

Sports Turf Manager

FOR BETTER, SAFER SPORTS TURF. AUTUMN 2013. VOL. 26. NO. 3.

Sports Turf Managers Must Address the Challenges of a Diverse Sport Loving Population

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

Canada is a diverse country with a long history of sport and involvement in athletics. Too often when categorizing Canadian sports, the popular opinion is that hockey dominates the Canadian sporting culture. While this is true when speaking about spectator sports, other sports are very significant when participation in a sport is taken into account.

Despite Canada's tradition of sport participation, a survey conducted by the Ministry of Heritage in 2010 and published in 2013 has shown that both the percentage of Canadians participating in sport and the total number of Canadians participating in sport is declining.

There are many factors that play into the participation rates in Canada including economic status and education level. One very interesting conclusion from the report is that recent immigrants to Canada participate in sport at the same rate as Canadian born residents. This shows that the decline in sport participation is not due to immigration.

THE KEY TO MANAGING MULTI-USE FIELDS IS TO UNDERSTAND THE SPORTS BEING PLAYED AND THEIR RESPECTIVE WEAR PATTERNS.

Amongst adults, golf is the most participated in sport in Canada, followed by hockey. The third most popular sport in terms of participation is soccer, but for youth, soccer is by far the most popular sport with close to double the participation rate compared to the next two, hockey and swimming.

One of the most interesting facts from the survey is that participation in sports not listed in the top 25, exceeds that in the most popular sport. This survey provides evidence of what

sports turf managers throughout Canada have already known. The diversity of sport in Canada is large and this presents a challenge to sports turf managers to provide safe accessible sports fields for a varied array of sports.

Much of sports turf research is performed on sport specific fields primarily for high-level stadiums and for high school sports in the United States. In Canada most fields are multi-use fields that must host a number of different sports with different demands, wear

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"I'm so glad I live in a world where there are Octobers." ~ L.M. Montgomery



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Deadline for Winter 2013 Sports Turf Manager: November 1

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- Events – Your portal to our programs and events with all the details as they become available
- Sports Turf Manager of the Year Award – Criteria, purpose, eligibility, policies and the nomination form
- Board of Directors 2014 – Call for nominations and nomination form.

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President's Desk

BY PAUL GILLEN



STA President, Paul Gillen



Tab Buckner (R) presents Township of
Langley Mayor Jack Froese with a small
token of appreciation from the Organizing
Committee of the West Coast Field Day.

This has been a great year to be an Association member. Following up on the Halifax field day in the spring, at the end of August we sponsored the west coast field day in Langley, British Columbia with our Western Canada Turfgrass Association (WCTA) partners, and presented the 26th annual Ontario field day in Mississauga on September 19th.

The western event, their first, was an exceptional learning experience; not only with the guest speakers, but with five stations set around the exhibit area where one could gain first-hand insights into everything from field safety to irrigation to sand injection to synthetic turf maintenance. Kudos to Tab Buckner and Jerry Rousseau and their committee for a job well done; in spite of the adverse weather conditions! For all of those western members who missed this one, be sure to mark your calendars when you get the notification for the next as this is a concise short-cut to a lot of knowledge.

The Ontario day was great, as well. The venue at Mississauga was first class and ideal for the program. It just keeps getting better every year – congratulations to Lee Huether and the committee.

Mark your calendar now for our one day seminar Introduction to Synthetic Turf and Air-Supported Structures on November 13. This is being held in partnership with the Ontario Recreation Facilities Association and will be hosted in Guelph. If you are considering a synthetic field in the future, then this is the day for you and your management personnel. We will be touching on everything from the evolution of synthetic turf, the turf system, field safety, construction and maintenance together with air-supported structures explained, construction and operational considerations. This is an information packed agenda and always generates a lot of questions for our experienced presenters.

This year's Ontario Turfgrass Symposium is right around the corner. It seems early to be talking about a February event, but now is the time to make your plans. Aside from the great line-up of speakers, this year is even more important because of the changes coming to pesticide licensing regulations.

It's hard to believe that we are coming to the end of another year – it seems like yesterday that we were complaining about the cold spring weather! We trust that your fields were up to the stress and that you have the time and resources to put them to bed in a way that will ensure safe and playable conditions in the spring.

We look forward to seeing you at one or both of the upcoming programs. •

NEW & RETURNING MEMBERS

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& Recreation
Victoria, BC

Ontario

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Nick DiGravio
Joel Julien
Seneca College
Toronto, ON

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City of Burlington, ON

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Event Calendar

ASSOCIATION EVENTS ARE HIGHLIGHTED IN GREEN

November 13

**Sports Turf Association/
Ontario Recreation Facilities Association**
Introduction to Synthetic Turf and Air-Supported Structures
Guelph, ON
www.sportsturfassociation.com
www.orfa.com

November 29

**University of Guelph Diploma of Turfgrass Management
Students
Turfgrass Symposium**
Guelph, ON
guelphturfsymposium@gmail.com

December 1

Sports Turf Association
**Sports Turf Manager of the Year Award
Nomination Deadline**
www.sportsturfassociation.com/Awards&Scholarship

2014

January 7 to 9

Landscape Ontario Congress
Toronto, Ontario
www.locongress.com

January 21 to 24

**Sports Turf Managers Association
Conference & Exhibition**
San Antonio, Texas
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January 22 to 24

**Ontario Golf Superintendents' Association
Ontario Golf Course Management Conference & Trade Show**
Toronto, Ontario
www.ogsa.ca

