



The Green Sheet

Central Pennsylvania Golf Course Superintendents Association

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USGA Northeast Region Update

Winter Prep

November 2, 2018

By Paul Jacobs, Agronomist, Northeast Region

Recent winters have been harsh in the Northeast. Winter injury has damaged turf at many golf courses over the last four to five years. Taking preventive measures now can greatly reduce the potential for winter injury on cool-season putting greens. While there is no surefire method to prevent winter injury, the following practices will help reduce the risk.

Height of cut

Increase the height of cut on putting greens to at least 0.150 inch. This will help promote carbohydrate storage and cold temperature hardiness.



Fertility

Avoid excessive nitrogen fertility that promotes luxuriant growth and unnecessary carbohydrate consumption. Research suggests that maintaining soil potassium at or above 50 parts per million can reduce winter injury on *Poa annua* putting greens. However, some research has shown that applications of potassium at extremely high rates during late fall can increase the severity of snow mold on creeping bentgrass putting greens, so be sure potassium rates are within reason.

Drainage

One of the most common forms of winter injury on *Poa annua* putting greens is crown hydration. Poor surface drainage is the single most important factor contributing to crown hydration. Eliminate collar dams to prevent water from accumulating along putting green and collar interfaces. Additionally, [dry wells](#) can be installed in low-lying areas of putting surfaces. [Narrow drainage channels](#) also can be installed to provide positive surface drainage away from low-lying areas. Some facilities install heating cables in drainage channels to quickly melt any ice that disrupts surface drainage. Holes can also be

cut over subsurface drain lines in low-lying areas with poor surface drainage to provide water with a direct route to drainage pipes.

Deep soil modification – Practices that reduce compaction and incorporate sand deep into putting green profiles can improve drainage when soils are not frozen. Practices such as drill-and-fill and deep-tine aeration are commonly performed during late fall but provide benefits that often extend into summer.

Shade

The correlation between shade and winter injury is complex but, in general, maximizing sunlight on putting greens throughout the day is advantageous. Maximizing sunlight penetration during winter helps snow and ice melt quickly and reduces the number of freeze and thaw cycles that cause the majority of winter injury in the Northeast. In addition to reducing the potential for winter injury, additional sunlight will expedite recovery in the spring if damage does occur. Additionally, turf needs cold temperatures and dry conditions during fall to properly harden off. Light is a critical component of this process.

Try to avoid scenarios where putting greens receive morning sunlight and afternoon shade during winter months. A few extra hours of afternoon shade can cause water to refreeze after being melted by morning sunlight. During tough winters, an extra few hours of afternoon shade can be the difference between healthy turf and winter injury.

2019 Winter Educational Meeting

January 28, 2019

Country Club of
Harrisburg

Reservation forms available soon.

President's Message

I spent the later part of the summer looking forward to October, with its many bright sunny dry days which would be perfect for some much-needed recovery and healing. It's November now and I'm still waiting. While the past month did finally bring some much needed cool and dry weather, those days were few and far between. November has always been a roll of the dice, I don't think full recovery of not only solid turf, but also the considerable lost revenue is quite possible at this point of the year. In addition, many of us are working feverishly to recover turf. Oh well, just another year.

As we prepare for the much-anticipated off season, there are some events in the not so distant future that I would like to bring to your attention. First, as many of you are aware, the Penn State Turf Conference is scheduled for November 13th through the 15th. While this is an excellent opportunity to learn a few things from the misery that we have all been through this year, its also a great time to meet up with some old classmates and peers to share some stories over a pint or two. As we fly through the holiday season, keep your radar focused on the Eastern PA Turf Conference on January 16th at Shady Maple. Also, our Central Penn Winter Ed meeting is scheduled for January 28th at the CC of Harrisburg. In addition to a great education line-up, this year marks the return of the David Rafferty Distinguished Leadership and Service Award.

