dozen nonfiction books. Linda is a member of the Authors Guild and the Golf Writers Association of America. You can connect with her at linda@glindacreative.com

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Crisis Turfgrass Management - Pennsylvania Turfgrass Council

JUNE 23, 2020

Michael Goatley, Jr., Ph.D.

Nothing reminds us of how fragile our lives, jobs, and relationships are until they are seriously disrupted by an unforeseen event. If you're anywhere near my age (58) then 9/11 and 4/16 have particular significance in our lives, and Covid-19 will be another event that will be remembered for how it changed the way we do things, even in managing turfgrasses. The 2020 Pandemic has certainly impacted the turfgrass industry and its effects will continue even as/after social distancing restrictions are relaxed and public activities on our sports fields and golf courses expand and/or return. For situations where budgets and labor forces were not severely impacted by the pandemic, turfgrass managers have taken advantage of the downtime in what are typical high turfgrass use periods to complete a variety of activities/projects that otherwise would not have been possible. I have noted irrigation and drainage installations, bunker renovations, a wide variety of tree management activities, earlier than ever spring transition of ryegrass overseeding back to bermudagrass, rebuilding/renovating infield skins, pitching mounds, and batter's boxes, etc. The only 'slaps on the hand' for the turfgrass managers that I have heard in these situations has been admonishments in some cases for not paying enough attention to 'social distancing.' However, the real world scenario for many turfgrass managers has been that they have had to be ultra-creative in managing their labor forces, not just to address social distancing guidelines, but to handle a budget that has been cut and might continue to shrink. Predicting what is going to happen for the rest of 2020 in our industry will likely be as accurate as most of our pandemic models have been to this point in time because this is such a fluid situation; it's uncharted territory from a variety of perspectives and perceptions. However, necessity brings out the best (and sometimes worst) of human ingenuity, and quite often our management and business models will never be the same again. In listening to and observing industry peers from around the mid-Atlantic, here's some forecasting that even if it doesn't pan out as I think it will, should still be applicable strategies to fit most turfgrass management situations:

Site-specific management continues. This is one of the oldest and best budget saving strategies in all phases of turfgrass management. Focus management on the areas that warrant the attention because of their specialized purpose or their intensity of use. Logically it's greens, tees, and fairways in that order on golf courses and it's been interesting watching how superintendents are adjusting pest, fertility, and mowing strategies to deal with current and anticipated challenges in budgets and labor. Similar concepts are being applied in sports fields with an emphasis on repairing and restoring the heaviest trafficked areas, and only providing minimal maintenance on most other areas. The classic example long preached in sports field management is to emphasize turf recovery between the hashes and the 30s in the spring on football fields, even when they are being used for spring soccer. Focus on infields and hips on grassed baseball and softball facilities and minimize efforts in the outfield (except for perhaps three general locations in left, center, and right?).

Many turfgrass managers have told me that budgets simply aren't going to allow for broad-scale scheduled aeration events, even if performed 'in house', and a primary reason is the cost of the tines themselves. The same limitations might apply to scheduled pesticide or fertilizer applications. Adjust the areas that you are managing to those that absolutely need the attention, and return to the other areas as budgets allow. It's been great to hear how our turfgrass industry professionals have been thinking in the big picture about how the contracted economy is going to affect everyone, including the industry sales force. But I particularly admired what one of our area's best sales staff told me, "It's now up to me to offer my clients alternative strategies and products that fit reduced budget and management programs. When these types of events happen, it serves as a reminder to me in my job to not take my customers for granted because at the end of the day, about the only thing that will eventually shut down turfgrass management is if you quit mowing." Which leads me to...

