Sports Turf Manager
FOR BETTER, SAFER SPORTS TURF. SUMMER 2013. VOL. 26. NO. 2.

Understanding Canada Goose Management

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The Canada goose — is it an iconic symbol of our nation or a pest that plagues our green spaces? Just as opinions of this bird vary, so does the goose itself — not all Canada geese are created equal. And thus come the challenges of Canada goose management. No singular management technique is effective or even appropriate to relieve the pressure these birds can apply to our landscapes. To improve our ability to manage geese and goose related conflict, we must know more about the issues and the birds themselves. It is not the intention of this article to describe the different methods of management (and there are many), but to identify some considerations important to understanding Canada goose management.

Taxonomy

The first issue is basic taxonomy— understanding the differences in subspecies and how they are categorized. Canada goose taxonomy is a dynamic classification system — one that has evolved and will likely continue to do so. Recently, the American Ornithologists' Union (AOU; the body responsible for naming birds in North America) divided Canada geese into two species — large bodied (Canada geese; *Branta canadensis*) and small bodied (Cackling geese; *Branta hutchinsii*). Within each species are several subspecies, such that 12 different subspecies of Canada and

THE CANADA GOOSE— IS IT AN ICONIC SYMBOL OF OUR NATION OR A PEST THAT PLAGUES OUR GREEN SPACES?

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Some of the best memories are made in flip flops. ~Kellie Elmore

Inside this issue...

REGULAR COLUMNS, DEPARTMENTS & SMALL FEATURES

Opinions expressed in articles published in Sports Turf Manager are those of the author and not necessarily those of the STA.

Deadline for Autumn 2013 Sports Turf Manager: September 6

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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
- Michael J. Bladon Educational Link – Search the Michigan State University's Turfgrass Information File.

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President's Desk

BY PAUL GILLEN

Welcome to summer, at last. It was a long time coming this year; or it seemed to be, anyway.

Your association personnel have had a busy spring. We've graduated 39 students from the spring offerings of the Sports Turf Management and Maintenance Course; 22 in Guelph and 17 in Midland, Ontario. Did you know that our instructors will come to you as we did in Midland and Moncton, New Brunswick? Contact Lee Huether for particulars if you are interested in having an in-house presentation of the course.

The National Leadership Forum of the Canadian Recreation Facilities Council was held June 10 and 11 in Toronto, Ontario. The STA sponsored the Innovations for the Sustainability of Sports Fields session for this national event.

Atlantic Sports Turf Field Day Program Participants L-R: STA Atlantic Director Gord Horsman/City of Moncton, Speaker Eric Lyons/University of Guelph, Event Day Chair Bob Daniels/Dalhousie Agricultural Campus, Event Host Rob Mullane/Halifax Regional Municipality, and Speaker George Bannerman/Bannerman.

L-R: Gord Horsman with speaker Tim Vanini/New Dimensions Turfgrass

We are making progress with our Branding and Marketing Project that we introduced in the last issue. Your directors participated in a discovery meeting late in May, with a number of member, partner and stakeholder interviews to follow. We hope to have an initial presentation of the combined results at the Board of Directors meeting this month. We are excited by the process, which, in the end, will help to guide and assist us in establishing and achieving our goals as an organization as we move into the next 25 years.

In this issue we look at the Sports Turf Field Day at the Dartmouth Sportsplex and Commons in the Halifax Regional Municipality where we hosted sports turf managers and industry professionals from Nova Scotia, New Brunswick and Prince Edward Island. We express our appreciation to our program participants and to all of our industry supporters. We also examine a Canada-wide plague – the goose problem. See "Understanding Canada Goose Management" inside together with an article on Oakville, Ontario's Canada Goose Management Program. As always, we welcome your comments.

Be sure to mark your calendars for the local upcoming field days – August 29 in Langley, British Columbia and September 19 in Mississauga, Ontario. Both have excellent programs arranged. We are also preparing for a 1-day Synthetic Turf Workshop to be held in November in association with our Ontario Recreation Facilities Association partners. Stay tuned to the STA website for the details of each event.

That's it for me for now. Always remember – "Safe and Playable". •

LIGHTNING SAFETY AND PREPAREDNESS

When thunder roars, GO INDOORS!

Every year in Canada, lightning can cause as many as 10 deaths and 164 injuries. You can avoid a tragedy like this by taking a few simple precautions.

If you can hear thunder, you can get hit by lightning. Take shelter immediately. If you cannot find a sturdy, fully enclosed building with wiring and plumbing, get into a metal-roofed vehicle. Stay inside for 30 minutes after the last rumble of thunder.

Direct strikes are responsible for only 5% of lightning-related deaths and injuries. Two other types of hazardous phenomena are caused by lightning. Ground current and side flash account for 60 to 80% of lightning-related injuries and deaths. A ground current is set up when lightning hits the ground, spreads out and sends a current through a victim. Side splash occurs when lightning hits a tall object, travels partly down the object and then jumps to a nearby victim.

For more information on lightning, visit Environment Canada's Lightning in Canada website at www.ec.gc.ca/foudre-lightning

New & Returning Members

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David Davidson
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Newmarket, ON

Event Calendar

ASSOCIATION EVENTS ARE HIGHLIGHTED IN GREEN

Sports Turf Manager of the Year

- While the deadline isn't until December 1, start the nomination process now.
- Download the criteria and nomination form from the STA website.
- Consider and identify the information you will need in support of your nomination.
- Who will you nominate? Ensure your nominee's eligibility.
- In what category? Begin to document and gather facts, figures, and photos to formulate and strengthen your nomination.
- Identify whom you will approach for letters of support (maximum of three). Contact them and discuss who, what and why.