I am pleased to announce that this year; we will be presenting the DLS award to none other than Pete Ramsay. Pete has been a dedicated member of our association since 1998, serving on the board and eventually President of the association in 2002-2003. Pete is currently the President of the PTC and has for many years been lending his support and ideas to the CPGCSA Board. In my opinion, however, his greatest contribution has come in recent years as he exposed the SRBC of the corruptive manor of operations and he remains at the forefront of the information stream to our association. Pete, thanks for all you have done and congratulations.

Enjoy the wind-down of the season and I look forward to seeing you all after the holidays.

Happy Off-Season,

Brian Ahrens
President

Upcoming Educational Events

- **PA Turfgrass Council Eastern Turf Conference & Trade Show**
January 16, 2019
Shady Maple, East Earl, PA
- **PA Turfgrass Council Northeastern Turf Conference & Trade Show**
January 31, 2019
- **LCAP 28th Winter Lawn Care Conference**
February 12, 2019
Holiday Inn Conference Center - Lehigh Valley
- **PA Turfgrass Council Western Turf Conference & Trade Show**
February 26 - 27, 2019



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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.

Robert Rosensteel Class B
Superintendent, Meadia Heights Golf Club

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.

Membership information is also available on the Central Penn website at:

www.cpgcsa.org

*Congratulations to Pete Ramsey,
2018 Recipient of the Rafferty DSL
Award.*

Pete will be honored at the Winter Educational Meeting on January 28th at Country Club of Harrisburg.

Our deepest sympathy to the family of Chuck Cadiz. Chuck was President of Central Penn GCSA in 1976, recipient of our Distinguished Service Award in 2004 and remained active with our association for many years beyond his retirement.

Charles "Chuck" H. Cadiz, 92, of Ephrata, PA and formerly of Harrisburg, PA and Phoenixville, PA, passed away on Friday, October 26, 2018 at Ephrata Manor. He was the loving husband of the late Winifred (Bower) Cadiz and son of the late Charles H. and Margaret (Keller) Cadiz. He was also preceded in death by a daughter, Susan Wilson and a brother, Richard Cadiz. Surviving are four children: James Cadiz (Terrie), Marsha Dougherty (Lawrence), Cathy Garovsky (John), and Beth Judy (Brian); 11 grandchildren; 15 great-grandchildren; and 2 great-great-grandchildren. Chuck was born in Harrisburg, PA and served in the U.S. Army during World War II. He worked as a Golf Course Superintendent and was the Creative Founder, Co-owner and Superintendent of Manada Golf Course in Grantville, PA. Chuck was also the Superintendent of Kimberton Golf Course and Eagle Lodge Golf Course. He was a Past-President of the Pennsylvania Turf Grass Council and the Central PA Golf Course Superintendent Association and member of the Philadelphia Golf Course Superintendent Association. Those who desire may make donations in Chuck's memory to the [Alzheimer's Association](http://alz.org) at alz.org.



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October Golf Results Moccasin Run Golf Course

1st Place

Barry Bollinger
Paul Wickey
Jeff Austin
Nolo Fernandez

5th Place

Mark Rubbo
Don Benner
Lee Kozsey

Closest to Pins

Tom Ocepek
Jeff Green
Mike Palermo

Turf's Most Important Meal

John Torsiello
September 6, 2018
golfcourseindustry.com

This fall, turf managers should avoid a potentially problematic occurrence — inefficient fall fertilization.

Low-nitrogen fertility in the fall has emerged due to heavy emphasis on potassium and the fear of creating turf that is too succulent, says Dr. Raymond Snyder, director of agronomy for Harrell's. "This has resulted in too little nitrogen applied in the fall period," he says, adding the result is "very poor turf conditions emerging in the spring resulting in the need for growing in of large turf areas and/or sod."



To better prepare turf for the next season, Snyder advises superintendents to develop more effective fall fertility programs and to utilize a fertilizer product that contains a component of soluble and controlled-release potassium. "Include more rapidly releasing controlled-release nitrogen with a longer lasting controlled-release nitrogen source," he says.

Superintendents rarely consider photosynthesis, says Aris Gharapetian, director of marketing for Target Specialty Products. "Our plants need sunlight, water and CO₂ to make valuable energy," he says. "This energy will be used to power operations like recovery from summer's stress, root system regeneration and preparation for winter. With day length, soil moisture and solar energy potential all reduced during the fall, it's important for turf managers to adjust nutritional plans."

