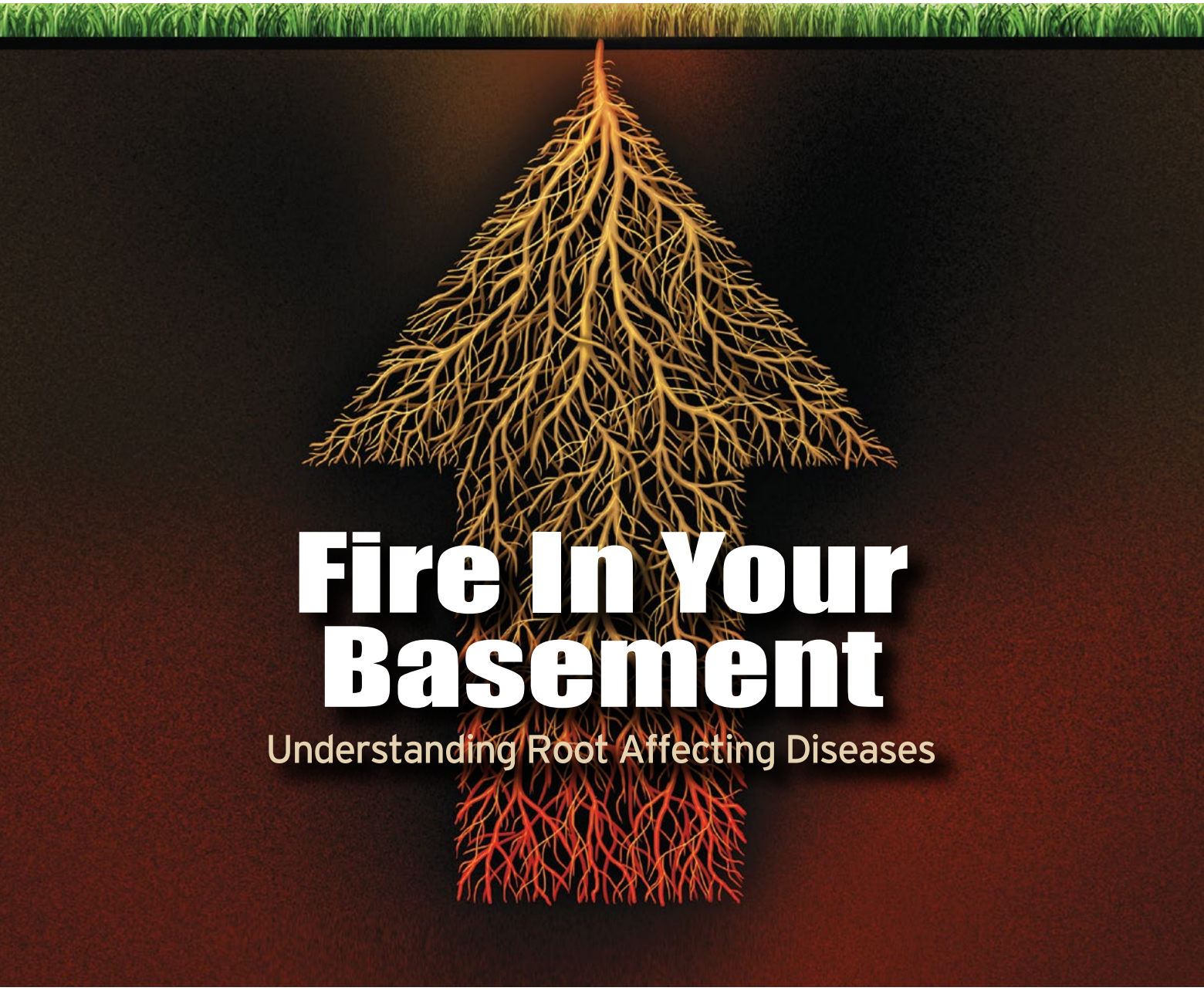
Spring Issue 2021

GreenMaster

Official Publication of the CGSA



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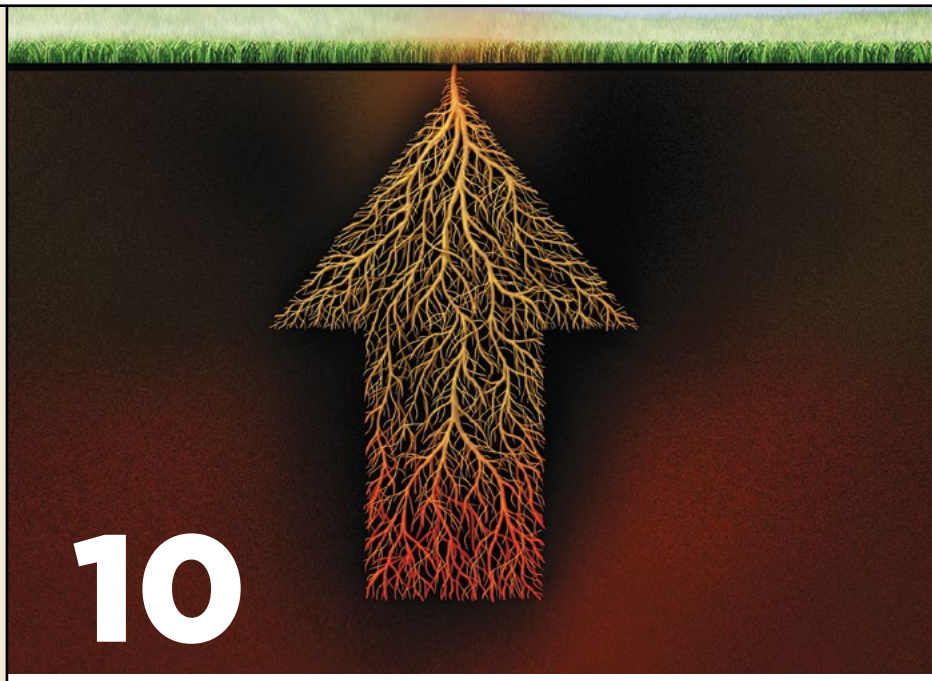


Darren Kalyniuk
CGSA PRESIDENT
PRÉSIDENT DE L'ACSG

It has been an honour

As I write my final president's message, I would never have thought we would still be battling this pandemic that has affected so many lives across the globe. My deepest condolences to everyone who has lost someone due to COVID.

As I move into the role of Past President and reflect on the year, I am very grateful to have been given the opportunity to lead CGSA during this unprecedented time. With all the bad, there has also been some good, especially in our industry where many people came together and showed how resilient we are when faced with adversities.

This past year, the CGSA Board and Staff had to make quick, yet difficult, decisions regarding CGSA's operations. Unfortunately, due to the growing safety concerns, we knew that the postponement and cancelation of some of our events was inevitable, as well as revamping our 2021 Canadian Conference by going virtual, while maintaining the top-level educational opportunities for our members.

I am very proud of our staff at CGSA who made sacrifices to help keep CGSA operating during these tough times. I would like to thank all of them for their hard work and devotion to our association and industry and making it what it is today.

I would also like to thank the Board of Directors for their support and commitment. I have enjoyed our discussions over the past year and am looking forward to supporting you in the future.

My time on the Board would not have been possible without the support from the MGSA as well as everyone at St. Boniface Golf Club. I am truly grateful to be working for such a great company for the past 24 years.

I know we often get caught up in our work, as we are passionate about what we do. Just like many, my family has sacrificed a lot for me during the golfing season. I am so blessed to have such an amazing and understanding family, so thank you Chantal, Olivia and Jakob.

