



The Green Sheet

Central Pennsylvania Golf Course Superintendents Association

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July 2020

Hand Sanitizer Effects On Turfgrass

Turf damage has all sorts of origins, but 2020 has no doubt brought an uptick in injuries involving one substance in particular: hand sanitizer.

July 2020 | Teresa Carson

A number of products are labeled for use on golf course turf, and superintendents take every precaution to make sure that products such as plant growth regulators, fertilizers, insecticides and herbicides are applied appropriately.

Occasionally, there may be accidental spills of products never meant to be in contact with turf — like motor oil — but a new and unexpected hazard has emerged in 2020, thanks mainly to COVID-19.

“It’s an embarrassing story,” says GCSAA Class A superintendent Tim Christians, superintendent at Makray Memorial Golf Club in Barrington, Ill. An embarrassing story involving the best of intentions — and hand sanitizer.

Makray Memorial has instituted a comprehensive program to protect employees and golfers from exposure to the COVID-19 virus. Employees practice social distancing and have their own tools, golf carts and hand sanitizer. The first day the hand sanitizer was issued, Christians quickly stuffed a bottle into his back pocket and headed out to tend to the golf course — without noticing that the bottle’s lid had popped off. After he bent down to fix a ball mark, Christians realized that a good portion of the contents of his bottle of hand sanitizer had ended up on the green.



A very hands-on experiment: Palms coated in alcohol-based hand sanitizer left their mark on a bentgrass green for 10 days or longer.

Photo by Ben Pease

What do you do in a case like this? If you’re Tim Christians, you call dad, because dad knows best, especially when he’s a well-known turfgrass professor: Nick Christians, Ph.D., at Iowa State University. Tim’s question: Do you think hand sanitizer will harm the grass? Dad’s answer: Probably, if it’s 60% alcohol, but let me do an experiment.

Tim soon discovered he was not alone, as golf courses around the country were supplying hand sanitizer to employees and golfers, and more than one superintendent was dealing with spills on turf. Back at Iowa State, the elder Christians turned to assistant professor Adam Thoms, Ph.D., and research assistant and graduate student Ben Pease for a hand in [evaluating the hazards of hand sanitizer on greens](#).

The researchers used Purell Advanced Hand Sanitizer, which contains 70% ethyl alcohol, and they assumed that any hand sanitizer with more than 60% alcohol would produce similar results. On May 11, Pease applied approximately 1 ounce of hand sanitizer (about three to four pumps from the bottle) to his hands and then pressed them into the green. Three days later, chlorosis was beginning to be evident, especially in areas that had received more product. By May 22, the outline of Pease’s hands was still visible, but the turf had almost returned to normal.

For a second experiment carried out concurrently with the first, Pease again applied sanitizer to his hands and pressed them into the turf in three different areas without reapplying sanitizer. This experiment attempted to illustrate what could happen if a golfer applied hand sanitizer and then touched another object, like a golf club or a ball, and then touched the turfgrass. Each set of handprints represented a consecutively lower application of hand sanitizer. And, as Pease points out, “As concentration is reduced, turf injury lessens.”

The final experiment showed the effects of different rates of sanitizer on the turf. The rates were 0.25, 0.5, 0.75 and 1.0 ounce, equivalent to approximately one, two, three and four pumps from the bottle. This time, the product was applied to a metal square that was then pressed into the turf. Seven days after application, as expected, the turf treated with 0.25 ounce of product had almost completely recovered, and the turf that had received the highest rate still appeared chlorotic.

...Continued next page...

President's Message

Hottest. Month. Ever. I do not think much more really needs to be said about the month of July. I hope that all of you were able to keep your composure, and your sanity, during an often stressful time of the year.

Not only were the daytime highs umm...high, but the nighttime lows were also not very low. I believe there were roughly 21-22 days when the low temperature never went below 72 degrees Fahrenheit! As we all know, an accumulation of nights when the plants never get to take a break can severely take a toll. Another point to make about July's weather was the rain. Some of us got next to nothing, others received more than they cared for, and each end of that spectrum offers its own unique challenges. Why do we do this again? While it is easy to get lost in the haze of summer, I think at the end of the day we do this because we enjoy it! Although difficult to fathom at times, and downright incorrect at others, I think when it comes down to it we like a challenge, and we love rising to and conquering said obstacle. Keep your wits about you, it will too pass and fall will arrive...I think!?