Sports Turf Manager of the Year. A professional award program of the Sports Turf Association with the Cooperation and Sponsorship of the Guelph Turfgrass Institute and GTI Solutions Group. Who will be our inaugural recipient?

2013 Field Days

August 29
Western Canada Turfgrass Association/ Sports Turf Association
West Coast Sports Field Training Day
Langley Events Centre/Willoughby Community Park
Langley, BC
www.sportsturfassociation.com/Events/FieldDays

September 19
Sports Turf Association
Sports Turf Field Day
Mississauga Valley Community Centre & Park
Mississauga, ON
www.sportsturfassociation.com/Events/FieldDays

December 1
Sports Turf Manager of the Year Award Nomination Deadline
www.sportsturfassociation.com/Awards&Scholarship

Understanding Canada Goose Management

Continued from page 1

Table 1. Taxonomy of Canada and Cackling Geese.

Large Bodied (Branta canadensis)		Small Bodied (Branta hutchinsii)	
Scientific Name	**Common Name**	**Scientific Name**	**Common Name**
B.c. canadensis	Atlantic	B.h. hutchinsii	Richardson's
B.c. interior	Interior	B.h. asiatica	Bering
B.c. maxima	Giant	B.h. leucopareia	Aleutian
B.c. moffiti	Moffit's	B.h. taverneri	Lesser*
B.c. parvipes	Lesser*	B.h. minima	Cackling
B.c. fulva	Vancouver		
B.c. occidentalis	Dusky		

*These geese are part of a group of geese called the "Lesser Complex." Features can be challenging to differentiate in the field.

Cackling geese are recognized in North America (Banks et al. 2004; Table 1). For the purpose of this article, all subspecies will be collectively referred to as Canada geese.

The differences in subspecies include physical size (e.g. the smallest form—the small Cackling Canada goose weighs 3 - 5 pounds, whereas the largest form — the Giant Canada goose weighs over 20 pounds), population numbers, status, distribution, and management.

Ecology

Understanding life-history and annual patterns of geese can assist managers to identify appropriate management windows. Canada geese are considered Arctic-nesting geese; that is, when following natural patterns, these birds generally nest in northern latitudes and migrate south after the breeding season. During mild climatic conditions, particularly in south-western Canada, Canada geese may begin nesting as early as February. Egg-laying is initiated in March and can continue into late May. Females typically lay 4 - 7 creamy white eggs (average is 5; total can be as high as 12) on consecutive days (Figure 1). They may also lay replacement eggs if originals are preyed upon, or the nest is destroyed early in incubation, which is approximately 25 - 27 days (Mowbray et al. 2002, Environment Canada 2003).

In late summer, prior to the fall migration, adult geese moult their flight feathers and grow a full new set over approximately 4 - 6 weeks. During moult young birds lose their down and grow their first set of flight feathers as well. Geese are vulnerable to predation during moult. Consequently, geese will form large moulting flocks on water bodies for protection. In addition, Canada geese exhibit high philopatry to nesting, migration and wintering areas allowing for perpetuation of distinctive subspecies. These traits have allowed biologists and managers the ability to create management programs targeting specific subspecies.

Geese form permanent pairs at 2 - 3 years. A pair will return to the female natal area to breed — some females set up nests in close proximity to their own hatch site. Geese may live greater than 20 years in the wild, particularly in urban settings where predation is low and forage is readily available.

Geese prefer to forage on tender grasses, but will take advantage of wetland vegetation, turfgrass, farm crops, and palatable ornamental vegetation. Geese generally clip the vegetation, but will also grub roots leaving an area denuded if grazing pressure is heavy.

Distribution

Canada is home and native land to most stocks of Canada geese — at least for some part of their life cycle. Being naturally migratory, these birds are capable of extraordinary migrations. Depending on the subspecies, these trips can extend thousands of kilometres. Typically, an annual migratory pattern consists of nesting on northern breeding grounds, migrating south for the winter (making some stops along the way), wintering in southern latitudes and then returning north again. Geese are extremely site faithful and repeatedly use the same route and teach the route to their offspring. Each species has a different migratory pattern; however, migratory pathways do overlap, particularly at temporary stopover sites in the spring and fall. During these times, members of threatened stocks may mix on fields with members of stocks with no conservation concern—even problem stocks.

Figure 1. Canada goose nest with five eggs.

Status

Understanding that there are 12 different subspecies of Canada geese provides the backdrop for understanding "status." Here, the term applies to the conservation and legal status of goose subspecies—e.g. is there a conservation concern and how is that concern labelled.

For those who have experienced crop or field damage from unrelenting flocks of Canada geese, it may seem difficult to believe that some stocks of Canada geese are of conservation concern — critically so — and they are being managed to sustain their numbers. In fact, the Bering goose subspecies (*B.h. hutchinsii*) was extinct by the early 1930's caused by heavy predation by Arctic foxes and human exploitation.

In the early 1900's many Canada goose populations experienced huge declines. Hunting, habitat loss, and introduced predators all contributed to declines that triggered awareness and conservation programs. Stochastic events also contributed to losses — the Dusky Canada goose suffered a huge loss in 1964 when an earthquake decimated the breeding colony on the Copper River Delta. This subspecies continues to be managed carefully to secure its sustainability.

The response to declining goose numbers was efforts to re-establish geese to native habitat and/or introduce stocks to new areas not previously inhabited by geese. For most stocks, the response has been more than successful.

Example 1:

The Giant Canada goose was extirpated from much of its native range. Reintroduction from its native habitat has been so successful that translocations of birds outside of its original range have occurred to control nuisance populations inside its native range (mid-western United States). The result has been an over successful expansion of the population into Canada and the United States.