January 27 to February 21

**University of Guelph
Turf Managers' Short Course**
Guelph, ON
www.turfmanagers.ca

February 17 to 21

**Western Canada Turfgrass Association/
Canadian Golf Superintendents Association**
Canadian International Turfgrass Conference & Trade Show
Vancouver, BC
www.golfsupers.com/vancouver2014

February 19 and 20

Ontario Turfgrass Symposium
The Changing Face of Turf
University of Guelph
Guelph, ON
www.turfsymposium.ca

August 17 to 24

**International Symposium on Turfgrass Management and
Science for Sports Fields**
Part of the International Horticultural Congress
Brisbane, Australia
http://www.ihc2014.org/symposium_29.html

Sports Turf Managers Must Address the Challenges of a Diverse Sport Loving Population

Continued from page 1

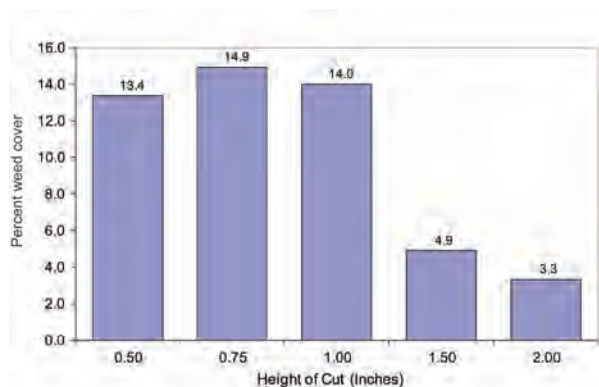


Figure 1. Percent weed cover of plots of Kentucky bluegrass cultivars mowed at different mowing heights. Each bar represents an average of four replicates.

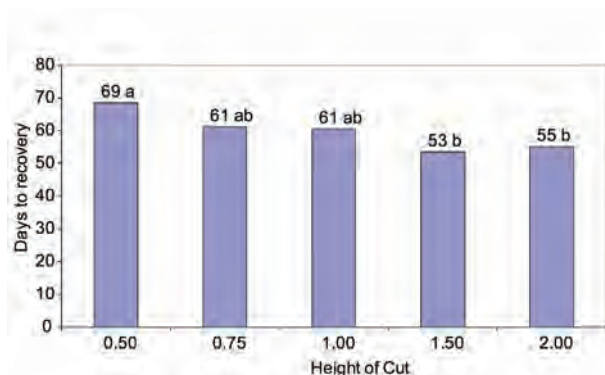


Figure 2. Days to complete divot recovery of Kentucky bluegrass cultivars mowed at different mowing heights. Each bar represents a recovery of four divots per cultivar.

patterns and user groups. What follows is a summary of factors that sports turf managers should incorporate into their programs in order to serve their diverse client base, based on a few of the sports they may encounter.

Soccer

The popularity of soccer in Canada particularly amongst youth, the most active segment of the population in sport, requires that management of multi-use fields must take into account the demands of soccer user groups as it is likely the game will be played on most fields at some point in time. Soccer has some advantages with regards to management, in that the field dimensions for the fields are somewhat variable, meaning it can fit on fields designed for other sports (Figure 3). In addition, different age groups play on different size fields. One common practice on soccer fields is to run two youth fields across each half of a full-length adult field. In order to help with preservation of the sidelines of the field, whatever the sport may be for the full sized field, make sure that the goalmouth of the youth field is beyond the sideline of the full sized field's sideline. This necessitates that lines be painted differently for the two different fields, but the increased quality of the sideline of a multi-use field may be worth it.

Soccer is a popular sport with a highly organized administrative structure. This leads to soccer being the most likely source of special requests and also complaints. Soccer teams often request low mowing heights for their sport. This is very difficult to achieve even with the new dwarf varieties of Kentucky bluegrass available. Research conducted at the Guelph Turfgrass Institute showed that low mowing heights on both dwarf and regular varieties of Kentucky bluegrass led to more weeds and slower divot recovery (Figure 1, 2). The lack of access to traditional herbicides limits our ability to achieve the desired quality under current budgetary constraints. This is while other sports are also requesting use of the fields, increasing the wear and tear. Soccer, with its administrative structure, makes it one of the easier user groups with which to

open lines of communication to explain the realities of sports turf management.

Football

Football is the second most popular field (non-diamond) sport in Canada with respect to participation. Most of this is youth participation. Football has very rigid field dimension requirements and has permanent goal posts on each goal line. Football also has a predictable and defined wear pattern. If soccer and football share a field, considerable efficiencies can be achieved by concentrating overseeding and aeration events to the centre of the field, where the majority of the wear takes place. Often portable soccer goals are placed in front of the football goal posts. This preserves the goal line but also creates a wear spot on the 5-yard line where the ball is placed for the point after touchdown conversion (Figure 4). Often football is very seasonal and this provides opportunities to heavily overseed and repair divoting before the soccer groups begin to use the fields. It is important to focus overseeding on the centre of the goal line and out to the 5-yard line if a field is used by both soccer and football.

