Sports Turf Manager

for safe, natural sports turf

Summer 2008

VOLUME 21, NUMBER 2

Annual Field Day

Join us Sept. 11 at Chinguacousy Park, Brampton, Canada's 'Flower City.' Stay tuned to our website for further details throughout the summer.

CHINGUACOUSY PARK, BRAMPTON

More Grey Water

The Burlington Golf & Country Club has also made the transition to a grey water system. See page 14 for coverage from this OTS session.

Making the Move to Grey Water at Woodbine

SEAN GAULT, MANAGER, RACING SURFACES, WOODBINE ENTERTAINMENT GROUP

An OTS Highlight Article. Water is a precious resource. In the past, most sports installations received their water by simply connecting to the local water source. However, global environmental concerns are sure to lead to restrictions on water use. Yet all sports turf needs a consistent, economically viable water supply. As municipal water becomes more expensive and restricted, the use of grey water on sports turf becomes increasingly attractive.

Sports fields and turf racecourses naturally need water to sustain the turf. Water improves the playability of the surface. A growing medium with the right amount of moisture provides give to the surface and helps the turf recover from the stress of sports events. Horses racing on dry turf courses risk higher rates of concussion injuries to their knees and ankles.

When each hoof of a one-thousand pound horse travelling at 35 to 40 miles per hour hits the turf, the impact is in the thousands of pounds per square inch. As the hoof lands, it slides forward slightly, plants, and then attempts to rotate forward with the front cutting edge of the horseshoe knifing through the turf as it pushes off. Some of this force will be absorbed into the ground, with the balance transferred back up the leg. A healthy turf with good roots and adequate moisture in the growing medium will give slightly, absorbing some of the impact and helping the roots withstand the crushing and tearing action of the hoof. Once turf is torn away, the uncovered growing medium will dry out rapidly.

Many turf courses use sand growing mediums. With inadequate water, the sand breaks away under foot causing the horse to lose his/her action, reducing their ability to compete and increasing the risk of soft tissue injury.

➟ page 8

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328 Victoria Rd. S., RR 2, Guelph, ON N1H 6H8
Tel: (519) 763-9431, Fax: (519) 766-1704
E-mail: info@sportsturfassociation.com
Web: www.sportsturfassociation.com

PUBLISHER
New Paradigm Communications
R.R. #8, Owen Sound, ON N4K 5W4
Tel. (519) 371-6818, Fax: (519) 371-5789
E-mail: joy@npc-solutions.com

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STA OFFICE HOURS
Lee Huether is in the office from 9:00 a.m. to 2:00 p.m. Tuesday through Friday. The office phone number is (519) 763-9431. At other times, a message may be left on the voice mail system. 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

Summer is here. I trust that all your fields are under control and you are now planning for some well deserved vacation time.

As I reported in my spring column, the *Athletic Field Construction Manual* is complete and the new STA electronic bookstore is now open. You can purchase your copy of this valuable manual online at www.sportsturfassociation.com. The response to the manual has been tremendous and all feedback to date has been quite positive. We anticipate the sale of many copyright licensing seals permitting the reproduction of the manual for tender specifications. This will bring into practice our intent to create uniformity in the design and construction of athletic fields. Great work everyone!

POSA Summer Operational Forum

I recently had the opportunity to speak at and attend the 2nd Annual Parks and Open Space Alliance (POSA) Summer Operational Forum that was held at the Glen Abbey Community Centre on June 25. The workshop was well attended with a good program of speakers. The Town of Oakville hosted the event and we would like to extend our thanks to Jane Arnett-Rivers, STA chairperson on the POSA Committee, Tom Mulvale, Supervisor of Sports Fields & IPM, who presented one of the STA sponsored sessions, and Scott Mairs, Glen Abbey Community Centre Manager. This collaborative effort between the Ontario Parks Association, Ontario Recreation Facilities Association and STA involved a number of individuals from all three organizations. Congratulations to all!