Lastly, I would like to thank our membership for their support of the CGSA, especially during this past year. Many that could, stepped up and continued to support the CGSA which helped our overall financials in the end. I am looking forward to seeing you at our virtual conference in March and I hope everyone continues to stay healthy and safe during these times.
Thanks. ***GM***

Ce fut un honneur de vous servir

Je n'aurais jamais cru qu'au moment d'écrire mon dernier message à titre de président, nous serions encore aux prises avec cette pandémie qui a affecté tant de vies à travers le monde. Mes plus sincères condoléances à tous ceux qui ont perdu quelqu'un des suites de la COVID.

Je me prépare maintenant à endosser mon nouveau rôle de président sortant. J'en profite pour vous dire que je suis très reconnaissant d'avoir eu l'occasion de diriger l'ACSG au cours de cette période sans précédent. Malgré tous les aspects négatifs des derniers mois, il faut également souligner les aspects positifs, surtout dans notre industrie, parce que nous avons démontré que nous pouvions nous serrer les coudes face à l'adversité.

L'année dernière, le conseil d'administration et le personnel de l'ACSG ont dû prendre des décisions rapides et difficiles concernant le fonctionnement de notre association. En raison des préoccupations croissantes en matière de sécurité, nous savions que le report et l'annulation de certains de nos événements étaient inévitables. Soulignons que, en 2021, notre congrès virtuel mettra à l'affiche des programmes de formation de haut niveau pour nos membres.

Les employés de l'ACSG ont fait beaucoup de sacrifices pour nous aider à continuer à fonctionner en ces temps difficiles et je suis très fier d'eux. Je tiens à les remercier pour leur travail acharné et leur dévouement envers notre association et notre industrie. Notre réussite repose sur eux.

Je tiens également à remercier les membres du conseil d'administration pour leur soutien et leur dévouement. J'ai aimé nos discussions au cours de l'année écoulée et j'ai hâte de continuer à travailler à vos côtés.

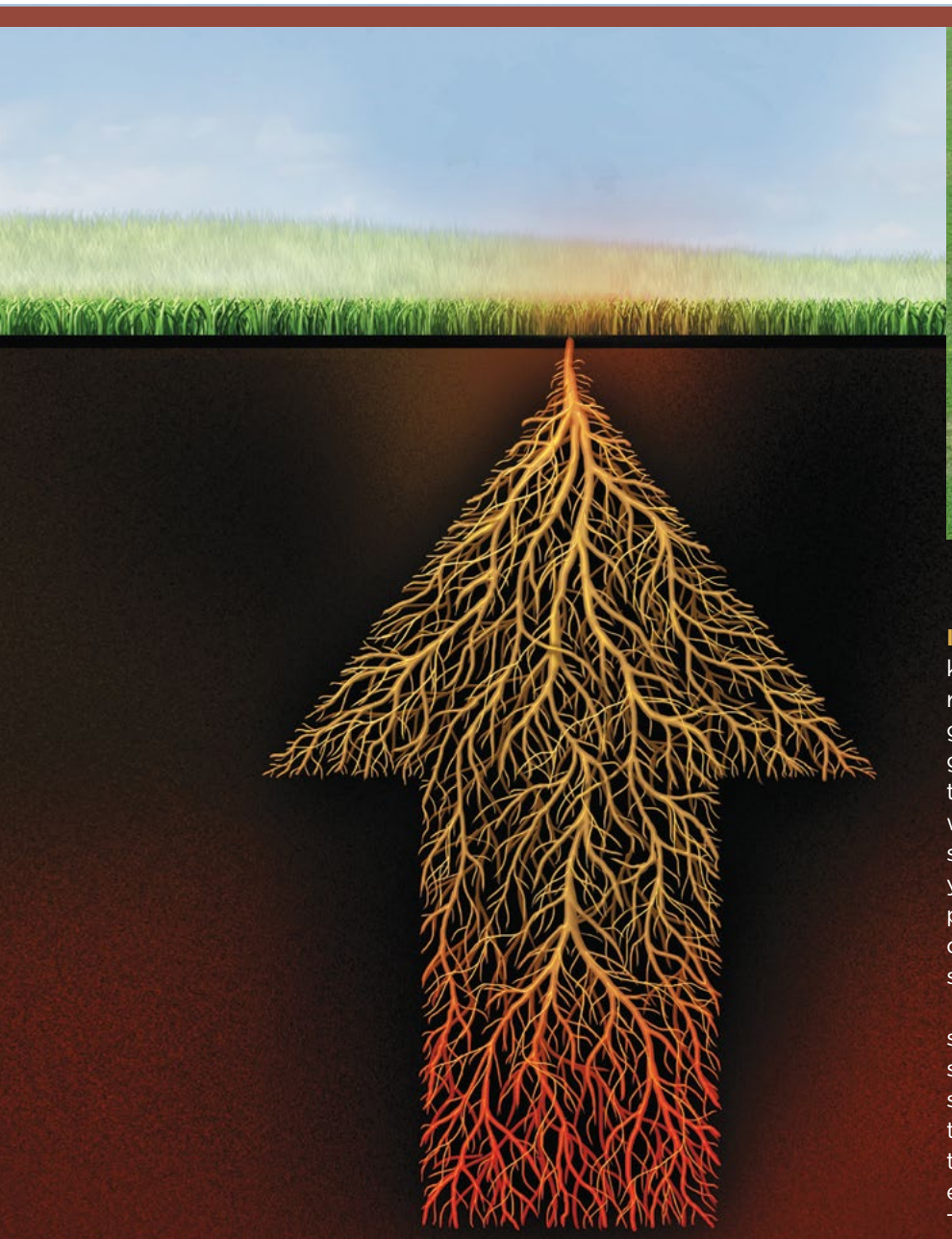
Ma participation au conseil d'administration n'aurait pas été possible sans le soutien de la MGSA et de tous les intervenants du Club de golf de Saint-Boniface. Je tiens à exprimer ma vive reconnaissance envers cette entreprise formidable pour laquelle je travaille depuis 24 ans.

Notre travail est passionnant, mais nous devons y consacrer beaucoup de temps. Ma famille, comme celle de plusieurs de nos membres, doit faire de nombreux sacrifices pendant la saison du golf. J'ai beaucoup de chance d'avoir une famille aussi incroyable et aussi compréhensive que la mienne. Alors, merci Chantal, Olivia et Jakob !

En terminant, j'aimerais remercier nos membres pour leur soutien à l'ACSG, particulièrement au cours de la dernière année. Beaucoup de ceux qui le pouvaient, ont mis les bouchées doubles pour continuer à soutenir l'ACSG, ce qui nous a vraiment aidé à contrôler nos finances.

J'ai hâte de vous revoir à notre congrès virtuel de mars ! D'ici là, je vous souhaite une bonne santé.
Merci. ***GM***

Fire In Your Understanding



It's July 1st and heat stress is already kicking in. We haven't had a beneficial rain in weeks and more than 300 golfers a day pace up and down our greens. Add to this increased cart traffic, the short staffs, and tighter windows to get anything done. I'm sure this sounds familiar to some of you, and yet, we are doing everything possible to navigate through all the different stresses that come with summer.

The last thing we need is a smoldering flame beneath the soil surface. Something we can't visibly see until the flames punch through the first floor. To which, by this time, the foundation has collapsed, and everything has turned into rubble. These are root affecting diseases.

Basement Root Affecting Diseases

Initial symptoms of take all patch develop as small reddish-brown patches. Patch size can increase to up to one metre or more in diameter. Annual bluegrass often colonizes these areas after the bentgrass has been killed or severely weakened.

Photo: Dr. Jesse Benelli, Bayer

Root affecting diseases represent an incredibly diverse set of pathogenic organisms that feed, infect, or otherwise hinder the below ground parts of the plants. For example, the pathogens that incite take-all patch and summer patch belong to the Ascomycete class of fungi. Fungi that contribute to fairy ring injury belong to the Basidiomycete class of fungi. Moreover, pathogens that cause Pythium Root Rot are not true fungi at all. Plant patristic nematodes represent yet another entirely different group of root affecting organisms.