Rugby

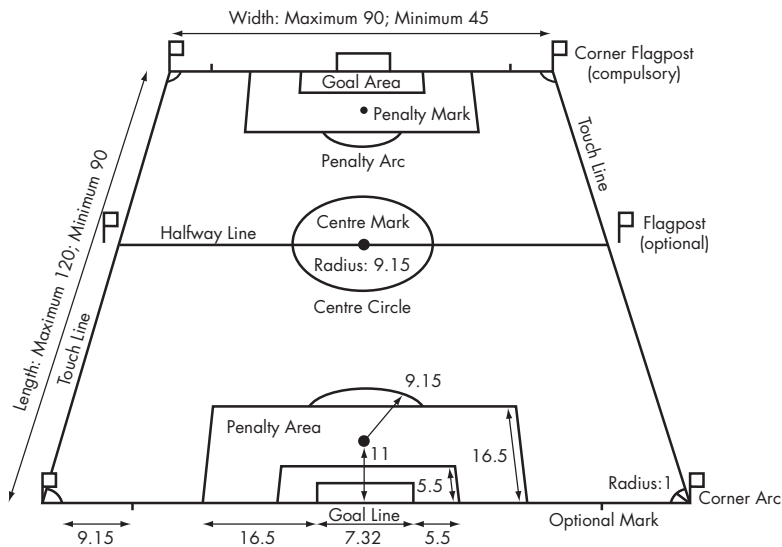
Rugby is in the top 25 of participation sports in Canada and although it has goal posts it does have flexible field dimensions that allow it to be played on a number of different sites. This is how the Canadian national team is able to play at BMO Field in Toronto. One of the aspects of rugby is a less defined wear pattern than football and soccer. This lessens the intensive wear down the centre of the field but also makes it harder to concentrate management practices when it is being played on a shared field. One of the crucial spots on a rugby field is between 5 and 10 meters from the sidelines as that is where many of the scrums take place on the field. This is important when considering the placement of youth soccer fields discussed earlier. Generally rugby has a culture of field preservation and can be a user group that is amenable to

10.0 FIELD DIMENSIONS

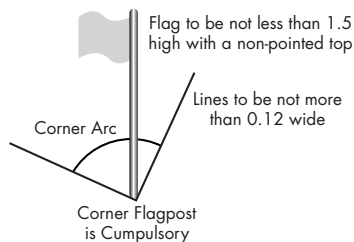
10.11 Soccer

All dimensions are in metres. Diagrams not to scale.

Figure 3. A diagram of acceptable soccer field dimensions reprinted from the Sports Turf Association's Athletic Field Construction Manual.



Corner Flagpost



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Figure 4. Wear from a soccer goal being placed in front of football goal post and the resulting wear spot on the 5-yard line of the football field.



Figure 5. Excessive wear caused by repetitive drills on a field shared by rugby, lacrosse and soccer.

opening lines of communication with regards to field preservation. Despite this, rugby is a physical sport and has drills that can cause severe damage to a field if they are repeated on one area of the field (Figure 5).

Lacrosse

Although lacrosse is the national sport of Canada it is not as popular as many other sports across all age groups, but the participation by youth is similar to that of football and rugby. Lacrosse can lead to a number of interesting wear patterns, particularly from drills and practices. Lacrosse also has a very small goalmouth creating extensive wear in the vicinity of the net. In addition to the foot traffic there is the added damage from the sticks. Lacrosse is also played indoors and coaches and players may be less aware of the need for field preservation during practice because they are used to practicing on synthetic surfaces (Figure 6). One thing to remember about lacrosse is that the goalmouth is 13 meters from the end line. This places the goalmouth just beyond the penalty spot in soccer. If soccer and lacrosse must share a field it is important to stress the need for the lacrosse team to move the goalmouth off the field whenever possible during practice and drills.

Cricket

Cricket is not in the top 25 sports in Canada but with recent immigration from



Figure 6. Circular wear pattern in the middle of a field caused by a lacrosse drill that used the soccer centre circle as a reference for the drill.

commonwealth countries it is one of the fastest growing sports in Canada according to the Cricket Canada website. For sports turf managers, one of the most important things to note is that the cricket pitch refers to the area where the ball is bowled to the batsman and where the wickets are located. Traditionally cricket pitches are mowed extremely low and the soil is compacted to provide an optimum bounce of the ball when bowled. This is unachievable with most municipal budgets and is only sustainable for the occasional competition. For this reason cricket pitches are often made from other materials such as synthetic turf and in other cases they can be constructed from clay materials similar to those used on clay tennis courts. Their small size with respect to the entire playing grounds makes this more economically attractive. Placement of cricket pitches is crucial as they must be surrounded by large fields but cannot be on the fields of play of other sports. They can be placed between two soccer fields or in the centre of two baseball or softball fields that have an area between their fences. Generally cricket players favour a smooth field so they prefer to be paired with sports with limited divoting of the field such as baseball, softball and even soccer. Pairing them with football, rugby and lacrosse is less desirable.

Ultimate Flying Disk

One sport that is popular amongst young adults is ultimate flying disk. Ultimate began as a counter culture sport in the late 1960's and 70's and is popular for its inclusive nature and its intent to not be overly competitive. One issue with ultimate is that it is played by young adults who as a group are the most abusive to fields with regards to wear due to both their size and athletic ability. In addition the most damaging part of the sport to fields is the rule that requires the players to pivot to avoid the defense. This pivoting causes severe turfgrass damage because most of the athletes are wearing cleats. Ultimate was originally supposed to require no special equipment. The wearing of cleats while playing ultimate causes much more severe wear than even physical sports such as rugby and football. In addition the demographic of groups that play ultimate, allow them to book lighted fields later for night play allowing for more wear on the fields.

Ultimate leagues are often run as for-profit social leagues so dealing with issues regarding wear can be addressed in a number of ways. One is to make sure that the organizer of the league is aware of the additional costs of excessive wear the sport may cause. In addition, a premium fee can be charged for sports dominated by adult social leagues run as a for-profit endeavor, thus assuring that sport is available to youth at an affordable rate. Finally sports such as ultimate that can cause severe wear can be segregated from the other sports so the actual wear and costs of recovery can be calculated so that appropriate fees can be determined and charged.


