Sports Turf Manager

FOR BETTER, SAFER SPORTS TURF. SUMMER 2014. VOL. 27. NO. 2.

Rolling With the Cool Kids

Nick Binder, Michigan State University

If you really think about it, you could say that athletic fields are the cool kids of turf management. People will drive for hours, pay hundreds of dollars and brave the worst weather conditions imaginable, just to get a seat as close to them as possible. National and international television broadcasts are fixated on them for hours at a time. Heck, athletic fields have even been showing up fashionably late to the turfgrass management party for decades.

Taking a quick look at the methods used to manage both athletic fields and golf course greens, it is rather easy to pick up on the similarities. When you glance a little closer, you'll find that virtually every one of these methods was originally honed by golf course superintendents across the world and then, typically years later, adopted by sports field managers everywhere. Tactics such as stripe mowing, applying sand topdressing, and core cultivation were at one time unique to putting green management and have since become commonplace on virtually every competition athletic field in the world; and because of it, the quality of those fields has improved dramatically!

"So who's showing up next to the party?"

One common management technique used daily (and sometimes more) by managers of golf course greens is routine lightweight rolling. Although it has yet to gain similar popularity in athletic field maintenance, it is a cultural practice used in managing turf that dates back as far as the 18th century on golf courses. Since this time, and particularly in the last quarter century, routine lightweight rolling has become an essential tool for golf courses. Research has proven that frequent and consistent rolling can provide a faster (smoother) putting surface, along with many other benefits that may not seem quite as obvious (and we'll discuss those a little later).

Although used on occasion during special circumstances, such as alleviating frost heaving or as a part of seeding/sodding projects, a roller is yet to become an everyday piece of equipment on a sports field. A rare field manager might swear by the benefits he or she gets from the consistent use of a lightweight roller, but it is definitely the exception rather than the rule.

Since we're on the topic of cool kids, I thought: Who's funnier, more popular, and just plain cooler than David Letterman? So why not use a Top 10 list to examine whether lightweight rolling might be the next cultural practice that began in golf to become a staple on athletic fields?

Let's take a look at the 2014 Canadian International Turfgrass Conference & Trade Show presentation given by Dr. Thom Nikolai of Michigan State University on his Top 10 Reasons to Roll Course Greens.

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Inside Features

Sports Turf Manager
Volume 27, Issue 2, ISSN 1201-3765

is the official publication of
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SPORTS TURF MANAGER
is published quarterly by Sports Turf Canada for free distribution to its membership. An annual subscription may be obtained for $129/year. Please direct advertising inquiries to Lee Huether at the STA office.

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CANADA POST PUBLICATIONS MAIL SALES AGREEMENT No. 40031883

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President's Desk

BY TENNESSEE PROPEDO

Well it looks like summer has finally arrived in Ontario after the winter that would not go away, but here at Sports Turf Canada things are happening at lightning speed. This past winter has proven to be a challenge for everyone in the turf Industry with winterkill being the number one problem for both the Sports Field Manager and the Golf Course Superintendent. In this month's magazine Dr. Peter Landschoot outlines the four types of winterkill, and our good friend Pam Charbonneau writes in detail about how the effects of this extended winter have played havoc locally on our fields in Ontario, and on our profession. Also in this month's edition we discuss the cultural practice of rolling athletic fields for a flat, even surface and improvement of playability.

I am pleased to announce that Ray Stukas is the recipient of our very first Sports Manager of the Year award. Ray has more than 30 years experience in parks operations and maintenance including turf management involving sports fields. He is well respected by all of his peers in the turf industry for his dedication and determination in providing safe playing fields not only for the citizens of Toronto but for all of the people who have ever played outdoor sports in "the big smoke". The nomination deadline for the 2015 award is December 1; it's not too early to consider and identify your nominee and start to gather information today!

We are also in the midst of adjudication for the prestigious R.W. Sheard Scholarship which is available to students who are enrolled in and have completed two semesters of education in a post-secondary program in turf management at a recognized college or university in Canada or, have completed the University of Guelph's Turf Managers' Short Course, or equivalent, in the current year, and have a desire to pursue a career in the sports turf industry.

Mark your calendars to join us on September 18 at Cutten Fields in Guelph for our 27th annual Ontario Fall Sports Turf Training Day where we will proudly honour both Ray and our scholarship winner with their awards plus enjoy a day of turf education and networking. Our strategic partners, the Western Turfgrass Association, are scheduling similar events this summer. Check our Events Calendar online at SportsTurfCanada.com for all the details as they become available.

Sports Turf Manager

FOR BETTER, SAFER SPORTS TURF. SUMMER 2014.

"We don't accomplish anything in this world alone... whatever happens is the result of the whole tapestry of one's life and all the weavings of individual threads from one to another that creates something." ~ Sandra Day O'Connor

SPORTS TURF CANADA

WHAT'S ONLINE

SportsTurfCanada.com

Your email address must be registered with us to log-in to the Members Only Section of our website.

Sports Turf Manager is Indexed In tgif turfgrass information file

281,781 pdf views in 2013!

Inside this issue...

REGULAR COLUMNS, DEPARTMENTS & SMALL FEATURES

Deadline for Autumn 2014 Sports Turf Manager: September 5

Rolling With the Cool Kids

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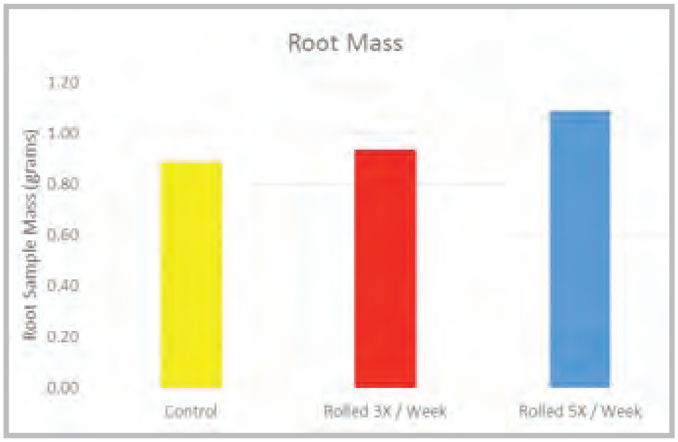

Fig. 1.

10. Alleviate heaving and minimize scalping when climactic conditions dictate
Nikolai talks about the freeze/thaw cycles contributing to uneven surfaces on golf course greens, and it certainly applies to athletic fields as well. This is undoubtedly the current most common reason for rolling athletic fields. Rolling not only helps to smooth out a bumpy playing surface but it can also protect against scalping during the first spring mowing.

9. Seed bed preparation
This is another reason that rolling logically translates from golf to athletic fields, where it is certainly time well spent when prepping a site for establishment by seed. In addition, rolling immediately after seeding is a great way to ensure that you achieve the all-important seed-to-soil contact required for germination and nutrient uptake. Similar benefits from rolling can also be seen when establishing an athletic field by sod. Lightweight rolling after sod installation can help create consistent contact between the soil and roots of the new turfgrass.

8. Broadleaf weed, moss, and algae reduction
Although moss and algae tend not to be as big of a problem on an athletic field as on a low mown putting green, broadleaf weeds certainly are a common menace. Dr. Nikolai's Top 10 list hypothesizes that an increased turf density could help to outcompete unwanted pests such as dandelions and white clover. This could be especially beneficial for managers of school athletic fields who are required to use little to no chemical herbicides.

7. Decreased localized dry spot
Research has shown that rolled putting greens experienced less localized dry spot, while the soil samples showed that the rolled plots retained more moisture and had greater root mass than those that were not. On an athletic field, the impact of increased root mass from rolling would be even more meaningful than on a golf course due to its positive effect on turf stability and, ultimately, athlete safety. Preliminary data from an athletic field rolling study at Michigan State University (Fig. 1) shows that rolling athletic fields five times per week may potentially increase root mass of a Kentucky bluegrass field maintained at 2.5 cm. More evidence needs to be seen to draw any conclusions on this and it is being evaluated further.

6. Height of cut raised and green speed retained
Ongoing athletic field research at Michigan State University also shows promising results regarding the possibility of routine rolling yielding a smoother, faster surface, just as it has on golf course greens. A soccer field gauge, which is essentially soccer's version of a golf Stimpmeter which measures green speed, was used to determine surface smoothness. Plots rolled five times per week were found to be faster than plots that were not rolled (Fig. 2). The thought of being able to create a surface that plays quicker, and more importantly is smoother and more consistent, would have the attention of athletes and coaches in such sports as soccer, baseball, lacrosse, and more.

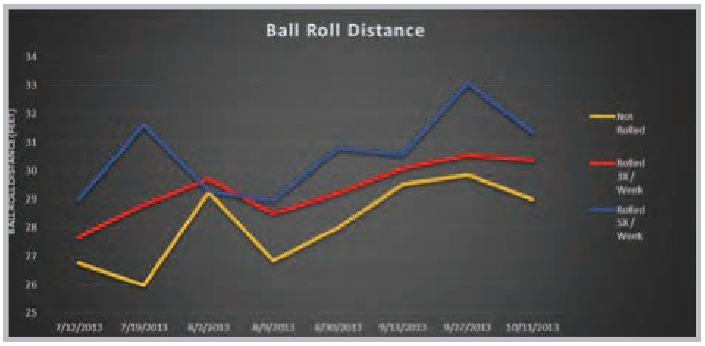

Fig. 2.