All of these can be incredibly difficult to keep track of, and the odds are that one or more of these maladies is affecting your facility. More commonly, several of these organisms are present simultaneously. Thus, creating what we call a disease complex. In this article, we will take a brief look at some of the more common root affecting maladies that we have seen across Canada in recent years.

PATCH DISEASES

The term "patch disease" is used to describe a group of organisms that produce ectotrophic runner hyphae along the roots, stolons, rhizomes, or stems. Take-all patch, summer patch, and to a lesser extent necrotic ring spot represent that vast majority of patch diseases on cool-season turf in Canada.

Take-all patch

The take-all patch pathogen (Gaeumannomyces graminis var. avenae) infects creeping bentgrass roots when soil temperatures are cool (8-16°C) and moist. Soils high in pH can often lead to greater disease development. Take-all symptoms usually appear in late spring to early summer during the time period coinciding with first wilt or heat stress. By the time visible symptoms are observed on the surface, up to 50% or more of the host's roots could be infected.

Historically, take-all patch was considered a primary disease of new putting green construction or on newly fumigated turfgrass surfaces. Over time, the severity of take-all patch would diminish with the increasing age of the playing surface. This was attributed to a phenomenon called Take-All Decline (TAD). It is believed that TAD occurs when there is a buildup of antagonist fungi or bacteria in the soil that competes with the take-all patch fungus. However, within the last 10 years there has been resurgence in take-all patch incidence and severity on older creeping bentgrass surfaces.

It is unclear why the resurgence in take-all patch incidence is occurring throughout Canada. One possible explanation is the rise of a new pathogen that is inciting symptoms

Table 1. Broad overview of major root affecting diseases in Canada

Turfgrass disease	Soil temperatures when active	When symptoms appear	Cultural control strategies	Classes of chemistry labeled for control*
Take all patch	8 – 16°C	Late spring / summer	Reduce soil pH / improve drainage	DMIs / QoIs
Summer patch	>18°C	Summer	Reduce soil pH / use of acidifying fertilizers / improve drainage / raise mowing heights / encourage bentgrass populations	DMIs / QoIs
Pythium root rot	>10°C	Spring / summer / fall	Improve surface and subsurface drainage / reduce organic mater	QoIs / QiIs / Phosphonates / Carbamates
Pythium root dysfunction	10 - 23°C	Spring / summer / fall	Spoon feed nitrogen fertilizers / reduce plant stress	QoIs / QiIs
Fairy ring	>12°C	Spring / summer / fall	Wetting agents to disrupt hydrophobic soil conditions / mask with nitrogen	DMIs / QoIs / Polyoxins

*Always refer to specific product labels for best guidance as differences in the spectrum of control among various classes of chemistry exists.

that closely resemble take-all patch. Dr. Katerina Jordan is a turfgrass pathologist at the University of Guelph and her lab is dedicated to investigating this organism that continues to sweep across Canada. This exciting research project funded, in part, by the Ontario Turfgrass Research Foundation will shed new light on this potentially new pathogen.

Management

A successful take-all patch management program incorporates three essential components: supplemental manganese, pH modification, and chemical treatment.

Applications of manganese sulfate (2-4 lbs of Mn per acre) when applied in the spring or fall can result in significant reductions in take-all patch severity. Immediately irrigate the manganese sulfate into the soil profile after application. In alkaline soils, decreasing soil pH between 6.0 – 6.2 has been shown to reduce take-all patch severity.

In Canada, there are few registered fungicides for control of take-all patch. This is due, in part, to how difficult it is to produce consistent disease symptoms within experimental trial areas to satisfy the regulatory requirements set by the PMRA. In general, applications of demethylation inhibitor fungicides (DMIs) and strobilurin fungicides applied in conjunction or in rotation at 28-day intervals perform well. Preventative applications should begin in the spring when mean soil temperatures rise to 10°C. Applications are also made during the fall months when soil temperatures consistently drop below 16°C.

It is best to use coarser droplet sizes and higher water carrier volumes when applying fungicides for take-all patch. Additionally, post application irrigation may help get the fungicide into the soil profile where the site of pathogen infection occurs. Keep in mind, regardless of which fungicide used, complete control of take-all patch remains difficult.

Summer patch

Summer patch, caused by Magnaporthe poae, is a severe disease of annual bluegrass, Kentucky bluegrass, and certain species of fine fescue. In the Southeast United States and the Mid-Atlantic, there have also been increasing reports of summer patch on creeping bentgrass putting greens. Unlike take-all patch which is active under cooler soil temperatures, the summer patch pathogen is strongly influenced by warm soil temperatures exceeding 20°C. The pathogen that causes summer patch produces ectotrophic runner hyphae along the roots, rhizomes, and stems of turfgrass plants. This causes root dysfunction and cripples that plants ability to acquire nutrients and water from the soil.

As bad as foliar symptoms appear, worsening damage occurs below ground where the root mass has been dramatically reduced. The substantial decrease in rooting causes a precarious situation where the golf course superintendent must apply more frequent water to the upper soil profile to keep plants adequately hydrated. Unfortunately, this further enhances the environment for continued disease development.

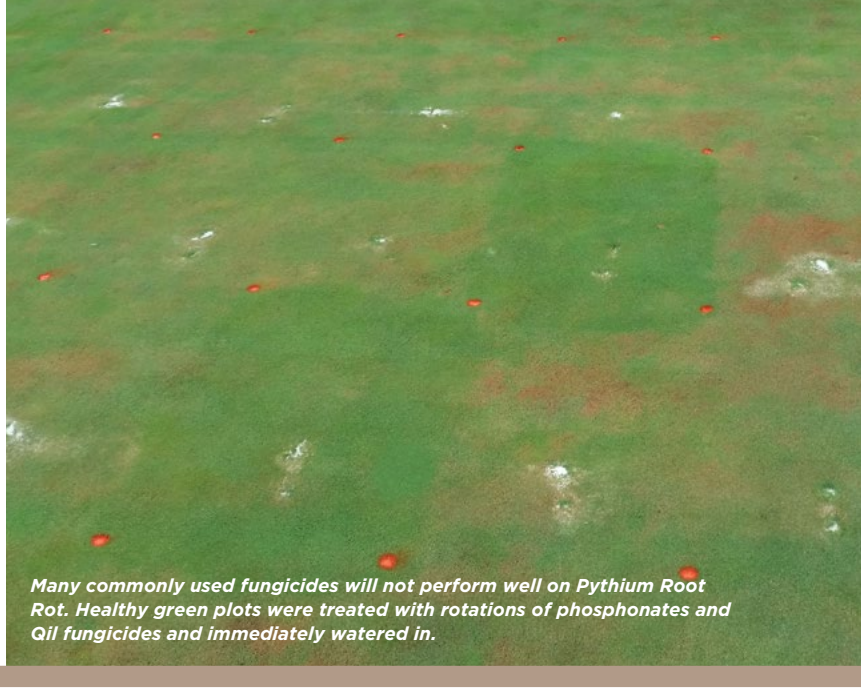
Management

Summer patch is primarily a disease of annual bluegrass putting greens. Thus, seeding newer cultivars of creeping bentgrass into existing greens can be an effective strategy to limit the development of summer patch over time. Additionally, managing microclimates by tree removal or selective pruning to alleviate shade stress can help favour the population of creeping bentgrass.

Summer patch is increasingly severe when the soil pH is greater than 6.5. Therefore, yearly applications of ammonium sulfate or

Symptoms of Pythium root dysfunction can often resemble those of take-all patch.