I want to thank everyone for coming out for our July meeting and spending some time with one another at the Carlisle Barracks. It was good to see people from the organization, for some the first time this year. Jeff...place was great and thank you for your hospitality. That course will always bring back memories for me personally, when I used to play in my father's after work/retired 9-hole league. I think I was the youngest, by about forty years! We are also finalizing our plans for both our September and October meetings, assuming they are able to occur of course, so be on the lookout for those dates.

Good luck to those of you performing your aerification this month as we wind down the summer and look forward to post Labor Day weather!

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Hand sanitizer effects on Turfgrass.....continued

“As one would guess, a solution with a high concentration of alcohol desiccated the turf, but this seemed to just be a contact burn,” says Pease. “Only the touched parts of the plant were affected, and then only transiently as we observed recovery after 10 days or more.”

This isn't the first time the team at Iowa State has investigated an unusual application on turf. In 2015, turfgrass student Zack Olinger and research associate and graduate student Dan Stray found that golfers spraying mosquito repellent containing the chemical DEET inadvertently severely damaged and killed turf. The evidence — green shoe prints on the turf — was unmistakable.



*Another print-causing culprit: The chemical DEET is often deadly to turf and comes in contact with it via golfers who spray their shoes with a DEET-containing mosquito repellent while standing on turf, leaving telltale green foot impressions.
Photo courtesy of Nick Christians*

https://www.gcmonline.com/course/turf/news/hand-sanitizer-kill-turfgrass?utm_source=informz&utm_medium=email&utm_campaign=general&zs=HxDEN1&zl=fhrr5

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

Nathan Thompson, Assistant in Training
LedgeRock Golf Club..... Class C

Nicholas Sama, Equipment Manager
LedgeRock Golf Club..... Class EM

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.

Congratulations to George and Madison Manos on the birth of their daughter Athena.
Also, congrats to Grandpa Thom Mahute

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Timing golf course aerification

Is there a “perfect” time for aerification? With some tried-and-true tips and a healthy dose of experience, turfgrass managers can make the best call.

July 2019 | Steven McDonald, M.S.

As an independent turfgrass consultant and researcher, I get hundreds, if not thousands, of agronomic questions each year. I could easily write a monthly column about some of the most perplexing questions I get while visiting golf courses. Most of those visits take place along the I-95 corridor — from Richmond, Va., north to Boston — but my work does allow me to venture out of this region as well.

One of the most common questions I get no matter where I’m working is about aerification timing. Whether you complete the same practice at the same time each year or switch up practices (depths of impact, for example) and when those practices take place, everyone at some point makes some sort of hole or opening in greens, tees and, hopefully, fairways.

There are sound agronomic reasons for making holes in seemingly healthy playing surfaces. Aerification is one of the most important practices used on fine turf areas that receive heavy machine and foot traffic. Among the many documented benefits of aerification, two of the most important are:

- It enables root systems to grow deeper and more densely.
- It can improve playability and firmness, as well as dilute thatch.

Unfortunately, I am often invited to consult when even aerification can’t save the day — when greens are on the verge of death and I have to make suggestions to nurse them back to health. Sometimes the call has to be made to close greens to play while they recover. Other times I feel like a coroner when asked to explain the death of greens. The presence of green grass in old aerification holes often provides useful clues in an otherwise dead green. These holes show that there are significant benefits to aerification.

Balancing the stresses of aerification

Despite its documented benefits, aerification, without question, can be stressful on turf when done under environmental pressures such as heat and shade, or when done to turf that is in poor health to begin with. In most parts of the country, all of those factors need to be considered during the most popular time for aerification, which is late summer and early fall.

Making that aerification hole — whether through solid tining or by removing a plug of soil/thatch/turf — incurs the risk of heaving the turf, meaning the roots separate from the soil. This is especially problematic in late summer, when root systems are weak. A heaved turf will take a few weeks to re-root and, in the meantime, will require more water, making the surface softer than it was before aerification.



Blowing and dragging large amounts of sand on the surface of the turf is necessary to fill the holes, but if done during stressful weather or too aggressively, such practices can lead to abrasion and physical damage.