5. Decreased cutworm activity – maybe!
Cutworms do their damage by feeding on roots and shoots of a turfgrass stand. This damage is much more evident and devastating at lower cutting heights, such as on putting greens, but can even become a problem on grass that is cut at home lawn height (7-10 cm). Anecdotal evidence indicates rolling may decrease cut worm activity on golf course greens and thus lead to a healthier, stronger rooted turf.

4. Improved topdressing incorporation
As indicated earlier, topdressing is one of the many cultural practices that athletic field management has adopted from the golf course industry. Sand topdressing needs to be incorporated into the root zone allowing it to serve its intended purpose beneath the canopy. No

research has been performed specifically with athletic field rolling, but vibratory rolling after topdressing has been proven to be better for working the sand into the soil profile. Performing your athletic field rolling following a topdressing application might very well add one more benefit.

3. Decreased dollar spot

One of the most impressive findings amongst the vast amount of research on rolling greens is the continued observation of decreased incidence of dollar spot. With the reason for this phenomenon being rather involved and somewhat intangible, the translation of this benefit to an athletic field setting currently stands at "to be determined" due to the current lack of dollar spot for athletic field rolling.

2. It's the economy (rolling/mowing frequency programs)

Cost savings analyses of greens rolling have focused on a rolling/mowing trade off in which labour, fuel, and maintenance costs are all considered. Alternating rolling and mowing, as opposed to mowing every day, is said to save time and money (both fuel and maintenance costs), while also improving wear tolerance and yielding similar green speeds. If comparable conditions can be replicated with this method on athletic fields, these cost savings could certainly be seen. This tactic could be particularly valuable on fields that do not receive play on a daily basis, and thus may not require a fresh mowing as often.

1. Increased customer satisfaction

The customer of a golf course, the golfer, is satisfied by many of the same things as the customer of an athletic field, the athlete. Both desire a smooth and consistent surface that will allow them to direct their concern toward their own performance rather than that of the turf. Routine lightweight rolling has been proven, through research and application, to help give golf course customers what they want. There is definitely some evidence that rolling can deliver the same to athletes.

Now with all these potential benefits, what has prevented the majority of groundskeepers and field managers from joining the rolling revolution seen in golf over the last 20+ years? Just as was once the case in golf turf management, the concern that detrimental effects caused by consistent rolling will negate, or even eclipse, its benefits has caused many sports field managers to balk at the idea.

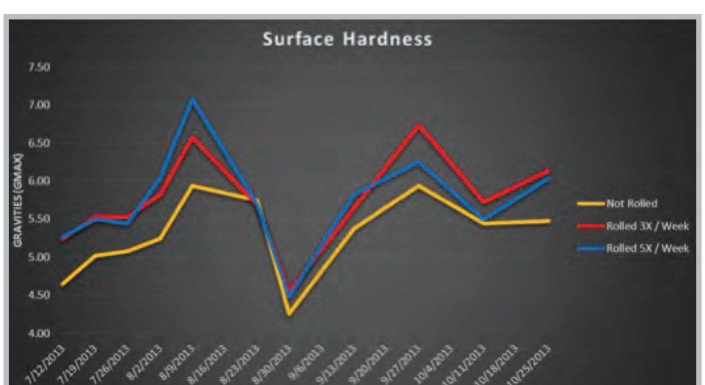

Fig. 3.

Certainly the number one concern with consistent rolling of athletic fields is the potential for compaction, and rightfully so. A compacted field can create an unhealthy turf stand, as well as create poor drainage and fields that are unplayable during any type of rainfall. Surface hardness (a measure of compaction) is being observed closely in all athletic field rolling studies at Michigan State University. To date, there has been no statistical evidence of any significant compaction (Fig. 3), however if a field manager chooses to implement a routine rolling program, he/she should do so with caution. Compaction is greatest when forces are applied to the wet ground, especially on fields with high silt/clay content and rolling should never be done on saturated soil. Additionally, on any field where frequent rolling occurs, regular core cultivation/aeration should also be done to counteract any potential compaction that may happen over time.

Furthermore, rolling should be done with extreme caution during potential periods of stress on the turf. Rolling during drought, heat, cold, or disease stress will only intensify or spread the negative effects incurred during these harsh conditions.

Overall, the evidence to support rolling golf course greens is strong and rarely debated. However, there currently just seems to not be enough research and experience for most athletic field managers to follow their superintendent counterparts in this practice. Early research is beginning to show that routine rolling of athletic fields is worth looking into, with more research and in every day practice. Only then will we get the chance to see this cultural practice roll through the door, fashionably late. •

New & Returning Members

British Columbia
Tim Roberts
District of Oak Bay, Victoria, BC

Duane Sharpe
Brett Young, Maple Ridge, BC

Jason Horton
District of Mission, BC

Derek Jazic
Resort Municipality of Whistler, BC

Saskatchewan
Darren Harris
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Steve Brake
Town of Ajax, ON

Barbara Rabicki
Town of Markham, ON

Jim Lennox
James B. Lennox & Associates
Ottawa, ON

Eckhard Pastrick
Danny O'Hearn
City of Waterloo, ON

Quebec
Paul Caron
Carpell Surfaces Inc.
Granby, QC

Event Calendar

August 17-24
International Symposium on Turfgrass Management and Science for Sports Fields
Part of the International Horticultural Congress
Brisbane, Australia
www.ihc2014.org/symposium_29.html

August 18
Ontario Turfgrass Research Foundation Fundraising Golf Tournament
Mississauga, ON
www.otrf.ca

September 18
Sports Turf Canada
27th Annual Ontario Sports Turf Training Day
Cutten Fields, Guelph, ON
SportsTurfCanada.com

December 1
Sports Turf Canada
Sports Turf Manager of the Year Award
Nomination Deadling
SportsTurfCanada.com/Awards&Scholarship

Sports Turf Canada Announces 2014 Sports Turf Manager of the Year

Sports Turf Canada is pleased to announce that Ray Stukas is the 2014 Sports Turf Manager of the Year.

The Sports Turf Manager of the Year award is a prestigious honour which recognizes an individual's professional ability and contribution to the Canadian sports turf industry and shows appreciation for his or her proactive and progressive efforts within the profession.

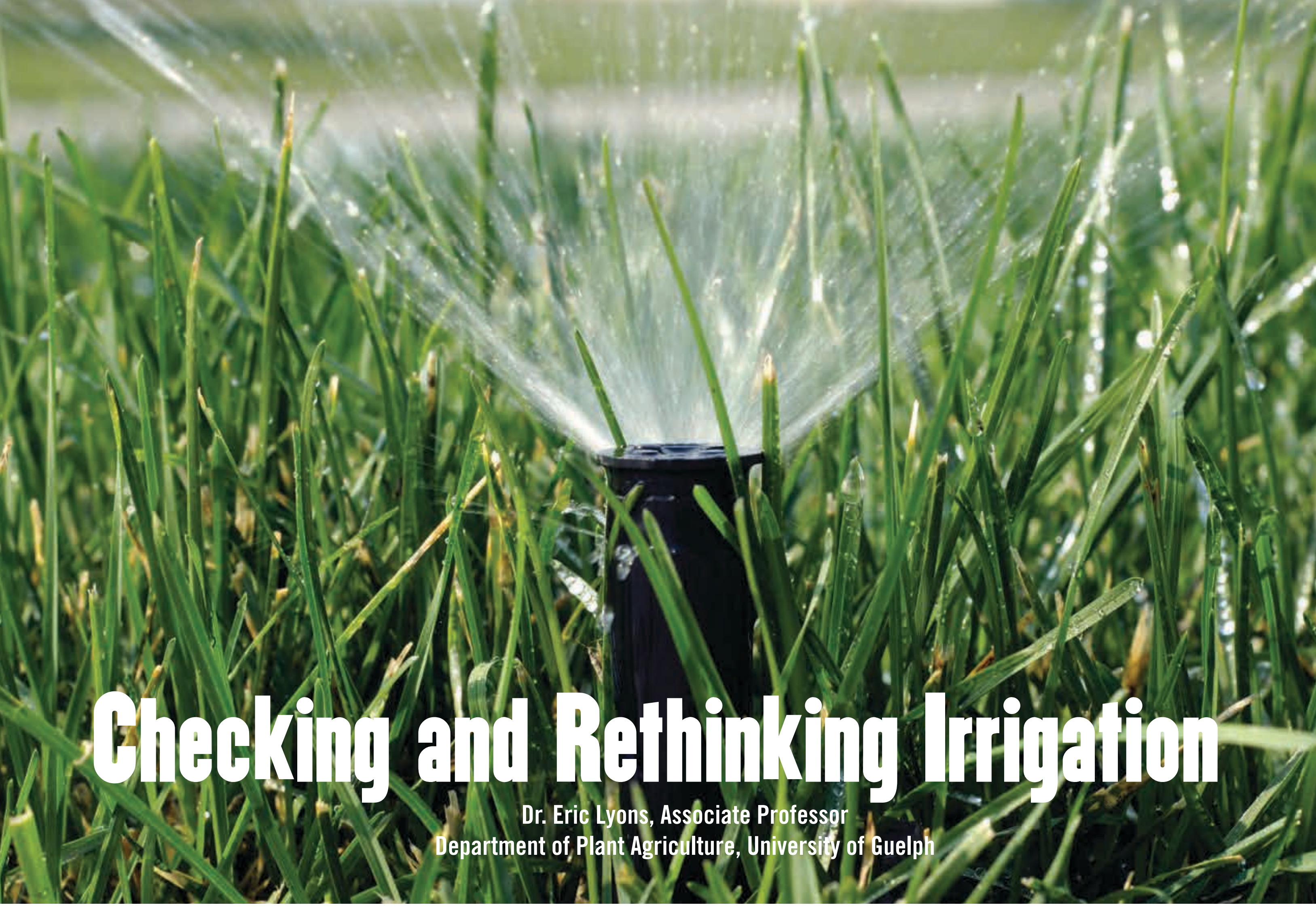
Mr. Stukas is Manager of Parks, Toronto & East York District, for the City of Toronto, Ontario. With over 30 years experience in parks operations and maintenance including turf management involving sports fields, Ray, in 2012 and into 2013, served in the leadership role organizing Toronto's new Outdoor Sports Field Improvement Program addressing more than 650 sports fields across the city. Communication with sports field stakeholders city wide was also guided by Ray and involved 16 public meetings that discussed permit issues, capital planning for field upgrades and field maintenance.

