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## SPORTS TURF MANAGER

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### STA OFFICE HOURS

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2:00 p.m. Tuesday through Friday. The office phone  
number is (519) 763-9431. At other times, a  
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Please include the vital information of name,  
telephone number with area code, and time of  
calling. The office may be reached at any time by  
faxing (519) 766-1704 or via e-mail.

# The President's Desk – Gord Dol

Wow! What a season. We have just experienced one of the wettest summers I can remember. I trust that your wet field policies were put to good use to protect your fields.

### Kudos to All On The Field Day

We recently held our 21<sup>st</sup> Annual Fall Field Day. As per usual, attendance was high with a great line-up of speakers and a first class venue. Thanks to the Field Day Committee for a job well done and to the City of Brampton for hosting this event. A special thanks to our speakers for sharing their expertise and to all the exhibitors and sponsors for their participation and generosity in making this day possible. Turn to pages 11-13 to view a photo gallery of the day. We will be setting our sights on the 2009 Field Day in short order and your ideas are most welcome.



### Key February Events

The 2009 Ontario Turfgrass Symposium is February 18th and 19th in Rozanski Hall at the University of Guelph. This year promises to be another great educational forum. The Sports Turf Association is proud to be a co-sponsor of the symposium, now in its 18<sup>th</sup> year.

[www.sportsturfassociation.com](http://www.sportsturfassociation.com). And while you're surfing, check out our website! After a lot of hard work, we have everything working including the Members Only section. If you do not have your password, please contact the office. If you do have the information but have yet to log on, it's about time to do so!

---

**The AFCM is available online.** Our *Athletic Field Construction Manual* has been very well received by the industry and numerous municipalities have already adopted it for future construction projects.

---

During the OTS, we hold our annual general meeting which is open to all members. We will also be electing directors to the board. Now would be the time to consider allowing your name to stand for election. If this interests you, please speak to any board member or call Lee at our office.

Applications for the STA Robert W. Sheard Scholarship are now being accepted. The deadline is November 1<sup>st</sup>. Details about the scholarship and the application form are available online.

Winter is fast approaching. The grass will not be green for much longer. Talk to you in again in December. ♦

### Construction Specifications Available

Earlier this year we launched the *Athletic Field Construction Manual*. It has been very well received by the industry. Numerous municipalities have already adopted this manual for future construction. Do you have your copy yet? Our e-commerce store is now open at

## Employment Listings...

Are you advertising a position or searching for a job? See the Turf Trades ad on page 21 or contact Lee at the office for details.



## EVENT CALENDAR

★ NOVEMBER 1 ★  
**Sports Turf Association**  
**Robert W. Sheard Scholarship**  
**Application Deadline**  
**Info: 519.763.9431**  
[www.sportsturfassociation.com](http://www.sportsturfassociation.com)

**December 3 & 4**  
**ON Recreation Facilities Association**  
**Facilities Operational Forum**  
**& Annual General Meeting**  
**Burlington, ON**  
**Info: 416.426.7062**  
[www.orfa.com](http://www.orfa.com)

**January 6-8**  
**Landscape Ontario Congress**  
**Toronto, ON**  
**Info: 905.875.1805**  
[www.locongress.com](http://www.locongress.com)

**January 13-17**  
**Sports Turf Managers Association**  
**20<sup>th</sup> Annual Conference & Exhibition**  
**San José, CA**  
**Info: 800-323-3875**  
[www.stma.org](http://www.stma.org)

**January 21-23**  
**ON Golf Superintendents' Association**  
**Golf Course Management**  
**Conference & Trade Show**  
**Toronto, ON**  
**Info: 519.767.3341**  
[www.golfsupers.on.ca](http://www.golfsupers.on.ca)

**February 2-27**  
**University of Guelph**  
**Turf Managers' Short Course**  
**Guelph, ON**  
**Info: 519.767.5000**  
[www.open.uoguelph.ca/turfmanager](http://www.open.uoguelph.ca/turfmanager)