Remember that you get to manage turfgrass growth. One of the best arguments that classified most turfgrass managers as 'essential employees' to governmental agencies is the fact that when environmental conditions are appropriate, grass is growing. Keep it growing, but only at a level that you can properly maintain. It's a no-brainer to reduce nitrogen inputs when trying to restrict turfgrass growth, but maintain them in areas that you are trying to improve. Raise cutting heights and reduce mowing frequency (both a sports field manager AND a golf superintendent told me they are hoping to use the necessity of raising their cutting heights at their facilities because of a limited labor force as a way to hopefully reset their clientele expectations regarding cutting heights on their sports fields and golf greens... that strategy won't work at every facility, but might it fit yours?). And where labor availability or social distancing requirements have greatly reduced the ability to simply keep up with the mowing, the use of plant growth regulators (PGRs) has great potential. This is a case where sometimes spending a little money can save you significant money based on the economics of the cost of product and the application of a PGR vs. the cost of labor, fuel, frequency, etc. in mowing. We didn't quite reach that point this spring, but one of our plans if we couldn't keep enough labor to cut the grass was to suppress the growth of much of our out of use cool-season turfgrass areas at the VT Turfgrass Research Center with a low level glyphosate application.

Anticipate a surge in managed turfgrass use as social distancing requirements are lifted. It is already happening and will only continue to grow as people are very weary of shelter-in-place and can't wait to get outdoors in social settings. The use demands on sports fields and golf turfs will grow exponentially later this summer. When revenues are to be generated by the use of the turfs, the pressure to make up for lost time to generate revenue will be immense. Some of my college sports field and parks and recreation supervisors have told me they already have coaches and supervisors anxious to get fields open for camps; these are

often the largest money-making events of the year, and for some, a primary means of supplementing their salaries or funding their leagues. And in most of these cases, the sports field manager (and their budget) has a history of not receiving any supplemental pay/operating funds for the turf management of these events. It will be no different for golf courses where a huge number of tournaments will be added to a much tighter window of play than ever before. All of this is understandable in order to restore funds to the coffers, but it also is potentially catastrophic to the long-term health of the various turfgrass systems. A park and recreation facility manager told me that "If one thought they had heavy demands for field use before, field use this summer is going to be on steroids!" Have you had discussions about this and possibly even developed a post-pandemic management plan at your facility? Do you have a plan or SOP that involves serious discussions between you as the turfgrass manager with your administration, owners, supervisors, and clientele about responsible turfgrass use patterns that generate income, but not at the expense of creating more problems? You've been anxiously waiting for your turfgrasses to be used, and yet this might be the biggest challenge you will face in 2020.

Take advantage of the challenges. Everyone that has been at this for any length of time always agrees that managing the turf is the easy part. One of our biggest daily challenges in our personal and professional lives is quite simply successful communication. While it's never easy, there is great opportunity for us to use these challenging periods as a time to educate our clientele and bosses about just how amazing a natural turfgrass system is, the expertise required to manage such a system, and how it is so easy to take turfgrasses for granted. You might as well get some credit for what you do now because very soon the skill and art of turfgrass management will once again be an afterthought. Many facilities required signs to communicate regarding social distancing protocols. I suggest you continue to utilize and expand your use of on-site signs at your facility, and take advantage of 'virtual communication' as well by utilizing social media platforms to instruct the public about appropriate use of the facilities. You get few opportunities where the public is paying attention to your communication efforts, but you do have that chance for a short window now.

A golf business model for the 2020 Pandemic that has huge upside for revenue BUT presents more challenges for the superintendent and their staff is the promotion of single cart-only golf (VT alum Mike Johnson gets credit for making me aware of this). If you track the dollars at the golf course, one of the most logical ways to generate more revenue is to increase the number of rounds. If everyone plays from a single cart, they are 1) practicing appropriate social distancing (a very key part of a successful argument for why to do this) and 2) reducing the time of a round for golfers by 25-33%. The positives: a course schedules more tee times, sells the use of more carts, and revenues increase. The negatives: walking golfers don't fit this business model and the golf turf maintenance team has to deal with the additional traffic from the extra carts. When Mike shared this situation with me, it made me chuckle as I remembered from my first job on the golf course in central Kentucky the group we called (fondly... well usually fondly) the Old Goats (no relation to me, at that time I was a Young Goat). They were the first group off the tee in the morning and there would be anywhere from 4 to 7 of the Goats in individual carts heading down the first fairway. I remember one of them telling me that "the day I have to ride with someone in a cart is the last day I will play golf." Who would have ever thought the Old Goats would actually be such trend setters in the 21st century?