Keeping You Up-to-Date

This issue of *Sports Turf Manager* contains a number of articles from the Ontario Turfgrass Symposium as well as an update from Ken Pavely on the proposed pesticide ban (Bill 64). Ken has attended a number of stakeholder meetings over the past several months on our behalf. We will do our best to keep you updated on this legislation.

See You at Our Annual Field Day!

Mark your calendars to be at Donald M. Gordon Chinguacousy Park in Brampton, Ontario on September 11. The planning for our Annual Field Day is well underway. As in the past, this promises to be another great event! There is no better way to meet and connect with other professional turf managers than at our Field Day. Watch your mailbox and inbox for all the details. I hope to see everyone there!

Membership invoices have been sent out and are now due. Your prompt attention to these would be greatly appreciated.

OTRF & GTI Summer Events

The Ontario Turfgrass Research Foundation (OTRF), Guelph Turfgrass Institute (GTI) and Guelph Soccer have teamed up for a pilot project. A number of mini soccer fields have been created and will be used for research purposes. With these in place, our researchers will be able to evaluate the impact of summer play and will lay the groundwork for more sports turf research in the very near future. Read the article on page 7 for more details.

This year's OTRF Fundraising Golf Tournament will be held August 11 at Westmount Golf and Country Club in Kitchener, Ontario. Visit the OTRF website for all the details www.otrf.ca.

Lastly, the GTI will be holding its Summer Research Field Day on August 21 in Guelph. Presented in cooperation with the Ontario Ministry of Agriculture, Food & Rural Affairs and the OTRF, the event will feature a tour of current research projects underway at the GTI. Information and registration details are available on the GTI website www.guelphturfgrass.ca

Have a great summer and don't forget the sunscreen! ♦

EVENT CALENDAR

August 11
Ontario Turfgrass Research Foundation Fundraising Golf Tournament
Westmount Golf & Country Club
Kitchener, ON
Info: www.otrf.ca

August 21
Guelph Turfgrass Institute
Research Field Day
Guelph, ON
Info: www.guelphturfgrass.ca

September 11
Sports Turf Association
21st Annual Field Day
Chinguacousy Park
Brampton, ON
Watch for details!
Info: (519) 763-9431
www.sportsturfassociation.com

November 1
Sports Turf Association
Robert W. Sheard Scholarship Application Deadline
Info: (519) 763-9431
www.sportsturfassociation.com

STA Annual Field Day, September 11 Chinguacousy Park, Brampton

Chinguacousy means 'Land of the Tall Pines.' At Brampton's Donald M. Gordon Chinguacousy Park you will also find sports fields, a curling rink, volleyball courts, tennis courts, a botanical garden and Mount Chinguacousy for skiing, snowboarding, snowblading, tubing and tobogganing. The park is home to many events, including the 21st Annual Sports Turf Association Field Day this fall.

Brampton, Canada's 'Flower City,' is the third largest city in the Greater Toronto Area. Home to more than 430,000 residents representing 62 distinct cultures, Brampton has positioned itself as a global economic contender and combines big city conveniences with a traditional quality of life. It is conveniently located to welcome sports turf managers from across Ontario.

The Field Day Committee is in the midst of applying the finishing touches to the event program. Please visit the STA website www.sportsturfassociation.com for all details as they become available!

Chinguacousy Park and Bruce Hay, City of Brampton's Manager of Parks Maintenance, are featured in this issue. See page 25 for Hay's member profile and page 26 for more information about the facility. Check it out for yourself this fall at our popular Annual Field Day!

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.

Autumn 2008 Submissions
If you have something you'd like to submit for the next issue, please forward it to the STA office by August 22, 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.

Bill 64: The Proposed Cosmetic Pesticides Ban Act

The proposed Cosmetic Pesticides Ban Act is intended to ban both the sale and use of pesticides for cosmetic purposes through amendments to the Pesticides Act. Originally announced by Premier Dalton McGuinty that it would not supersede municipal bylaws, that position was later reversed and the clear intent of the Bill is to supersede all existing municipal bylaws of a similar nature.