**February 4 & 5**  
**Ontario Parks Association**  
**53<sup>rd</sup> Annual Educational Conference**  
**Explorations Trade Show (Feb. 5)**  
**Hamilton, ON**  
**Info: 905.864.6182**  
[www.opassoc.on.ca](http://www.opassoc.on.ca)

★ FEBRUARY 18 & 19 ★  
**Ontario Turfgrass Symposium**  
**The Challenge of Green**  
**University of Guelph**  
**Guelph, ON**  
**Info: 519.767.5000**  
[www.open.uoguelph.ca/ots](http://www.open.uoguelph.ca/ots)

## Ontario Turfgrass Symposium Addresses 'The Challenge of Green'

The University of Guelph will host the 18<sup>th</sup> Annual Ontario Turfgrass Symposium (OTS), February 18<sup>th</sup> and 19<sup>th</sup>, 2009 at Rozanski Hall. Speakers from both industry and academia will provide valuable insight reflecting the OTS 2009 theme – *The Challenge of Green*.

Recent governmental policies have placed demands on turf managers that require new knowledge and skills. Delegates will participate in sessions providing current information that respond to the complexities of maintaining healthy turf in today's more restrictive growing environment. Sports turf, facilities, golf and lawn care professionals and nursery sod growers will all benefit from the many topics including the econom-



colleagues in the turf industry. Share success stories and strategies to create optimum conditions for healthy turf.

**Stay tuned for more details!** In the winter issue of the Sports Turf Manager, we'll publish a detailed list of OTS sports turf sessions as well as early bird registration information for STA members.

ics of the turf industry, new pest and disease controls, safety issues for staff, and other industry-related sessions.

Turf industry leaders and associated staff will benefit from both learning sessions and the opportunity to network with

OTS is an invaluable forum for discovering the best practices coming from Ontario, Canada and internationally.

Visit the conference website at [www.open.uoguelph.ca/ots](http://www.open.uoguelph.ca/ots) or call 519.767.5000 for more information.



## ODDS & ENDS

### STA Membership Plaques

Display membership plaques are available in executive engraved walnut for \$50 plus S&H and gst. To order, contact Lee at the STA office.

### Winter 2008 Submissions

If you have something you'd like to submit for the next issue, please forward it to the STA office by November 7, 2008.

### Editorial Content

Opinions expressed in articles published in *Sports Turf Manager* are those of the author and not necessarily those of the STA, unless otherwise indicated.



## Guelph Turfgrass Institute/ Ontario Turfgrass Research Foundation Field Day

Participants attending the 2008 GTI/OTRF Research Field Day were treated to a beautiful, sunny summer day. After welcoming remarks from the Honourable Leona Dombrowsky (Minister of Agriculture, Food & Rural Affairs), Kevin Falls (President, Ontario Turfgrass Research Foundation) and Dr. Rob Gordon (Dean, Ontario Agricultural College) the approximately 100 participants headed out for a ten stop tour covering a wide range of research from aquatic toxicology to the very latest pesticide alternatives.

Popular tour stops included the NTEP Kentucky bluegrass trials that include some of the new Texas bluegrass hybrids which have the potential to introduce a new level of drought tolerance into

bluegrass seedings. A new mowing trial shows the performance of a number of the newer dwarf bluegrass varieties cut at fairway height and above. Tom Hsiang provided an excellent overview of his disease research and discussed some of the newer products that are making their way to the marketplace. There was also a chance to score a goal on the GTI soccer field to win a GTI 20th anniversary hat.

Results from current research projects will appear in future GTI *Annual Research Reports*. Thanks to all faculty and staff who helped with the field day as well as the industry professionals who took time from their busy schedules to join us for the morning. The next GTI/OTRF summer field day will be in 2010.

## New Release

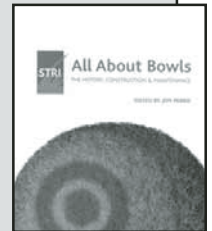
### All About Bowls: The History, Construction & Maintenance of Bowling Greens

Now available from the Sports Turf Research Institute (STRI) bookstore, the new book is a fully updated version of the original 'bowls bible,' *Bowling Greens – Their History, Construction and Maintenance*, which has been out of print for over four years. First published in 1988, the original was produced in black and white.