Photo by Steven McDonald

Aerification is also stressful because of the sand commonly used to topdress the green and the cleanup required. Sand on greens in late summer can store a lot of heat, especially when it’s sunny and temperatures are higher than 88 degrees F. Think about walking barefoot on beach sand on an August day — the sand hurts your feet, so you wear sandals. However, on a putting green, the grass doesn’t get a reprieve from the heat of the sand, which can cause severe heat stress to the turf. Additionally, the sand must be worked into the holes to achieve the best benefits of core aerification. Sand is abrasive, and extreme care needs to be taken not to abrade the turf.

The impact on green speeds must also be considered. More nitrogen is typically applied following aerification to get the holes to fill in quicker, which can reduce green speeds for three to five weeks or longer. Applying additional nitrogen to speed recovery might have an unintended negative impact too. For example, the stimulated grass may require more frequent mowing and rolling to obtain targeted speeds, but mechanical damage may result from that increase in maintenance, especially if there is a significant amount of sand in the leaf canopy.

Greens injured by late-summer aerification will likely remain in poor condition until late autumn. Lifting and other mechanical injuries may also result in slow recovery, and greens may remain weak until the following spring, sometimes until April or May.



Aerifying dormant greens in early spring when there is no leaf growth on trees can sometimes result in a longer recovery compared with waiting until the greens resume normal growth. It is entirely weather-dependent.

Photo by Steven McDonald

In my career, which has included more than 1,500 golf course visits, I estimate I have seen more than 80 occurrences of greens hurt by late-summer aerification in the Mid-Atlantic and Northeast regions. In years such as 2018, aerification in late August and September caused notable damage, regardless of which method (hollow tines vs. solid tines vs. aggressive spiking) was used.

Even waiting until early October is no guarantee for success: 2018 was unusually hot and wet, and those environmental stresses resulted in extremely slow recovery from aerification. Another consideration at that time of year is the shortening of daily sunlight, which can lead to frosts, which slow turf growth significantly.

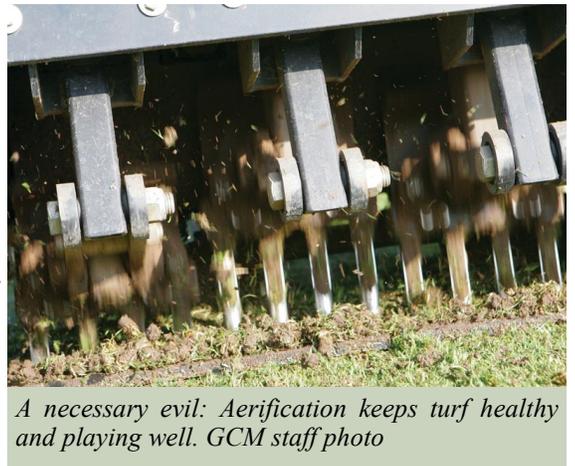
In some years, August may be a great time to aerate, but it only takes one event of extreme turf stress to cause superintendents to rethink when and how they aerify. The injury from aerification in 2018 (and other years) varied among courses and from green to green on those courses. Many times, shaded greens or greens that lacked air movement were most severely damaged.

Recipes for aerification success

There is not a single recipe for successful aerification timing and methods that is applicable to every golf course. Some golf courses experience little golf from Halloween until late spring, for example, and these courses potentially have fewer issues with aerification timing because they have more flexibility. Some golf courses have a core group of 20 to 30 players who will play almost every day of the year, including in winter, as long as they can access the golf course.

Every course is unique in regard to golfing schedule, budget, labor, grass species and growing environments. For many, you can add seasonal concerns, a heavy tournament schedule, or the agendas of club professionals or owners to the mix. It's hard to say which of those factors is the most important, but it varies from course to course, and the superintendents on the ground at those facilities will know the landscape best and how to make an informed decision.

The most common time to aerify is late summer, and that's also widely thought to be the best time to aerate, agronomically speaking, because holes heal quickly, and greens have typically recovered before any late-summer or autumn golf tournaments. I agree that mid- to late August and early September do provide a good time for quick healing. However, if the weather is not ideal at the time of aerification, as well as over the next few weeks during recovery, greens will not heal as quickly as they would during favorable weather. Do you trust the weather forecast? Keep in mind, if significant damage does occur, it could mean 30 to 60 days of additional stress on your greens.