Example 2:

Canada geese were introduced to parts of western Canada (e.g. Okanagan Valley; Southern Vancouver Island; Lower mainland, British Columbia) in the 1960 - 70's to provide sport hunting opportunities and increase wildlife viewing opportunities. Since then changes in habitat, urban expansion, and agricultural practices have resulted in exponential increases in these birds in non-native landscapes.

In both examples, as with many translocations of geese across North America, translocated geese and their progeny did not migrate. The groups established non-migratory resident populations in locations to which they were located. The full understanding of the inability to migrate is not complete; however, reasons likely stem from young geese/eggs being removed to a new location without the benefit of adult geese to initiate a migratory pattern. That is, young geese were moved to a new location, did not know where to fly, and no one was there to show them.

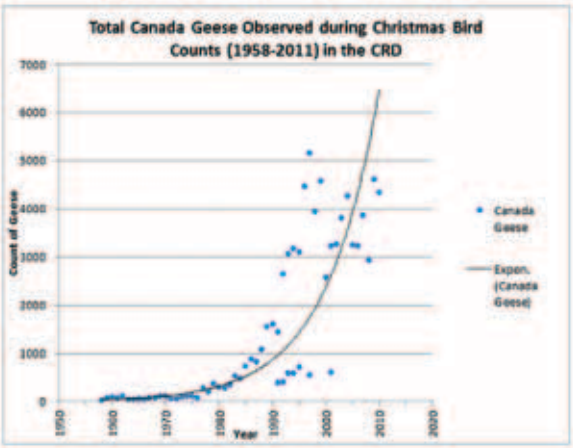

Figure 2. An example of exponential growth, typical of urban populations of Canada geese.

Population Numbers

Environment Canada states that Canada geese have increased dramatically in abundance and geographic distribution during recent decades. By their estimate, at least 7 million Canada geese are present in North America. The population status of each subspecies is provided in the Migratory Birds Regulatory Report Series (see www.ec.gc.ca/rcom-mbhr). In many urban regions the population growth is exponential (e.g., the Capital Regional District on southern Vancouver Island, Figure 2).

Management Issues

The arise of huge non-migratory resident goose populations is a relative new phenomenon, but has quickly risen to the top of "pest" problems for many turf, park, school, and farm operators in addition to a significant safety hazard for water reservoir and airport authorities.

Confounding the obvious economic and safety concerns associated with goose management is the responsibly to manage geese within the legislative framework and respect that some goose stocks still have conservation concerns (recall the Dusky geese). In addition, the general public may have substantial concerns with goose management that will need to be respectfully addressed.

Regulatory Considerations

Prior to the consideration of any management program for Canada geese, it is likely that authorizations from the federal government and other levels of government will be required for management activities Like all migratory waterfowl, geese are protected under the federal Migratory Birds Convention Act (1994) and pursuant Migratory Bird Regulations. This federal piece of legislation does not differentiate nuisance populations and ensures protection to all geese regardless of conservation status. Having stated that, the Canadian Wildlife Service (Environment Canada) provides authorizations for specific management and control activities which are helpful for mitigating conflict between people and geese. To facilitate goose management, Environment Canada has developed a series of handbooks to assist with management planning and best management practices (see www.ec.gc.ca/mbc-com).

Approaches to Management

To appropriately manage Canada geese and allocate resources for effective management several questions need to be addressed which can help form the basis of a Management Plan.

For example:

1) Define the problem—are the problem birds resident or migratory? Are the problem birds affecting a small area, (e.g. a field) or a larger area? (e.g. several towns)
2) Who are the impacted stakeholders?
3) What is an acceptable level of impact from Canada geese? (e.g. tolerance at a park may be higher than tolerance at an airport)
4) What is attracting the geese? (e.g. do people feed geese)
5) Are any tools in place to control geese? (e.g. hunting within regular hunting seasons)

In general, conducting goose management at the largest possible scale will be most effective so that geese are not bounced back and forth between jurisdictions; wasting resources (e.g., see www.okanagangooseplan.com for an example of a collaborative goose management program in British Columbia).

Summary

In general, the rise of the Canada goose population has come from changes on the landscape, and well-intentioned, but overly successful introductions of subspecies outside of their native ranges. The loss of migratory behaviour and decreased predation in urban environments has developed a robust population almost everywhere introductions were applied.

As a nation, we are suffering from uncontrolled growth of nonmigratory resident geese which need to be managed, but without disregarding native stocks that retain migratory patterns and are more self-regulating. In addition, we should aim to prevent the mixing of migratory stocks with non-migratory geese to ensure subspecies integrity remains intact. Using the tools that are available, under appropriate authorizations, we should humanely control and reduce population growth of introduced populations which were created under artificial conditions. Finding this balance is the conundrum that faces all managers—be it of geese, habitat or other green spaces. But by understanding the issues underlying management, we can move forward making successful and effective decisions. •

Non-migratory resident Canada goose nest on houseboat (District of West Kelowna, BC).

Non-migratory resident Canada goose nesting in planter (5th floor balcony), (Kelowna, BC).

The result of geese grazing on pasture.

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National Audubon Society. 2012. Christmas Bird Count Results Data and Research. Available: http://birds.audubon.org/christmas-bird-count (Accessed June 2012).