"With the leadership and commitment displayed by Ray Stukas in the areas of community consultation, public engagement and best practice initiatives, among others, we are pleased to honour him as the inaugural Sports Turf Manager of the Year," announced association president Tennessee Propedo.

By sponsoring this award, the Guelph Turfgrass Institute assists in the recognition of sports turf managers who exemplify vision and leadership in the sports turf industry. "The GTI is honoured to partner with Sports Turf Canada in the creation of this award that will help promote and recognize outstanding sports turf managers in Canada", added GTI director Rob Witherspoon.

The nomination deadline for the 2015 Sports Turf Manager of the Year is December 1, 2014. Visit SportsTurfCanada.com for eligibility, criteria and the nomination form. •

GTI GUELPH TURFGRASS INSTITUTE



Checking and Rethinking Irrigation

Dr. Eric Lyons, Associate Professor
Department of Plant Agriculture, University of Guelph

July is the typically a peak month for outdoor water use so it makes sense to spend some extra time checking your irrigation system and rethinking your irrigation practices. Irrigation is a valuable tool in maintaining safe, playable sports fields and proper irrigation practices will extend the environmental sustainability of sports fields within our communities.

Prioritize Irrigated Areas

Not all fields get the same amount of use and not all irrigation systems need to be run on the same cycle. Soil based fields on natural root zones often can be irrigated less frequently than fields with constructed sand root zones. Where fields with minimal play, or park lawn areas are also irrigated make sure they are on their own schedule so that you are not using a resource where it is not needed. Finally the grass variety on the field can impact how often it needs to be irrigated. Spend the time this month to evaluate each irrigated field individually to determine the maximum time between irrigation events to preserve water.

Irrigation Runoff

One of the greatest losses of water during outdoor water use is applying water at a rate that exceeds infiltration into the soil. This leads to runoff and over watering of low areas of a crowned field and under watering the crown. Consider breaking the irrigation cycle into three equal segments split by two 20-minute soak in periods. This allows for irrigation water to infiltrate and allows watering deeper and less frequently throughout dry periods.

Determine Irrigation Needs Efficiently

Rather than just setting the irrigation system to water once per week use field observations or climatic data to determine irrigation needs. This will help you justify your irrigation budget and use water more efficiently. It will also let you know when to skip a planned irrigation event because of sufficient rainfall.

Check Your System

Take the time to check the system and make sure all the heads are functioning properly. Make sure that they are aligned in the right directions. Make sure the system is running at the proper pressure and the pump is checked and up to date with its service. Check the programs on the controller and make sure there are no ghost programs running without your knowledge. Finally make sure the rain sensor shut offs are functioning.

Irrigation systems need to be monitored and maintained on a regular basis but use the month of July to spend some extra time thinking about your irrigation system and practices as this month is the peak for outdoor water use. •

Canada is ready to welcome the world!

Canada is proud to host two major international women's soccer competitions. The FIFA U-20 Women's World Cup Canada 2014 and the FIFA Women's World Cup Canada 2015™ .

The FIFA U-20 Women's World Cup Canada 2014 will be held in Edmonton, Alberta; Toronto, Ontario; Montreal, Quebec; and Moncton, New Brunswick from August 5 to 24, 2014.

The FIFA Women's World Cup Canada 2015™ will take place in Vancouver, British Columbia; Edmonton, Alberta; Winnipeg, Manitoba; Ottawa, Ontario; Montreal, Quebec; and Moncton, New Brunswick from June 6 to July 5, 2015.

Held every four years, the FIFA Women's World Cup™ is one of the world's premier women's sport events. In fact, Canada 2015 will be the largest women's single sport competition ever held. •

Source: Canadian Heritage pch.gc.ca

GLOSSARY OF SYNTHETIC TURF TERMS

Editor's Note: At one of our recent professional development courses a participant suggested emphasizing the basics with more information on terminology. In anticipation of the launch of our Synthetic Sports Turf Field Safety and Maintenance Course we begin with the Synthetic Turf Council's Glossary of Turfgrass Terms for Synthetic Turf. Check our Events Calendar online at www.SportsTurfCanada.com for course details as they become available.

Adhesive
Industrial adhesives, products not found in home supply stores, are used to bond synthetic turf seams and inserts, and, in some applications, a total glue down of the synthetic turf to the base. Synthetic turf adhesives should be applied by experienced, professional installers. The adhesives should provide a strong, hazard-free, and durable bond between adjacent turf panels or sections and to be usable for installation under variable weather conditions. The adhesive should also be resistant to water, fungus, and mildew. Synthetic turf adhesives include: one-part adhesives (urethane), two-part (epoxy or urethane), hot melt, and water-based (latex).

Base Materials (or Aggregate Base)
– Construction & installation

The aggregate base on which the synthetic turf is installed provides a structurally sound foundation for field construction, and a media for drainage of the field. The base is designed to ensure that once the field is in place, it never moves. A good geotechnical report will provide essential information for a firm and stable base for the synthetic turf.

Antimicrobial — *Additive*
An agent that kills microbes. Can be effective on bacteria and/or fungi. Can be applied topically or embedded in fiber or infill.

Antistatic Properties – *Turf*
Resisting the tendency to produce annoying static electric shocks in situations where friction of the foot tread builds up static in low-humidity conditions.

ASTM – *Standards organization*
The American Society for Testing and Materials. An international standards organization that develops and publishes voluntary consensus technical standards for a wide range of materials, products, systems, and services.

Backing
Materials comprising the back of the turf, as opposed to the turf or face. The adhesive backing refers to the urethane or latex coating. Turf backing refers to the stabilizing fabrics that are used to secure the fiber tufts.

Ball-Surface Interaction – *Performance*
Ball-surface interaction describes the performance characteristics of the field that relate to the ways in which the ball reacts to the surface. It is important that the ball perform as close as possible to the optimal performance characteristics for the sport or sports being played on the field. Therefore, measurements of vertical ball rebound, angled ball rebound, and ball roll, are taken to compare against the published standards of the regulatory organization(s) applicable to each sport.

Brushing (or Grooming) – *Maintenance*
Periodic brushing or grooming of the synthetic turf surface by a static (non-rotary) double brush is important to redistribute the infill evenly throughout the field, ensure that the exposed part of the fiber is uniform in its direction and is vertical, and helps remove litter, leaves, etc. The brushing activities should conform to the written maintenance guidelines provided by the installation company.

Cleaning – *Maintenance*
The periodic use of a vacuum, sweeper or blower should be applied to keep the synthetic surface clean. This equipment should be compatible with synthetic turf fields. This typically means wider tires and softer nylon type brushes. The cleaning activities should conform to the written maintenance suggested guidelines provided by the synthetic installation builder.

Collection – *Resource recovery (ASTM D7209)*
Logistical process of moving (plastics) waste from its source to a place where it can be recovered.

Compaction – *Construction & Installation*
The field base materials should be thoroughly compacted to prevent any significant differential settlement across the area of synthetic turf surfacing. The appropriate moisture content must be maintained in the base materials to allow for optimal levels of compaction. Compaction can also mean an unwanted condition of the infill. De-compacting the infill using special maintenance equipment will improve drainage, g-max, safety, and playability.

Contaminant – *Resource Recovery (ASTM D7209)*
Unwanted substance or material defined according to the intended use.

Crumb Rubber and Coated Rubber Infill
Crumb rubber is derived from scrap car and truck tires that are ground up and recycled. Two types of crumb rubber infill exist: ambient and cryogenic. Together these make up the most widely used infill in the synthetic sports field and landscape market. Crumb rubber infill is substantially metal free, and, according to the STC Guidelines for Crumb Rubber Infill, should not contain liberated fiber in an amount that exceeds .01% of the total weight of crumb rubber, or .6 lbs. per ton.

