

On the Grow

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Turfgrass Disease Diagnosis

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Inside this Issue

- | | |
|----|---|
| 3 | August Presidents Message
- Mike Meiers |
| 4 | Iowa Turfgrass Update
- Jeff Wendel, CGCS |
| 5 | Ride On Sprayers
- Dave Hardy |
| 6 | Turfgrass Disease Diagnosis
- Steve Kammerer |
| 11 | Rust Disease on Perennial Rye Grass
- Nick Christians, PhD |

Advertisers

River City Turf and Ornamental	4
Professional Solutions	10
Agrium Advanced Technologies	10
Pace Supply	11

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August Presidents Message

Mike Meiers, IPLCA President



It is August. The busy season continues and we are gearing up for fall aeration. Once again I hope everyone's customers are happy with a green, lush lawn. We have been blessed this year with mostly mild days here in South West Iowa, with fall-like temperatures in mid-summer. This is both good and bad – good because of the relief the lawns and trees get from decreased temperature stress, but not so good for the same reason: I fear we may not get as many new aeration/over seeding clients this fall. Time will tell.

In this month's article, I wanted to share with everyone my most recent family vacation. Back in July my wife, two-year-old son and I traveled to Rapid City, South Dakota. Coming from Council Bluffs, it was around an eight hour trip including stopping for fuel and groceries. Our stay started at the Best Western Ramkota in, where our son enjoyed a kid's pool in their indoor water park. This hotel was great – the room was comfortable and the water park was very enjoyable.

The next morning we started the vacation at Bear Country, which is a small drive-through wildlife park. It was incredible the number of animals in this sanctuary, including bighorn sheep, arctic wolves, and many, many bears. The animals of course are used to vehicles in the park, and are not shy to say the least. There were countless photo opportunities throughout the park, with many animals right next to the road.

Our next stop was Mt. Rushmore. Everyone has heard of this famous sculpture, and it is truly something to see. It is hard to realize the scale of the sculpture until you see it in person. The sheer size is daunting, and would seem like an impossible task to accomplish. The site is finished with a large viewing area, big enough for hundreds of people to gather and still get good photos. After Mt. Rushmore, we headed to Deadwood to see the historical old town. Walking up and down the main drag feels like you're in a western movie. We even witnessed a live gun-shoot, complete with a back story and blanks fired with real gunpowder. Every shot made me jump, it was incredibly loud. The scene too takes you back in time and makes you think back to the days

when people really did shoot each other on the streets.

The next day was the best day by far. We got up early and had a big breakfast, then headed to Custer State Park. To say the least, this park should be on everyone's bucket list. The beauty of the rolling rocky hills, the pine forests, and the wildlife is truly breathtaking. We saw several herds of buffalo roaming the open prairies with many of them crossing the road, making for some spectacular views. We saw what I thought was the patriarch of the herd – this bison was literally as big as our car, and we were lucky enough to have it right next to us. My son absolutely loved seeing the buffalo, and had the "omg" look on his face the whole time.

After seeing the buffalo, the drive continued through the park around switch-backs on mountainous terrain, through rocky tunnels, and around massive trees. We made our way to a hilltop lake for some R & R. The water in this lake is clear as glass, with large rocks protruding through the water surface making small islands. The lake had a small beach where we enjoyed the cold, refreshing water.

The next day we were scheduled to head home, and stopped at Reptile Gardens before we left. This is another wildlife sanctuary that everyone must see. It has the largest collection of reptiles in the US, including alligators, lizards, and the most poisonous snakes in the world. The best part, however was watching my son pet a 107 year old tortoise. These gentle giants are incredible to see, and they love neck scratches.

This vacation was one that I will never forget, and I cannot wait to go back. We were only there for 4 days, and there are many more attractions that we did not see including the Crazy Horse monument and the badlands. The whole trip was relatively inexpensive as well, with the highest two purchases being our hotel stay and fuel. We saw a lot in just a few days, and anyone could do what we did on an extended weekend.

Iowa Turfgrass Update

Jeff Wendel, CGCS, Iowa Turfgrass Institute

More about bees, colony collapse disorder and science

Colony Collapse Disorder (CCD) is a problem that challenges honeybee health and the economic stability of commercial beekeeping and pollination operations in the United States. Despite a number of claims in the general and scientific media, researchers have not identified a cause or causes of CCD. This information is from the USDA Agricultural Research Service and was last updated on 6/20/14.