Best wishes in your return to whatever normal becomes in turfgrass management for 2020!

JUNE 23, 2020 | PENNSYLVANIA TURFGRASS COUNCIL | PODCAST
 PODCAST: [PLAY IN NEW WINDOW](#) | [DOWNLOAD](#)

*Michael Goatley, Jr., Ph.D., Professor and Extension Turfgrass Specialist,
 School of Plant and Environmental Sciences, Virginia Tech*

[Rounds 4 Research](#)

2020 R4R auction rescheduled for July 20-26

The annual event was originally scheduled for April 27-May 3 but was postponed due to the COVID-19 pandemic. Donations are still being accepted and will be accepted throughout the end of the auction. Please contact [Mischia Wright](#), associate director, EIFG, if you have questions.

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 are auctioned online.

Whether you are an organization looking to solicit rounds or a golfer looking for the opportunity to support research while enjoying the sport you love, Rounds 4 Research provides a way for all aspects of the game to come together to ensure its future. The 2019 R4R auction raised more than \$364,000.





MINIMUM MAINTENANCE FOR GOLF COURSES DURING COVID-19 OUTBREAK

After a period of extended closure, a store can restock its shelves and easily resume normal operations. A restaurant can fire up the burners and be back in business. But a golf course is a living thing, and superintendents can't bring the course back to regular playing conditions simply or quickly after a period of neglect. Even if the course is closed, a minimum maintenance regimen will help keep the turf healthy and "standing by" for when facilities are able to resume standard operations.

The GCSAA and USGA recommend the following minimum practices for course maintenance. Keep in mind that turf conditions and needs vary greatly around the country, so the guidelines should be adapted to the current growing conditions in your region.

As you carry out your maintenance operations during this time, it is important that each golf facility comply with CDC guidelines in addition to any state or local executive orders. Measures should include but are not limited to:

- Minimize the number of maintenance staff members working on the golf course at one time.
- Maintain social distancing guidelines at all times.
- Assign staff equipment to avoid sharing between employees.
- Stagger working hours and break times.
- Place hand sanitizer throughout maintenance area.
- Regularly disinfect any surface that is contacted.

MOWING

In order to maintain turf that is healthy enough to survive while also reducing weed encroachment, the following mowing frequency is recommended:

- Greens 2-3x per week
- Tees 1-2x per week
- Fairways 1-2x per week
- Collars 1-2x per week
- Approaches 1-2x per week
- Driving Range Tees and Targets 1-2x per week
- Driving Range 1x every two weeks
- Rough 1x every one to two weeks

Utilize plant growth regulators where possible to manage growth rate and clipping yields. Increasing mowing heights will allow for longer intervals between mowing.



BUNKER MAINTENANCE

Bunkers should be maintained as necessary to prevent weed encroachment.



EQUIPMENT MAINTENANCE

Carry out routine maintenance as required to keep essential equipment in good operating condition.



IRRIGATION

Irrigation should be applied as necessary to ensure adequate turf health and density. Avoid excessive irrigation, which will promote unnecessary growth.



PLANT PROTECTANTS AND FERTILIZERS

Apply plant protectants and fertilizers judiciously to maintain plant health while not encouraging unnecessary growth.



ADDITIONAL RESOURCES



GCSAA COVID-19:
gcsaa.org/pandemic



USGA COVID-19:
<https://www.usga.org/course-care/covid-19-resource-center.html>

Penn State Field Day Cancelled

For the first time in over 50 years, Penn State's Turfgrass Field Day will be cancelled. The biennial event was originally scheduled for Aug 5th 2020, but because of the COVID-19 pandemic all Penn State Cooperative Extension in-person events have been cancelled until early October. Plans are in place to hold the field day event during the summer of 2021. We are hopeful that all other turfgrass educational events sponsored by Penn State and/or the Pennsylvania Turfgrass Council will take place later this year, and in 2021.