Secondly, Gharapetian points to nitrogen-driven growth. Nitrogen's ability to drive shoot growth is less in the fall when compared to springtime applications. "In the spring, we're cautious to not over apply nitrogen and drive shoot growth at the expense of roots," he says. "Fall nitrogen reacts in a different manner and affords the opportunity for recovery and carbohydrate production without roots having to pay the price. Moderation is still key."

Another overlooked issue, Gharapetian says, is potassium's influence on several plant functions. "Plants use potassium to kick start sugar, protein and starch production," he says. "This is mission-critical in the fall as these energies are what plants will depend on for winter survival and spring performance. Also, by helping maintain turgor pressure, potassium dramatically lowers a plant's risk of disease, drought stress and winter injury."

Likewise, zinc plays a small role in more plant reactions than any other nutrient, Gharapetian says. However, its deficiency is rarely noticeable. Zinc helps to keep plants alive in waterlogged soils and zinc regulates plant temperature. This means the plant's reactions to wild temperature swings are tempered by zinc.

The importance of fall nutrition is often overlooked as nighttime temps are lower, days are shorter and there's less stress on the plant, Gharapetian says. Turf seems to look better and better as fall proceeds and the tendency is to minimize nutrient inputs. "The fact is, fall is the most critical time of year for proper nutrition," he says. "This sets the stage for how your turf will overwinter and how it will perform the following season."

There are a number of reasons for improper fall fertilization, says Dr. James Murphy, extension specialist in turf management for Rutgers University. The amount and complexity of issues a superintendent has to manage compete, and sometimes agronomic issues aren't at the top of the list. "Experience with different turf and environmental conditions plays a role in one's understanding of the relative significance of these factors," he says. "Sometimes, we fall into a rut and do the same thing over and over without taking the time to think critically about the objectives for our actions. But it is important to make the time to review your situation and adjust programs, including fall fertilization, when needed."

Existing turfgrass conditions dictate whether fall fertilization is needed and, if so, how much, Murphy says. "An older turf that is healthy and vigorous requires much less fertilization than a young immature turf," he says. "Therefore, the longer you manage a turf, it is more likely that you will need to adjust fertilization rates down to avoid over-fertilizing."

A sparse, worn-out turf needs more fertilization to help with recovery than a healthy, dense stand of grass, Murphy says. Additionally, the immediate need for recovery in a worn-out turf dictates that more (and perhaps all) of the nitrogen should be in the quick-release form rather than the slow-release form.

"Fall fertilization, especially with nitrogen and phosphate, favors the development of annual bluegrass over other cool-season turfgrasses, including creeping bentgrass, Kentucky bluegrass and tall fescue," he says. "As a result, superintendents who want to discourage annual bluegrass encroachment should consider withholding or at least minimizing fall fertilization."

The timing of fertilization, as well as the nitrogen source(s), control whether fall fertilization results in turf responses primarily during the fall or spring. For example, early fall applications containing greater percentages of quick-release nitrogen (ammoniacal, nitrate,

urea forms) result in the turf responding during fall. Conversely, applications later in the fall or containing a greater percentage of slow-release (water insoluble and coated forms) nitrogen will shift the turf responses toward early spring.

“It is important to determine which responses are needed (fall or spring) and pick a timing and fertilizer product that provides that,” Murphy says. “Turf that needs to grow actively in both fall and spring (for example, annual bluegrass turf) would benefit from both an early fall fertilization with quick-release nitrogen and a late-fall fertilization that includes a larger percentage of slow-release nitrogen.”

Fall fertilization needs to start sooner in more northern (colder) regions. “Late fall fertilization in New Jersey typically occurs during November,” Murphy says. “However, November is often too late for a colder region such as northern New England, especially if a turf response is expected this fall.”

Nitrogen and phosphate fertilizers should not be applied when the soil’s water content is high (wet) or frozen. Both conditions encourage nutrient loss from runoff or leaching. Similarly, nitrogen and phosphate fertilizers should not be applied to dormant turf.