One can find a number of research studies that blame neonicotinoid pesticides for CCD. Several studies that reported a negative impact on honeybees by neonicotinoids relied on large, unrealistic doses and gave bees no other choice for pollen, and therefore did not reflect risk to honey bees under real world conditions. Nor have the studies demonstrated a direct connection or correlation to CCD.

Neonicotinoid-based products have replaced many older agricultural products because of their effectiveness against harmful pests, excellent operator safety, and a relatively favorable environmental profile.

You can find extensive information about pollinators by visiting <http://pollinator.org/beeissues.htm>. The letter from Laurie Davies Adams, Executive Director is particularly interesting, scroll down the page a bit to find her letter.

This link is to a study titled, “[Are Neonicotinoids Killing Bees?](#)” Clearly, these researchers support a ban on this type of pesticide.

Researchers from the Universities of Wageningen, Ghent and Amsterdam have come to a different conclusion: A recently published review summarized 15 years of research on the hazards of neonicotinoids to bees. The conclusion: **While many laboratory studies described sub lethal effects, no adverse effects to bee colonies were ever observed in field studies at field-realistic exposure conditions.**

View the work here: <http://www.coloss.org/documents/blacquiere-et-al.-2012>

John Entine’s article is also an interesting read on the neonic issue, visit: <http://www.forbes.com/sites/jo-entine/2014/02/05/bee-deaths-reversal-as-evidence-points-away-from-neonics-as-driver-pressure-builds-to-rethink-ban/>

Recommendations for Turfgrass Professionals

Please remember that you are under scrutiny every time you use plant protectant products, fertilizers, etc. Make sure you carefully follow label directions, time your applications properly and make each treatment with the utmost regard for the environment.

Best Recommendations for the Public

The best action the public can take to improve honeybee survival is not to use pesticides indiscriminately. In particular, the public should avoid applying pesticides during mid-day hours, when honeybees are most likely to be out foraging for nectar and pollen on flowering plants.

In addition, the public can plant pollinator-friendly plants—plants that are good sources of nectar and pollen such as red clover, foxglove, bee balm, joe-pye weed, and other native plants. (For more information, visit www.nappc.org.)



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Ride On Sprayers

Dave Hardy, Northeast Director

Ride on sprayers over the past few years have really gained popularity. Their aren't too many of us that don't use them on a regular basis. These sprayers have dramatically increased our productivity and helped us and our staff tackle large projects with less strain. However good these sprayers are, they have also caused a fair amount of challenges.

I think the most frequent problem I see is turf damage caused by too much herbicide. Most of these sprayers have small tanks. So in order for operators to reduce the number of fill ups operators reduce the amount of gallons sprayed per acre. Many of us use 10 gal per acre or less. I have been amazed at how effective this generally is, however it leaves little room for operator error.

A few mistakes related to herbicide injury I have seen include the operators stopping their machines and forgetting to turn off the boom. The operator when using the hand wand to spot spray will over apply, especially when the weed is under the grass canopy. The operator may also over apply with the boom when going around obstacles or overlapping too much. And the last thing I have noticed is that when you let the mix sit in the lines over a weekend that the mix can separate, or perhaps the water evaporates. The end result is that the spray coming out of the tips can be so concentrate that it will cause turf injury.

I am in the process of updating my machines to help curb some of these issues. First thing I am working

on is wiring electric valves on the sprayer booms, the valves will be wired to a push button switch mounted to the handlebars. The valve will only open when the operator is pressing the switch. I mount the valves after the pump supplies the hand wand so that the operator may still use the hand wand without pressing the button. The second thing I am updating is the tips on my spray wand. I am removing the adjustable tips and installing flat fan spray tips. The adjustable tips tend to spray out in a cone shape so the operator often will kill the grass around the weed and may never even kill the weed in the process. The flat fan spray tips do a good job of penetrating the turf canopy and reduce the chance of turf injury.

The third thing I do is increase GPA in the warmer months. And the last thing I do is preach proper techniques. When using the hand wand, be sure you are sweeping your arm before you squeeze the trigger and do not quit swinging the arm until the trigger is released. When using the boom always keep track of where you have already sprayed and where your previous track is.

The solutions to help prevent herbicide injury seem easy enough; however, I know that most solutions are better written on paper than implemented in real life, so I guess time will tell. There are many more things to be mentioned about ride on sprayers so perhaps this will be a topic for further discussion in the future.