Specific exemptions to the use prohibition currently include uses related to golf courses, as long as prescribed conditions have been met; uses related to agriculture; uses related to forestry; uses related to the promotion of public health or safety; and other uses prescribed in regulation.

Included in the bill is the review of some 200 active ingredients now registered for use in Ontario for lawn, garden and tree use. In spite of Health Canada's recent announcement to re-register 2,4-D, the product remains on the list for non-use. That may or may not change while the government reviews the contents of the bill.

After the announcement earlier this winter, the Ministry of the Environment (MOE) received approximately 6,000 submissions through their EBR posting up until February 17. Since then, numerous stakeholders' meetings were held with MOE staff, including with the STA. The position statement put forward by the STA reiterated the importance of maintaining quality turf for fields of all classifications, and the need for tools to battle infestations that affect safety and playability. It was also proposed that any pesticide applications made would be done via the use of IPM accredited agents under strict provincial control and regulation.

Just recently, the bill received 2nd reading and was sent to Committee for a one day hearing, held June 9. From there, further consideration will be given to the bill's contents before 3rd and final reading.

Effectiveness of the bioherbicide Sarritor. Be sure to read Dr. Alan Watson's article on pages 16-17.

Implementation and enforcement measures will focus on outreach and education efforts on the use of pesticide alternatives on lawns, gardens, parks and school yards. More than $10 million over the next four years has been allocated in support of the government's plan to ban the use of cosmetic pesticides. Education and outreach programs will be developed with stakeholder groups to further enhance the government's ability to reach all sectors of the Ontario public.

Enforcement will likely be a last resort but will remain with the MOE as is currently in effect.

The goal of the government is to have the Bill passed and implemented by the spring of 2009. Stay tuned for further updates as they become available.

— Ken Pavely, Dol Turf Restoration Ltd.

Industry News

New Verti-Art Professional Care for Artificial Turf

Redexim Charterhouse has developed a complete range of professional artificial turf maintenance machines. Known worldwide for their reliable and effective range of natural turf care equipment such as the Verti-Drain line of products, Redexim Charterhouse offers this array of specialized equipment to meet the demands of artificial turf. Just as natural turf needs regular care, artificial turf needs regular maintenance in order to maintain its realistic appearance and a safe, playable surface. Because natural decomposition of debris is difficult, unhealthy bacteria can grow and flourish, and hidden hazards such as glass and metal can be a problem. Proper cleaning, disinfecting, filling and grooming of artificial turf become quick and efficient tasks with the Verti-Art range of equipment. For more information on the various products available, contact Dick Raycroft, 905-637-5216 or 1-800-883-0761 (ext. 116) or e-mail draycroft@gcduke.com.

CLIMATE CHANGE MAY BE FUELING A NEW GENERATION OF AGGRESSIVE WEEDS

Is global warming fueling a new generation of more aggressive weeds? According to recent research, the answer may be yes. One of the major characteristics of a warming planet is an increase in the amount of carbon dioxide in the atmosphere. Rising carbon dioxide has been shown to help vegetable and grain crops grow more quickly, become more drought-resistant and produce potentially higher yields. Unfortunately, though, the impact of rising carbon dioxide seems to be far more pronounced in the weeds that compete with crops than in the crops themselves.

"Weeds are survivors," said Lee Van Wychen, Director of Science Policy for the Weed Science Society of America. "They can fill various niches and thrive under a wide range of conditions. While we have about 45 major crops in the U.S., there are more than 400 species of different weeds associated with those crops. There is always another weed species ready to become a major competitor with a crop if growing conditions change, such as an increase in carbon dioxide levels."

The impact of rising carbon dioxide levels on weeds can be striking. In a study conducted by Dr. Lewis Ziska of the U.S. Department of Agriculture's Agricultural Research Service, weeds grown under urban conditions of warmer temperatures and more carbon dioxide – conditions anticipated for the rest of the world in 50 years – grew to *four times* the height of those in a country plot 40 miles outside the city, where carbon dioxide and temperature reflected background conditions.