Additional Sources of Information

Okanagan Valley Goose Management Program: www.okanagangooseplan.com

Environment Canada: http://www.ec.gc.ca

US Humane Society Canada Goose Egg Addling Protocol: www.humanesociety.org/assets/pdfs/WILD_Goose_Egg_Addling_Protocol.pdf

Weed Suppression in Turfgrass Using Different Species and Thicknesses of Leaf Mulch

Peter Purvis and Erica Gunn, *Guelph Turfgrass Institute, University of Guelph*
Pam Charbonneau, *Ontario Ministry of Agriculture Food. Ministry of Rural Affairs*

Autumn is a nice time of year. The beautifully cool, crisp weather, the spectacular colours and falling leaves...yes, the seemingly endless hours of raking fallen leaves. Many of us still physically remove leaves from our turf each fall, putting them in bags or moving them onto the street for pick up. However, some municipalities are tightening their rules on curb-side leaf collection.

Mulching tree leaves is an alternative to raking and has many positive benefits for the turfgrass ecosystem. Research at Purdue University found that adding mulched leaves to turf increased soil microbial activity and organic carbon content but did not increase thatch levels, did not promote turfgrass diseases and did not negatively affect visual turf quality or colour (1). Experiments at Michigan State found that the addition of mulched maple and oak leaves promoted early spring green-up and reduced populations of common dandelion in turf (2). The City of Guelph and other municipalities regularly mulch tree leaves in their parks and sport field complexes to manage their fallen leaves (Figure 1).

Turfgrass managers need effective, non-chemical methods for controlling weeds and promoting high quality soil and turf, particularly since the use of cosmetic pesticides is banned in many provinces and municipalities across Canada. This three year study examined the effectiveness of two thicknesses of mulched tree leaves and needles applied to control broadleaf weeds in established lawn-type turf. We also evaluated the overall turf and soil quality when mulched leaves were applied.

Materials and Methods

- In October 2010, eighty plots (20 treatments x 4 replications; each plot 2 m x 2 m in size) were established on weed infested lawn-type turf at the Guelph Turfgrass Institute, Guelph Ontario.

Figure 2: Research plots at the Guelph Turfgrass Institute with applied tree leaf and needle mulch.

Figure 3: A plot containing a 5 cm depth of mulched gingko leaves.

Table 1. Soil organic matter content (%), nutrient status (mg/L) and pH from samples collected in October 2012.

	OM	P	K	Mg	pH
Weedy control	4.2	7.8	73	318	7.7
Par 3 herbicide	3.6	4.2	53	310	7.8
Urea (0.25 kg N/100 m^2)	4.5	7.2	78	338	7.7
Urea (0.50 kg N/100 m^2)	3.3	4.1	58	313	7.8
All leaves and needles combined (2.5 cm)	3.9	8.1	77	325	7.8
All leaves and needles combined (5.0 cm)	4.2	10.8	82	335	7.7
White ash (2.5 cm)	3.3	4.4	51	293	7.8
White ash (5.0 cm)	4.2	4.8	57	305	7.7
Ginkgo (2.5 cm)	3.5	3.7	54	298	7.8
Ginkgo (5.0 cm)	3.7	6.1	57	318	7.8
Norway maple (2.5 cm)	3.7	5.5	62	325	7.7
Norway maple (5.0 cm)	3.8	3.6	61	305	7.8
Silver maple (2.5 cm)	3.8	4.2	63	313	7.8
Silver maple (5.0 cm)	4.0	5.8	66	323	7.8
Sugar maple (2.5 cm)	3.8	3.9	58	308	7.8
Sugar maple (5.0 cm)	3.8	4.5	59	325	7.7
Eastern white pine (2.5 cm)	3.8	4.9	57	310	7.7
Eastern white pine (5.0 cm)	3.6	5.1	59	325	7.7

- Leaves of Norway maple, silver maple, sugar maple, ginkgo and white ash, and needles of eastern white pine were collected from the Arboretum at the University of Guelph and separately mulched using a commercially available mulching lawn mower.
- The following treatments were applied in 2010, 2011 and 2012:

1. Mulched leaves or needles from each separate tree species applied to turf plots at two separate depths (2.5 cm or 5 cm thick; Figures 2 and 3).
2. A composite blend of all mulched leaves and needles applied at two separate depths (2.5 cm and 5 cm).
3. Fertilizer (Urea; 46-0-0) applied annually at two rates (0.25 and 0.50 kg N per 100 m^2) in May, September and October.
4. A broadleaf herbicide (Par 3 applied at 55 ml per 100 m^2) applied each September.
5. A weedy control plot with no treatment application.

- The plot area was maintained as lawn-type turf. The area was mowed at a height of 7 cm once per week. The plots were not irrigated.

Figure 1: A park in the City of Guelph before and after leaves were mulched.

- Throughout the experiment, turfgrass canopy reflectance readings (an indicator of turf quality and colour) were taken.
- Soil samples were collected each fall and sent to Laboratory Services at the University of Guelph for nutrient and organic matter analysis.

Result and Discussion

Soil Analysis

There were no significant (statistical) differences among treatments for soil organic matter content, nutrient content, or pH levels. These results were observed in all years but only the data for 2012 is shown (Table 1). It is interesting to note that plots receiving repeated applications of leaf mulch had similar physical and chemical properties as those receiving no mulch. It is likely that the duration of this trial was too short to detect any changes in soil properties. Soil physical and chemical changes would likely only appear after many years of leaf mulch application.

Weed Counts

The number of weeds per plot were counted each spring, summer and fall. The data shown is for October 2011 and 2012 (Table 2) but similar results were observed throughout the experiment. The predominant weed species (from most to least) were dandelion, white clover, black medic, birdsfoot trefoil, narrow-leaf plantain and chickweed. As expected, the least number of weeds were found in the plots sprayed with a broadleaf herbicide. In contrast, there were no statistical differences in the number of weeds per plot among the remaining treatments.