Adequate potassium access for the entire season is too often overlooked in all types of turf, says Dr. Larry Murphy, owner of Murphy Agro.

“Winter hardiness is tremendously important for cool-season species and should not be overlooked for warm-season species, particularly if there is a chance of occasional freezing,” he says. “Many turf grades or mixes simply do not supply sufficient potassium. Loss of stand can frequently be attributed to low available potassium from all sources, soil and fertilizer. Sufficient potassium is critical for sugar synthesis and transport and for retention of water.”



Count on one hand

There are five aspects of fall fertilization not to overlook or take for granted, says Dr. Raymond Snyder, director of agronomy for Harrell’s.

- Fall fertilization is a great time to prepare the plant for cold temperature stress.
- Turf utilizes nutrients during the fall for building carbohydrates.
- Fall carbohydrate development helps the plant cope with cold temperature extremes and promotes healthy turf conditions the following spring.
- The use of nitrogen versus potassium is often undervalued (fall fertilization is often focused on potassium but proper nitrogen inputs are key to building carbohydrates)
- Controlled-release nitrogen sources should be utilized in the fall.

Other nutrients are crucial for fall and winter vigor and hardiness. For example, Larry Murphy says phosphorus is very important at all times but poses a “dilemma” where restrictions have been placed on its use in fertilization.

“Run-off and erosion are the mechanisms of loss, but phosphorus reactions with soil components (fixation) are the big reasons for poor utilization efficiency,” he says. Phosphorus availability and uptake should be enhanced if possible by treatment of either dry or liquid phosphorus with a polymer having a high concentration of carboxyl groups that “diminish soil phosphorus fixation reactions.”

Joel Simmons, president of EarthWorks, believes biological soil management (BSM), an approach he’s advocated for three decades for all soil types. BSM uses carbon-based fertility, which helps provide long-term feeding opportunities for the soil’s microbial populations. Carbon-based fertilizers balance the carbon/nitrogen ratio in the soil and can be blended with or without synthetic fertilizer.

“If I had only had one fertilizer application to make all year it would be a winter or dormant feed application with a carbon-based product,” Simmons says.

As the turf’s top growth slows down in mid to late fall in many parts of the country, microbial activity under the turf layer is still very active and a good feeding of the microbial activity can help to break down thatch, flocculate the soil, build water holding capacities, buffer sodium build up, and help to bring a quick and vibrant spring green up, Simmons says.

“If this same application is made without a carbon base, the available carbon in the soil that is used by microbes for all these vital functions is burned up and the soil and the plant can suffer,” he says.

By balancing the carbon to nitrogen ratio in the soil, Simmons says nitrogen “rolls through” nitrification more efficiently, allowing superintendents to use less fertility with better recovery because microbes are more active, and more fertility is being made available to the plant. “Even in 12-month environments the winter feed can be of great value for the same biological reasons as in cooler parts of the country,” Simmons adds. “The only weather conditions to avoid may be applying to frozen soils because of the potential for surface run off.”

The message is clear: Do not overlook or undervalue any basic when it comes to feeding your turf this fall. Your reward will be a healthy stand and a beautiful green up come spring.

Blow out!

September 7, 2017

Rick Woelfel

Follow these recommendations for a properly executed irrigation shutdown that protects the system's components and minimizes the risk of weather-induced damage.

Finding success in the turf industry requires having the ability to think ahead. Even as the golf season continues full bore in the northern half of North America, superintendents are preparing for the close of their golf season.

One major step in the season-ending ritual involves shutting down the irrigation system and taking steps to protect it from the weather over the winter. A properly executed shutdown protects the system's components and minimizes the risk of weather-induced damage or other issues over the winter.

Because of the acreage and the topography of a typical golf-course property, shutting down the irrigation system should be a meticulous process. Brian Vinchesi, a design engineer for Irrigation Consulting Inc. in Pepperell, Mass., stresses it's important not to rush things. "With a golf course, it is important to go slow," he says. "Speed gets you nowhere. (An 18-hole facility) should take two or three days to winterize."