So what if there are a few more weeds? Well, Ziska's research shows that common ragweed plants exposed to higher levels of carbon dioxide dramatically increased the amount of pollen they produced. A doubling in carbon dioxide led to a quadrupling of pollen. Some people are allergic to ragweed pollen, resulting in the "hay fever" response, including sneezing and watery eyes. Additional work by Ziska also suggests that even recent increases in carbon dioxide during the last 50 years may have led to bigger poison ivy plants with a more virulent form of the oil that causes people to break out in a rash.

"As the climate and carbon dioxide levels change, we can no longer assume the weed control strategies we used in the past will continue to work," Ziska said. "Not only are some of the nation's most invasive weeds spreading, but they are becoming more difficult and costly to control. Understanding the impact of increasing carbon dioxide on weed control is still in its infancy. While researchers explore new approaches, we will need to mix and match the strategies currently available."

Weeds are survivors. They can fill various niches and thrive under a wide range of conditions. While we have about 45 major crops in the U.S., there are more than 400 species of different weeds associated with them.

About WSSA

The Weed Science Society of America (WSSA), a nonprofit professional society, was founded in 1956 to encourage and promote the development of knowledge concerning weeds and their impact on the environment. WSSA promotes research, education and extension outreach activities related to weeds, provides science-based information to the public and policy makers, and fosters awareness of weeds and their impacts on managed and natural ecosystems. For more information, visit www.wssa.net.

Promoting Ontario Turf Research

Combining Soccer & Research

If you are driving by the Guelph Turfgrass Institute (GTI), you will be surprised to see soccer nets and pitches on the research plots. The local soccer club and the GTI have teamed up to install mini soccer fields. University of Guelph turfgrass researchers will perform experimental trials on active playing fields and the soccer youth of Guelph will gain extra playing fields. A monitoring protocol to evaluate the impact of play on the field over the summer season will help lay the groundwork for the development of a more extensive sports field research complex at the GTI. Future research could involve how to minimize wear of natural playing surfaces and the effects of field conditions on sports injuries. As more money is invested in turfgrass research, more trials on sports turf management and the related health benefits can be conducted. These goals can be achieved with the research expertise and facilities that are available at the Guelph Turfgrass Institute. In the current turmoil of new government regulations, the time is now to promote sports turf research for the improved health benefits of the next generation of sports participants.

New Logo & Website

Summer is definitely on its way and as the turfgrass research plots here at the GTI green up, the OTRF is taking on a new 'green' look. The Ontario Turfgrass Research Foundation has launched a new logo and website (www.otrf.ca). Check out the website for information on the latest OTRF funded research, membership, golf tournament details and news events.

Planning for the Future

The GTI and the OTRF have launched Vision 2027, an in depth plan that outlines the targets for turfgrass and environmental research at the GTI for the next 20 years. Effective design, development and management of green spaces within urban areas will become increasingly critical in the near future. Vision 2027, available on the OTRF website, charts a plan for turfgrass research at the GTI that will take management of our green spaces to the next level.

To ensure that the GTI facility continues to be a global leader in the area of urban green space management, the OTRF continues in its quest to solicit donations. In the past few years donations have grown exponentially allowing unprecedented amounts to be disbursed for turfgrass research. This year, the OTRF has chosen a cross section of projects that focus on the areas of fungicides, fertilization methods, identification and management of turfgrass diseases and environmental concerns. The results from most of these projects are timely and applicable to sports field management.

Take the OTRF Challenge

Did you know that all donations are tax deductible? Consider an OTRF membership…. your turfgrass and sports fields will appreciate it !

OTRF
ONTARIO TURFGRASS RESEARCH FOUNDATION

NEW MEMBERS

WELCOME TO THE STA!