However, though not statistically different, a few interesting trends did emerge from the data. There tended to be fewer weeds in the plots where the maximum thickness of a composite blend of all leaves and needles was applied. There also tended to be fewer weeds in plots that received nitrogen fertilizer. For example in 2012, plots receiving a 5 cm depth of all leaves combined had 29% weed cover and plots receiving only nitrogen had up to 25% weed cover, whereas the corresponding weedy control plot had 44% weed cover (Table 2).

Turfgrass Quality

There were no differences among treatments in turf colour and quality throughout the experiment (data not shown). However, it is

Table 2. Total number of weeds per plot (%) in 2011 and 2012.

	Weeds per Plot (%)	
	October 2011	October 2012
Weedy control	37	44
Par 3 herbicide	13	1
Urea (0.25 kg N/100 m^2)	23	25
Urea (0.50 kg N/100 m^2)	26	24
All leaves and needles combined (2.5 cm)	29	38
All leaves and needles combined (5.0 cm)	21	29
White ash (2.5 cm)	30	36
White ash (5.0 cm)	39	44
Ginkgo (2.5 cm)	27	33
Ginkgo (5.0 cm)	39	40
Norway maple (2.5 cm)	35	31
Norway maple (5.0 cm)	25	32
Silver maple (2.5 cm)	32	35
Silver maple (5.0 cm)	38	44
Sugar maple (2.5 cm)	31	44
Sugar maple (5.0 cm)	17	32
Eastern white pine (2.5 cm)	32	41
Eastern white pine (5.0 cm)	31	34

significant to note that there were no detrimental effects on turfgrass colour and quality caused by any leaf mulch treatment, even at the maximum depth of application. Repeated addition of mulched leaves to turf did not cause any injury or harm to the grass.

Summary

This coming autumn, when leaves blanket your turf, why not mulch them instead of removing them? Even a thick layer of mulched leaves applied year-after-year will not harm your grass. In fact, it could possibly reduce the weed populations of your turf and improve your soil quality in the long term.

Acknowledgements

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Second Biennial Atlantic Sports Turf Field Day - June 18 Dartmouth, Nova Scotia

Tailgate Tradeshow Exhibitors

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Vesey's Equipment

Written by R.W. Daniels, Dalhousie Agricultural Campus, Department of Environmental Sciences

As the Sports Turf Association continues to expand its role in supporting turf managers throughout Canada, it, in cooperation with Halifax Regional Municipality, held a very successful SportsTurf Field Day on June 18, in Dartmouth, Nova Scotia. The first such event in Atlantic Canada was held in Moncton in 2011. This year's event consisted of a morning educational program, held at the Dartmouth Sportsplex, addressing specific topics on turfgrass by Dr. Eric Lyons, University of Guelph; and Dr Tim Vanini, New Dimensions Turfgrass. This was followed by a noon "Tailgate" Tradeshow, practical equipment and product demonstrations conducted by Mar-Co Clay Products, and the remaining educational session by George Bannerman of Gordon Bannerman Limited. These later events were held on the Dartmouth Commons.

The event attracted some 60 recreational field practitioners from three Atlantic provinces. The educational sessions were recognized by Plant Health Atlantic which enabled qualified individuals to accumulate Continuing Education Credits recognized by this organization.

Dr. Eric Lyons made two presentations to those in attendance. The first dealt with "Maximizing Benefits of New Technologies in Turf Management: Fertilizer and Novel Grass Species." Eric spoke on how new fertilizers are being continually introduced and available to athletic field managers. As the frequency of these introductions increase, along with the technologies used to develop the products, a thorough understanding of the benefits derived when using them as part of a seasonal maintenance program is necessary.

As Dr. Lyons referred to new technologies in turfgrass, he challenged the participants to understand how their management practices affect turfgrass. Doing things correctly results in significant improvements while doing things poorly generally results in a significant setback. With regard to turfgrass nutrition, he emphasized the importance of delivery and how to apply products properly, with special reference to fertilizer application frequency and usage of the right equipment.

In dealing with the newer, long-lasting fertilizers, he emphasized both the potential benefits and problems. These potential problems are in application errors, the fact that mistakes take a long time period to correct, application equipment must be calibrated properly and operational errors avoided. In determining a fertility program, one needs to understand that nutrients are best applied during the time period in which the plant is actively growing.

As overseeding has become a regular practice in sports field management, individual managers must continue to evaluate all new products and turf varieties available. Additionally, those responsible for establishing seasonal maintenance schedules must determine how any new product can be successfully integrated into their program to provide for a better playing surface throughout the year.

The second presentation by Dr. Lyons dealt with "Maximizing Benefits of New Technologies" with specific reference to weed management. At this time, he gave a review of previously used "chemical" products such as "Killex," which contains 2,4-D, Dicamba and Mecoprop. Multiple new methods are now becoming available although most only contain one active ingredient. These products are mainly biological and may contain heavy metals. Additionally, these products are very expensive and to date do not give the weed control results as obtained from the previous (chemical) products.

The importance of weeds in established turf should not be underestimated as the higher the weed population the lower the actual turf cover, which can result in increased injury to those playing on the field surface. This is due to the fact that established turfgrass roots provide for increased stability in the turfgrass soil.

The remainder of the morning consisted of a presentation by Dr. Tim Vanini of New Dimensions Turfgrass. His topic was "Research and Real World Applications Using Crumb Rubber to Improve Natural Sports Fields." Although crumb rubber has been available and used for natural sport fields since the 1990's, many questions relating to its proper usage are being asked. In many instances, its improper usage has resulted in conflicting results with respect to the ability of this product to successfully improve the playability of a sports field.