The new version is now available in full colour with additional content in a hard back cover. The 224 pages have been revised and brought up to date with current images and photographs by editor Jeff Perris, STRI Consultant Agronomist for 42 years.

*All About Bowls* is an indispensable aid to all bowling clubs and greenkeepers. It provides a comprehensive year round guide to the management of both flat and crown greens. It is fully supported by Bowls England, who provided the book's foreword, and the British Crown Green Bowls Association.

Cost of the new book, ISBN-978-187-343-1603, is £22.50 plus postage and packing. It is available via STRI's website at [www.stri.co.uk/bookshop](http://www.stri.co.uk/bookshop).



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## STA Scholarship

**Deadline: November 1, 2008**

In order to encourage, support and provide leadership to those considering a career in the sports turf industry, the STA offers the Robert W. Sheard Scholarship. One scholarship in the amount of \$1,000 may be awarded annually.

We encourage you to apply for the STA Robert W. Sheard Scholarship if you:

- are a Canadian citizen or landed immigrant;
- are currently enrolled in and have completed one full year 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;
- have been employed in the sports turf industry in the current year (including seasonal employment) by a member of the Sports Turf Association;
- have a desire to pursue a career in the sports turf industry.

The Scholarship Program is funded through STA membership fees. The award is intended to assist students with the cost of tuition, books and related expenses.

Visit [www.sportsturfassociation.com](http://www.sportsturfassociation.com) for scholarship policies, application requirements and an application form.

### QUOTABLE QUOTE...

Even if something is left undone, everyone must take time to sit still and watch the leaves turn.

~ Elizabeth Lawrence



TOWN OF OAKVILLE

## NEW ONLINE TURF FARM & TURFGRASS DIRECTORY DEVELOPED BY TPI

**N**eed turfgrass? Locate a turf farm near you and buy the turfgrass type best suited for your next project! Turfgrass Producers International (TPI) offers an online comprehensive directory of turfgrass growers at [www.TurfGrassSod.org](http://www.TurfGrassSod.org).

Search for turfgrass farm growers by state, country or turf type (species). The directory allows you to further refine your search by selecting criteria based on specific turf cuts such as big roll, slab, fold, plugs, sprigs, standard roll or washed turf. Turf installation is also indicated in the farm listing if they provide this service. Turfgrass farms are sorted geographically (country, state and province) and include contact name, company, address, phone, fax, email and website (with hyperlinks to take you directly to the farm website).

The TPI online directory is offered as a convenient resource in finding turfgrass sod farms for landscape contractors, golf course superintendents, city/state municipalities or others interested in purchasing turfgrass sod. All companies listed in the directory are current TPI members. The directory also features industry-related suppliers of equipment, machinery, parts and business services for turfgrass sod farms.

For your next landscape or turfgrass needs project, visit the TPI directory at [www.TurfGrassSod.org](http://www.TurfGrassSod.org) and click on the tab "Turfgrass Sod Producers" next to "Find" from the home page. For further information about TPI or if you have questions about the directory, please contact Susan Hall at 1-800-405-8873 or email [shall@TurfGrassSod.org](mailto:shall@TurfGrassSod.org).

### About TPI

The Turfgrass Producers International (TPI) is the leading organization for turfgrass sod growers, with more than 1,100 members worldwide. Founded in 1967, TPI is dedicated to the advancement of the turfgrass sod industry. Through the education of its members, product users and various green industry and government entities, the association serves to encourage the use of turfgrass sod. TPI also advocates the role and value of turfgrass sod to businesses, media, government entities and the general public. By providing members with access to a full range of programs and services, and by publishing the industry's No. 1 publication dedicated solely to turfgrass sod production, *Turf News* magazine, TPI leads the way for advancing the turfgrass sod industry. Visit the TPI website at [www.TurfGrassSod.org](http://www.TurfGrassSod.org).