Coated rubber: Both ambient and cryogenic rubber can be coated with colourants, sealers, or anti-microbial substances if desired. Coated rubber provides additional aesthetic appeal, reduction of dust by products during the manufacturing process and complete encapsulation of the rubber particle.

Density – *Turf*
The amount of pile fiber in the turf and the closeness of the tufts.

Drainage System – *Construction & Installation*
An efficient and effective underground drainage system is an integral component of a synthetic turf system, and is designed to carry away the water that percolates through the turf. The system chosen will depend on the use of the field, climate, amount of rainfall and other factors.

Durability – *Performance*

Durability describes the performance characteristic of the field that relates to the resistance of the synthetic turf system to wear and tear, and the environment. This characteristic is established by testing for such things as abrasion resistance, joint strength, tuft bind, and climatic resistance to uv, water, and heat.

Edge Anchoring – *Construction & Installation*

Edge anchoring is the system that is designed to be installed at the perimeter of the field to attach to the synthetic turf, anchor it, and transition to whatever abuts the field, such as a running track. The anchor may consist of a concrete curb, a treated wood nailer, a composite material or a trench drain. These may vary by design and region, but should always provide a secure anchor.

Elastic Layer Pad (E-layer)

Construction & Installation

Elastic layers (E-layers) are poured in-place *(in situ)* pads and must be installed by specialty contractors. They are completely permeable and are typically comprised of rubber granulate and polyurethane binder. E-layers can vary in thickness (typically 19, 25 or 35 mm) and do not have seams typical of other resilient underlayments. These pads are more expensive than rubber, foam or panel shock attenuation systems however, budget allowing, they offer the most consistent surface planarity as well as the most permanent base available for safe g-max levels over the lifecycle of multiple surfaces.

Energy Recovery – *Resource Recovery (ASTM D7209)*

Use of combustible waste as a means to generate energy through direct incineration with or without other waste but with recovery of the heat. Forms of energy recovery include incineration and gasification. Gasification is considered to be more efficient and cleaner.

Environmental Impact

– Resource Recovery (ASTM D7209)

Any change to the environment, whether adverse or beneficial, wholly or partially, resulting from an organization's activities or products.

EPDM Infill – *Infill*

EPDM (ethylene propylene diene monomer) is a polymer elastomer with high resistance to abrasion and wear and will not change its solid form under high temperatures. Typical EPDM colours are green and tan. EPDM has proven its durability as an infill product in all types of climates. Its excellent elasticity properties and resistance to atmospheric and chemical agents provide a stable, high performance infill product.

Face Weight – *Turf*

The total weight of the yarn/fiber tufted into the backing.

Fiber

Typically, the fiber used in synthetic turf is textured and/or non-textured polypropylene, polyethylene, nylon, or other suitable performing hybrid or copolymer in tape form or monofilament. Minimum fiber sizes are 50 microns for polypropylene or polyester, 100 microns for tape form (slit film) polyethylene, 140-300 form monofilament polyethylene (shape dependent), and 500 denier for nylon. Fibers should be compliant with ASTM guideline for total lead content.

Fiber Size – *Fiber*

Refers to the denier per filament (DPF) or thickness of a filament. Fiber size impacts resilience, performance and wear.

FIFA – *Sport Governing Body*

The Fédération Internationale de Football Association (International Federation of Association Football) is the international governing body of association football (soccer). FIFA dictates design and performance characteristics required for FIFA approved soccer fields.

G-Max – *Testing*

A field's level of shock absorbency is tested by using a unit of measurement called the g-max, where one "g" represents a single unit of gravity. The peak acceleration reached upon impact of two objects, such as a football player and the synthetic turf surface, is the maximum number of g's a field is able to absorb. A field with a higher g-max level loses its ability to absorb the force – and places more impact on the athlete during a collision, while a surface with a lower g-max absorbs more force, lessening the impact to the athlete. Using ASTM F1936 test method, g-max readings shall not exceed 200 at each test point. With proper maintenance, a synthetic turf field should have a g-max of well below 200. The g-max guideline in the STC's Guidelines for Synthetic Turf Performance is "below 165" for the life of the synthetic turf field.

Industrial Rework (also known as Post-Industrial Material) – *Resource Recovery (ASTM D7209)*

Rework generated by a different company or manufacturing plant from the company or manufacturing plant producing the products to this specification and the composition is known by the industrial source of material.

Irrigation – *Construction & Installation*

Sprinklers and irrigation systems are used for cooling and control of static electricity and dust in synthetic turf systems.

Landfill – *Resource Recovery (ASTM D7209)*

Waste disposal site for the deposit of waste onto or into land under controlled or regulated conditions.

Lines and Markings – *Construction & Installation*

Lines and markings, such as sport specific game lines, logos, and numbers, should be applied to the synthetic turf surface in one of three methods: with coloured fiber that is either tufted or knitted into the synthetic turf panels during the manufacturing process, installed as inlays, or with temporary or permanent paint that is approved for use on synthetic turf surfaces. Tufted-in or inlaid lines and markings are a permanent part of the surface. Painted lines and markings installed with either permanent or temporary paint require maintenance. Even permanently painted lines require additional paint on a periodic basis.

Maintenance

Maintaining a synthetic turf field is essential for optimum appearance, safety, playing performance, and field longevity. A regular schedule of maintenance should include surface cleaning, debris removal, grooming, and infill redistribution and de-compaction. The maintenance procedures and equipment, as specified by the synthetic turf systems builder and required for the system, should be evaluated during the selection process so that the appropriate budget resources for manpower and equipment may be allocated. Note: Refer to the Synthetic Turf Council's Suggested Guidelines for the Maintenance of Infilled Synthetic Turf Surfaces, April 2007, for additional information.

Maintenance Log – *Maintenance*

A maintenance log should be kept to record the maintenance performed on the field as recommended by the field builder.

Material Recovery – *Resource Recovery (ASTM D7209)*

Material processing operations including mechanical recycling, feedstock (chemical) recycling, and organic recycling, but excluding energy recovery. See also Recovery.

Nylon – *Fiber*

A petrochemical-based fiber invented in 1938. There are two basic types of nylon: Type 6,6 nylon and Type 6 nylon. Nylon is the dominant fiber choice for commercial carpet use due to its wear characteristics.

Organic Infill – *Infill*

There are several organic infills available in the North American market, all utilizing different organic components, such as natural cork and/or ground fibers from the outside shell of the coconut. These products can be utilized in professional sports applications as well as for landscaping. At the end of its life cycle it can be recycled directly into the environment.

Pad (also known as Shock Pad)

– Construction & Installation

Shock attenuation pads offer an added level of protection and consistent playability to the playing surface and are designed to contribute to a safe g-max level throughout a synthetic turf field's life. Roll out or panel systems are relatively economical and offer ease of installation. Pads can be permeable or impermeable. Some can replace all or portions of the stone base and provide both shock attenuation and drainage, while others are used in combination with a traditional stone and drainage base. Pads can be placed directly over asphalt or cement stabilized surfaces. Provided care is taken in the turf install/removal process, some last more than one turf lifecycle. Some pads are made from recycled materials, while others are made from virgin materials and may be recyclable.

Perforations – *Turf*

For synthetic turf systems designed to be permeable to water, a system with a fully coated secondary backing will typically have holes punched into the backing at regular internals to provide adequate vertical drainage throughout the system.

Performance Evaluation of Synthetic Turf

– Testing

There are three basic categories that define the overall performance of a synthetic turf sports field: ball/surface interaction, player/surface interaction, and durability. Refer to the specific category for its definition.

Permeability – *Construction & Installation*

Synthetic turf and the base on which it is installed is usually designed to allow for water to percolate through it so that there is no standing water on the surface. Water permeability rates for both the field's surfacing and the field base materials should be designed to accommodate the local weather and rainfall patterns.

Pigment – *Fiber*

Highly coloured and insoluble, coloured pigments are added to polymer to create coloured fiber.

Pile – *Turf*

The visible surface of turf, consisting of yarn tufts. Sometimes called the face or nap.

Pile Height – *Turf*

The length of the tufts measured from the primary backing top surface to their tips. Pile tufts should be gently extended but not stretched during accurate measurement. This specification is expressed in fractions of an inch or decimal fractions of an inch in the U.S.

Pile Weight – *Turf*

The weight in ounces of the fiber in a square yard of turf.

Plastics Recycling – *Resource Recovery (ASTM D7209)*

Process by which plastic materials or products that would otherwise become solid waste are collected, processed, and returned to use in plastic products that have fulfilled their intended purpose or can no longer be used.

Plastics Waste – *Resource Recovery (ASTM D7209)*

Any plastics material or object that the holder discards, or intends to discard, or is required to discard.

Player-Surface Interaction – *Performance*

Player-surface interaction describes the performance characteristics of the field that relate to footing, shock absorbency, surface abrasion, and surface stability, for example. These characteristics are determined through testing for vertical deformation, force reduction, traction, slip resistance, energy restitution, abrasiveness, among others. Proper shoe selection is a critical component to the way a player interacts with the playing surface.

Polyethylene – *Fiber*

A polymer of ethylene, the same material that is used in plastic bags.

Polymer – *Fiber*

Polymers are large chemical molecules from which synthetic fibers, synthetic infill and backing systems are made. Polymers are complex, chain-like macromolecules which are made by uniting simpler molecules called monomers. Synthetic polymers used for synthetic turf fiber include Type 6 nylon (polyamides), polyethylene and polypropylene.