Summary

Canada has a diverse sporting history and unlike our neighbours to the south, most of our fields undergo constant use through the entire growing season and are used by multiple sports. The key to managing multi-use fields is to understand the sports being played and their respective wear patterns. This allows the

turfgrass manager to work with the booking manager of the fields to make sure that sports that can optimize efficiencies with respect to wear can be placed together.

One of the goals of the sports turf manager in Canada should be to provide sport for the diverse multicultural sporting community that resides here. In order to do this the sports turf manager must understand the sports being played. Managers must also open lines of communication with the user groups. The specialized user groups need to be listened to and in return they must be educated as to how their sport affects the fields and what they can do to preserve the integrity of the fields for their own sport and for other user groups. •

Sport Participation 2010 Research Paper, Canadian Heritage, February 2013
http://publications.gc.ca/collections/collection_2013/pc-ch/CH24-1-2012-eng.pdf



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Eight Steps to an Easy Field Facelift

Jeffrey T. Fowler, *Penn State Cooperative Extension*

Over the last 10 years I have been called to countless athletic fields to lend some advice to the athletic field manager, school custodian or the school board member who wanted a "better" field for the young athletes in their district. After a few stops with similar answers, I realized that many people were forgetting the basic steps that we need to keep in the forefront when maintaining athletic fields. Each of these eight steps has been or could be written in its own book form, but this article serves as a friendly reminder of the basics.

1. Soil Testing

Soil testing is the first step in any field facelift. Without a soil test we have no idea what the soil needs and thus what the turf plant needs to thrive. I like to compare soil testing to a human blood pressure. Medical professionals can tell a lot about our health by taking our blood pressure. Turf professionals can tell a lot about our soil's health by conducting a simple soil test. This test will give you the soil pH and nutrient levels present in the sample.

A soil test is conducted by taking 20 - 32 core samples on the field, mixing them together and allowing them to dry. Taking a representative sample and sending it to a certified laboratory. Check with your provincial agricultural ministry for a list of laboratories that can perform this test. In Ontario they are listed at www.omafra.gov.on.ca/english/crops/resource/soillabs.htm. The cost of this inexpensive test will pay for itself many times over in the amount you save on lime and fertilizer expenses.

2. Lime and Fertilizer

Dollar for dollar fertilization does more to improve poor quality turfgrass than any other single management practice. Proper fertilization practices will produce a dense,

medium to dark green turf that resists pests and environmental stresses. However, careless application techniques and/or applying excessive amounts of fertilizer at the wrong time of the year can result in serious turf damage and contamination of water resources. Successful turf maintenance fertilization requires an assessment of the nutritional requirements of your turf, an understanding of fertilizers, how much and when fertilizers should be applied, as well as proper application techniques.¹

3. Mowing

Whether we are mowing with a reel type or rotary type mower we need to make sure that we are always using a sharp blade. Mowing frequency depends upon the rate of growth. We should never remove more than one-third of the green growth in one mowing. If we want to maintain a height of 5 cm, we should mow when the plant reaches 7.5 cm. Clippings do not need to be removed as long as we maintain a regular mowing schedule.

4. Aeration

Aeration is the process of disturbing the soil to relieve compaction. Compacted soil does not allow proper air, water, and nutrient penetration and makes it difficult for proper plant root growth. Core removal should be performed at least two times a year when the plants are actively growing. There are many different aeration methods that can be used during the playing season that will not disrupt play.

5. Topdressing

Topdressing is the addition of sand or soil to the surface of the turf. Topdressing gives the sports turf manager a chance to improve the soil quality, improve the seedbed for new plants and rooting of both new and existing



plants. Topdressing also gives an opportunity to level the surface of a playing field. The material used during topdressing should be chemically and physically very similar to the existing soil unless the intent is to modify the soil texture.

6. Overseeding

Overseeding into thin turf or small patches of bare soil can be done in late winter, spring or early fall. When overseeding, it is especially important that the seed comes in contact with the soil and has space to germinate. Perennial ryegrass overseeded at the rate of 4 - 6 kg/100 m² serves very well. Perennial rye is a quick germinating variety that can tolerate enough wear to be effective on an athletic field.

7. Playing Surface

I have been asked many times at different athletic field maintenance seminars if I would do a quick demonstration on "puddle repair." My answer has always been the same, "NO." We cannot fix puddles; we fix low spots in our playing surface by constantly working the skinned portion of a softball or baseball field. Working with our favorite leveling drag we need to constantly be working the skin in all directions to maintain a playing surface that will not form low spots.

8. Transition Areas

The appearance of the transition areas can make your field look like a million bucks or a million ducks, depending on the care. These areas, where the grass and skin areas on a baseball or softball field meet, where players run on and off of the field, or athletes always

walk to and from the practice field, can really make or break the appearance, safety and playability of a field. We need to continually work to keep these areas from forming lips, dips and safety hazards on our playing fields.

9. Communications

Wait, the title of this article is "Eight Steps to an Easy Field Facelift" not nine steps. Well, like Garth Brooks sings in his song "Friends in Low Places", I was going home one night and thought to myself, Jeff, is that really the way that article should end? No, so I wrote another step, just as Garth wrote another verse.

Even if we know everything there is to know about the first eight steps of a field facelift, no one will understand them if we do not follow step nine. We have to let people around us, our bosses, supervisors, coaches, players, volunteer parents and school administrators know what we know. Not only what we need for a safer and more playable field, but also why we need it. Our job as sports turf managers is to maintain fields; their job is to do something else. We need to communicate our needs and our reasons for our needs so that they better understand the importance of the first eight steps.