# Saturated Hydraulic Conductivity of Sand Based Root Zones cont.

**From the front cover.** Under Ontario conditions, the highest daily rainfall ever recorded occurred on October 15, 1954, during Hurricane Hazel when 18.29 cm fell over a 24 hour period. The previous rain that approached this amount per day was in 1887. During the 1954 rain, a once-in-a-hundred year storm, the maximum intensity of rainfall was 5.2 cm/hour which is easily accommodated by the USGA rate



of 15 cm/hr. During intense summer storms, which are very localized, 10 cm of rain may fall in 15 minutes on an individual field but the frequency of such

---

**Examine this scenario.** If using finer sand will result in a lower hydraulic conductivity and result in the root zone holding more plant available water – and savings of \$4,340 per season on one soccer field – more research must be done in this field.

---

storms is less than one per summer. Most rainfall is at a rate of 0.5 cm/hr or less. Should we design a root zone with sand which has a hydraulic conductivity of 10 cm/hr? There is a price to pay for designing a root zone to accommodate this infrequent occurrence of an intense rain. That price is the cost of water.

The facts of water movement in soil show that the higher the saturated conduc-

tivity of the root zone mix, the lower the amount of available water the root zone will retain. Thus more frequent irrigation will be required and less of the natural rainfall on the soil will be utilized as much of it will be lost by drainage. This loss through drainage is a waste of a valuable commodity.

If a saving of 25% can be achieved using a finer sand which will have a lower hydraulic conductivity but which will result in the root zone holding more plant available water, it will save 2,480 cubic metres of water with a value of \$4,340 per season on one soccer field.

With today's emphasis on more efficient use of water, there is a great and immediate need for research in the relationship between particle size distribution of sand, saturated hydraulic conductivity and aeration porosity in sand based root zones. This research must include the time required for a return to full aeration porosity on both an hourly basis and on a daily basis. Studies at Bingley Sports Turf

Research Institute have shown a significant decline in the hydraulic conductivity as a field matures, particularly those using organic amendments, or as the active and decaying root system develops. Therefore the project must extend over several years.

The studies must be done in the field. The technology is available. Where is the money for the research?

## FYI

### New Online Forum Available

The Professional Lawn Care Association of Ontario has added a new online forum to its website [www.plcao.on.ca](http://www.plcao.on.ca). STA members are invited to take advantage of this opportunity to initiate discussion, post questions and look for answers on a variety of turf-related topics.



## NEW MEMBERS

### WELCOME TO THE STA!

**Urban Turf Ltd., St. John's NL**  
Jim Floyd

**Town of Oakville, ON**  
Stephen Booth

**Nutrite, Kitchener, ON**  
Paul Proulx

**Dol Turf Restoration Ltd.**  
**Bond Head, ON**  
Andrea Wallis

**Town of Midland, ON**  
Dave Hamelin

**Town of Newmarket, ON**  
Jeff Bond & Derek Walsom

**Township of Centre Wellington**  
**Fergus, ON**  
Andy Goldie, Dan Reeves  
& Matt Tucker

**City of Kingston, ON**  
Mark Fluhrer

**Appleby College, Oakville, ON**  
Ken Rivers

**City of Mississauga, ON**  
Chris Katotikidis, Anthony Alfano,  
Rob D'Ovidio, Wayne Graham,  
Jane Maffrett, Cliff Towers,  
Mark Trudelle, David Warden  
& Andy Wickens





Figure 1



Figure 2

## WHAT DO RUST DISEASES HAVE TO DO WITH TEA DRINKING, RED DOGS AND BARBERRY PLANTS?

DR. TOM HSIANG, PROFESSOR, DEPARTMENT OF ENVIRONMENTAL BIOLOGY, UNIVERSITY OF GUELPH

There used to be a very popular garden plant called barberry which has attractive variegated foliage (Figure 1), and served very well as hedges since they have prickly thorns. But then they mostly disappeared from the urban landscape. What did the disappearance of this plant have to do with turfgrass rusts? Barberry was banned in 1966 for import into and trade within Canada. The reason for this was because barberry acts as the alternate host for the rust *Puccinia graminis* which causes stem rust of wheat and also rust on a variety of turfgrasses (Figure 2). The meaning of alternate host is that the fungus needs both the grass host and the alternate host to complete a full life cycle.