Crumb rubber used in sports turf consists of used car tires that have been very finely ground. Only the rubber component is used as all other material in the original tire is removed.

Dr. Vanini indicated that up to 15% of athletic field injuries are related to the condition of the field. He emphasized that

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playing quality is a function of both safety and playability as it is the player-surface interaction that contributes to sports turf injuries. Sports turf hardness is measured by means of a Clegg Hammer.

The most significant benefit of crumb rubber is that it provides resiliency to the playing surface through its ability to reduce surface compaction. An application of crumb rubber softens and stabilizes the media in the field as it aids in providing for a more consistent and uniform playing surface.

Dr. Vanini emphasized that it is important for the field manager to know what portion of the growing media is being managed. He indicated that the top 2 inches (5 cm) which contains the plant and its crown (growing point) are the most critical. He stressed the importance of always protecting the crown as it is from this region of the plant that all continuous growth arises. It was in fact the recognition of the vital role of the crown that initiated the concept of using this product on natural turfgrass playing surfaces.

Early research consisted of evaluating various sizes of crumb rubber particles. While originally large size particles were used, it was soon discovered that finer sized particles were preferred. The latest research indicates that individual particles 0.75 inches (1.9 cm) in diameter are most commonly used. Research was conducted to evaluate surface hardness by simulating "game traffic," as he tried to make practical assessments of the effect of "real traffic" as experienced during various situations.

While at Michigan State University from 2001-2005, Dr. Vanini began to study the role of crumb rubber as a component of field management as it related to other cultural practices such as fertilization, watering, aeration and overseeding. Individual trials were established which contained no crumb rubber, and received only seasonal rainfall and normal seasonal maintenance of fertilizer. Those plots were evaluated against similar plots consisting of added crumb rubber and additional amounts of both water and fertilizer. Results showed that, regardless of the presence of crumb rubber, those plots receiving the largest amount of water were consistently softer. From this he determined, by adding crumb rubber in the upper layers of the soil profile over a time period, he could increase the stabilization of the playing surface. This stabilization could be achieved successfully versus using cultural practices such as irrigation and aerification.

The initial method of incorporating crumb rubber into the playing media was by tilling the product into the existing media. This technique proved unsuccessful as it was both too time consuming and difficult to get the crumb rubber evenly placed and distributed within the growing media. The next step was to core aerate and use crumb rubber as a topdressing. It is recommended that you apply infrequent and heavy topdressing applications of crumb rubber to sports turf. A minimum application would consist of 0.25 to 0.50 inches (0.64 to 1.27 cm) in depth with the specific amount dependent on the present mowing height of the established turfgrass. The goal is to improve field drainage, resulting in better turfgrass growth, which makes for an improved, consistent playing surface. For maximum effect, it is desirable to have 100% turf cover on a field as the addition of crumb rubber does not increase new plant growth but protects the existing turf. In addition, it decreases surface hardness, increases surface consistency, increases turf wear tolerance, and extends the green cover on a field thus reducing the requirement to overseed. Speculation is that within the next five to ten years additional research will be available to provide for more accurate usage of this product.

The afternoon started with an outdoor barbeque which provided an opportunity for all to mix and share ideas relating to their sports field maintenance practices. During this time period, delegates were able to participate in the "Tailgate Tradeshow." Industry suppliers contributed to the success of this event as they answered questions relating to the products and services they are able to provide.

A practical and hands-on demonstration by Mar-Co Clay products and the final educational session by George Bannerman of Gordon Bannerman Limited concluded the day. The topic discussed by George was "Infield Grooming."

Based on the comments of the course participants, all felt that the event was most worthwhile, and the information and experience gained warranted the continuation of such an event. It is hoped that the organizers and sponsors of this day will continue to offer additional educational opportunities to sports turf managers in the future. The support of all speakers, industry supporters, Halifax Regional Municipality and the Sports Turf Association in making this a successful day was recognized by all in attendance. •

National Turfgrass Evaluation Program

National Kentucky Bluegrass Test: 2011 – 2015

Erica Gunn, *Guelph Turfgrass Institute, University of Guelph*

NTEP Kentucky bluegrass test at the Guelph Turfgrass Institute (GTI)

Have you ever wondered where to find the best turfgrass cultivar for your specific needs? Why not take a look at the National Turfgrass Evaluation Program's (NTEP) list. NTEP is known world-wide for its turfgrass species research program and currently evaluates 17 different turfgrass species in as many as 6 provinces and 40 US states.

Figure 1: Seeding a NTEP Kentucky bluegrass test, Erica Gunn, Ken Carey and Alex Porter.

Partnering with the United States Department of Agriculture, NTEP collects and summarizes information on each species on an annual basis. Turfgrass colour, quality, density, heat/cold tolerance, pest resistance are just some of the information that is collected at the various research stations involved. Once that information is summarized it can be accessed by turfgrass managers, plant breeders, researchers, and government around the world.

The Guelph Turfgrass Institute (GTI) has a long history with NTEP dating back to 1999 when we conducted our first test with perennial ryegrass. Since then, Kentucky bluegrass tests were conducted in 2000, 2005 and now our latest test which started in 2011.

The 2011 Kentucky bluegrass test is being conducted at 11 official locations where they are maintained as medium or low maintenance turf. There are also 13 ancillary test locations that look at the cultivars with respect to summer patch, traffic tolerance, sod strength, salt tolerance, shade tolerance or organic maintenance. These tests are being run in New York, Minnesota, Washington, Colorado, Utah, Virginia, and Guelph, just to name a few. Each test takes place over a four year period.