If we adopt these nine steps, and formulate a game plan for our fields, these steps will have spectators saying, "How did they do that?" •

¹ Turfgrass Fertilization; A Basic Guide for Professional Turfgrass Managers, Peter Landschoot, Assoc. Professor of Turfgrass Science, the Pennsylvania State University, 2003.



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Using Canopy Reflectance Tools in Turfgrass Management

Dr. Ken Carey, *Department of Plant Agriculture, University of Guelph*

Background

Turfgrass managers can tell a lot about turf just by looking at it – and the more experienced they are, the better their judgement. Nutrient status, pest damage, abiotic stresses (drought, traffic, etc.) are all visible to the trained eye. Sometimes, however, it's good to have some tools to help – the highly trained manager may not be available to see everything, or the problem may produce very subtle effects. This article discusses some recent innovations in assessing turfgrass, developed and widely used in turf research, which might be useful to the turfgrass manager.

What we see when we look at a turfgrass sward could be termed “canopy reflectance” – it's just the ambient sunlight reflected off the leaves in the full visible light spectrum. A trained researcher or turfgrass manager learns to record and interpret the details of what they see, whether it's the off colour of nutrient deficiency or spray damage, or the darkening of drought stress. However, both in research and in practical management situations, we work with less well-trained helpers, and will benefit from techniques that remove the subjectivity and observer bias, and reduce the need for training.

One very familiar tool is a camera, and with improved digital cameras this is a very useful adjunct to assessing problems. However, even though they can form an important permanent record, the digital photos still need to be interpreted. Researchers are working on improving software to analyze digital images to document and quantify turf characteristics (weed and disease infestation, drought and nutrient stress),

but these full spectrum techniques are still relatively early in development for widespread turf use.

A more mature, and somewhat simpler, technology for assessing turf involves restricting the wavelengths observed to ones that we have learned through experience are indicative of turfgrass problems. Photosynthesis in plants involves chlorophyll absorbing light to power the plant, and the wavelengths that chlorophyll absorbs are a subset of the sunlight hitting the plant (Figure 1). Light that chlorophyll absorbs is not reflected, and the light hitting the plant looks different from that reflected. Of the visible wavelengths, chlorophyll absorbs red light, generally, so the light reflected is white minus red = green. The wavelengths that chlorophyll absorbs are often termed photosynthetically active radiation or PAR.

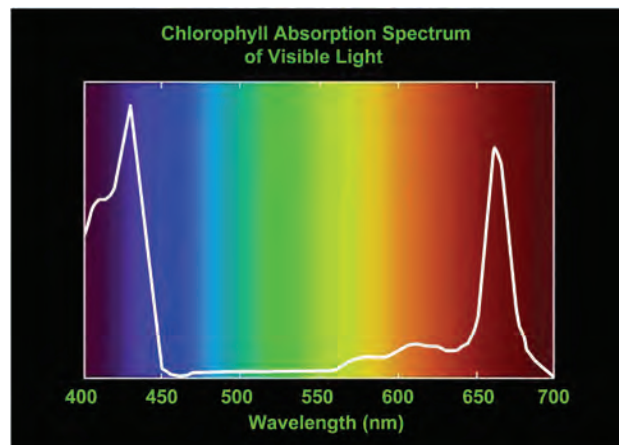


Figure 1. The peaks show the wavelengths of visible light that are absorbed by chlorophyll (Photosynthetically active radiation).

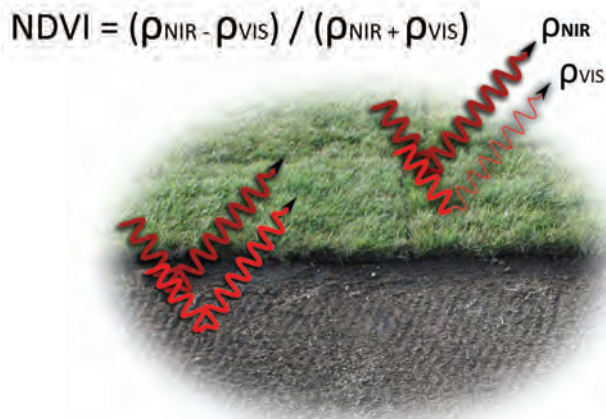


Figure 2. Measurement (ρ_{VIS}) and reference (ρ_{NIR}) waves of light reflecting off bare soil and turf.

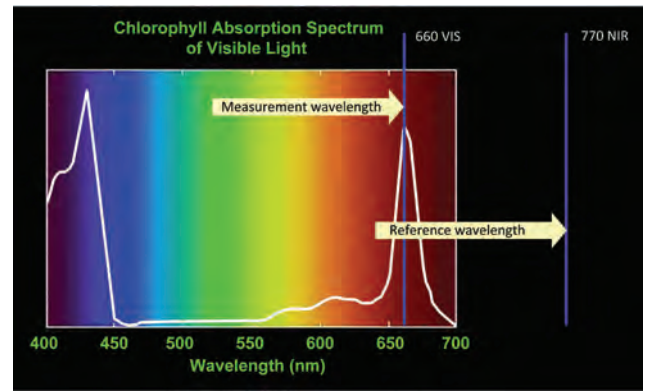


Figure 3. Measurement (660 nm) and reference (770 nm) wavelengths used by the Greenseeker to calculate NDVI.