**R**ust diseases on plants have been recognized since ancient times and are one of the few plant diseases mentioned in the Bible. The Romans even had a God of Rust, Robigus, who was honoured annually by sacrifices of red coloured animals such as cows or dogs, and red wine. Rust diseases have had severe economic impact, and a severe outbreak of rust on coffee in the mid-1800s was probably responsible for changing Britain to a land of tea drinkers. Rust diseases are notorious on cereal crops, and world-wide losses to wheat stem rust are estimated at several billion dollars each year. Rust fungi require living host tissue to feed, although spores can survive on the surfaces of dead plant tis-

sues. Rusts are also highly specific to their host species, and a rust of perennial ryegrass may be unable to infect Kentucky bluegrass, and vice-versa. In some cases, some rust isolates are specific to particular host cultivars, so that they cannot attack other cultivars even within the same host species.

Rust fungi have among the most complicated life cycles of all living organisms, and there may be five distinct spore stages with two different host plant species required to complete a full cycle. Over 500 years ago, wheat farmers first started to notice that wheat rust was often worse when barberry bushes were growing nearby. This led to eradication programs for alternate hosts that were mentioned at

the start of this article. Did these eradication programs for the alternate host manage to both break the life cycle and eradicate the rusts? Not really, because not all barberry plants were eradicated, and mostly because in North America, the rust can survive on living host tissue near the Gulf of Mexico and then travel northward in spring time.

In this article, we'll look at the major rusts that attack cool season turfgrasses. We'll discuss their biology and ways of recognizing and controlling these diseases on turfgrass.

### Hosts

Nearly all grasses can be affected by their own rusts, but among cool season

turfgrasses, perennial ryegrass seems to be most greatly affected. Rust is also a problem on Kentucky bluegrass, but often only one species is affected in an area. All of these rusts also have their cereal hosts, for example, *P. graminis* on wheat and *P. coronata* on oats. However, as they are so specialized, the strain attacking the cereal may not be able to attack turfgrasses. The alternate host for *P. graminis* is barberry (Figure 1), and that for *P. coronata* is buckthorn (Figure 3). Orange spots are visible on these alternate host plants in the spring to early summer. The common rust on perennial ryegrass is called crown rust (Figure 4) caused by *Puccinia coronata*. It is called crown rust, not because it attacks the crown of plants, but because the spores have protrusions that look like crowns (Figure 5).

### Season of Occurrence

Rust on turfgrass is most commonly visible on leaf blades in late summer into fall. However, infections may start in late spring, and through several cycles of infection, the levels of rust build up by the end of summer.

### Conditions Favouring Disease

The conditions that are favourable for initial infection differ from those that encourage development of the disease in the field. Infection is favoured by low light intensity, 20 to 25°C, and high humidity (e.g. long dew periods). After infection, disease development is enhanced by high light intensity, 25 to 35°C, and dry leaf surfaces. Alternation of wet cooler weather with hot dry weather during summer will greatly enhance infection and allow disease levels to build up. In the last part of summer and into early fall, dry, warm and sunny conditions slow the growth of the grass, and also allow the rust to almost completely infect the entire leaf blades and produce abundant spores.

### Symptoms

The first symptoms on grass are small yellow flecks on leaves or sheaths on upper or lower leaf surfaces depending on the species of rust. Reddish-brown pustules (Figure 6) appear on leaf blades bearing masses of summer spores (Figure 7).



Figure 3

**Fig. 1:** Variegated barberry plant which was very common in the mid-1900s but almost disappeared because of efforts to eradicate wheat stem rust by eliminating this alternate host.