Polypropylene – *Fiber, Backing*

A polymer of propylene, the same material that is frequently used in packaging.

Polyurethane – *Backing*

A polymer of a diisocyanate and usually a polyol. When reacted these materials form a urethane.

Post-Consumer Material

– Resource Recovery (ASTM D7209)

Plastics material, generated by the end users of products that has fulfilled its intended purpose or can no longer be used, this includes material returned from within the distribution chain. Post-consumer material is part of the broader category of recovered material.

Post-Industrial Material

– Resource Recovery (ASTM D7209)

Plastics waste generated by a manufacturer. See Industrial Rework.

Post-Installation Testing – *Testing*

After installation, a field should be tested periodically to record its g-max, and other safety and performance values, to determine if and what remedial maintenance is required. A schedule for on-going testing should be included and understood by the parties. Seams and inlays should be regularly inspected and repaired, as needed.

Primary Backing – *Backing*

The primary backing materials are of a woven or non-woven fabric in one or more layers which are utilized in the tufting process, or of high strength polyester multi-filament fiber utilized in the knitting process. This backing material provides the initial dimensional stability for the system.

Recovered Material

— Resource Recovery (ASTM D7209)

(Plastics) materials and by-products that have been separated, diverted, or removed from the solid waste stream, but not including those materials and by-products generated from the reused within an original manufacturing process. This definition includes post-consumer and post-industrial material only, whether or not plastic material has been commingled, reprocessed, reground or reconstituted.

Recovery – *Resource Recovery (ASTM D7209)*

Processing of (plastics) waste material for the original purpose or for other purposes including energy recovery.

Recyclate – *Resource Recovery (ASTM D7209)*

Plastic material resulting from the recycling of plastics.

Recycled Content – *Resource Recovery (ASTM D7209)*

Percentage by weight of recyclate in a material or product.

Recycled Plastic – *Resource Recovery (ASTM D7209)*

See Recyclate.

Recycling – *Resource Recovery (ASTM D7209)*

Processing (plastics) waste materials in a manufacturing process for the original purpose or for other purposes, but excluding energy recovery.

Regrind – *Resource Recovery (ASTM D7209)*

Recovered plastics material reclaimed by shredding and granulating recovered material.

Resource Recover – *Resource Recovery (ASTM D7209)*

Recovery of material or energy.

Reuse – *Resource Recovery (ASTM D7209)*

Use of a product more than once in its original form.

Sand (Silica) and Coated Silica Sand Infill

– Infill

Pure silica sand is one of the original infilling materials utilized in synthetic turf. This product is a natural infill that is non-toxic, chemically stable and fracture resistant. Silica sand infills are typically tan, off-tan or white in colour and – depending upon plant location – may be round or sub-round in particle shape. As a natural product there is no possibility of heavy metals, and the dust/turbidity rating is less than 100. It can be used in conjunction with many other infills on the market to provide a safe and more realistic playing surface. The round shape plays an integral part in the synthetic turf system. It is important that silica sand have a high purity (greater than 90 %) to resist crushing and absorption of bacteria and other field contaminants. Silica sand can either be coated with different materials as a standalone product or can be used to firm up in combination with traditional crumb rubber infill systems.

Coated Silica Sand. This class of infill consists of coated, high-purity silica sand with either a soft or rigid coating specifically engineered for synthetic turf. These coatings are either elastomeric or acrylic in nature (non-toxic) and form a bond with the sand grain sealing it from bacteria to provide superior performance and durability over the life of a field. Coated sand is available in various sizes to meet the application's needs.

Depending on the amount and type of infill, coated sands can either be used with or without a pad and are available in various colours. All of the coatings are non-toxic and are bonded to the quartz grain for superior performance and durability over the life of your field. These materials are typically used as a homogenous infill which provides both ballast and shock absorbing qualities to a synthetic turf application.

Seam – *Construction & Installation*
Synthetic turf materials are manufactured in panels or rolls that are usually 15 feet wide. Each panel or roll should be attached to the next with a seam to form the fabric of the field. Seams should be glued with a supplemental backing material or sewn with high strength sewing thread. The bonding or fastening of all system material components should provide a permanent, tight, secure, and hazard-free athletic playing surface. Seam gaps should be uniform. For tufted infill systems the gap between the fibers should not exceed the gauge of the tufting.

Seaming Tape – *Construction & Installation*
Seaming tape is commonly used for seams and/or inlaid lines and markings. The tape is comprised of a fabric that should be installed below the backing material on both sides of a seam or inlay. The fabric used for seaming tape should provide dimensional strength and enough surface texture to bond well with the adhesive.

Seam Repair – *Maintenance*
Seams that open or become loose may require some immediate and temporary gluing until they can be inspected and corrected by the installation builder. The gluing should conform to the written maintenance suggested guidelines provided by the synthetic turf vendor.

Secondary Backing – *Backing*
The secondary backing materials are applied through a coating process with a single or multiple applications of one or various materials. A tufted fabric typically receives a suitable coating of polyurethane, latex, hot melt, or other coatings or fabrics in various weight and thickness configurations, depending on individual system design. The secondary backing provides an additional level of tuft bind and structural integrity to the synthetic turf.

Shock Pad – *Construction & Installation*
See Pad.

Shredding – *Resource Recovery (ASTM D7209)*
Any mechanical process by which plastics waste is fragmented into irregular pieces of any dimension or shape.

Synthetic Fiber – *Fiber*
Produced by man-made means, not available in nature in the same form.

TPE Infill
Thermo plastic elastomer (TPE) infill is non-toxic, heavy metal free, available in a variety of colours that resist fading, very long lasting, and 100% recyclable and reusable as infill when the field is replaced. TPE infill, when utilizing virgin-based resins, will offer consistent performance and excellent G-Max over a wide temperature range.

Tuft – *Turf*
A cluster of yarns drawn through a fabric and projecting from the surface in the form of cut yarns.

Tuft Bind – *Testing*
The force (usually measured in pounds) required to pull a tuft from the turf backing. Also known as tuft lock.

Urethane – *Backing*
Polyurethane. A polymeric resin applied as an adhesive backing. This backing encapsulates the yarn for extra tuft bind.

Virgin Plastic – *Resource Recovery (ASTM D7209)*
Material in the form of pellets, granules, powder, floc, or liquid that has not been subjected to use or processing other than that required for its initial manufacture.

Warranty
Warranties for the synthetic turf field systems should be clearly understood and may include the following:

- Acceptable uses for the field
- Expected number of yearly hours of use of the field
- Type of shoes used
- Fading
- Colour match within specifications
- Excessive fiber wear
- Acceptable loss of pile height over time
- Wrinkling and panel movement
- Shock absorbency (g-max)
- Seam integrity
- Drainage
- Response time for required repairs or replacement
- Other items deemed relevant

Waste – *Resource Recovery (ASTM D7209)*
Any substance or object that the holder discards or intends or is required to discard.

Yarn – *Fiber*
A continuous strand of fibers used in tufting, weaving and bonding to form turf and other fabrics.

Yarn Weight – *Turf*
The total weight of the yarn in the turf. Also commonly referred to as Face Weight and/or Pile Weight.

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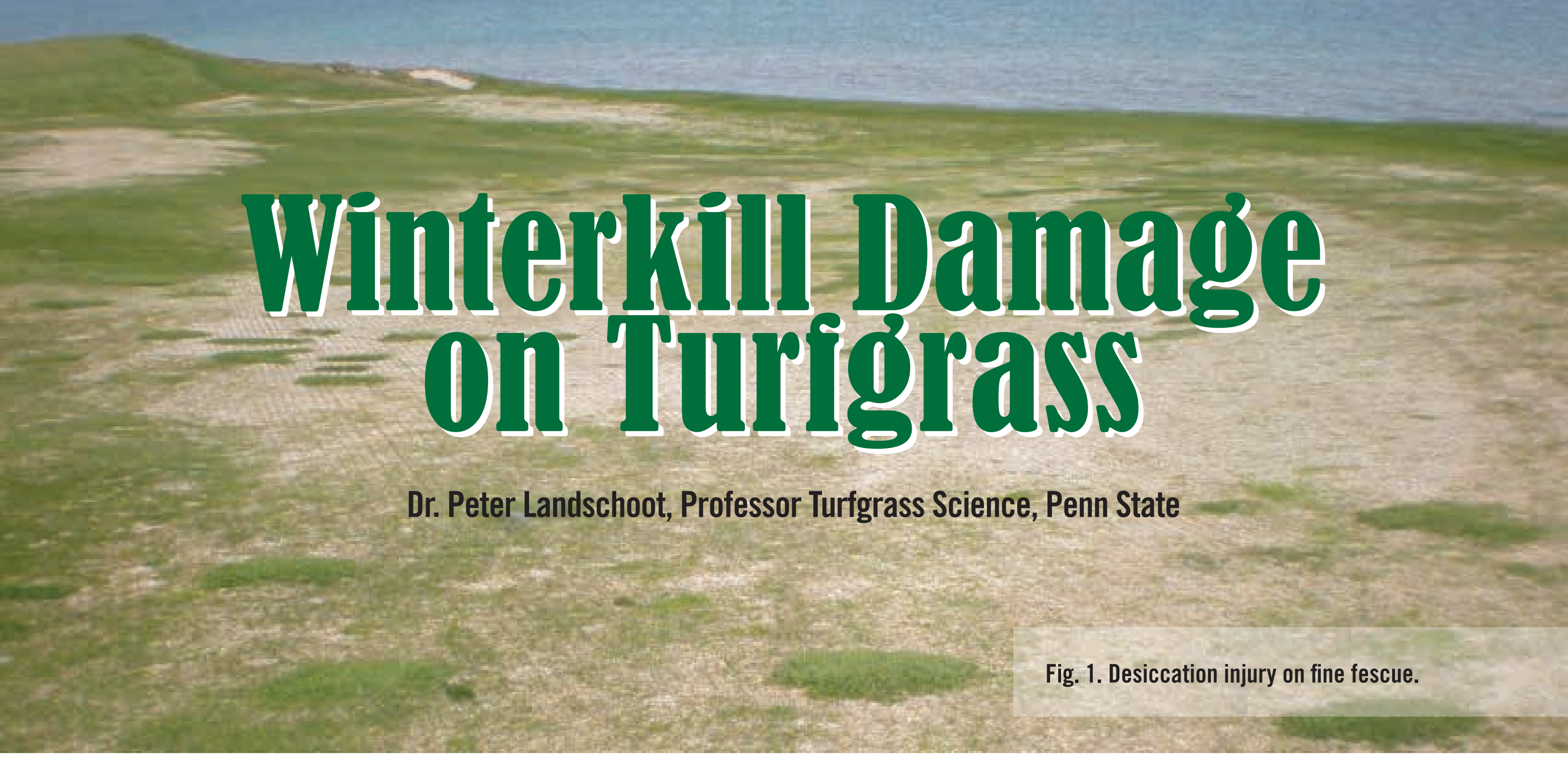
SPORTS TURF CANADA