Various sensors have been developed which all function in a similar fashion, comparing the reflectance off a surface (e.g. turf) of a wavelength that chlorophyll absorbs (measurement wavelength), with one that chlorophyll does not absorb (reference wavelength). Figure 2 shows light reflecting from turf and bare soil. The longer (reference) wavelength is not absorbed by chlorophyll and is reflected equally from both surfaces; the shorter (measurement) wavelength is partly absorbed by the plant, and the reflected amount is reduced. Usually the measurement wavelength used is in the red (visible) part of the spectrum and the reference in the near-infrared (Figure 3). Canopy reflectance sensors like this will report/record an index which is usually of the form $(\rho_{NIR} - \rho_{VIS}) / (\rho_{NIR} + \rho_{VIS})$. Rho (ρ) is the reflectance, and you can see from the formula that when there is no absorbance by chlorophyll ($\rho_{NIR} = \rho_{VIS}$) the top of the ratio is zero, and the index is zero. When all of the measurement wavelength is absorbed ($\rho_{VIS} = 0$), the ratio becomes ρ_{NIR} / ρ_{NIR} or 1. Some sensor systems, like the Greenseeker (Figure 4), will report an index between 0 and 1 (sometimes called the normalized-difference vegetation index, or NDVI), others like the Spectrum FieldScout (Figure 5) multiply the index and report a value between 0 and 1000 (chlorophyll index).

Canopy reflectance in turf management

The key feature of canopy reflectance indices like NDVI and the chlorophyll index is that the values observed in turfgrass are very sensitive to a multitude of things of interest to a turf manager. Changes in nutrient status, moisture status, traffic, insects, disease, rootzone problems, and other biotic and abiotic stresses can all produce subtle shifts in canopy reflectance, some of which are even undetectable by a trained human eye.

Canopy reflectance, especially as it is affected by nutrient status, has become an important tool in precision agriculture, where maximizing yields and optimizing fertilizer inputs is tied to systems that measure reflectance. The uses in turfgrass



Figure 4. Greenseeker canopy reflectance sensor system.



Figure 5. Spectrum FieldScout chlorophyll meter.

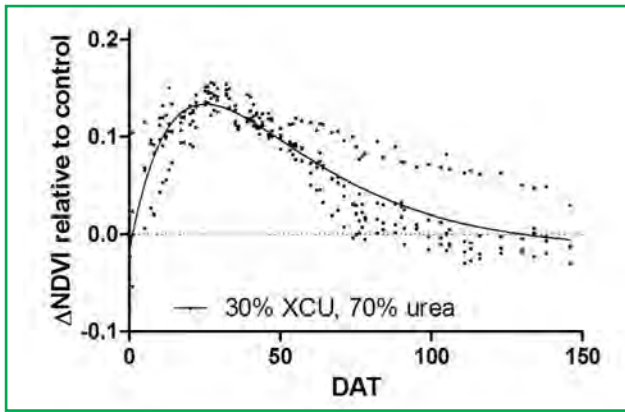


Figure 6. Change in canopy reflectance following a single application of slow-release nitrogen fertilizer (points represent data from four replicate plots; the line is the best fit release curve; DAT = days after treatment).

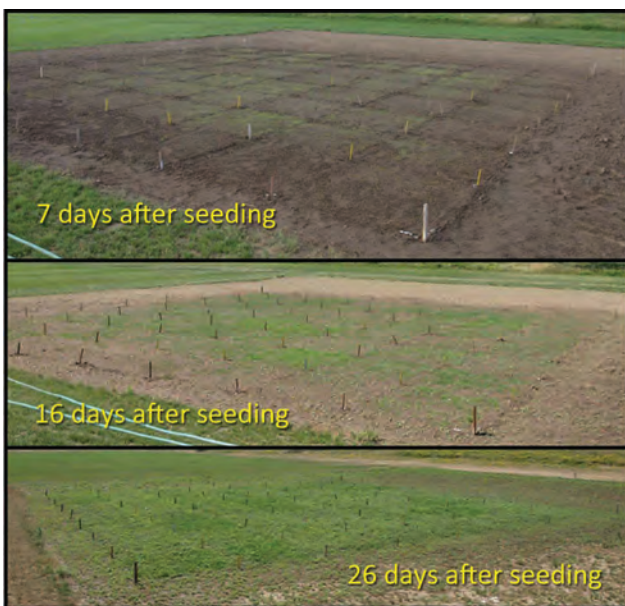


Figure 7. Cover development in turf trial.

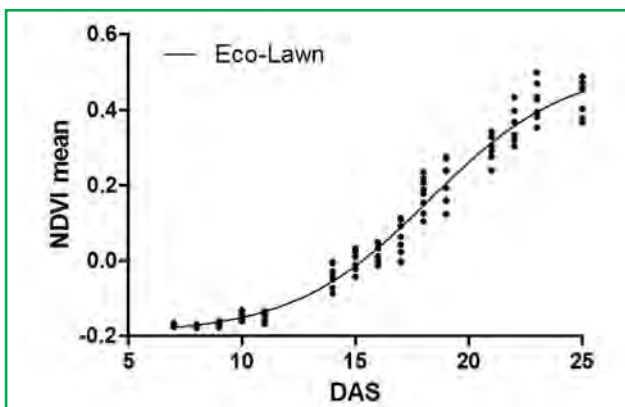


Figure 8. Increase in canopy reflectance with germination and cover development in seeded turf.

management will likely be more complex as they develop, since yield and nutrient stress are only a small part of the stresses that turf experiences. For example, research is currently being done to examine the potential in water management [Crum et al. 2010. *Crop Science* 50:301-315.], but most of the current use is in turf research.

A few examples of the power and sensitivity of the system will, we hope, convince you that it is a technique to watch. The more the system is used in research, the faster the applications to the real world will be developed.