To complete the process efficiently and safely, it's essential to have a written plan in place. Scott Pace is the Eastern regional manager for Rain Bird's Golf Division. He's spent his entire career, more than two decades, dealing with irrigation issues.

"If you don't have a good plan and do things step by step in the winter, you're going to have problems in the spring that could be really, really bad," he says. "You could end up with broken pipes, you could end up with broken sprinklers, you could end up with a pump station with broken pipes. It's very, very important that you have a plan, be systematic about it and not rush in any way."

The plan, according to Rain Bird's Golf Technical Bulletin (11-19-01), should include an accurate drawing or drawings of the irrigation system, highlighting the location of "All 'Zone Shut-Off' or 'Zone Isolation' valves, All 'Drain' valves, all remote control valves, valve-in-head sprinklers, all quick coupling valves, controller locations and areas they control, etc." Mark these locations with flags so you and your team won't have to spend time looking for them during the actual shutdown process.

At the same time, be sure each valve is operating properly. The written shutdown plan should list the areas to be evacuated in sequence, starting with the areas farthest from the compressor and working back toward it from there. "(Superintendents) should drain the main line if they have drain valves or use quick couples," Vinchesi says, "and then blow the system out with compressed air. It works best if you can blow it out from the pump system location. The amount of compressed air is what is important, not pressure."

Vinchesi recommends a minimum air volume of 160 cubic feet per minute (CFM) for an 18-hole facility, but the ideal volume will vary from course to course depending on the capacity of the irrigation system and the topography of the property. Most courses will require something in the range of 250-300 CFM range and some larger systems may require as much as 600 CFM.

It's also essential that the air pressure in the system during the blow out not exceed what the system is designed to handle. This should be calculated by determining the maximum pressure at the weakest part of the system. This figure will be somewhere in the neighborhood of 60 pounds per square inch (PSI). During the blow out, the air pressure should be well below that figure. "Our recommendation is somewhere between 40 and 50 PSI and to not exceed that," Pace says.

Over the course of his career, Pace has seen superintendents exceed their systems' air-pressure specifications with calamitous results. "That's probably one of the biggest mistakes I've seen over the years," he says. "Not adjusting (the air volume) and compensating with pressure. They'll turn the pressure up to 100 PSI and damage the system."

The compressor should be inserted into the irrigation system at the system's highest point. Care must be taken to dissipate the heat



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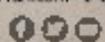


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Blow out!...continued from Page 6

generated by the compressed air before it enters the system, because overly hot air will damage the components.

“(Superintendents) will make a connection with their compressor and that air is hot,” Pace says “and it heats up as it goes through the fitting. I’ve seen guys melt pipes right at the connection point so you need to figure out the best place to connect to system without doing damage caused by that heated air coming out of the compressor.”

Pace suggests using a 2- or 3-foot piece of galvanized pipe as a heat sink to absorb the heat coming off the compressor and pipe at the connection point. He notes it’s important to use a compressor that’s compatible with the irrigation system itself. If the air flow or air pressure through the system continues to generate excessive heat, he suggests using a longer piece of pipe as the heat sink.

Vinchesi says that in some cases it may be preferable to blow out the system from more than one location, depending on the topography of the property. Depending on the layout of the golf course, elevation changes especially, you may have to blow out from several places, he adds.

Pace says when blowing out from multiple sites, it’s best to start at the highest point on the property and go from there. “Typically, you would like to go from the high points to the low points on the golf course and if you have multiple high points on the golf course, you would want to connect the compressor at those locations and then work through it systematically from the low point back to the compressor when you’re turning on stations or sprinkler heads,” he adds.

Frank Tichenor is the superintendent at Forest Hill Field Club in Bloomfield, N.J., where he oversees a staff of 14 that tends to an A.W. Tillinghast design that dates back to 1926 and features an abundance of elevation changes. The club installed a Rain Bird irrigation system roughly a decade ago and Tichenor takes a systematic approach when he shuts it down each year. “I have a checklist,” he says. “We’ve got a few different things that we do when we blow out.”