Casey Colthurst
Town of Tecumseh, ON

Rob Gagen
City of Pickering, ON

Peter Bromby
York Region District School Board
Newmarket, ON

Tim Schaly
City of Belleville, ON

John Renaud
GreenLawn, Mississauga, ON

Tim Murphy & Don Steenson
Town of Ajax, ON

Daniel Gemme
Paysagiste Rive Sud, Longueuil, QC

Dan Dychuck
City of Kitchener, ON

Jeff Burgess
City of Windsor, ON

Debbie Allen
Town of Quispamsis, NB

Douglas Armour
Total Irrigation, Stouffville, ON

Scott Preece & Duncan Sanders
City of London, ON

Chris Barkley
Town of Orangeville, ON

Terry Childs
Nature's Way Landscaping
Gananoque, ON

Bob Mackenzie & Larry Green
Town of Petawawa, ON

COVER STORY CONTINUED...

CHRONICLING WOODBINE'S GREY WATER SYSTEM UPDATE • SEAN GAULT, MANAGER RACING SURFACES, WEG

Thoroughbred dirt and standardbred traprock/limestone tracks also require adequate levels of moisture mixed evenly through the racing cushion. This is not required just to keep the material from blowing away, but to give the material body. In turn, this helps cushion impact and holds the material together while the hoof plants and pushes off.

Conversely, when holding sporting events during inclement weather conditions, facilities require adequate drainage infrastructure to remove excess water – both before and during events. Turf stake races can be run on soft courses, but overnight races will usually be transferred to dirt or synthetic tracks to reduce the damage done to a soft turf. Owners, trainers, jockeys and drivers are all reluctant to race on sloppy and/or drying out dirt/traprock tracks, so every effort is made to enhance drainage from the racing surfaces.

Like all athletes, horses need good footing to perform to their potential. Safety is always an issue. The most satisfying events from a facility operator's perspective are those where the focus is on the players and the game, not the quality of the playing surface.

Ontario's Horseracing Home

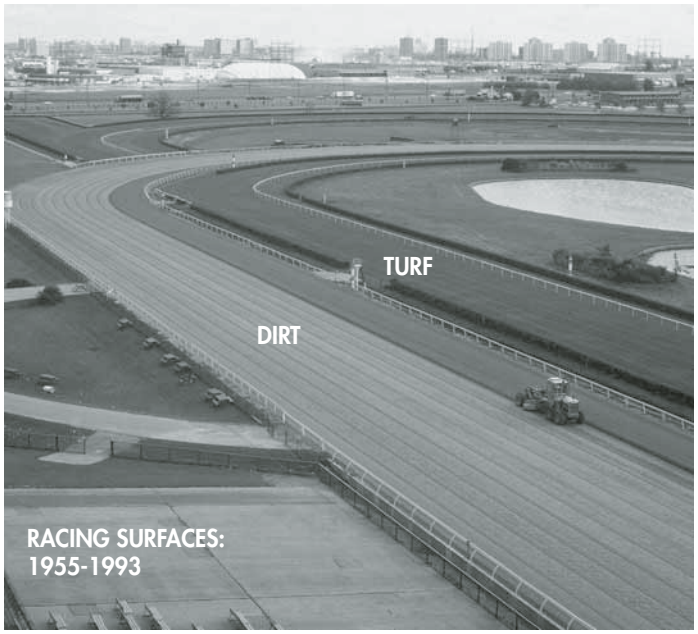
Woodbine Entertainment Group, (WEG) owns and operates Woodbine Racetrack in Toronto and Mohawk Racetrack in Campbellville, Ontario. These are entertainment locations featuring dining, sports bars, gaming on horseracing and OLG slots. WEG also operates the Champions Off-Track Wagering Network, the Greenwood Teletheater in the Beaches area of Toronto, The Turf Lounge in the Bay Street business district of Toronto, WEGZ Stadium Bar in Concord and the HorsePlayer Interactive network.