Fertilizer performance and release characteristics

Figure 6 shows a sample of data collected from recent fertilizer performance trials at the Guelph Turfgrass Institute (GTI). The points show the change in NDVI as a fertilizer application at day 0 gradually releases and increases the absorption of PAR to the maximum at ~25 days after treatment, then gradually declines as the fertilizer runs out at ~100 days. Using these techniques we can help fine tune release characteristics of fertilizers, but the same data could help a turf manager track nutrient status.

Germination, establishment and cover development in turf

Canopy reflectance can be used to track the establishment of newly seeded turf. In research trials, we can use this to assess different cultivars, blends and mixtures, or different management techniques in establishment. Figure 7 shows cover development in a recent trial at the GTI, and Figure 8 shows the change in canopy reflectance in one of the entries over the first 26 days after seeding. Figure 9 shows data from an earlier trial, in this case using the chlorophyll index rather than NDVI. Sixteen Kentucky bluegrass cultivars show clear differences in speed of establishment as measured by canopy reflectance.

Drought stress, water use and localized dry spot

Figure 10 shows localized dry spot and treatment effects of wetting agents in a recent trial. If we look at the canopy reflectance and independent assessments of soil moisture (Figure 11) and localized dry spot (Figure 12), the potential of canopy reflectance to detect and help manage water problems is clear. We have also used the technique in assessing the

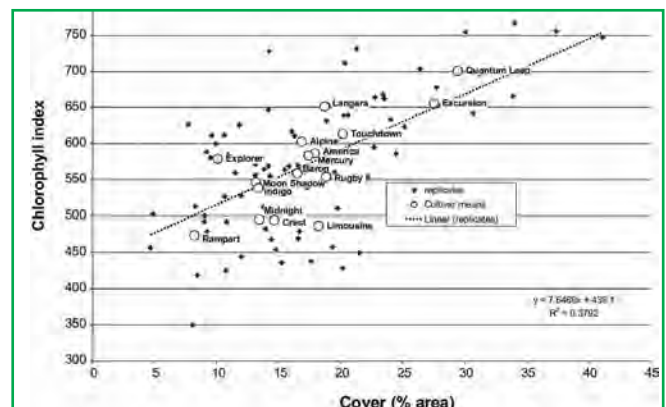


Figure 9. Association between grass cover and canopy reflectance (chlorophyll index) in Kentucky bluegrass cultivars.



Figure 10. Localized dry spot in bentgrass turf; some plots are treated with wetting agents.

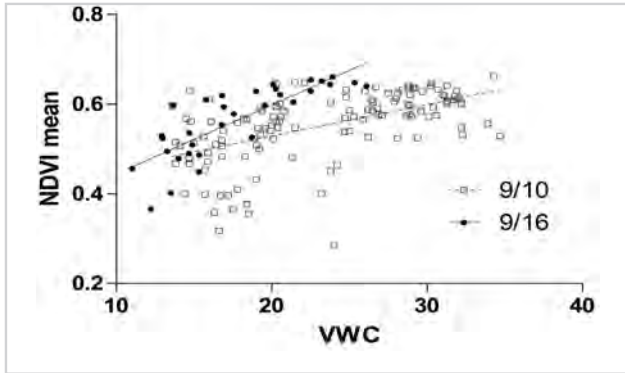


Figure 11. Association between soil moisture (volumetric water content – VWC) and canopy reflectance in wetting agent trial.

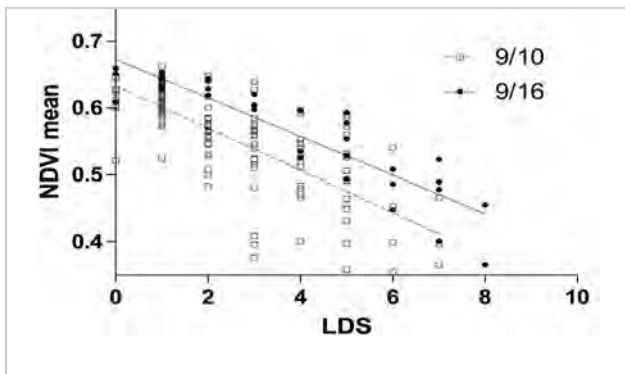


Figure 12. Association between localized dry spot (rated visually) and canopy reflectance in wetting agent trial.

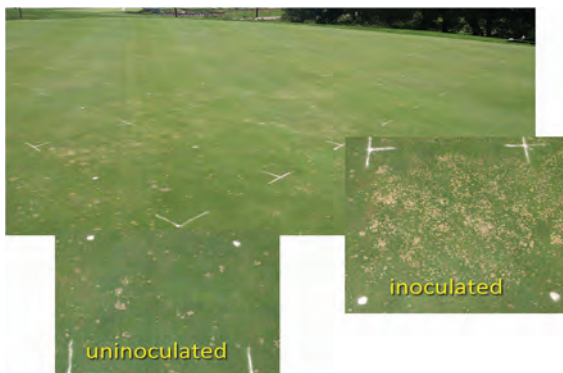


Figure 13. Dollar spot disease on inoculated and uninoculated plots.

effectiveness of different irrigation regimes in establishing turf from dry seeding, hydroseeding, and sod.

Other biotic and abiotic stresses

As mentioned above, many stresses that affect turfgrass will be detectable in changes in canopy reflectance. We routinely use the technique in assessing trials involving dollar spot disease, for example. Figure 13 shows symptoms of dollar spot as they develop in a recent trial, and Figure 14 shows how the disease pressure shows up in the canopy reflectance data.

What's needed before the tools are widely used by turf managers?

Experience – we need to have a better grasp of how the numbers change across species, management conditions, etc. It is a very young technique outside of research applications.