**Fig. 2:** Rust on Kentucky bluegrass surrounding a creeping bentgrass green in August. The creeping bentgrass is not susceptible to the Kentucky bluegrass rust and the thicker, more lush Kentucky bluegrass also contributes to more infection.

**Fig. 3:** Buckthorn in late spring infected by the crown rust fungus. The spores produced in specialized small cups on this host can only infect turfgrasses such as perennial ryegrass.

**Fig. 4:** Crown rust of perennial ryegrass in late August causing widespread yellowing on a sports field. The yellow-orange colour comes both from the infected grass blades and the yellow colour of the rust spores and the bodies that produce the spores.

**Fig. 5:** *Puccinia coronata* causing crown rust. It is called crown rust not because it attacks the crown of the plant, but because the spores have protrusions that look like a crown.

**Fig. 6:** A yellow spot on a leaf blade caused by a rust is composed of the yellow plant tissue due to feeding by the rust and the yellow-orange rust spores.



Figure 4

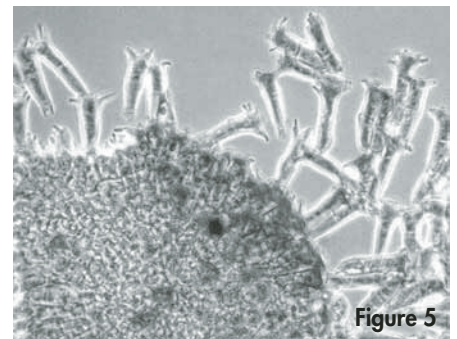


Figure 5

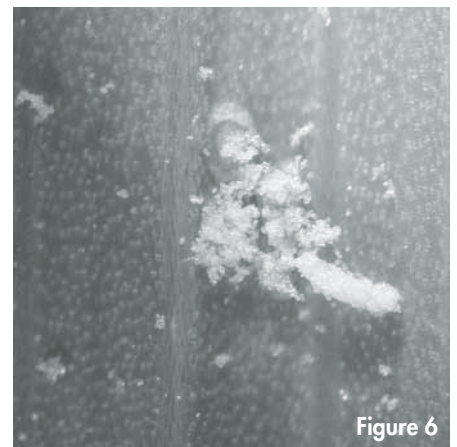


Figure 6



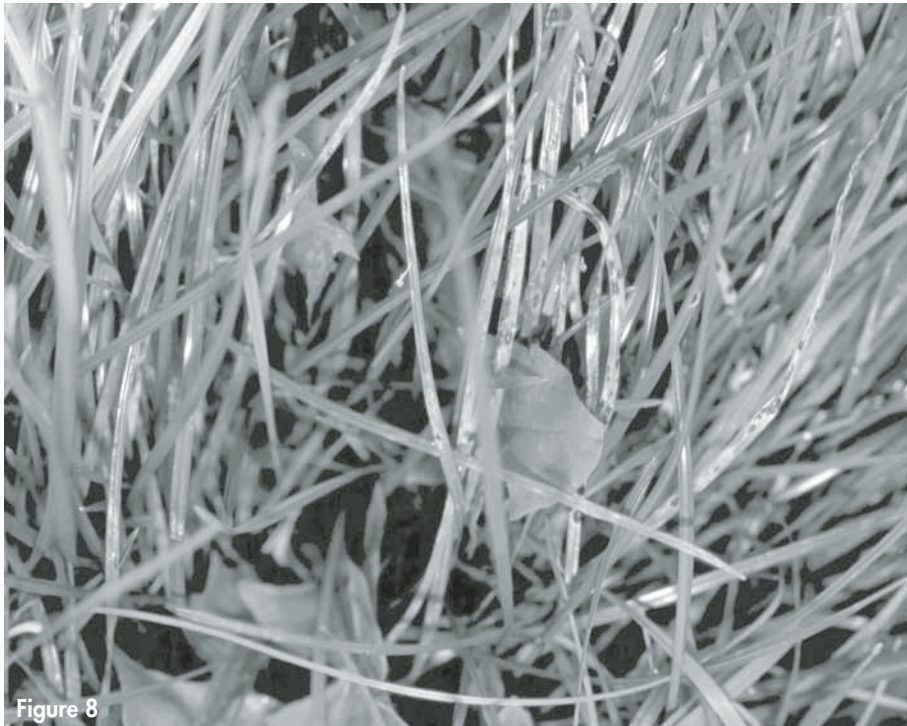


Figure 8

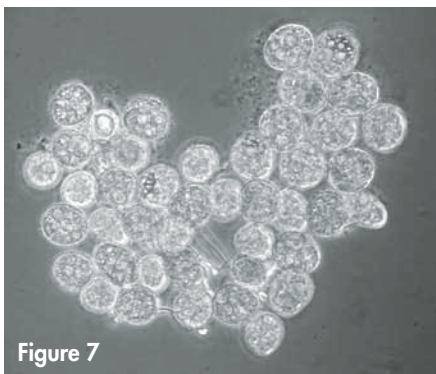


Figure 7

**Fig. 7:** Rust spores are thick walled to withstand drying and can travel long distances.

**Fig. 8:** Rust infections on perennial ryegrass later in the season. The rust has stopped producing the yellow-orange summer spore and has started producing the black winter spores which overwinter on dead grass foliage. The black spores will germinate in the spring to produce another short-lived spore that can only infect the alternate host, not the grass host.

These rust spores can easily be rubbed off, giving a reddish tinge to shoes and equipment which commonly occurs in fields with lots of rust. These rust species are not known to be poisonous or produce toxins to animals, so occasional contact or even inadvertent ingestion shouldn't cause a health problem. Only above ground plant parts are infected, and severe

attacks may result in yellowing and wilt. After tissue has been killed or nearing the end of the growing season, brown or black spots composed of black winter spores may develop in place of the reddish-brown pustules (Figure 8).