A necessary evil: Aerification keeps turf healthy and playing well. GCM staff photo

Ideally, in the Mid-Atlantic and Northeast, autumn greens aerification would occur in mid- to late September or early October, which would generally give 14 to 18 days of good growth prior to frost. Unfortunately for many clubs, this timing overlaps with the height of year-end golf events, at a time of year that typically provides outstanding weather for playing golf. After frost occurs in October/November, there will be a significant reduction in growth and recovery, so pushing aerification back later into autumn can sometimes lead to other issues.

Late-autumn aerification (late October/November/December) is the least stressful on the actual turf, and more aggressive practices can be performed during that time frame. The downside is that sunlight hours are short and nighttime temperatures are cool, so even if there are some warm days, the holes will typically not heal until spring. Additionally, if the turf has shade from the south, soil will usually take longer to dry out following aerification.

Despite all the factors superintendents must consider regarding late-fall aerification, I do have many clients aerifying with high levels of success after their closing-day events in October. When they are aggressive in late fall, it takes pressure off early-spring aerification, enabling them to do something less injurious in spring, followed by some small-tine openings of the surface in May/June (which heal in seven to 10 days). This regimen should allow superintendents to comfortably maintain putting greens in a healthier condition with little to no disruption from the middle of April until late October. I have never seen an increase in winter-kill or any issues with late-autumn aerification, even when it has been highly aggressive.

If holes from aggressive late-autumn/winter aerification are still visible in the green in spring, a simple solid tine, smaller coring tine or less aggressive sand injection (or a combination of those) could be done in spring. This lowers the pressure to be aggressive during spring aerification if the greens are performing well and thatch is not excessive. It also reduces the dilemma of how aggressive to be, knowing spring weather is highly unpredictable.

Spring aerification

Spring is one of the most challenging times to aerify, especially for sand-based bentgrass greens in the Mid-Atlantic, Northeast and Upper Midwest. No matter the timing, an aerification hole made from March 1 through May 1 will likely not heal fully until mid-May in most years.

So why is it that we want to run out and make holes as soon as possible in spring? For many, the golf schedule drives this train. If possible, consider waiting until the grass has resumed normal growth (May or early June). Coring when grass is actively growing will impact golfers for fewer days in spring. For example, if the hole is made on May 15, it will likely heal in 12 to 14 days. By comparison, a hole made on April 1 can take 30 to 40 days to heal fully.

Further complicating matters is spring weather, which can be unpredictable, with cold soils and low sun angles. The numerous early-spring golf events that most facilities host make timing spring aerifications even more difficult.

The other big factor driving aerification scheduling and timing, regardless of when superintendents are considering doing this work, is staffing. All of us in the green industry are well aware of the labor issues facing superintendents, and aerification is certainly a labor-intensive and time-consuming process. Many golf course managers feel they have more labor in August and September than they do in November, for example, and schedule aerification accordingly. But don't sleep in the off-season, when you can do four to six greens a day or take the course of two weeks to finish as the weather allows, given that the growth rate of the grass is slow and the golf course may not be as crowded. As with anything, this might not be possible at all golf courses.

Pick your poison

The dilemma of aerification timing is not going to change anytime soon. There is no ideal time to aerify putting greens, but there also isn't an ideal time to close them for four to six weeks because of poor turf health or turf loss from a lack of oxygen or excessive thatch.

My suggestion would be to try different timings and methods, see what works and what doesn't for your situation, and trust your instincts. If your aerification program is working well both below the ground — you're keeping thatch in check, roots are deep and dense, etc. — and above it — you're getting good grass performance — then there is no need to consider changes to your aerification timing.

Otherwise, try some of the suggestions noted above, even if only on a practice green, to learn how timing the process impacts recovery. Regardless of when and how aggressive your aerifications are, there will be complaints. But for superintendents, that's just par for the course.

Poa annua and aerification timing

Many argue that aerifying in late autumn encourages *Poa annua* germination. *Poa* germination patterns can vary widely based on many factors. A field research study in Maryland found this to be partially true, but field observations I've made after visiting many of the same golf courses for more than 10 years have illustrated that if you aerate after the *Poa* germinates, you may naturally be able to mitigate this problem in late autumn.