Job Posting: Lawn Care Technician

Struyk Turf LTD of Council Bluff, IA is in search of a college level applicator/spray technician to join our team. This position involves applying fertilizer and pesticide to residential and commercial lawns, diagnosing and treating lawn problems, responding to customer needs and many other tasks as assigned, all in a timely and efficient manner. The ideal candidate will possess a two or four year degree in Turfgrass Management or a related field. Turf Industry experience is also desired.

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Turfgrass Disease Diagnosis

Proper sample preparation is the first step in the process of disease diagnosis.

BY DR. STEVE KAMMERER

When lumped with all other day-to-day tasks, disease management can be one of the most challenging problems that face golf course superintendents. Sometimes when problems arise on turfgrasses, an unknown “disease” is the presumed culprit. Sample diagnostics can be useful in identifying the primary potential pathogens and when they are most likely to be infecting. This information is critically important in designing an agronomic program for prevention of diseases. This article is

a short guide to taking the right steps to diagnosing problems associated with pathogens and extrapolating the results of a turfgrass diagnosis summary.

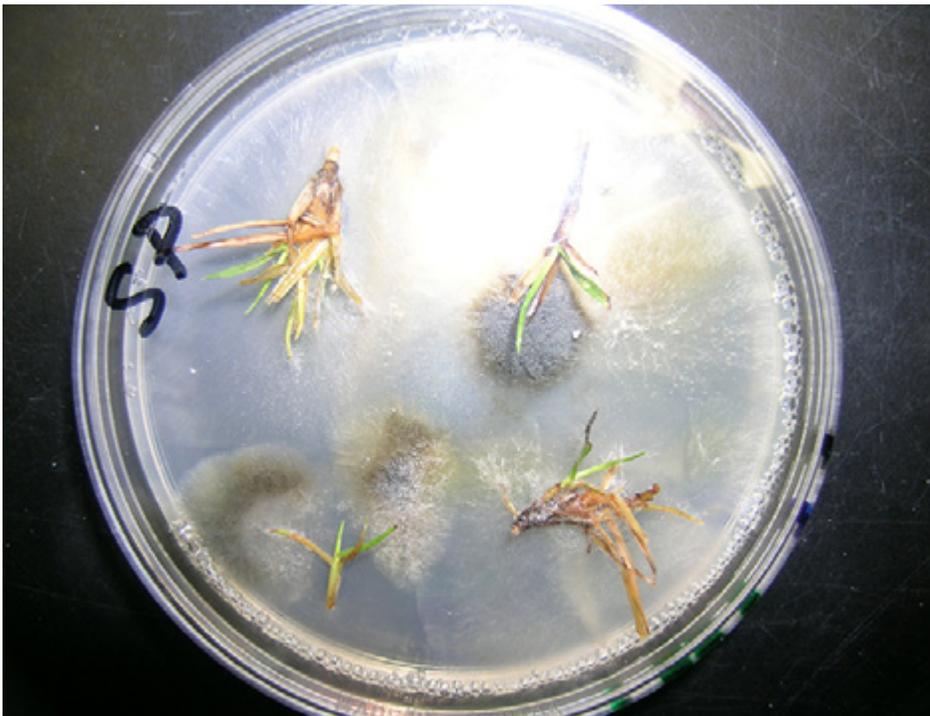
TURFGRASS DISEASE SYMPTOMS VERSUS INFECTION

Diseases of turfgrass are symptoms of infection by a biotic (living) agent. Not all diseases of turfgrass are caused by fungi. Plant parasitic nematodes are also classified as causing disease in

turf. Interestingly enough, fungal pathogens and the diseases they cause have been documented as being more likely in turfgrass damaged/stressed by nematode feeding. The time period between infection and the appearance of visible symptoms can be short, as in the case of *Pythium* blight (*Pythium aphanidermatum*) and dollar spot (*Sclerotinia homoeocarpa*). Long infection periods that precede disease symptom expression exist with the diseases take-all patch and bermudagrass decline (*Gaeumannomyces*



It is important to search for both above-ground symptoms and below-ground symptoms before submitting a sample.



Plating the samples on growing media will help identify causal pathogens.

graminis varieties). In the case of leaf and sheath spot (*Chrysorhiza / Rhizoctonia zae*), sometimes called “mini-ring,” while infection may be rapid and progress for months, no obvious visible symptoms may be apparent until stresses that slow turfgrass growth favor the growth of the pathogen over the host (the turfgrass).