Winterkill Damage on Turfgrass

Dr. Peter Landschoot, Professor Turfgrass Science, Penn State

Fig. 1. Desiccation injury on fine fescue.

Winterkill is a generic term used to describe death of turfgrasses during the winter months, and can be caused by abiotic factors and/or disease. The four types of abiotic winterkill observed in the northern United States include desiccation, direct low temperature kill, ice encasement, and crown hydration.

Desiccation

Desiccation occurs when turf is unprotected by snow cover and subject to drying cold winds for extended periods during the winter. Under these conditions, the exposed turf can lose significant moisture in crown tissues (where new roots, leaves, and stems are produced), resulting in death of the plant. This type of damage is most frequently observed on susceptible species growing on elevated sites exposed to prevailing winds. Desiccation is most common on annual bluegrass putting greens, but can also occur on golf course fairways, lawns, and sports turf. All cool-season turfgrasses can suffer from winter desiccation injury.

Preventative measures to reduce winter desiccation include heavy sand topdressing applications in late fall, fabric covers, and various types of wind screens around sensitive areas.

Direct Low Temperature Kill

Turfgrasses can sometimes be damaged by a phenomenon known as direct low temperature kill. This type of winterkill occurs during extremely cold temperatures early in the winter following a relatively warm period in late fall. Typically, plant tissues undergo a dehydration process in late fall in response to gradually decreasing temperatures and shorter photoperiods. The dehydration process is accompanied by an increase in cellular solutes (potassium ions, sugars, etc.), allowing the plants to "harden off" or tolerate freezing temperatures. Warm weather during late fall can delay the hardening process and allow plants to become susceptible to ice formation in crown tissues with the advent of sudden and dramatic drop in temperatures.

Fig. 2. Direct low temperature kill on a new stand of perennial ryegrass.

Although direct low temperature kill is difficult to prevent, measures that may help protect plants include avoiding excess nitrogen fertilization in mid fall before plants begin to harden off, and seeding susceptible species early enough in late summer/fall so that they have time to mature and develop an ability to acclimate to cold temperatures later in the season.

Ice Encasement

Turf death due to ice encasement occurs when a thick covering of ice over turf causes a reduction in gas exchange between ice-encased turf and the atmosphere. As the semi-dormant turf under the ice continues to respire, oxygen is depleted and a buildup of toxic gasses such as carbon dioxide, butanol, and ethyl butyrate occurs. Oxygen depletion and toxic gasses can kill turf when thick ice coverings last for weeks or months during the winter.

The thickness of ice, duration of encasement, grass species, and condition of turf under the ice all dictate the degree of damage that will occur. Therefore, predicting damage based on the number of days that ice covers turf is not reliable. Nevertheless, some authors suggest removing substantial ice layers from annual bluegrass and perennial ryegrass after 30 - 45 days. Creeping bentgrass can withstand longer periods under ice than annual bluegrass.

Various measures have been employed to reduce damage due to ice encasement. One preventive measure used in northern climates with regular episodes of winterkill includes covering putting greens with semipermeable covers, then adding insulating layers of straw, and covering the straw with impermeable covers. Whereas this method is somewhat effective, it is labour intensive and often not practical in areas where winterkill occurs only once in 10 or 20 years. In Pennsylvania, it's more common to remove ice from putting greens using dark-coloured melting agents, such as black sand or Milorganite fertilizer; or with aerators, hand tools, and small tractors equipped with scraping or lifting accessories. Due to the possibility of turf damage, extreme care must be used when attempting to remove ice from putting green surfaces.

Crown Hydration

Crown hydration is the most common and destructive type of abiotic winter injury, and usually occurs in late winter following periods of thawing and freezing. During late February and March, temperatures often rise above freezing for a few days at a time. When this happens, some turfgrasses (most notably annual bluegrass and perennial ryegrass) begin to deharden and crowns become hydrated. If a rapid freezing event follows the thaw, ice forms inside the crowns of hydrated turfgrasses and either ruptures cell membranes (when ice forms inside of cells), or draws moisture out of cells (when ice crystals form between cells).

Crown hydration injury is most pronounced on turfgrasses growing in depressions and poorly-drained soils. During warming periods in late winter, surface soil temperatures rise and some thawing takes place. However, soil remains frozen beneath the surface and water does not drain from depressions. As water from thawed snow and ice collects in depressions, turf residing in these areas becomes super-hydrated. When water refreezes during a rapid and dramatic drop in temperature, these super-hydrated plants are killed.

Crown hydration events are impossible to predict, and there is very little turf managers can do to prevent these situations. The best way to reduce crown hydration problems is to avoid practices that force susceptible plants into early emergence from winter dormancy, and to employ measures that improve surface drainage on sensitive sites.

Assessing Recovery From Winterkill

Sometimes an area of grass will appear dead, but many plants still possess viable crown tissues. Turfgrass managers can assess recovery potential by taking plugs of damaged turf and placing these in a warm, well-lighted area for several days or weeks to determine if regrowth occurs. Just because a few tillers emerge from the plugs does not necessarily mean the turf will fully recover, but this method can help turf managers decide on whether reseeding will be required. •

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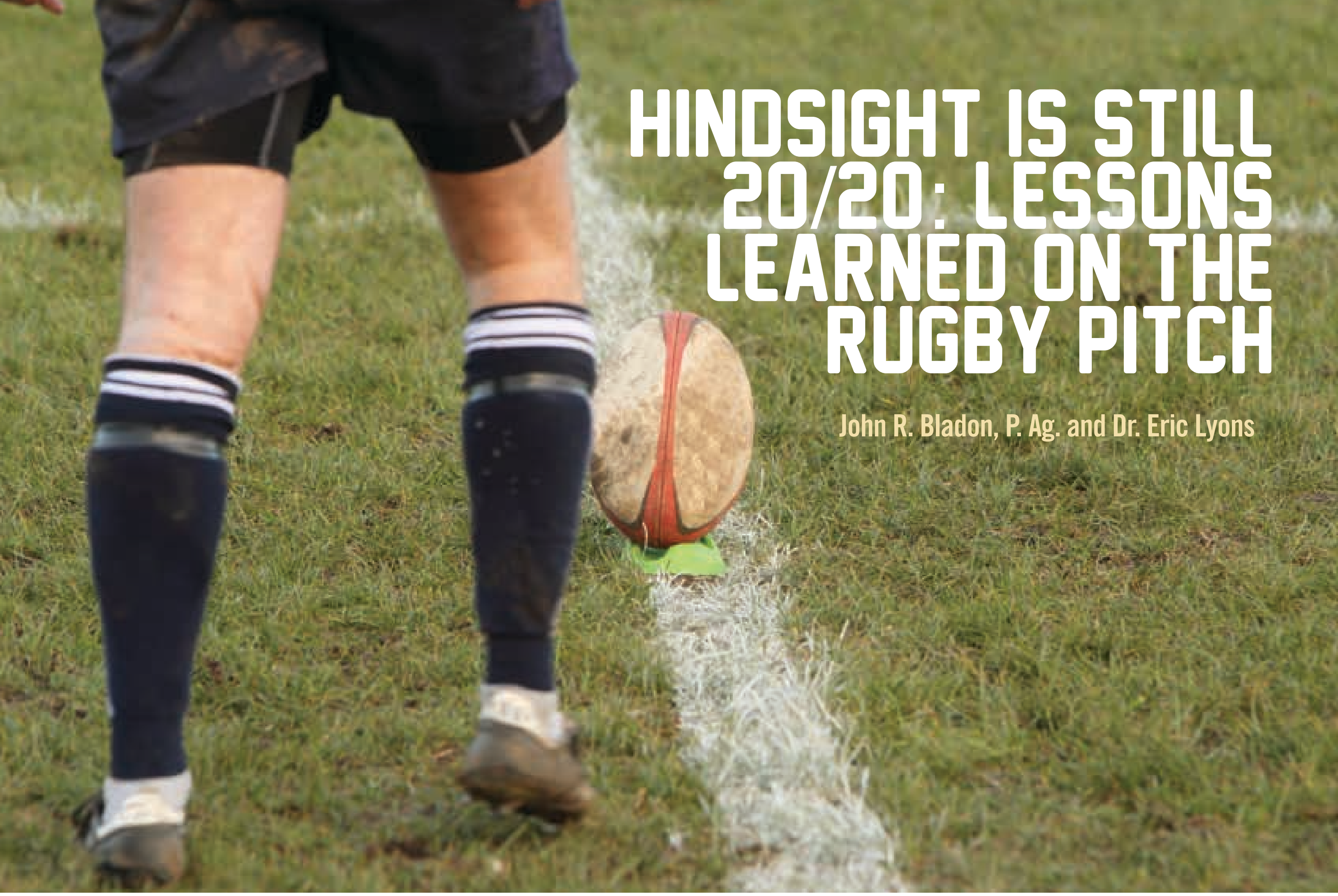
Fig. 3. Crown hydration damage on annual bluegrass putting green. Green patches are creeping bentgrass.