**Rutgers Turfgrass Field Day
is re-scheduled to
Wednesday, October 7, 2020**

**LCAP Pest & Disease Walk
at Penn State University - Berks Campus
is re-scheduled to October 22, 2020**



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Warm-Season Grasses for Warm Seasons

June 19, 2020

Elliott Dowling, agronomist, Northeast Region

Warm-season grasses are not just for southern states anymore. If you haven't considered using them on your course, this should be the season to give them a try.

As temperatures rise, the thought of transitioning areas to warm-season grasses resurfaces on Course Consulting Service visits. This is an annual conversation that will likely occur from now until temperatures start to cool again. If you are thinking about utilizing warm-season grasses, now is a good time to experiment – especially on par-3 tees, practice tees or short game fairways. These areas receive a lot of divots during the season and cool-season grasses are slow to recover during summer heat.



Warm-season grasses are not just for southern states anymore. If you haven't considered using them on your course, this should be the season to give them a try.

States like Maryland and Pennsylvania are within in the transition zone, so it is appropriate to try warm-season grasses. If you have areas of the course that rarely meet expectations during summer; if you are concerned about water, pesticide or fungicide inputs; or just want to try something new, this is the year to sod some bermudagrass on a tee or small fairway and compare the performance to cool-season grasses.

[Green Section Record](#)

Volume 58, Issue 12

<https://www.usga.org/content/usga/home-page/course-care/green-section-record/58/12/warm-season-grasses-for-warm-seasons.html#returnable>

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Understanding turf fungicide resistance and FRAC codes

Brian Aynardi, Ph.D., offers a primer on how resistance develops, which turf pathogens are resistant to which fungicides, and steps superintendents can take to rein in resistance.

June 18, 2020 | Brian Aynardi, Ph.D., Northeast research scientist, PBI-Gordon

Fungicides have been used widely in the golf course industry for more than 100 years, since the Bordeaux mixture was first used to control brown patch at the Arlington Turf Gardens, located between Arlington National Cemetery and the Potomac River, in 1917. Over the past century, many fungicide groups with a variety of modes of action have been developed by research scientists.

The types of active ingredients have evolved throughout those years, starting with elements such as mercury, copper and arsenic. Heavy metal fungicides gave way to site-specific fungicides, which were less toxic. These new fungicide groups, in many ways, were as exciting to the turf world as Chuck Connors firing off his Winchester Model 1892 at the start of the iconic TV show “The Rifleman.” The products stopped their pathogenic target in a similar way to Chuck — with a lethal shot to a specific spot in the metabolic pathway.



Photos courtesy of PBI-Gordon

The first of these “Rifleman” fungicides, the benzimidazoles, were brought to market in the 1960s, followed by the dicarboximides, and then the DMIs in the 1970s. In the years that followed, other notable fungicide groups — such as the SDHIs, phenylamides and the QoIs — were introduced and widely used. With the exception of the phenylamides, all offered broad-spectrum disease (pathogen) control.

Unfortunately for resistance management, over time these site-specific active ingredients were not always as lethal as Connors’ 1892, as pathogen resistance would quickly develop following the introduction of each of these fungicide groups. Benzimidazole resistance was first documented in 1973 and dicarboximide resistance in 1980, and, in later years, resistance for other groups followed suit.

The following turfgrass pathogens have documented cases of resistance to at least one group of fungicides: *Clariireedia* spp. (dollar spot), *Colletotrichum cereale* (anthracnose), *Pythium aphanidermatum* (Pythium blight), *Magnaporthe oryzae* (gray leaf spot), and *Microdochium nivale* (pink snow mold). The year in which resistance was first documented is listed below by pathogen and fungicide group.