Photo: Dr. Lane Tredway, NC State



Many commonly used fungicides will not perform well on Pythium Root Rot. Healthy green plots were treated with rotations of phosphonates and QiI fungicides and immediately watered in.

Photo: Dr. Jesse Benelli, Bayer

other acidifying fertilizers such as sulfur-coated urea can drastically reduce the severity of summer patch. Be advised that sulfur-coated urea has the potential to burn turf if the rate is too high and air temperatures are too hot. Additionally, symptom expression tends to worsen under compacted soil conditions. Alleviating compaction through cultivation practices in the spring and fall will help promote root development and lower the severity of summer patch.

The use of preventive fungicides is also an effective way to reduce summer patch development. Applications should be initiated once soil temperatures are consistently above 18°C in the top 5 cm of the soil profile. Applications should be applied at a minimum of 2 gal/M using a nozzle tip that produces coarse droplets. At lower carrier volumes, it becomes that much more important to water in these fungicides immediately after application. Among the best performing chemistries for summer patch control are DMI and QoI fungicides. Maintain applications for summer patch every 28 days if the soil environment remains conducive for continued development. Be advised, frequent use of multi-site contact fungicides at high rates has been shown to enhance summer patch severity.

PYTHIUM ROOT DISEASES

Pythium root diseases are a relatively new malady that was first characterized in the 1980s. In Canada, both Pythium Root Rot and Pythium Root Dysfunction have been documented predominately on creeping bentgrass putting greens. Pythium root diseases also tend to occur as a disease complex with patch diseases and plant parasitic nematodes. Unlike Pythium foliar blight, which produces cottony white mycelium on leaf surfaces, Pythium root diseases do not produce aerial mycelium and are microscopically identified through the presence of oospores imbedded in root tissue. There are several key differences between Pythium Root Rot and Pythium Root Dysfunction that are important to understand.

Pythium Root Rot

Pythium root rot is predominantly a disease of putting green turf with saturated root zones. Unlike Pythium Blight which occurs under very hot conditions, Pythium root rot can be active across a very broad range of soil temperatures (>10°C). As Dr. Lee Miller (Turfgrass Pathologist at the University of Missouri) says, "Pythium Root Rot only needs a pool to swim in." Pythium root rot can occur on both new and old putting green construction but tends to be more severe on poorly draining greens with high organic matter accumulation.

Pythium Root Dysfunction

The key difference between Pythium Root Dysfunction (PRD) and Pythium root rot is that PRD primarily occurs in very dry sandy soils on new construction. Peak infection occurs when daily soil temperatures are between 10-23°C. Symptoms can occur any time of year but tend to be most notable during extended periods of dry hot weather. An accurate diagnosis of PRD is critical as symptoms can often mimic those associated with take-all patch. Low mowing heights coupled with low nitrogen fertility can exacerbate visible symptoms. Disease symptoms can also become more prevalent after a heavy sand topdressing event where affected patches of turf struggle to grow through the sand topdressing. Microscopic diagnosis of PRD can be difficult during peak visible disease development. This is due to the nature of infection that substantially reduces root mass and most roots with large numbers of oospores may have likely 'fluffed' off earlier in the season.

Thatch collapse on a golf tee located in Southern Ontario.

Photo: Scott Dyker

Creeping bentgrass putting green affected by Root-Knot Nematodes in Southern Ontario. Laboratory services revealed the presence of more than 300 root-knot nematodes per cubic cm of soil.

Photo: David DeCorso

Management

Cultural programs are critical for management of Pythium root diseases. Pythium root rot occurs under saturated soils, thus increasing surface and subsurface drainage and effectively managing organic matter in the rootzone will lower disease development. Additionally, it would be wise to conduct an irrigation audit on putting green surfaces. Pythium root rot will tend to occur in areas with too much irrigation overlap. For Pythium root dysfunction, increasing nitrogen fertility and raising mowing heights has reduced the visible expression of this disease.

Selecting the proper fungicide is critical for the management of either Pythium root disease. Since Pythium is not a true fungus, many commonly used fungicides will not have strong activity against these diseases. Most products that control Pythium blight will have some degree of control against rooting infecting Pythium. However, it is important to target these applications to the root zone environment for optimal control.

FAIRY RING FUNGI

Fairy ring is caused by more than 80 different species of wood-decaying basidiomycete fungi. The occurrence of fairy ring seems to be rising throughout Canada in recent years. This is likely the result of lower mowing heights and reduced fertility that encourage greater visible expression of the disease. Higher mowing heights and greater levels of nitrogen fertilization likely masked symptoms of fairy rings during earlier times.

Notable symptoms of fairy ring include the expression of patches, rings, or arcs on the turfgrass sward. Fairy ring fungi do not directly infect turfgrass plants. Injury most often stems from hydrophobic residues created by the fungus or as an excess of ammonium released by the fairy ring fungi. Symptoms of fairy ring are classified into three types:

- Type 1 fairy ring tends to be the most severe and is characteristic by hydrophobic rings or patches of dead turf.
- Type 2 fairy rings produce stimulated rings or arcs in the turfgrass sward that often appear darker than the surrounding turf. Type 2 fairy ring can often manifest itself into type 1 fairy ring.
- Type 3 fairy ring is the least severe and is characterized by profuse mushroom production in the shape of rings or arcs. Regardless of the fairy ring type, most fairy ring fungi become active when soil temperatures exceed 10°C.

Additionally, another new disease that shares some commonalities with fairy ring is thatch collapse. As the name suggests thatch collapse is caused by a group of basidiomycete fungi that decomposes thatch and other organic material. This disrupts the uniformity of the playing surface and is cosmetically disruptive.

Management

Managing fairy ring is best done preventatively before visible symptoms are present. In curative situations, Dr. Mike Fidanza (turfgrass pathologist at Penn State University) often recommends a 3-part strategy for managing Type 1 or Type 2 fairy ring. The first step is to needle tine the affected area before any spray applications. Secondly, apply a wetting agent and water it in to help alleviate hydrophobic conditions and to prep the soil environment for chemical treatment. And lastly, apply a good fungicide at a high rate and lightly water the chemical in the rootzone. The most used fungicides for fairy ring control are DMIs, QoIs, and treatments of Polyoxin-D zinc salt.

PLANT PARASITIC NEMATODES

Awareness of plant parasitic nematodes (PPN) has grown tremendously in the last 10 years. As

Cam Shaw highlighted in "Lifting the Veil on Plant Parasitic Nematodes in Cool-Season Turf" publication in the August 2020 issue of ONCourse, high populations of PPN have been reported across many geographically important locations in Canada. High levels of PPN are commonly observed near coastal areas (British Columbia and Atlantic Canada) where harsh winter environments are not commonly experienced. Moderate to high levels of different PPN species are also commonly observed in Ontario, Quebec, Alberta, and the Prairies.

There are numerous genera and species of plant parasitic nematodes in Canada. Dr. Katerina Jordan has reported Spiral, Ring, Stunt, Root-knot and Cyst nematodes as among the most common plant parasitic nematodes across Canada. Regardless of the nematode species, most visible damage is restricted to putting green surfaces where additional stresses are present. However, in the last 5 years there have been increasing reports of root-knot nematode injury occurring on athletic fields seeded with perennial ryegrass. As of now, these reports are restricted to the United Kingdom and coastal regions of British Columbia.

Management

Managing the symptoms and severity of plant parasitic nematodes is done through reducing the stress on the turfgrass. However, this remains difficult on putting green surfaces due to expectations of low mowing heights and faster green speeds. Additionally, plant parasitic nematodes will often form a complex with several other root affecting diseases. Effectively managing those other present diseases will further reduce the overall stress on the turf.