Research at two golf courses in Maryland between late September and the middle of October found that the majority (50% to 70%) of *Poa* had germinated by that time, and most germination ended by early November (1). The research found that, on average, 24% of all *Poa* seedlings emerged between November and May. My field observations line up with this data, and I have seen significantly more *Poa* in greens aerated before Nov. 1 in most years in the Mid-Atlantic and Northeast regions. I have also seeded *Poa* (collected seedheads in spring and cleaned and dried them for the following autumn) for research trials, and we have struggled to get it to germinate after the middle of October in fumigated soils with no competition.

Is there a higher risk of *Poa* invasion into greens when they are thin from aerification damage in August or September, given that 50% to 70% of the total *Poa* germinates in late September or October in Maryland? Or is there a higher risk of *Poa* encroachment with aerification late into the year? Although there is no exact research on this question, a lot of nearly pure creeping bentgrass greens are aerified in late autumn each year. Many other components besides aerification — use of plant growth regulators, shade, *Poa* seed bank, existing populations of bentgrass and *Poa* — also factor into this issue.

Literature cited

Kaminski, J.E., and P.H. Dernoeden. 2007. Seasonal *Poa annua* L. seedling emergence patterns in Maryland. *Crop Science* 47 (2):773-779. doi:10.2135/cropsci2006.03.0191

Steven McDonald is the president of [Turfgrass Disease Solutions](#), located in Pottstown, Pa.

<https://www.gcmonline.com/course/environment/news/timing-aerification>



Prevention of excessive organic matter accumulation requires aerification and sand topdressing. Photo by Steven McDonald



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<https://www.gcsaa.org/resources/back2golf-resources>



Stop Reading This Update and Go Play Golf

July 03, 2020

Paul Jacobs, agronomist, Northeast Region
Volume 58, Issue 13

The golf seasons of 2018 and 2019 were largely characterized by frequent rain events and the challenges that come with them – disease, weeds and soft playing conditions, to name a few. After the last two seasons, soft and saturated conditions started to seem like the norm. Who would have thought that most of the cart restrictions we would see up to this point in the year would have nothing to do with rain at all?

It goes without saying that 2020 has been a unique and challenging year. However, the last few weeks have offered some of the best golf conditions one could ask for. Most of the Northeast has seen very little rain, which puts maintenance teams in control of course conditioning as long as the irrigation system is reliable. Minimal rain doesn't always equate to great golf conditions, but it is certainly better than too much rain.



Golf courses are in great condition and the weather has been ideal for golf.

Are some courses dealing with excessive cart traffic due to single-rider cart mandates? Absolutely. However, most of the impact from this traffic is in out-of-play areas and at least golfers are out playing. Furthermore, keep in mind that cart traffic is usually more damaging to wet or saturated turf than it is under dry conditions.

Are some courses seeing non-irrigated areas, such as primary rough, start to go dormant? Absolutely. But don't forget, dry rough and fairways offer the opportunity to hit long drives and different types of approach shots. These are all good things from a golfer's perspective. Additionally, the dry conditions that are causing the primary rough to go dormant are also creating great aesthetics and playability in high rough fine fescue areas.

Managing turf in the summer months will always be challenging for one reason or another and dry conditions are sure to highlight any inadequacies in the irrigation system. But, all things considered, the past few weeks have been great for golf and most courses are holding up very well.

<https://www.usga.org/content/usga/home-page/course-care/green-section-record/58/13/stop-reading-this-update-and-go-play-golf.html>



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First, we want to thank you for all that you are doing in these extraordinary times. Your dedication and perseverance is inspiring. And we vow to support you in any way that we can. Towards that end, we'd like to offer you a **No Interest, No Payments for 9 Months Financing Plan***. So your plans can stay in place.

If this can help your current planning, please call us today. And if there is anything else we can do to support you, please let us know.

*Offer valid on qualifying purchases made between 30 March 2020 to 06 July 2020 and is subject to approval by John Deere Financial. Payments may vary based upon the end of lease term purchase option price and length of lease term. No payments, no interest for 9 months followed by 4.75% APR for 63 months only in the case of lease purchase or 51 months only in the case of operating lease. Taxes, freight, setup and delivery charges could increase monthly payment. Not available for consumer use. Available at participating U.S. dealers. Prices and models may vary by dealer. Offer available on new equipment and in the U.S. only. Prices and savings in U.S. dollars.