Calibration – the sensitivity of the tool to so many factors means that in order to isolate effects of interest, we need to learn to calibrate to remove extraneous noise (we use untreated control plots in research, and similar techniques can be used in management).

History – the more the tools are used on a particular turf area, the better the information. The advantage of these tools is that they automatically record and time-stamp the information, and if so-equipped will even record GPS information.

More computer tools – recording, analysing, and interpreting canopy reflectance data is dependent on computer software and training. At the moment the tools are research tools; widespread use of the techniques in industry will require computer tools that assist in the analysis and interpretation.

The tools and techniques are powerful, the equipment is easy to use and becoming more and more affordable all the time (currently low four figures for the equipment we use in research), and worth keeping an eye on if you're a turfgrass manager. Someday in the not too distant future you may be sending your crew out to take routine canopy reflectance readings of your turf, and using the data to make your job easier. •

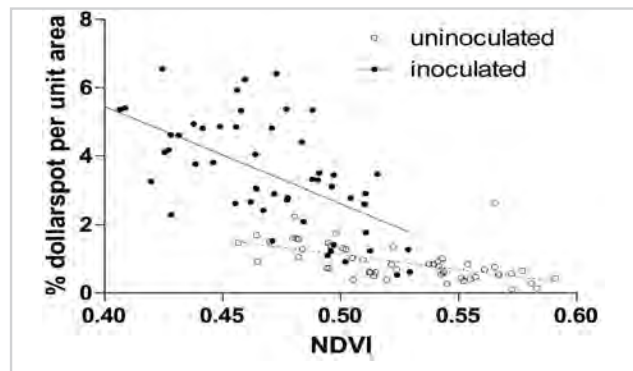


Figure 14. Association between canopy reflectance and dollar spot disease levels in trial plots.

Inaugural *Field Day Langley, BC*



Langley Events Centre and Willoughby Community Park

There was certainly a lot of hubbub surrounding the inaugural West Coast Sports Field Training Day hosted by WCTA Past President/STA Director and Manager of Parks Operations for the Township of Langley, Tab Buckner. Judging by the email and phone inquiries received by the Western Canada Turfgrass Association office, a lot of people were pleasantly surprised to learn a summertime event with education and a supplier trade show was being planned.

When the day was done, 106 delegates, 22 vendors, 5 demonstration station exhibitors and 2 world class speakers took part in the Sports Turf Association sanctioned event held August 29 at the Langley Events Centre and Willoughby Community Park in Langley, British Columbia.

This rain or shine indoor/outdoor event was modelled after the STA Field Day, the day-long educational forum and tradeshow held annually in Ontario for 26 years, and also in 2011 and 2013, where efforts to support Atlantic sports turf managers saw the STA deliver additional field days in Moncton, New Brunswick and Halifax, Nova Scotia respectively.

“We were excited to work with Tab Buckner on the first ever West Coast Training Day,” commented Lee Huether, Executive Manger of the STA. “Our partnership with the

WCTA has paved the way for events like this to take place and we’re closer to achieving our goal of supporting sports turf managers from coast to coast.”

The training day was designed for participation by all levels of sports turf management personnel; the formula included education, networking opportunities, a chance to visit suppliers at the outdoor tradeshow, live demonstrations and hands on equipment testing.

“It’s been a long time since we’ve done any sort of field day,” stated WCTA Executive Director Jerry Rousseau, “and while we’ve been involved with a lot of great golf events over the years, we’ve never done something of this scale for our sports turf members.”

“At the end of the day we accomplished our goal of providing a low-cost, high quality education opportunity for our membership,” said Tab Buckner. “We’re calling the day a huge success and really want to thank all our sponsors, tradeshow vendors, speakers and of course everyone who attended for making it possible. I especially want to thank TOL Parks Department staff for getting things done and the Township of Langley itself for allowing this event to be hosted here.”



Kwantlen University Turf Management Instructor Stan Kazymierchuk (L) welcomes speaker Mark Lucas from the University of California



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Tab Buckner gives the signal for groups to move to the next demo station



Tradeshow Vendors

Photos © Jerry Rousseau, Western Canada Turfgrass Association

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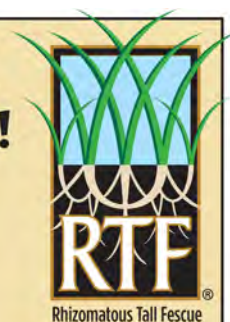
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26th Annual Field Day Mississauga, ON



Speakers (L-R) Eric Lyons, Sean Jordan and Jeff Fowler



Jeff Fowler, Penn State Cooperative Extension, took participants from the classroom to the field

With the arrival of October we have reached the end of both summer and the STA field day season.

We began in June on the east coast in Halifax Regional Municipality, travelled to the Township of Langley in August and returned to the City of Mississauga for the 26th annual event on September 19th.

At this final field day, a fixture on the turfgrass calendar for over a quarter-century, we welcomed more than 200 participants from Ontario's sports turf and turfgrass sector to the Mississauga Valley Community Centre and Park.

We thank our respected speakers for sharing with us their knowledge and expertise – watch for their articles in this and future editions of the Sports Turf Manager; our sponsors and exhibitors who lend their generous support, participation and are an integral part of the learning experience; and the City of Mississauga and all the parks and facilities personnel who assisted. We know just what is involved in hosting this event, be it in Nova Scotia, British Columbia or Ontario!

We have, from June to September, networked with hundreds of sports turf professionals from across the country. It has been our privilege and we look forward to seeing you at future events! Better, safer sports turf. That's what it's all about.

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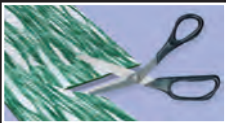
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