FIRST STEPS TO FIELD DISEASE DIAGNOSIS

First, get out your disease guides. The *Turfgrass Disease Compendium* by the American Phytopathology Society (APS) is a great guide that describes the biology of the pathogens along with pictures. Second, invest in a good handheld field macroscope, and get down on your hands and knees. Dissect a portion of the affected turfgrass. Take pictures and notes of symptoms where they are occurring. Close-up pictures are critical, where you can literally see the individual turfgrass leaves. You cannot assume that all the symptoms in one area or all over the golf course are due to just one pathogen. Third, cut into the soil and observe the roots and soil profile. Many fungal pathogens of turfgrass are soil-borne and most active right at or below the soil surface, whereas the

symptoms may appear on the above-ground tissue.

STEPS FOR PREPARING A SAMPLE FOR LABORATORY DIAGNOSIS

For laboratory diagnostics at a university clinic or otherwise, take samples as early as possible. As part

of my Ph.D. project at the University of Florida, I conducted a two-year scouting program in South Florida on seashore paspalum fairways. Twenty percent of the time when I visited a golf course and recovered a pathogen, there were obvious classic symptoms of the disease. However, 80% of the time there were vague to slight symptoms not consistent with typical of *Rhizoctonia* or *Rhizoctonia*-like diseases, yet fungal isolates within this group were still recovered. With regard to most of these “exceptions” where I obtained these fungal isolates from the surface sterilized turfgrass tissue, the superintendents were largely unaware of any disease issues or infection. Another important finding was that 35% of these recovered fungal isolates were associated with samples of below-ground root and rhizome tissues. As many sprayed fungicides bind or enter leaf tissue quickly upon drying, there is generally less fungicide moving to below-ground turfgrass tissues as compared to above-ground. Thus, there may be a better chance of identifying/recovering the causal pathogen from the below-ground tissues.

Take the samples prior to, not after, a fungicide application. Even if the diagnostic laboratory that analyzes



Disease diagnosis should not be rushed, if possible. Proper incubation can help identify causal pathogens so that effective treatment can be implemented.



Diseases such as Rhizoctonia zeae can be found in hard-to-find areas, such as the crown of the plant.

your samples uses selective media in an attempt to induce the fungal pathogen to grow out of the affected tissue for more conclusive identification, a fungicide application, especially of a xylem mobile fungicide, can really complicate the already difficult task of identification of the causal fungus. This can result in a diagnosis of “no pathogens found.”

If sending a sample to a diagnostic clinic or lab, confirm that someone will be there to receive the sample when it arrives. Do not ship a sample on a Friday because your sample may sit for three-plus days before someone sees it. Keep the samples out of the heat and sun after taking them and prior to shipping. If you are going to be traveling or outside for several hours or more, get a small cooler to keep the samples cool, but do not immerse the samples in ice or cold water. Samples should not dry out. Wrap the turfgrass

samples in aluminum foil and then place in a paper bags. Label each sample if taken from different areas. Use overnight shipping so the samples will arrive as fresh as possible.

Most clinics have a submission form. It is extremely helpful to include additional information on the submission form or via email. Pictures of the symptoms can be extremely helpful, and include any obvious cultural issues of the sample location, such as “this is a ‘push-up’ green that has drainage problems.” A short chronology of activities 30 to 45 days prior to the appearance of symptoms will be helpful as well. This should include fungicides applied and major cultural practices recently performed. Any and all additional information you provide can be extremely helpful.

A cup-cutter sample of the affected area is generally adequate for any diagnostic clinic. If variable symptoms

exist, several samples are useful. Because no superintendent wants a green to resemble Swiss cheese, an alternative is to get a smaller core sampler. Additionally, multiple smaller samples are better than one big cup cutter sampler. Sample from the edge of the affected areas. The University of Florida’s RAPID Turf diagnostic clinic’s diagnosticians plate out several pieces of turfgrass tissue on selective media and then assess the plates following incubation over a period of days to help quantify the results. It can be common to identify more than one presumed fungal pathogen out of a sample.

INTERPRETING THE DIAGNOSIS

A superintendent once told me that when he sends out a turfgrass sample, he doesn’t include any pictures or additional information with the sample.

When I asked why, he said he wants a definitive diagnosis of what is present, and felt that including this additional information biases the diagnosis and leads to guessing. Disease diagnostics, especially for turfgrass, is a science and an art that takes experience.