There are currently no plant protectants labeled for use against PPN ion golf turf in Canada. In the United States, there have been several new nematicides registered for golf course use, including Fluopyram,

Symptoms of root-knot nematode damage on a perennial ryegrass golf tee in the UK. Similar symptoms are now being observed in coastal British Columbia.

Photo: Dr. Deborah Cox

Abamectin, and Fluensulfone among others. Although our control options are limited in Canada, it remains crucial to correctly diagnose populations of plant parasitic nematodes using a reputable diagnostic service. An accurate diagnosis will help curb unnecessary applications that would likely have no affect and thus save you time and money.

IMPORTANCE OF AN ACCURATE DIAGNOSIS

The aim of this article is to shed light on several diseases and maladies that are occurring beneath soil surface. From my perspective, these are the diseases that worry me the most. Dollar spot can be a tough disease to manage by virtue of its persistence – but that doesn't scare me. The reason it doesn't scare me is that we can literally see the symptoms and signs as disease development is occurring. Dollar spot and the pathogen that incites it will let us know when it's active by virtue of fluffy white mycelium on the surface. The same cannot be said for patch diseases, root Pythium diseases, fairy ring, or plant parasitic nematodes.

I hope from reading this that you can see several common trends throughout the article. It may seem intimidating to develop a management program to defend all these diseases. Think of what they have in common and focus on the similarities. Reducing the stress on the turf through sound agronomic practices can reduce the severity of many of these diseases. This includes subtle increases in nitrogen fertility or simply changing the nitrogen source of your fertility program. Additionally, a slight bump in mowing height can reduce stress and give your plant more energy to handle the stress of summer.

The use of plant protectants can also be consolidated if timed properly. This is because several of these diseases are controlled by the same modes of action, namely DMIs and QoIs. The timing of application is also critical. If your main problems are fairy ring and take-all patch, then a fungicide application once soil temperatures reach 10°C can control both with a single spray. Conversely, if Pythium root rot and summer patch are a primary concern then applying a DMI or QoI fungicide in combination with a Pythium control product can simultaneously control both once soil temperatures exceed 18°C. This creates opportunity to do multiple things at once to save you time and labour.

The most important thing you can do is correctly identify these maladies through a reputable diagnostic lab. Many of these diseases carry overlapping symptoms and can also mimic abiotic summer stresses such as heat, drought, traffic or hydrophobic related stresses. An accurate diagnosis saves you time and other valuable resources to put you in the best possible position to extinguish these flames early on while giving your golfing community consistent and reliable playing surfaces throughout the season. ***GM***

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THE CANADIAN Golf Course Management Conference

The Canadian Golf Superintendents Association (CGSA) will hold our first virtual conference March 2 – 4, 2021. Although we are disappointed that we can't be together in person, we are excited to present you with the Canadian Experience Live virtual conference.

The conference has a different format this year, but The Canadian will deliver the same top notch education sessions, trade show, awards ceremonies, and networking opportunities that our delegates love. Here's a sneak peek of what to expect!

Awards Ceremony

We are excited to bring you our awards ceremony, sponsored by Bayer, in a new format this year that we know you will enjoy. Our distinguished award recipients will be recognized throughout the conference, giving you more time to enjoy the presentations.

Equipment Technicians Program

Another advantage of our virtual conference is the Equipment Technicians Program and shop tours. We can't always visit shops at an in-person conference but the virtual platform allows us to show you some of your colleague's shops across the country. Be sure and visit the Equipment Technician room and don't miss their presentations!

Trade Show

A virtual trade show provides 24/7 access to exhibitors and delegates. There is the opportunity to meet live with numerous delegates or join a private chat. Remember, this is your opportunity to see the new and exciting services and products.

As an exhibitor, you have the advantage of setting up your booth from your office or home, which means no loading docks, convention centre limitations or staff travel costs. You can also set your booth up at your convenience. In addition, you will have access to data from all delegates who visit your booth. You are able to see delegates as they enter your booth so reach out to them. Consider a promotion or advance schedule to ensure you see the delegates you want to reach.

Gamification

Because everything is new this year, we are introducing Gamification. This program gives you the opportunity to win many prizes including a $500 VISA gift card, CGSA membership and event registrations. Delegates earn points by participating in designated activities (see chart on page 21).

the canadian Experience LIVE

Most out of Conference

- More education than ever in concurrent sessions
- You're able to attend every session
- Network cross-country with colleagues
- All sessions recorded and available following week
- Earn more CECs
- Win gamification prizes by participating

TUESDAY, MARCH 2
11:00 – 5:30

The Canadian Experience Live kicks off with opening ceremonies and welcome remarks. Some tips will be introduced to help you become familiar with the online learning platform. Immediately following will be the keynote address exclusively sponsored by Syngenta Canada. Be sure and join CGSA and Bayer Canada to recognize Paul Robertson as the CGSA/Bayer Superintendent of the Year. You will also want to celebrate with the CGSA/Toro Assistant Superintendent of the Year.

Our exciting new trade show format will allow you to visit the exhibit hall and meet new and existing suppliers in a live format.

WEDNESDAY, MARCH 3
11:00 – 6:00

Day two presents many concurrent education sessions and Live trade show time. You will want to attend the awards ceremony exclusively sponsored by Bayer and recognize the CGSA/Foley Company Equipment Technician of the Year. CGSA's Gordon Witteveen Award winner, sponsored by Toro, will also be recognized during the ceremony.

Closing the day is our virtual networking opportunity. This will be a great chance to see your colleagues and delegates in an informal setting.

THURSDAY, MARCH 4
11:00 - 5:00

As The Canadian Experience Live comes to a close, the day starts with the CGSA/Rain Bird Environmental Achievement Award. You will want to visit the trade show, participate in the concurrent education sessions and attend the awards ceremony recognizing the John B. Steel recipient.

Make sure you participate in the Equipment Technicians education program including a shop tour and Electrical Circuit Testing & Voltage by Toro.

EDUCATION SESSIONS MARCH 2, 3, 4

SPONSORED BY syngenta

NEW this year, Industry Presentations will be part of the concurrent education schedule.

Optimizing Fungicide Performance
Rick Latin, Ph.D., Purdue University

What's Next in Golf Course Architecture
Jeff Mingay, Mingay Golf Course Design

Best Management Practices to Keep Poa Annual Greens Healthy and Playing Well During Summer
Adam Moeller, USGA

After Grubs and Chinch Bugs – Your Greatest Challenge is How to Positively Influence What Golfers Are Saying About You
Tim O'Connor, Golf & Performance Coach, University of Guelph Golf Teams

Innovative Control Strategies for Dollar Spot and Snow Mold
Paul Koch, Ph.D., University of Wisconsin

Employment Contracts and Key Employer Policies
Laura Williams, Williams HR Law

Life with Less Chemical Inputs – Progressive Data Driven IPM Practices for 20 Years
Frank Rossi, Ph.D., Cornell University

Green Futures; Golf Course Landscapes, Climate Change and Management
Richard Hebda, Ph.D., Curator, Royal BC Museum
(Photo credit: Royal BC Museum)

The Art of Application
Doug Baumann, Ph.D., Syngenta Canada

Precision Turfgrass Management
Katie Dodson, Ph.D., Syngenta

I Got Issues – Let's Talk BMP's
Thomas Nikolai, Ph.D., Michigan State University

Turf Disease Management in the Era of Reduced Fungicide Use
Tom Hsiang, Ph.D., University of Guelph

How to Program PGR's Based on Growing Conditions
Bill Kreuser, Ph.D., University of Nebraska-Lincoln

Root Diseases in Turfgrass
Jesse Benelli, Ph.D., Bayer Environmental Science

Panel – The Challenge and Change of Human Resources
Superintendents and Assistants

Visit: www.golfsupers.com/TheCanadian.html

To register, see complete schedule and certified education credits (CECs).