The Guelph test was seeded in the fall of 2011 (Figure 1). There are 82 Kentucky bluegrass cultivar entries in total and they were divided into three replicates. An area was tilled at the GTI and staked out in 1.5 m x 1.5 m square plots.After seeding, the plots were observed daily to determine the rate at which they germinated (Figures 2 and 3). In May 2012, the plots were rated for spring cover. Monthly turfgrass quality ratings were taken from June to November 2012.

The Guelph test is being managed as a Medium Maintenance Organic regime, as specified by NTEP. This involves specific maintenance practices, such as being mowed at 2.5 - 3.5 inches (6 - 9 cm) every 7 - 10 days. Nitrogen is to be applied at a rate of 3 lbs/1000 ft^2 (1.5 kg/100 m^2) organic products only. The trial is allowed to receive irrigation only to prevent dormancy. Fungicides could be used only to prevent stand loss. Weed and insect control was allowed only

to prevent stand loss using organic products only. Also, appropriate cultural practices are permitted.

NTEP allows some flexibility in the actual maintenance program based on individual research station location and environmental factors. In 2012, the plots at GTI were mowed at 3 inches (7 cm) when necessary. The trial was fertilized with Milorganite Lawn & Fairway 6-2-0 at a rate of 0.5 kg N/100 m^2 in April, June and September. Milorganite is considered an organic fertilizer since it is made using processed sewage. Monitoring for weeds in late spring showed levels above acceptable thresholds therefore Fiesta, an organic, broad spectrum herbicide, was applied in June and again in August. Also, due to drought issues in 2012, irrigation was used to prevent trial death as well as to prevent dormancy.

For 2013, this trial will continue to be rated monthly for turfgrass quality. Maintenance of the plots with respect to mowing will continue as in 2012. Weeds, insects and disease will be monitored and treated as necessary. The trial will be irrigated to prevent dormancy. Please come by the Turfgrass Institute in Guelph, Ontario for a visit anytime to check out our Kentucky bluegrass test. Additional information about NTEP and results of past turfgrass species tests can be found at www.ntep.org. •

Figure 2: NTEP plots 11 days after seeding.

Figure 3: NTEP plots 35 days after seeding.

Incident and Accident Reports Are Necessary Operational Tools

Terry Piche, *Technical Director, Ontario Recreation Facilities Association Inc.*

Ontario's Occupational Health and Safety Act (OHSA) governed by the Ministry of Labour (MOL) is specific to the obligations of all workplace parties when it comes to reporting workplace incidents and accidents. Further complicating these situations are workplace accidents that involve non-workers.

Incidents

Incidents are best described as "an unplanned event that results in, or has potential to result in, property damage, injury, illness, death or other loss". Reporting these types of events is a worker's legal obligation under the OHSA. This written information allows employers to assess and improve worker training, update policy and procedures, improve personal protective equipment, make building repairs/improvements, or warn others of the potential for injury.

Accidents

An accident is often described as an event that will require some level of medical attention. These events will have a series of internal and external reports that must be completed – often in a set specific timeframe. However, the term "accident" has been under scrutiny over the past few years among safety professionals, particularly since the Workplace Safety & Insurance Board came out with the "Road to Zero" strategy. The rationale is that if every incident investigation drills down far enough to determine the root cause, it is evident that "every" incident is avoidable. In other words, if we can find the reason an incident occurred, then it could have been prevented – therefore not "accidental".

At the 2013 Ontario Turfgrass Symposium, Frank Cowan Co. Risk Analyst, Jessica Jaremchuk remarked that "in court, it is not what has happened and how you state your action, but being able to prove that your operation had done everything reasonable within their power to avoid the event that occurred". This statement rings true in both workplace investigations and civil litigation. Incidents that are recorded and acted upon are a positive defense tool when operational competency is called into question. Liz Sisolak, from the Public Services Health & Safety Association (PSHSA) reminded the workshop participants of "the legal duty of workers under the OHSA to report both hazards and incidents so that they can be prevented".

A consistent message was jointly presented by the Frank Cowan Co., PSHSA and Ontario Recreation Facilities Association representatives during this session on the importance of regularly reviewing and updating current policies and procedures that guide worker incident and accident reporting obligations for workers and non-workers. When establishing procedures, clearly define who is responsible for collecting information and how information will be collected and filed/logged. It is important to include these same details as part of all new worker orientations.

There was also further emphasis of the Internal Responsibility System, or IRS as described in the OHSA. This System places accountability on all workplace parties to know and comply with all legislation and to be active in making all workplaces safe.

Internal Responsibility Systems (IRS)

The Internal Responsibility System is one in which every individual is responsible for health and safety. It can be thought of as your organizational chart, with a clear set of statements about responsibility and authority for health and safety listed for each person – no exceptions. Simply put, the IRS means everyone in the workplace has a role to play and a duty to actively ensure workers are safe. Every worker who sees a health and safety problem such as a hazard in the workplace has a duty to report the situation to management. Once a hazard has been identified, the employer and supervisor have a duty to look at the problem and eliminate any hazard that could injure workers.

When are accidents involving members of the general public to be reported to the MOL?

This ongoing legal decision was recently clarified when the Court of Appeal released its decision in the Blue Mountain v. Ontario Ministry of Labour case. The Ontario Labour Relations Board and a lower court held previously that the OHSA required employers to report any "critical injury" or fatality to any "person" at a workplace; including whenever a non-worker died or was critically injured at or near a place where a worker is working, has passed through, or may at some other time work, regardless of the cause of the incident. The Court of Appeal held that this literal interpretation was unreasonable.