HINDSIGHT IS STILL 20/20: LESSONS LEARNED ON THE RUGBY PITCH

John R. Bladon, P. Ag. and Dr. Eric Lyons

Introduction

As projects or any management process goes from the planning stages, to execution and to the final phases toward completion, there is always an element of risk to the successful completion of the project. Each element of the project opens the door for a potential breakdown in either work processes or communications. This requires the stakeholders involved to make compromises from the original goal. In the end, ensuring all stakeholders have a clear vision of the project from launch to completion is vital to the success of any project and minimizes the potential for conflict and in turn, a less than ideal result.

The purpose of this article is to summarize the elements of a presentation given by John Bladon, Bill Clausen and Eric Lyons at the 2014 Ontario Turfgrass Symposium. The presentation reviewed the lessons learned during a recent natural sports turf project undertaken at the University of Guelph. The presentation discussed the roles of each of the various stakeholders and provided insight into the role of quality control or quality assurance in the completion of any project and how quality control can have a proactive effect on project outcomes and goals.

The Project: An Overview

Project planning began in 2010. The student-funded project encompassed the area just south of Alumni House for the construction of two artificial turf fields and one natural turf field for utilization by the rugby teams at the University of Guelph. Construction of the artificial surfaces was executed in 2011 and successfully completed by August of that same year. Construction of the natural surface was executed in 2011 and completed in the spring of 2012 with a planned opening for competition set in the fall of 2012. The three key stakeholders were the client – the University of Guelph; Stantec – engaged to oversee architecture, project management and project specifications, and Wilco – the general construction contractor. The goal for the natural turf portion of the project was to produce a “Category 2” field as outlined by the STA (now Sports Turf Canada) “Athletic Field Construction Manual” and Wilco satisfied the requirements laid out in the tender documentation. By Victoria Day weekend of 2012, issues with the performance of the constructed field were noticed on campus as the surface was completely saturated and mowing was impossible due to the wet conditions. The stakeholders continued to convene at the site throughout the months that followed and attempted to diagnose and resolve issues with the field performance through a variety of investigative and cultural techniques. In addition to the potential issues with the root zone materials, the original design included some features traditionally not included in constructed root zones. Unfortunately, efforts to increase water infiltration via hollow tine aeration and deep tine aeration and to disrupt the landscape fabric failed to alleviate the problems. At this point, Bill Clausen contacted John Bladon of The Chimera Group and Dr. Eric Lyons, both partners in the Canadian Turfgrass Advisory Group (CTAG), to walk the surface and assess the issues with the field performance. This initiated a discussion about an audit for the University, providing a scientific framework for why the field had failed and create scenarios for the remediation of the problem in a manner acceptable to all stakeholders.

The Audit: Insight, Observations and Data

The audit process was initiated with the stakeholders gathering on the field for a site review and a question and answer investigative session with CTAG. Following the site review and Q & A, Bladon and Lyons began the process of gathering observations and samples from the site. Irrigation water, soil samples (chemical analysis) and complete cores (physical analysis) were all gathered and copies of the specifications for construction were acquired from the stakeholders. After only a few steps, it was immediately evident that the discolouration of the field was due to the lack of drainage and therefore, a lack of oxygen. Waterlogged symptoms were being exacerbated by elevated thatch levels and in some areas, the initial stages of black layer were observed within the upper rootzone. Black layer is caused by microbial action under anoxic conditions and is a symptom of poorly draining root zones. It was clear that either drainage was fully compromised or the root zone was not functioning up to the standards that were outlined in the tender documentation. Natural turf sports fields are subjected to intense traffic under all types of weather and soil moisture conditions. Professional sports turf managers must confront the requirement for a high performing field that will endure exhaustive athletic competition while being used during any weather condition imaginable. A sports field must also provide firm footing, adequate cushioning on impact and shear resistance during play. It must also drain well and resist the compacting

Particle Size Analysis

% Gravel	0.0%
% Sand	95.4%
% Silt	3.7%
% Clay	0.9%

Sand Sieve Size Analysis (ASTM F-1632-03)

Gravel (> 2 mm)	0.0%
Very Coarse Sand (2.0 - 1.0 mm)	0.6%
Coarse Sand (1.0 - 0.5 mm)	9.3%
Medium Sand (0.5 - 0.25 mm)	37.6%
Fine Sand (0.25 - 0.15 mm)	29.6%
Very Fine Sand (0.15 - 0.05 mm)	18.3%
Silt (0.05 - 0.002 mm)	3.7%
Clay (< 0.002 mm)	0.9%

Particle Size Analysis

% Gravel	0.2%
% Sand	95.6%
% Silt	3.2%
% Clay	1.0%

Sand Sieve Size Analysis (ASTM F-1632-03)

Gravel (> 2 mm)	0.2%
Very Coarse Sand (2.0 - 1.0 mm)	1.3%
Coarse Sand (1.0 - 0.5 mm)	13.1%
Medium Sand (0.5 - 0.25 mm)	53.0%
Fine Sand (0.25 - 0.15 mm)	21.6%
Very Fine Sand (0.15 - 0.05 mm)	6.6%
Silt (0.05 - 0.002 mm)	3.2%
Clay (< 0.002 mm)	1.0%

Fig. 3. Example of how material fractions can vary greatly in spite of similar textural (sand, silt and clay) analysis. The upper material had a saturated hydraulic conductivity of 50 cm/hour while the bottom one measured 18.8 cm/hour.

Fig. 1. The field the day of the audit; immediately upon entering the site, the discolouration of the surface was evident suggesting either the possibility of a nutrient deficiency or anoxia (oxygen deprivation).

Fig. 2. Upper left: thatch levels exceeding 50 mm, upper right: diffuse black layer, lower left: irrigation valve box holding water, lower right: water squishing underfoot.

effects of severe traffic. The foundation of the high performing field lies in the proper selection of the root zone material. Sports fields developed on native soils with high silt and clay content often have increased stability but typically drain poorly and the quality of the playing surface quickly declines during and following rainfall events. As silt, clay and very fine sand (0.053 mm – 0.150 mm) content within a constructed root zone rises, saturated hydraulic conductivity typically rapidly declines.

The specifications for a "Category 2" field were utilized for project planning and construction. Per section 5.5.1 (a) of the STA's "Athletic Field Construction Manual" regarding root zone material, the manual suggests the following:

Soil Analysis – The root zone material shall be a well structured top soil containing less than 25% silt plus clay and greater than 3% organic matter in the natural state. The percentage of silt plus clay shall be verified by particle size analysis prior to construction or delivery to the site. The soil should contain less than 5% carbonates to ensure significant subsoil has not been incorporated in the top soil during stripping.

Laboratory results of the particle size distribution testing confirmed 77% sand, 13% silt and 10% clay for a combined total of 23% silt plus clay and therefore the Category 2 specifications being met with regard to maximum silt and clay content. However, a closer inspection of the sand portion of the matrix revealed that it failed to be well structured in terms of sand based root zones. A breakdown of the sand portion of the mixture revealed the presence of 50% very fine sand (0.053 mm – 0.150 mm) within this fraction and this, when combined with the 23% silt plus clay, created a root zone that failed and was unacceptable based on its inability to drain properly. Further analysis of the performance of the root zone was conducted including a saturated hydraulic conductivity test to establish and benchmark the ability of water to move through the matrix. The test reinforced a poorly performing root zone by only allowing 0.19 cm/hour of flow.