You can also follow along on Twitter (@GolfSupers). #cgcmc21

CGSA's AGM

CGSA's AGM is traditionally part of the in-person conference. This year it will be held on March 10. The AGM will also feature the awards ceremony sponsored by Bayer for 25 & 30 year pin presentations, scholarships and accreditation. Details for the AGM will be sent to you.

GAMIFICATION

Earn points to win many prizes including a CGSA membership, event registration, $500 VISA gift card, 5 (Five) $100 VISA gift cards (more details available during the conference).

Action	Points
Register early	100
Visit a trade show booth – points each time you visit a new booth in the exhibit hall	500
Attend an education session – points each time you attend a session	200
Attend an award presentation	200

REGISTER TODAY

visit: https://golfsupers.com/TheCanadian.html

USING OUR VIRTUAL CONFERENCE PLATFORM

- Login with the credentials sent to you by email after registering
- **Lobby:** Here you will find announcements for the day, information of upcoming events/ sessions
- **Public Lobby:** Click public lobby chat on the right hand side of the homepage to chat with staff and delegates at anytime throughout the Conference
- **Sessions:** All concurrent education sessions, award ceremonies and equipment technicians program will be listed here by date. To participate in a session, click on Sessions on the left side of your screen, below Lobby. The list of sessions will be in the session hall with topics, times and presenters
- **Networking:** Click on the networking section to participate in our networking event Wednesday at 4:15.
- **Technical difficulties?** Just click on the IT Help button at the bottom left of your screen.

TRADE SHOW: HOW TO CONNECT WITH SUPPLIERS

- Login to PheedLoop (received in email with your login credentials)
- Click on Exhibit Hall
- You will enter the Exhibit Hall which contains an alphabetical list of exhibitors. You can also search an exhibitor at the top and filter the exhibitors listed
- Click on the Booth you wish to visit and then get connected
- Click on the public chat on the right side of your screen to chat with the exhibitor and other delegates
- Click join live at the top of your screen and you can join booth staff in real time using video
- To chat directly with a member of the supplier team, you will see staff name(s) in the middle of the screen and press start chat
- Click ***request information*** at the top of your screen to request additional information from the exhibitor
- If you visit the exhibit hall after the conference or not during the live schedule, don't worry. You can leave a message and the supplier will respond as soon as possible.

Questions? Please reach out to CGSA staff at cgsa@golfsupers.com or 416-626-8873. Staff will also be available during the conference to answer any questions you may have and tips will be provided at the start of each day to help maximize your experience.

CGSA Conference Sponsors

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RAIN BIRD

Please note, all information included in this article was sent to print in January so please be sure to visit the conference website for the most up to date details.

In the of

J. Paul Robertson is the 2020 CGSA / Bayer Superintendent of the Year.

When J. Paul Robertson thinks back on all the Superintendent of the Year recipients before him, he is humbled. "In an industry full of exceptional professionals, outstanding local and national supporting associations, and the freedom to pursue our dreams in the greatest country in the world. What more could anyone hope for!"

Paul Robertson is the 2020 CGSA/Bayer Superintendent of the Year winner and you can see why. The degree of dedication Paul demonstrates in representing his golf club, mentoring his staff and his commitment to continuous self-improvement, passion, and initiatives to elevate the club to the highest standards are reflected in a club that is recognized as one of the top courses in the country.

Known as one of the most respected golf course superintendents in British Columbia, Paul is also known to his staff as a leader, mentor, a big thinker, someone who never asks anyone to do something he would not do, and the first to share credit. He is innovative and forward thinking and most importantly, a friend.

Paul Robertson started his career on the golf course around the age of 16, working during the summer at his hometown golf club, Melville Golf and Country Club (MGCC) in Saskatchewan. After his first year of university, he returned to MGCC to work for the summer. They had just hired a new superintendent and offered to extend Paul's work into the fall. That is when he was hooked and never looked back. Paul loved the diversity of the job. One day digging an outhouse, the next day installing a new irrigation system in house! He also liked being part of a team and the wide range of personalities that work on a golf course.

Paul was a math/science major in university and was always interested in how things work. Golf and turf management was so interesting, so technical; that is what attracted him the most. Before his first turf management program, he read every turfgrass management textbook used by every major turf program.

Paul received his Master's Degree in Business Administration and Project Management Distinctions from Penn State University, Bachelor's Degree in Horticulture and Agronomy Honours from Olds College and Associate Degree Golf and Parks Management Honours from Fairview College. He was recognized as the top student in North America and has received many awards including the CGSA Gordon Witteveen Award in 2015.

Paul started at Victoria Golf Club in January 2000 and in 2018, he became the Assistant General Manager/Superintendent and Project Manager. For the past 20 plus years Paul has brought some of the highest standards to Victoria Golf Club. He has overseen numerous capital improve-

Company my Heroes

Paul is the Assistant General Manager / Superintendent at the Victoria Golf Club, BC.

ments including course renovations and replacement of the irrigation system, and the design and construction of a new staff facility and equipment/maintenance building all designed for compliance, efficiency, and safety of operation.

Paul has hosted the Pacific Northwest Golf Association Cup (2007), the PNGA Senior Women's (2011), the Golf Canada 2014 World Junior Qualifier (2014), the PGA of Canada Championship (2016), the PGA of BC Head Professional Championship (2018), and the Canadian Mid-Amateur National Championship (2018).

When asked who his mentors are, Paul noted Chuck Dietz, the first superintendent he worked for at Melville Golf and Country Club as being one of the most influential people in his life, reflecting fondly on Chuck as the kindest, most fun person. Mike Laturnus was the superintendent at Melfort Golf Club, just up the road from St. Brieux Golf Club where Paul held his first superintendent job and was Paul's go-to for advice on everything! Paul also reflected on Guy Beatty, who was the big city superintendent at the Willows in Saskatoon and a great resource and friend over the years, and Dave Moroz who Paul met at a turfgrass short course at the University of Saskatchewan and they have been friends ever since.

Paul has served on many committees, written articles and has spoken at numerous conferences. He has dedicated hours of his time over the years with both the British Columbia Golf Superintendents Association (BCGSA) & CGSA. He served on the BCGSA board of directors and was their president for two terms in 2017 and 2018 and led the charge on the CGSA/BCGSA dual billing initiative. He has been an enormous supporter of the CGSA, and he continues to give back to our industry and so many people.

When asked what advice he would give to his younger self, Paul replied, "Have more fun. Don't take yourself too seriously, be less impressed and more connected. Have a clear picture of your definition of success, so you don't pass it along the way." His two suggestions for anyone thinking of entering this industry, "First - at the beginning of your career, say "hell yes" to everything. You never know where an opportunity will take you! Second - Education, education and more education."

"It was great reaching out to Paul to let him know he had been selected as the CGSA/Bayer Superintendent of the Year for 2020," said Lori Micucci, CGSA's Manager of Member Services. Paul's reaction was, "I'm in the company of my heroes! Thank you CGSA and Bayer, for your support, leadership, and commitment to the Golf Course Superintendent."***GM***

▶ FEATURE ▶ PAUL KOCH, PH.D., UNIVERSITY OF WISCONSIN – MADISON

Snow Mold

This article originally appeared in the August 2020 issue of Golfdom magazine (www.golfdom.com/snow-mold-strikes-again/) and is being reprinted here with their permission.

By my count, this is the 8th consecutive year I have written a snow mold article for Golfdom. Over these eight years, some things have been constants, such as the need to mix multiple active ingredients for acceptable disease control in heavy pressure environments. Other things are specific to each year, such as how minor environmental changes over a small area can lead to large changes in disease development.

This article will be much the same, certain things you have heard me say before (you need multiple actives if you're in a high-pressure area!) and others you haven't, because I haven't mentioned them. Let's take a look back at the 2019-2020 winter to help us prepare for 2020-2021.