USDA Investigating Unsolicited seeds

The U.S. Department of Agriculture (USDA) urges anyone who receives an unsolicited package of seeds to mail those seeds to the location listed below for your state. If more than one location is listed for your state, please select the location closest to your residence.

Instructions for Mailing Seed Packets:

- Place the unopened seed packet and any packaging, including the mailing label in a mailing envelope. If the seed packets are open, first place the seeds and their packaging into a zip-lock bag, seal it, and then place everything into a mailing envelope.
- Please include your name, address, and phone number so that a State or Federal agriculture official can contact you for additional information, if needed.



If you are unable to mail the package, please contact your APHIS [State plant health director](#) to arrange a no-contact pick up or to determine a convenient drop-off location.



Distributors of Turf Care Products

P.O. Box 372
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Business: 215-672-9274

Andrew Harrison
Sales Representative, PA & MD
Business: 443-547-0252
andrewpoconoturf@gmail.com

Matt Paulina
Sales Representative, PA & NJ
Business: 610-883-6108
mattpaulina@gmail.com

It's Dry Out Here

July 17, 2020

Elliott Dowling, agronomist, Northeast Region
Volume 58, Issue 14

As the title of the USGA article "[Stop Reading This Update and Go Play Golf](#)" suggests, the current stretch of dry weather in the Northeast has created excellent playing conditions. This is a welcome change from the wet weather experienced over the past several years.



Irrigation pond levels are low on several courses. The fear of running low on water is real during a drought and should be addressed before the next drought arrives.

While playing conditions at most courses have remained good to this point, the effects of an extended drought are taking shape. Unirrigated areas are showing signs of drought stress, manifested in an off-color dormant appearance. Fortunately, drought-stressed dormant turf will recover once it rains enough to wet soils. Irrigation pond levels are also dropping, leading to some definite concern about what lies ahead.

The Northeast typically receives enough rain during the season, so drought emergency plans are rarely discussed. As a result, during extended periods of dry weather we often find ourselves worrying and wondering how much longer a course can go without rain. This is especially true for courses short on water supply or those that rely on city water. [Developing a drought emergency plan](#) is a good idea, even if it never gets used. The plan will always be there if needed to guide decisions about which areas receive water first, how much water will be used and when it is appropriate to purchase water, if applicable.

It will rain again; probably enough to average out monthly or annual totals and make most forget about a drought. However, planning is important and knowing what you are going to do, and what is expected, during a drought will help you manage resources to the best of your ability.

<https://www.usga.org/content/usga/home-page/course-care/green-section-record/58/14/it-s-dry-out-here.html#returnable>

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

Fame[®]
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RAPID MOBILITY

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- Rainfast in 15 minutes

DISEASE CONTROL

- Brown patch
- Fairy ring
- Summer patch & more

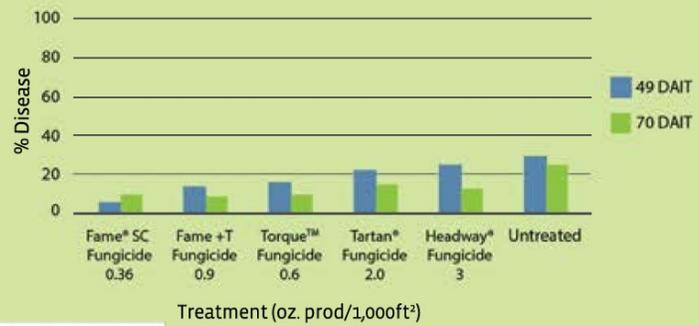
PLANT HEALTH

- 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

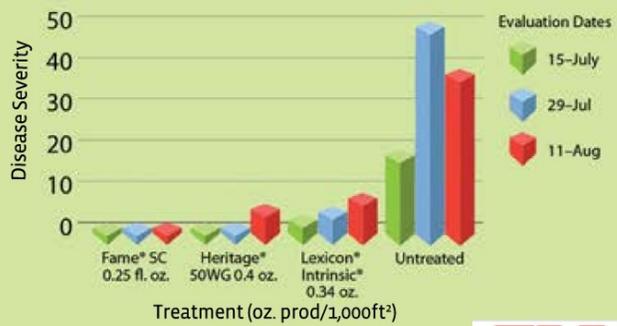
Fairy Ring Control



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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