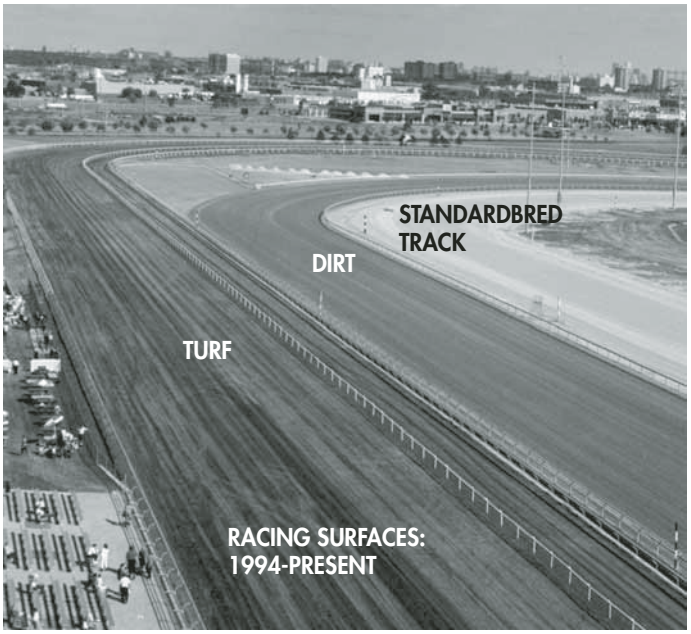
While the entertainment side of WEG's operations attract most of the attention, their core product has always been horseracing. In Ontario this industry supports over 50,000 people from the farming and breeding operations to the on-track racing personnel and associated support industries.

The Original Grey Water System

Built in 1955, Woodbine was home to thoroughbred racing and the flagship racetrack of the Ontario Jockey Club's five racetracks. The original design of Woodbine made very good use of grey water. It recognized the need for an efficient collection system, a holding area for the water and a dependable method to supply that water back to the racing surfaces. The entire site, which now measures about 600 acres, was divided into three areas for collection of rainwater/snow melt. The parking lots on the north end of the property were one site, the dirt and turf racetracks in the centre of the property were the second, and the stable area in the south end was the third area for collection (photo below). Each area was drained using storm sewers flowing in an east-west configuration into a large storm sewer running north from the stable area in the south end of the property, under the racetracks in the middle, through the parking lots at the north end, and emptying into a retention pond north of Rexdale Boulevard. Overflow from the pond emptied into the Humber river system.

On demand, grey water would be pumped from the Rexdale Pond south





to two locations. The first was a standpipe in the track maintenance harrow yard for loading water trucks that supplied water to the dirt tracks. The second location was three ponds located in the infield of the tracks. This provided additional storage capacity from which the turf courses were irrigated. Aesthetically, the ponds helped provide a more attractive landscape for patrons to view and enjoy.

The Need for Change

This grey water system handled the demands placed upon it for the first 35 years. However, in the early 90s, the racing industry was changing in a dramatic way – and by 1994, Woodbine became the only North American track that raced both breeds on the same day. The Ontario Jockey Club then renamed and focused itself as the Woodbine Entertainment Group and decided to expand and develop the grey water system. This meant additional investment in water quality improvements.

The pictures of the racing surfaces at the top of this page shows the dramatic reconfiguration of Woodbine's racing surfaces from their original configuration (1955-1993) to the post-1994 configuration. In the latter, the inner turf course was removed and replaced with a 7/8 of a mile standardbred track and a 1-1/2 turf course was built around the one-mile oval dirt track.

Historically, race meets had moved from one track to another throughout the course of the year, giving each track a great deal of downtime. With the new structure, Woodbine would operate continuously with thoroughbreds training and racing up to eleven months of the year and standardbreds racing over six months of the year. Consequently, the composition of the racing surfaces needed to change to meet the demands of racing in a wider range of weather conditions; from hot dry summers to cool, wet springs and autumns to the snowy, freezing temperatures of winter.

Jockeys and drivers do not want to race on deep sloppy tracks if possible. Therefore, it is imperative to get the water and snow away from the track. Sandy tracks allow you to run in weather conditions that are colder and wetter. In periods of warm/dry weather, these surfaces require large amounts of water to give them some life. The table entitled "Racing Surface Water Requirements" below details the composition of these tracks and estimates the summer water requirements.