TURF HARDENING IMPACTS SNOW MOLD RESISTANCE...A LOT

From an environmental standpoint, last fall and winter in the Midwest were drunk. An early and prolonged cold snap in October and November caused early course closures and a mad rush to blow out irrigation systems and get out snow mold applications.

In Madison, we got almost 6 inches of snow on Halloween, which made for some difficult trick-or-treating. Fast-forward to December,

Figure 1.
Snow mold pressure at our research station in Madison, WI was very high despite a relatively short window of snow cover.

Strikes Again

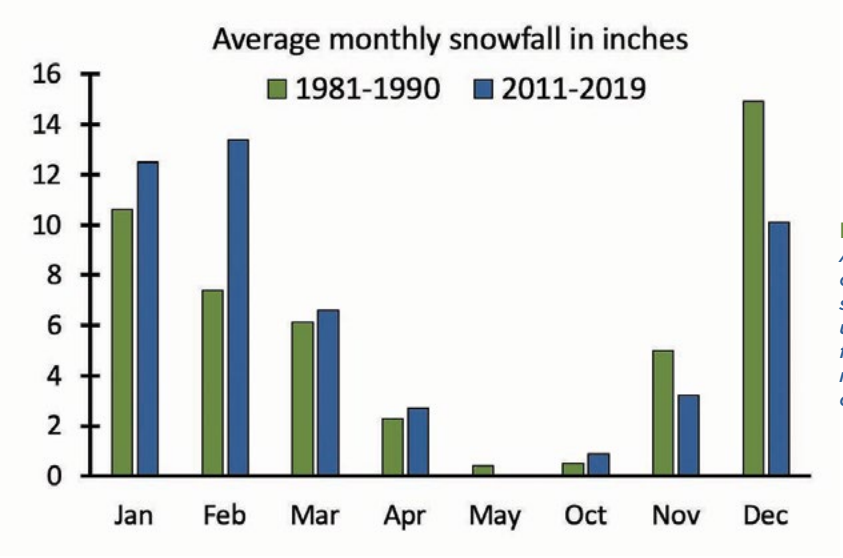


Figure 2.
Average monthly snowfall in Madison, WI has increased over the last ten years in January and February but fallen significantly in November and December. December is usually a critical time for snow mold development. The figure is taken from the website https://news.wisc.edu/new-weather-normals-show-how-madisons-climate-has-changed-over-40-years/.

and the weather felt more like September. Multiple weeks with high temperatures in the 40s and 50s culminated in a 54°F Christmas Day and a Koch household Christmas party that moved to the back patio. Winter returned on January 1st when snow fell, and it stuck until mid-March.

Discussion among superintendents in Wisconsin centered around how much snow mold would develop, and whether breakthrough would occur in treated areas. I was unsure, torn between conflicting indicators. On the one hand, there was snow on the unfrozen ground, which generally leads to lots of snow mold. On the other hand, the snow fell late, was never that deep, and barely lasted 60 days.

In the end, snow mold pressure was very high across most of Wisconsin and the upper Midwest (Figure 1). This indicated that even with a short window of snow cover, the lack of turf hardening allowed for widespread snow mold to develop on non-treated turf. Turf hardening is a complex process that allows the turf to be ready for the winter ahead and is a critical component for snow mold resistance.

Fortunately, snow mold breakthrough on treated turf was very rare, suggesting that snow mold applications made in October and November knocked back the fungal population enough so that it couldn't recover and cause disease before the snow melted in spring.

Our changing winters make it difficult to consistently predict how climate change will impact future snow mold development. Prior to this year, most of the evidence I observed suggested that climate change was resulting in later and less snow cover and less disease development (Figure 2). But, 2019-2020 showed that warmer temperatures in late fall could lead to 'dehardening' of the turf, which results in widespread snow mold development on turf that is, for lack of a better phrase, 'unprepared for winter.' How this plays out with further climate change in the years ahead will be interesting (and essential) to watch.

Figure 3.
There can be a sharp cutoff in effective snow mold control. At our research site on Timber Ridge GC in Minocqua, WI, the difference between no control and great control was just 12 days.

FUNGICIDE TIMING MATTERS

Timing of snow mold fungicide applications is something I have talked about before, but the 2019-2020 winter provided a great example of just how important it is. Applying snow mold fungicides too late (i.e., when snow is already on the ground) is bad. However, applying them too early is also bad, most likely due to a combination of product breakdown before snow cover AND the snow mold fungi not actively growing (and not taking up) the fungicide at the time of application.

But, what is too early, and how do you determine the optimal time to apply when the conditions fluctuate so much from year to year?

To investigate this, we have researched optimal snow mold fungicide timing for the past five years. The study is straightforward; we apply Instrata once at various times prior to 'expected' snow cover for that particular site and then rate how much snow mold developed on the site the following spring. The application timings are 8, 6, 4, 2, and 0 weeks before the expected snow cover.

At our research site in Minocqua, WI, in 2019-2020, the cutoff from almost no control (applied October 14th) to excellent control (applied October 26th) was only 12 days (Figure 3). The control increased dramatically over the same two application dates at research sites in Wausau in central Wisconsin and Madison in southern WI.

As part of this project, we have also researched various environmental measurements that can effectively predict the optimal timing. To date, the most effective has been 'heating degree days.' Heating degree days are the opposite of growing degree days because you set a base temperature (we use 50°F) and beginning on July 1st of each year, record how much BELOW 50°F the average daily temperature was.

From our past research, we know that increases in snow mold control are seen when fungicide applications are made at heating degree day accumulations right around 100, and that is precisely what we saw at these three sites in 2019-2020. More research is needed across more locations. Still, we know that fungicide timing is essential for snow mold control, and we're making progress on ways to predict when that optimal timing will be.

EFFECTIVE ALTERNATIVE SNOW MOLD PRODUCTS DON'T YET EXIST

There are a host of alternatives to traditional fungicides that have provided some level of efficacy against certain turf diseases. For example, iron sulfate can reduce dollar spot and phosphites are effective against Pythium blight. Even Microdochium patch that occurs in snowless areas of the Pacific Northwest and northern Europe can be controlled using combinations of iron sulfate, Civitas mineral oil, and phosphites. However, we haven't yet found an alternative product that is effective against traditional snow molds.

We have tested Civitas many times with poor results. This past winter, we tested a potential new biocontrol agent with poor results. We tested applications of iron sulfate and phosphite applied six times on a 2-week interval throughout the fall leading up to snow cover and still had poor results (Figure 4).

Figure 4.
I thought that repeatedly applying iron sulfate (Extreme Green) and potassium phosphite (Duraphite) throughout the fall would knock back the snow mold fungal population and provide significant disease control. As this photo from Timber Ridge GC in Minocqua, WI shows…I was wrong.

Figure 5.
Many treatments provide highly effective snow mold control despite really high disease pressure at our research site on Marquette GC in Marquette, MI.

The bottom line is that there remains considerable interest in developing alternative methods to control snow mold in areas where snow cover persists, but right now, those options don't exist.

MIX THOSE ACTIVE INGREDIENTS!

Every year, I talk about mixing multiple active ingredients for successful snow mold control, and our research this year once again showed how important that is. We conducted snow mold research at four sites in 2019-2020: Marquette GC in Marquette, MI; Timber Ridge GC in Minocqua, WI; Wausau CC in Wausau, WI; and the OJ Noer Turfgrass Research Facility in Madison, WI.

Snow mold pressure was high at all four sites, and in all of them, the only products that performed well were those that had mixtures of three or more active ingredients. In Marquette, the main snow mold present was speckled snow mold (Typhula ishikariensis), and the amount of disease in the non-treated control was a whopping 87.5%. In Wausau, the main snow mold present was Microdochium patch (Microdochium nivale), and the amount of disease in the non-treated control was high at 71%.

