

**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 <sup>2</sup> )	4.5	7.2	78	338	7.7
Urea (0.50 kg N/100 m <sup>2</sup> )	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<sup>2</sup>) in May, September and October.
  4. A broadleaf herbicide (Par 3 applied at 55 ml per 100 m<sup>2</sup>) 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.

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**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 <sup>2</sup> )	23	25
Urea (0.50 kg N/100 m <sup>2</sup> )	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**

The authors thank the Ontario Turfgrass Research Foundation (OTRF) for their generous financial support of this research. We also thank researchers Ken Carey and Alex Porter of the Department of Plant Agriculture, University of Guelph for their assistance in this project. •

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



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*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.

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



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

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<sup>2</sup> (1.5 kg/100 m<sup>2</sup>) 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<sup>2</sup> 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](http://www.ntep.org).

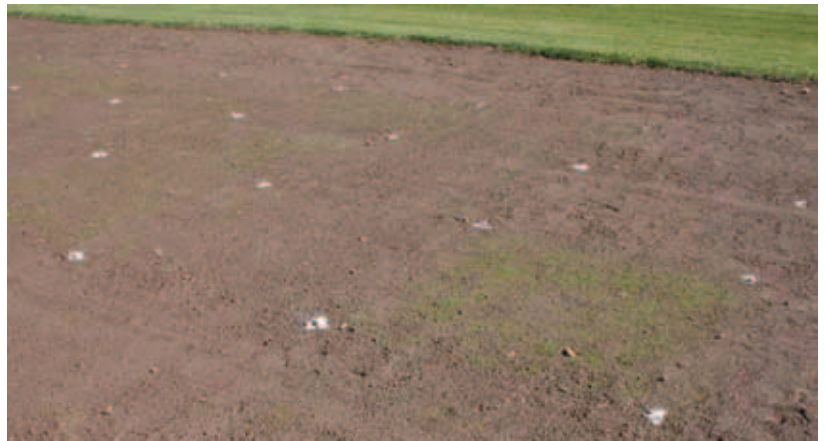


Figure 2: NTEP plots 11 days after seeding.



Figure 3: NTEP plots 35 days after seeding.

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# 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.





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### 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](http://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/](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>

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# 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