Fungicide resistance by pathogen and group

Pathogen	Disease	Year	Fungicide group	FRAC group
<i>Clariireedia</i> spp.	Dollar spot	1973	Benzimidazole	1
<i>Clariireedia</i> spp.	Dollar spot	1983	Dicarboximide	2
<i>Clariireedia</i> spp.	Dollar spot	1992	DMI	3
<i>Clariireedia</i> spp.	Dollar spot	2017	SDHI	7
<i>Pythium aphanidermatum</i>	Pythium blight	1984	Phenylamide	4
<i>Pythium aphanidermatum</i>	Pythium blight	2003	Strobilurin	11
<i>Colletotrichum cereale</i>	Anthracnose	2002	Benzimidazole	1
<i>Colletotrichum cereale</i>	Anthracnose	2002	Strobilurin	11
<i>Colletotrichum cereale</i>	Anthracnose	2005	DMI	3
<i>Magnaporthe oryzae</i>	Gray leaf spot	2000	Strobilurin	11
<i>Microdochium nivale</i>	Pink snow mold	1980	Dicarboximide	2

In talking with golf course superintendents who worked in the industry during this period, while they agreed that the influx of newer and safer fungicides was exciting, they thought tougher times were on the horizon with the increasing prevalence of pathogen resistance.

Mark Kuhns, CGCS, who most recently served as director of grounds at Baltusrol Golf Club in Springfield, N.J., from 1999-2019 and is now with Turco Golf, says of that time period, “With all the new systemic fungicides, there was a strong desire to increase spray intervals far beyond the shorter interval provided by chlorothalonil, which new products on the market provided. They were also much safer for the environment. But around 2000, we were worried there weren’t going to be new products coming to market. Thanks to the R&D efforts from industry and the advent of premix products, superintendents were able to adapt to increasing re-

sistance issues.”

To be fair, there is no specific point at which resistance became the norm that it is today. Rather, there was a transition over time where fungicide resistance saw an increase in the number of pathogens that developed resistance as well as in the number of groups that became compromised. Before diving into the state of resistance today, it is important to revisit some general plant pathology to understand why resistance happens.

First, fungicides are used to control the pathogen; the pathogen is what causes a plant to exhibit disease symptoms because of a continual irritation or attack in the presence of conducive environmental conditions.

Resistance of pathogens affecting turfgrass is not limited to true fungi, but also includes fungal-like oomycetes (i.e., *Pythium* spp.). The commonality in the pathogens that have developed resistance is that they either reproduce quickly via the production of an abundance of propagules such as spores or mycelia, and/or they reproduce where sexual reproduction allows for the exchange of genetic material.

The predominant cause of resistance in turfgrass pathogens is due to a target site (binding site) alteration. Therefore, repeated applications with an active ingredient that targets a specific site in the metabolic pathway will eventually result in the pathogen adapting to that active ingredient (or even to that group of fungicides).

The development of an integrated pest management (IPM) strategy is an important method whereby the use of synthetic pesticides is not eliminated, but rather their use is incorporated alongside cultural practices to try to break the disease triangle (host, pathogen and environment) to reduce the overall use of pesticides. However, even with an IPM approach, fungicide resistance continually evolves.



Initial symptoms of Pythium blight.

In an effort to combat pathogen resistance to chemical control measures, plant pathologists formally developed the Fungicide Resistance Action Committee, or FRAC, in 1981. Since its formation, FRAC has provided resistance management guidelines and updates through a variety of publications, including an annual report that lists the current active ingredients by mode of action, target site, group name, chemical group, common name and FRAC group number. Additionally, each group is given a designation on the likelihood of resistance development. While trade names are not provided because the active ingredients listed span various commodities, any turfgrass manager can access this information by visiting www.frac.info and downloading the [FRAC Code List 2020](#) to determine the risk level for the active ingredient they are choosing to apply.

Fungicide labels list the FRAC code for each active ingredient in a given product at the top of the label. This allows for ease in determining which fungicide groups are being used with each application.