Even under these heavy disease pressures, there were plenty of treatments that provided highly effective control (Figure 5). At Marquette, there were 16 of 63 treatments that allowed less than 5% disease, and at Wausau, 28 of the 63 treatments allowed less than 1% disease to occur.

The common theme among ALL of these successful treatments is that they contained three or more active ingredients. While the specific mixtures varied, almost all of them included a DMI fungicide such as tebuconazole or propiconazole, a contact fungicide such as chlorothalonil or PCNB, and an additional active ingredient such as pyraclostrobin, azoxystrobin, or iprodione.

I strongly encourage you to view the full research results at the University of Wisconsin's Turfgrass Diagnostic Lab Fungicide Results page (https://tdl.wisc.edu/results/) and contact me with any questions you have.

In addition, I will be presenting on innovative control strategies for Dollar Spot and Snow Mold, at The Canadian Golf Course Management Conference, March 3rd at 11:10 am Eastern Standard Time. I look forward to seeing you there.

Acknowledgments

I want to acknowledge and thank my Field Research Manager, Kurt Hockemeyer, for organizing and implementing our research trials. Also, a huge thank you to the host superintendents that allow us to conduct this research and provide this great information to all of you: Craig Moore at Marquette GC, Jay Pritzl at Timber Ridge GC, and Randy Slavik and Aaron Hansen at Wausau CC. Lastly, thank you to Adjuvants Plus, AMVAC, BASF, Bayer, Belchim, FMC, Nufarm, PBI Gordon, Precision, PrimeSource, SePro, Simplot, Quali-Pro, and Syngenta for supporting this research. ***GM***

Growing and so

All the people I have introduced you to in past issues have had amazing stories of their journey into the golf industry, and this next person is no exception.

Permettez-moi de vous présenter Trevor Anderson AGS, Surintendant du Terrain du Mount Bruno Country Club à St-Bruno-de-Montarville, Québec.

Like many, Anderson got into the business due to having an interest in the game of golf. "My father was the Superintendent at Whitlock Golf and Country Club, just outside of Montreal, when I was very young." He continued, "Although my father moved on to other things before I could take an interest in what he was doing there, I was always intrigued by the fact that he had, at one point, run a golf course."

As Anderson got a little older, his interest in golf really peaked, and a job at a golf course seemed like a great way to earn a little money while also being able to enjoy some golf. "I worked as a caddie for 1 round, it was not for me, so I decided to give the maintenance side a try, and 22 years later I'm still at it."

It was at Beaconsfield Golf Club in Montreal that Trevor got his start in the industry and eventually had the opportunity to work under mentor and Master Superintendent, Doug Meyer, AGS. Trevor enrolled in the Turfgrass Management program offered at the University of Guelph and graduated in 2005 with an associate's diploma in turfgrass management.

Shortly after, Trevor continued building his resume and knowledge by working at some amazing courses along his journey in Ottawa at Kanata Golf and Country Club as well as at Club de Golf Le Fontainebleau in Montreal, before accepting his current role as Golf Course Superintendent at Mount Bruno Country Club in 2017.

Trevor rolling the fairways in the early morning light.

When asked who has influenced him the most in his career, the first name out of Trevor's mouth was Doug Meyer, MS, AGS. "I worked for Doug for many years at Beaconsfield, and without his encouragement, I would not be where I am today." Anderson continued, "He really pushed me to further my education and always gave me opportunities to learn and grow, and never held me back when it was time for me to move on."

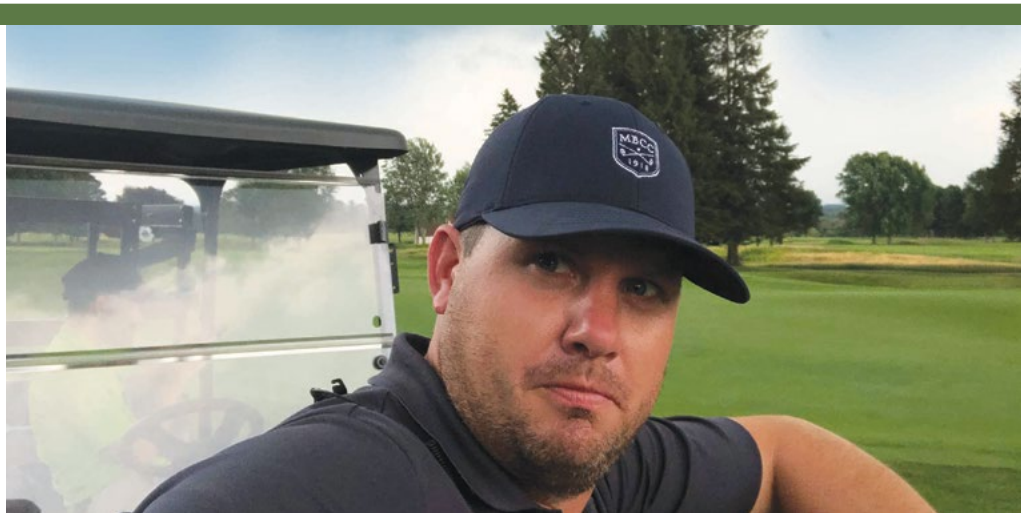
Trevor is amongst a growing list of Superintendents and/or Assistants who currently hold either their AGS, AAGS or MS designation. "The main reason for completing the AGS and eventually the MS programs is because I enjoy furthering my education and for me these designations show my commitment to this profession."

Whether you have a designation or not, we all love what we do and have our own reasons for why we are in this industry and what makes this profession so unique compared to other jobs. "The connection to the outdoors, and to the people, are things I enjoy very much about my work," he mentioned. "I also enjoy providing a product the membership can enjoy and be proud of. I love pushing the limits of what might be deemed impossible and seeing how the golf course reacts to it, and how our profession continues to evolve and place an importance on continuing to learn."

With the new technology in equipment and tools today, Trevor

Grass Much More

Trevor's German Shepherd side kick Lexi keeping an eye out for geese.



Trevor Anderson, AGS.

has also been impressed by how social media has made an impact on our industry, "The amount of information that is exchanged daily between superintendents on a platform like Twitter is incredible. I've picked up and shared so many great ideas and asked and answered so many questions that reach such a larger audience than ever before."

As we continue to educate ourselves through conferences, social media or even just a simple phone call or video chat with our peers, we have experienced an increase and awareness of our mental health and creating a proper work/life balance. Trevor found this to be one of his biggest challenges with working long hours early in his career with the idea that if we were not always working, then we were not working at all. "I won't deny that sometimes we need to work longer hours, but I have missed many important moments in life because I always felt I needed to be at work." He continued, "Our jobs at times are very demanding so it requires a really good team both at work and at home. I believe that our profession can provide an excellent lifestyle, one that I enjoy very much."

When Trevor does get away from the course, he enjoys spending time in their backyard summer oasis with his wife Alison who he has been married to for 13 years along with their 3 boys, Jacob, Logan, Lucas, and of course, his German Shepherd side kick/course goose chaser Lexi.

When asked what advice he would give to someone getting into the industry, he said, "Educate yourself, and this is not just limited to turf management education." He continued, "Growing grass is only a part of what superintendents do today. Learn about business, finance, human resources, meteorology, whatever it is, and take the time to learn all the aspects of the course operation, including, mechanics, irrigation, horticulture, and building maintenance. Do not strictly focus on agronomy."

And, Trevor's final words of advice, "Go experience different courses and different operations. If I had one regret about my career path it's that I didn't take advantage of these world-class internships that are available. I think our industry can afford you the ability to see some incredible parts of the world and learn from so many great professionals, so take advantage."***GM***