In addition to having a written plan for handling the shutdown, Tichenor will make sure to order a compressor in timely fashion and have a sufficient number of fittings on hand. “It’s almost like a countdown to the day we blow the system out,” he says.

During the period prior to the actual shutdown, Tichenor and his team strive to extract as much moisture from the system as possible. “The key is to get as much water as possible out of (the system) early,” he says. “We’ve got quite a few drains out there where we can drain it in different sections. A couple days in advance, we open up the drains. We have a dedicated (2-inch) fitting for the air compressor that we put in when we put in the system.”

Although the golf course remains open through Dec. 31, Tichenor blows his system out around Halloween. “We’re not really watering anything in November,” he says. “I want to get it done before it gets real cold. It’s really kind of a pain in the neck to blow it out when it is freezing out because you get stuck heads and everything. It’s not a lot of fun if you get a stuck head and it’s 30 degrees.”

While the irrigation system may not be operational after the shutdown is completed, its components must still be protected. Like many superintendents, Tichenor keeps a heater running in his pumphouse during the winter months. “We have a heater in our pumphouse that we keep at (approximately) 40 degrees,” he says. “I just would rather keep the temperature above freezing.”

Calculations

While irrigation consultant Brian Vinchesi recommends a minimum air volume of approximately 160 cubic feet per minute (CFM) for an 18-hole facility, the ideal volume varies from course to course depending on the capacity of the irrigation system and the topography of the property. Most courses, according to Vinchesi, will require something in the range of 250-300 CFM range and some larger systems may require as much as 600 CFM.

Rain Bird recommends using the following formula to determine the proper volume of air for a particular irrigation system.

Maximum capacity of an irrigation system in gallons per minute (GPM) /7.5 = the required volume of air in cubic feet per minute (CFM) For example, capacity of irrigation system 900 GPM/7.5 = a recommended 120 CFM of air during the blow out.

Vinchesi recommends keeping the pump system control panel powered up during the winter months. “If the pump house is not heated, some components, such as a pressure-relief valve will need to be disassembled,” he says. “Some other components, such as backflow prevention devices, may need to be heat taped for the winter if water cannot be drained out of them.”

.....Continued on Page 10.....

Blow out!.....continued from Page 9

Pace recommends leaving all stain valves open during the winter. He also advises running the system through a full cycle on a weekly basis with all sprinkler heads activating all valves. “If water settles out to a slow point, you can relieve some of the pressure,” he says. Pace also recommends superintendents continue to provide power to their satellite control boxes and weather stations during the winter months.

Vinchesi cautions against waiting too long to perform the shutdown. “Anything with water in it above ground is going to be susceptible to damage during freezing temperatures,” he says. “The in-ground equipment can wait until the soil starts to freeze, but if you wait too long, the water in the sprinklers will freeze or damage them and make your eventual blowout problematic.”

Pace emphasizes planning ahead, including ordering the right compressor far in advance and getting the task done as quickly as expeditiously as possible. He notes that some in the industry underestimate the time it takes complete a shutdown properly.

“If you rush it, you have a tendency not to get all the water out,” he says. “We recommend you shut the system down and then come back the next day to see what’s settled back and to see if there is any more water from those areas.”

Pace says that it’s literally impossible to eliminate 100 percent of the water from an irrigation system, even if the shutdown is done properly. But in the end, Pace adds that executing a proper shutdown and winterization of the irrigation system, while it may be a time-consuming process, will pay off handsomely.

“My thing is, get it winterized as early as possible that you can do it,” he says, “and leave your golf course in good condition and your irrigation system ready for next year.”



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2019 Winter Educational Meeting

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Country Club of Harrisburg

- Innovative Drainage Solution – Chip Conklin, Capiphon USA
- Drones – All you need to know about drones and how it could be useful on the golf course
- Year in Review – Chase Rogan, GCSAA
- DSL Presentation – Recipient Pete Ramsey
- Theoretical and Practical Golf Course Architecture and Design - Ron Forse and Jim Nagle, Forse Design
- Future proof your career—Tim Morgahan, Aspire Golf



The Green Sheet

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