In addition to being vigilant as to which fungicide groups are included in a spray program, the following suggestions should be helpful in delaying the development of pathogen resistance to fungicides:

- Use IPM practices to break the disease cycle, such as: planting resistant cultivars or non-hosts, fertilizing to prevent or reduce the severity of stress-related diseases, increasing mowing heights, and improving drainage and air movement.
- Site-specific fungicides from the same FRAC group should not be used in more than two consecutive applications. This rule of thumb holds true even when using premix products.
- Use multisite fungicides whenever possible, as they have low to no risk for resistance.
- Incorporate phosphites, SAR (systemic acquired resistance) or ISR (induced systemic resistance) products into the disease management program.

The advent of site-specific fungicides has provided turfgrass managers with an abundance of products from which to choose. It cannot be overstated how imperative it is to properly rotate these fungicides to delay the development of pathogen resistance. Should 2020 take the same direction as the past few growing seasons, the pathogens most at risk for resistance will be spreading themselves far and wide to wreak havoc on high-amenity turf. And while innovations may someday provide superintendents with their own Winchester Model 1892, until then, rotation and IPM are the keys to keeping fungicide resistance at bay.

Brian Aynardi, Ph.D., is the Northeast research scientist for PBI-Gordon. Aynardi holds a Ph.D. in plant pathology from Penn State University, where he developed conventional and quantitative PCR detection methods for Sclerotinia homoeocarpa, the pathogen that causes dollar spot of turfgrass.

[https://www.gcmonline.com/course/turf/news/turf-fungicide-resistance-frac
utm_source=informz&utm_medium=email&utm_campaign=general](https://www.gcmonline.com/course/turf/news/turf-fungicide-resistance-frac&utm_source=informz&utm_medium=email&utm_campaign=general)

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- Brown patch
- Fairy ring
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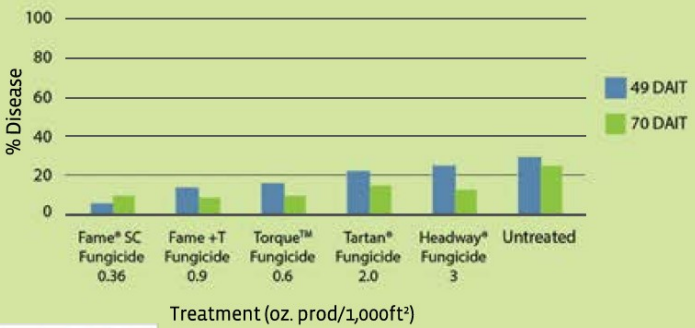
PLANT HEALTH

- Root mass
- Root length
- Consistent chlorophyll production

DISEASES CONTROLLED

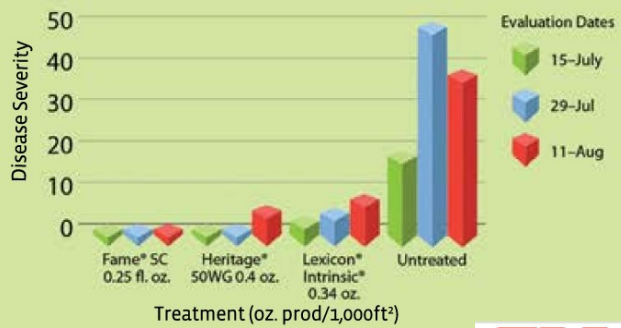
- Brown Patch
- Fairy Ring
- Leaf Spot
- Necrotic Ring Spot
- Pink Patch
- Pythium Blight
- Pythium Root Dysfunction
- Pythium Root Rot
- Red Thread
- Rust
- Southern Blight
- Spring Dead Spot
- Summer Patch
- Take-All Patch
- Yellow Patch

Fairy Ring Control



Treatment (oz. prod/1,000ft²)
 Source: Penn State University, 2016

Brown Patch Control in Tall Fescue



Treatment (oz. prod/1,000ft²)
 Source: North Carolina State University, 2014



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