Constructed root zones are inherently different than native topsoil fields with high sand content. In order to ensure a constructed root zone will drain properly, the amount of fines within the matrix must be appropriately minimized. Generally, sands containing more fine particles can be used but only when minimal silt and clay are present. The root zone materials, like those used for this project, with an abundance of fine and very fine sand particles, silt, and clay, will not drain and cause issues with performance like the drainage characteristics observed while on this site. In order to confirm a field's root zone is "well structured" and the appropriate balance between sand fractions, silt, and clay, a saturated hydraulic conductivity test (from a lab independent of the supplier) should be performed as part of quality control and general project due diligence. When the reconstruction process was initiated, specifications were also based on performance of the root zone not only on the sand, silt, and clay fractions. In addition, a rigid quality control process was put in place to ensure all materials met specifications and would ensure a successful end result.

Conclusions

Although it is important to minimize the risks associated with any project, it is equally important to be able to resolve conflicts as they arise once a project has been initiated. Clearly, one of the lessons learned on the rugby pitch last year was that a number of potential issues can be proactively averted by establishing open communications and rigid quality controls prior to a project starting. Additionally, engaging an independent group of experts at the earliest possible interval to ensure specifications are appropriate and quality controls are executed to the mutual benefit of all stakeholders, can pay clear dividends on any project.

Finally, in this situation, it must be noted that it was the diligent efforts of Bill Clausen, working on behalf of the University of Guelph, who brought all the stakeholders together to resolve a significant conflict. Because of his efforts and a spirit of cooperation amongst all the stakeholders, everyone came together and pushed on towards a resolution and a common goal in spite of that conflict. Many lessons were learned through this process but the greatest lessons come when positives come from the resolution of negative situations. •

Looking Back at Winter 2014

Pam Charbonneau, OMAF Turfgrass Specialist

Fig. 1. Dead areas of annual bluegrass on an irrigated soccer field.

Dr. Pete Landschoot, Penn State University, has done a thorough job of covering off all of the possible types of winter injury that turf can succumb to. In this article there will be an attempt to give some "local knowledge" to highlight the types of winter injury we experienced here in Ontario, with a focus on sports fields in the southwestern part of the province.

Unless you have been living under a rock or in a foreign country, you know that last winter was hard on turfgrass survival in Ontario, especially on golf course putting greens. Other turf areas such as sports fields did not fare as badly, but they didn't come through unscathed either.

Winter Injury Was Species Dependent

The two species that suffered the most injury were annual bluegrass and perennial ryegrass, but for different reasons. Annual bluegrass has two weaknesses when it comes to winter survival. It has many other weaknesses because of poor wear tolerance, susceptibility to diseases, poor drought tolerance, etc. which are good topics for future articles. Back to winter survival, annual bluegrass does not do well when it is covered with a layer of ice. What happens under the layer of ice is described by Dr. Landschoot. In Canada, we actually call this phenomenon of turf death due to ice encasement "anoxia". This term was used by Dr. Julie Dionne who did some of the pivotal research work on what happens to golf course greens under snow and ice. This is a fairly accurate term because the turfgrass plants under the ice are using up all of the oxygen leading to a low amount of oxygen which is the definition of the word anoxia.

Where do we see a preponderance of annual bluegrass? Many of the irrigated sports fields that we visit are becoming overrun with this weedy grass species. This could be an indication that irrigation scheduling is too frequent, not giving the fields a chance to dry out completely and promoting the invasion of this shallow-rooted, compaction tolerant, water loving grass species (Fig. 1).

The other species that did not survive well last winter was perennial ryegrass. This is the backbone species of most sports field overseeding programs because of its ability to germinate quickly and tolerate traffic. Its weakness is its lack of winterhardiness. Perennial ryegrass is susceptible to crown hydration injury. This happens in the early spring when we get frequent freeze/thaw cycles. Again, this type of winter injury is described well in the article by Dr. Landschoot. The perennial ryegrass plants that are particularly susceptible are those in low lying areas that are poorly drained where water will change from water to ice when the temperatures fluctuate. This type of injury can also occur with annual bluegrass as well, making it doubly susceptible to winter injury. Perennial ryegrass winter injury was observed this spring on sports fields that had successful overseeding programs, but that had areas of poor drainage (Fig. 2 and 3).

Guelph Turfgrass Institute Research Plots

Over the past two seasons we have been evaluating creeping types of perennial ryegrass and tall fescue to assess their drought tolerance, ability to resist weed invasion and their suitability for use on home lawns and sports fields in Ontario. This winter was fortuitous. We were able to gather some very interesting data on how these spreading types of these two species survive a very icy, extremely cold and extremely long Ontario winter.

Our observations this spring were that the tall fescue fared much better than the perennial ryegrass in trials that were seeded in the fall 2011 and the fall 2012. The chart (Fig. 4) summarizes the amount of dead turf averaged over the grass

Fig. 2. Dead areas of perennial ryegrass in heavily overseeded areas.

Fig. 3. A close up of dead grass plants.

species using point quadrat data from a spring assessment on May 22, 2014. The cultivars from the 2011 trial were:

- RPR: Regenerative Perennial Ryegrass, Barenbrug
- RTF: Rhizomatous Tall Fescue, Barenbrug
- HLM: home lawn mix (50% Kentucky bluegrass, 30% fine fescues and 20% perennial ryegrass), Quality Seed.

The RPR plots had roughly 44.5% dead turfgrass plants compared to the RTF with 18.5%. The HLM had significantly fewer dead turfgrass plants (1%).

The spreading perennial ryegrass and tall fescue trial that was seeded in 2012 had the following species:

- Natural Knit Perennial Ryegrass, Ledeboer
- Regenerative Perennial Ryegrass, Barenbrug
- Natural Knit Tall Fescue, Ledeboer
- Water Star® Tall Fescue, Lawn Life
- Rhizomatous Tall Fescue, Barenbrug
- Home Lawn Mix (50% Kentucky bluegrass, 30% fine fescues and 20% perennial ryegrass), Quality Seed.

Overall there was more winter injury in the 2012 trial than the 2011 trial. The Natural Knit Perennial Ryegrass plots had 60% dead turfgrass plants, the RPR had 43% which were significantly different from each other. All of the others were statistically the same (Water Star Tall Fescue, Natural Knit Tall Fescue, Rhizomatous Tall Fescue and the Home Lawn Mix).

It is unfortunate that these trials did not have conventional perennial ryegrass to compare with the creeping types, but the border edges of the trials were seeded to a conventional perennial ryegrass cultivar and those areas also sustained extensive damage from crown hydration.

The winter injury that the plots sustained over the 2013/2014 winter resulted in very thin stands of these turfgrass species. This can be seen as a problem or an opportunity to evaluate the spreading ability of these turfgrasses over the 2014 growing season and these results will be available by December 2014.

The loss of annual bluegrass from winter injury can also be seen as an opportunity for ridding your sports fields of this weedy grass and aggressively overseeding with perennial ryegrass. What also could be considered is the use of tall fescue in an overseeding program. It has some of the same characteristics of perennial ryegrass – wear tolerance, fairly rapid establishment but is much more drought tolerant than perennial ryegrass. Seeing what we saw this winter with the better winter survival from tall fescue compared with perennial ryegrass, a switch in overseeding species could lead to better sports field playing surfaces. •

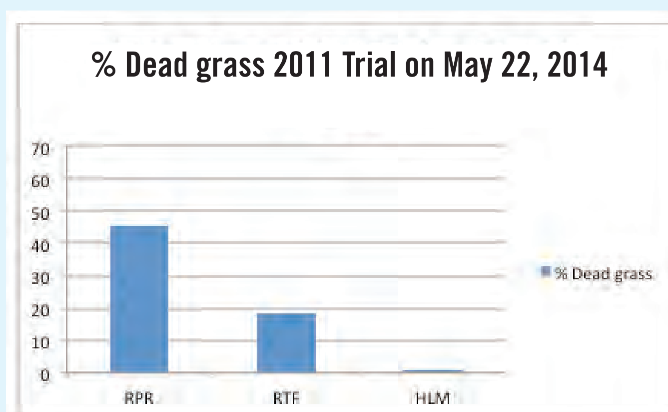
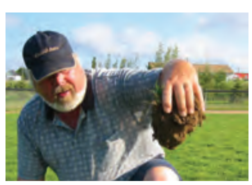
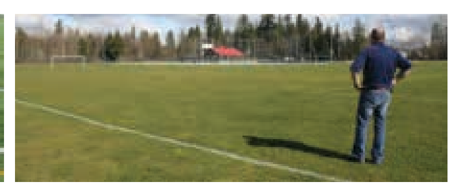


Fig. 4. Percent dead grass 2011 trial on May 22, 2014.

Fig. 5. Percent dead grass 2012 trial on May 22, 2014.

The heart of better, safer sports turf field management.



Sports Turf Canada Members are:

- MUNICIPALITIES
- SCHOOLS
- COMMUNITY COLLEGES
- UNIVERSITIES
- RESEARCHERS
- LANDSCAPE ARCHITECTS
- CONTRACTORS
- INDUSTRY SUPPLIERS
- AND MANY, MANY MORE...

Sports Turf Canada provides members with:

- A dedicated organization of experts
- The promotion of quality, safe sports turf across Canada
- A commitment to constantly improving our association to serve our members and our partners
- Environmental stewardship – we value sports turf and its impact on the environment
- A commitment to sports turf through ongoing educational opportunities, resources and the support of research
- Regular communication through ***Sports Turf Manager*** magazine, enews and website

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