There are “tricks” to diagnosing the most likely causal pathogens. Some fungi grow optimally at high temperatures, some at low temperatures, and some can grow through specific fungicides that inhibit other fungi — selective media incorporate some of these fungicides into the media. Certain fungi express very definitive and unique characteristics when the infected plants are grown in a high-humidity growth chamber versus when they are grown in a petri dish.

I receive phone calls from extremely frustrated superintendents or distributor reps who tell me, “I sent a sample to University A, then another sample to University B, and then yet another sample to a third lab, and I got three different answers.”

Or worse yet, “I got a diagnosis of no disease found.” I try to respond that “no disease found” is great information, as it means that either the pathogen is in remission and your efforts are providing benefit, or the problem is not a disease but something else. This will save a lot of guessing and unnecessary fungicide applications. I’ve had a few superintendents “test me” by letting me sample an area that they had already treated once or several times with fungicide or had spot-treated with a non-selective herbicide to see if my diagnoses were just

educated “guesses.” A credible laboratory is one where every diagnosis is not necessarily a disease.

A turfgrass sample sent to a diagnostic lab is a “snapshot in time.” It can be quite common to get a different diagnosis each time you take and ship



Sometimes, two diseases can be present and active at one location. Both *Rhizoctonia* and *Pythium* were identified in this location.

a sample, even to the same lab. It has been documented that zoysiagrass initially damaged by *Rhizoctonia* experienced delayed recovery due to secondary infection by *Pythium*. I worked with a golf course that had severe yearly outbreaks of *Bipolaris* leaf spot, even after several fungicide applications. Upon taking samples from this golf course, I recovered *Pythium* from about 15% of the surface sterilized tissue. We designed

an economical preventive fungicide program, targeting applications prior to the heavy summer rains and focusing on a *Pythium* fungicide in conjunction with a contact fungicide for the *Bipolaris*. These preventive applications resulted in less fungicide applied,

less spraying, less money spent, and less time/labor involved in fighting this continuing problem curatively. Most important, the turfgrass responded favorably and the disease was much less severe.

Remember that turfgrass damaged by disease requires time to recover and grow new tissue. If the weather or growing conditions are less than optimal, turf recovery may be slow. It doesn't necessarily mean that the disease or the pathogen is still active. Additionally, weak turfgrass is much more susceptible to infection by secondary pathogens, so preventive fungicide applications need to be initiated or continued until the point that the turf has fully recovered.

CONCLUSION

Disease management is a challenging facet of turfgrass management. Planning and use of preemptive turfgrass sampling techniques for

pathogen detection will help guide activities on the golf course and will assist in identifying the diseases of significance that need attention.

DR. STEVE KAMMERER is a Field Technical Manager for Syngenta who earned much experience evaluating turfgrass disease samples while earning his Ph.D. at the University of Florida.

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Rust Disease on Perennial Ryegrass

Nick Christians, PhD, Iowa State University

On July 17, I received an e-mail from Larry Ginger of American Lawn Care with a picture of rust disease showing up on perennial ryegrass, but not on Kentucky bluegrass. Rust is a fungal disease caused by fungi in the genus Puccinea.



Picture from Larry Ginger showing rust on ryegrass patch in lawn taken July 17.

I had not seen this problem at that time, but yesterday (July 21) I took data on the National Turfgrass Evaluation Program (NTEP) trial at the research station. I found that many of the cultivars were covered with rust. I took data on the rust problem this morning (July 22). I have not seen the problem on the Kentucky bluegrasses as of today, but it clearly a severe outbreak on some of the perennial ryegrasses. Rust often shows up in August on Kentucky bluegrass, perennial ryegrass, and even on tall fescue (see earlier blogs). This year it is early and appears to be hitting the ryegrasses first.



Close up of rust on Kentucky bluegrass from last year.



Rust spores on my shoes after taking data.

Continued on Page 12...

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Rust Disease on Perennial Ryegrass Continued...

In the pictures below are individual ryegrass plots covered with rust on July 22. Rust is clearly cultivar specific and there were cultivars covered with it and adjacent plots that were completely free of the disease. This is another reason for choosing your grass seed carefully. There is usually a good reason to spend a little more on grass seed. I have not analyzed the data on which cultivars were affected, but that will be in next year's report. NTEP does have data available on ryegrass susceptibility to this disease at ntep.org.

Rust is a fungi and there are fungicides that control it, but we generally recommend that you let the disease run its course. It usually goes away by itself. You may want to treat on sensitive areas, such as sports fields if it becomes necessary.