### Life Cycle

Most rusts require more than one host species to complete a life cycle. In addition to the grass host, the other host, known as the alternate host, is usually a woody or herbaceous species such as barberry (Figure 1) or buckthorn (Figure 3). Typically the fungus overwinters on living or dead tissue of the grass host. If the fungus overwinters on living tissue, such as in areas of very mild winters, then there is no need to pass through the alternate host, and then the dormant mycelium will produce spores which serve as the primary source of infection the following spring. This likely does not occur in northern latitudes because of the severe winters.

In the spring, overwintering resting spores (teliospores) on dead grass tissue produce other spores (called basidiospores) which will only infect the alternate host. A few weeks after successful infection of this alternate host, another set of spores (called aeciospores) are produced in late spring or early summer

which then infect the grass host. Infections on the grass host lead to production of pustules which bear many more spores (called uredospores) to re-infect grass (cycling stage which increases the amount of rust). As the grass host tissue dies off, another spore stage (usually black or dark brown and called teliospores) is produced on the grass tissue (Figure 8), and these structures overwinter.

Most rusts require more than one host species to complete a life cycle. In addition to the grass host, the alternate host is usually a woody or herbaceous species.

### Cultural Control

Mowing and managing fertility will usually control rust disease. The grass should be watered infrequently but thoroughly early in the day to minimize leaf wetness periods and to avoid drought stress. Fertilization should be sufficient to avoid nutrient stress and to improve leaf growth. Increased mowing height with greater frequency of mowing should reduce disease symptoms, although some researchers recommend reducing the height of cut so that there is less foliage for infection. The drawback of this method is that the plant is weakened with a relatively smaller root system, and may be less able to fight off infection. Reducing shade and improving air circulation should lead to drier leaf surfaces and less opportunity for infection.

### Chemical Control

No chemicals are registered for turfgrass rust disease control in Canada, but in the U.S., azoxystrobin and propiconazole have been found to be very effective. Consult provincial publications product labels for recommendations.

### Resistant Turfgrasses

Cultivars of Kentucky bluegrass and perennial ryegrass with increased resistance to rust are available. Consult local publications or contact seed company representatives for lists of varieties. ♦