Remember that a phone call to the MOL is free and should always be made if ever in doubt; not calling can be very expensive. If you want to acid test how well your current program is working – pull the "incident file" and if there are no reports… it is most likely broken! •

Editor's Note: There are fourteen jurisdictions in Canada: one federal, ten provincial and three territorial each having its own occupational health and safety legislation. Visit www.ccohs.ca/oshanswers/legisl/intro.html for information about OH&S legislation in your region.

Resources

ORFA Guidelines for Reporting Critical Injuries In A Recreation Workplace – Involving Non-Workers
http://orfa.com/library/guide_bp/

Ontario Ministry of Labour http://www.labour.gov.on.ca/english/

Workplace Safety & Insurance Board http://www.wsib.on.ca

Health and Safety Ontario http://www.healthandsafetyontario.ca/HSO/Home.aspx

Frank Cowan Company – Risk Management Centre of Excellence http://excellence.frankcowan.com/

Courts of Ontario: Blue Mountain Resorts Limited Applicant (Appellant) and Richard Den Bok, The Ministry of Labour and The Ontario Labour Relations Board http://www.ontariocourts.ca/decisions/2013/2013ONCA0075.htm

On board and ready for the trip to Aylmer.

Canada Goose Management Program: *Oakville, Ontario*

Dwayne McAllister
Supervisor, Sports Fields and IPM, Town of Oakville

Eggs being sprayed.

For the past 12 years the Town of Oakville, Ontario, like many other waterfront municipalities, has had an ongoing battle with our beloved Canada goose. Nothing is more endearing than watching a mother goose scurrying her little ones along as they try to catch up and stay out of harm's way. The problem is the little ones mature quickly and anyone who has ever visited a waterfront park has witnessed the mess they leave behind which, is not so endearing.

A few facts about our friends from the North. Canada geese fall under the Migratory Birds Convention Act which means it is unlawful to hunt, kill, sell, disturb nests or eggs unless a permit is granted by Environment Canada. Yes, Canadian geese do mate for life and for the most part they will return to the same mating site every year. Nests will contain from 3 to 12 eggs. An adult goose will eat 4 lbs of grass daily, and here's the kicker, will excrete up to 2 lbs of that.

Mating starts in late February and ends mid-April. Nesting starts mid-March and goes to the middle of May. Every spring the Town of Oakville applies for and has been granted a permit that allows us to approach the nest and spray the eggs with a substance that prevents the eggs from hatching. The staff is fully trained by experts in the field and the process itself is done with the utmost care to reduce stress to the birds.

Lakefront sites, creek banks, retention ponds and past sites are checked for nesting birds. The sight of a lone goose standing neck straight and chest puffed out is a sure sign a nest is nearby. During the spraying the male bird does his best to distract our staff while the female stays close to the nest. Eventually, with a lot of hissing and nipping at the feet, they move away allowing staff to hand turn and coat each egg with the spray.

Gloves are worn during this process and the spray has no odour, so the birds do not detect any change with the egg. Once sprayed and the staff are far enough away, the goose will hurry back to its nest and is quite often seen bobbing its head as if taking count. It quickly gets back on top of the nest while its mate escorts staff away with plenty of vocal scolding. They then sit on the nest, each taking a turn with the incubation phase until finally they realize that the eggs are not going to hatch.

By then mating season is over and the geese will seek out their clan and get themselves to a good foraging area for the summer. Unfortunately for us, a good foraging area is usually one of our waterfront parks thus creating the need for Step Two of the management plan.

The Town of Oakville posts on its website that we are undertaking this task. If you have nests on your lakefront, riverfront, industrial site or apartment balcony, (yes we have done them there), and will grant us permission to enter your property and let us spray, all you need to do is sign up. Each year the list grows.

Then it's time for the Annual Goose Round Up. Again, once all logistics and permits are in place, a joint effort coordinated with a team from the City of Mississauga and our team from Oakville set out to catch and capture close to 2,000 geese to be shipped to their summer residence.

A week or so after the moulting season begins (mid May to mid July) the birds lose their flight feathers. Boats are sent out a couple of days prior to scan the water for locations and the clutches proximity to parkland. Weather is watched closely by the event coordinators— a big part of the success is dependent upon calm waters with no storms in sight. By this point staff has been fully trained and it is becoming apparent that past experience will definitely help with keeping the birds calm and stress free during the process. We have also learned that the wearing of gray or dark colours assists in the process. The standard safety orange shirts will not be seen on this day.

The day is timed from start to finish. We have more than six locations

to get the staff, t-bars and snow fence set up and angled like a runway or funnel that leads the geese into the back of a livestock transport truck. Once this is accomplished the staff walks the ground and herds any groups on land towards the runway. A human wedge is formed to push the geese in the right direction.

While this is being done the boats are herding the geese from the lake inland. This takes time as the birds are not to be stressed or overworked. Once on shore the same process of slowly walking behind them and clapping hands seems to work best in keeping them together and on the right path. Once the park is done it is off to the next location, minus the few that suddenly remembered they could fly. Obviously the moulting process has not started for them.

It should also be noted that the young are not taken, with sufficient mature geese left behind to tend to them as another endearing characteristic is any adult goose in the clan will tend to young goslings.

At the end of the two days close to 2,000 birds have been transported to a sanctuary in Aylmer. Representatives from both municipalities make the trip to ensure the release at that end goes as smoothly as the capture.

It is a lot of work. The outcome is well worth it. Think about it, 2000 geese times 2 lbs of droppings shipped away for a least six to eight weeks. Drastically reduces the complaint calls pertaining to this issue. •

Photo credit: Tom Mulvale and Brad Harden, Town of Oakville

Three boats corral and direct the geese to come on shore.

Head count taken as the geese go up the runway and board the transport.

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