New Grey Water Requirements

However, there are other issues influencing the use of grey water:

Location: The track no longer resides on the outskirts of the city. Apartments border the Rexdale retention pond. Residents and patrons are very aware of water restrictions in their own neighbourhoods.

Patron comforts: The new turf course is located directly in front of viewing and tent barbecue areas. While this brings the excitement of racing closer to patrons, lingering odour from irrigation water can dampen that enthusiasm.

Health concerns: Standardbred tracks are watered while the horses are on the track warming up for their race, so health issues are a concern to the horsemen.

Environmental concerns: Overflow from the collection system drains into the Humber river system.

RACING SURFACE WATER REQUIREMENTS

Track	Dimensions	Composition	Water Requirement*
Dirt Thoroughbred	1 mile plus chutes	80-85% sand 15-20% silt & clay	420-580,000 gal/wk
Turf Thoroughbred	1-1/2 mile, 22 acres	95% sand 5% topsoil	660-1,400,000 gal/wk
Standardbred	7/8 mile	traprock	180-210,000 gal/wk

** summer*

The chart "Grey Water Design Requirements" details very simply the major items dealt with during the design/renovation phase, as well as over the next 15 years as Woodbine diligently worked to minimize the use of potable water on the racing surfaces in an environmentally acceptable manner.

When we look at the capacity the grey water system required for the new tracks and break it down into collection, storage and supply, we see that the basic infrastructure was already present. Collection was the most immediate issue required to handle the increased surface area that needed to be drained. The new 22-acre E.P. Taylor Turf Course was designed using a sand-growing medium similar to a USGA specification, but allowing for a firmer racing surface. Water drains vertically through the sand into a 4" gravel underlay with drain lines spaced every 20 feet. The drain lines were connected into new storm sewer lines or run into ditches that drain into existing catch basins.

Drain lines were placed under the thoroughbred dirt and standardbred traprock tracks to remove ground water. However, the oval shaped tracks rely on horizontal drainage and are sloped inward, moving rain water into ditches on the inside of each track. This meant new catch basins and storm sewer lines were required on the inside of the standardbred track to complement those already existing inside the thoroughbred track. Grassed ditches (which absorbed much of the runoff) were replaced with asphalt, increasing the amount of water captured and making future maintenance easier. A concrete ditch 5/16 of a mile long was built between the dirt track and the turf course in the front stretch area. This was designed to intercept surface water and the eroded track material it carried before it could flow onto the turf course. All storm lines were tied into the existing collection line running north into the Rexdale retention pond.

Racing surface materials are in constant need of replenishment. Large amounts of the sandy racing cushion are carried into the ditches by rainfall runoff and by maintenance procedures that pull steel plates over the surface to squeeze water out of the track after a rainfall. To prepare the standardbred track for winter racing, snow and wet traprock are graded off the racing surface, pushing the material into the outer ditch. This excess material fills ditches and catch basins and plugs storm sewer lines.

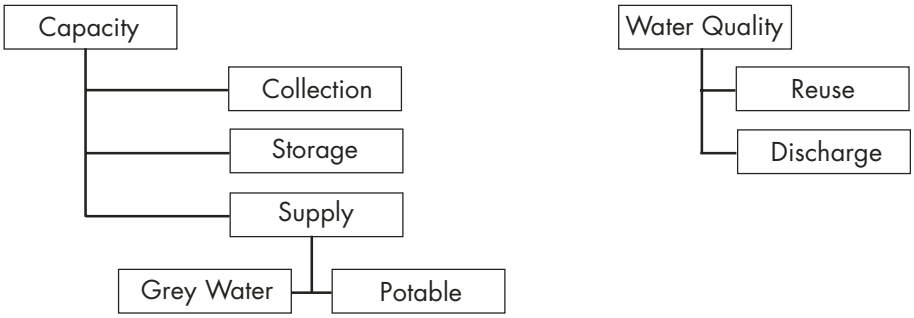
To maintain the integrity of the collection system all-year round, regular maintenance is required. Snow is graded off and trucked away as often as necessary. Every spring, the ditch is cleaned out with a backhoe or gradall. The large amounts of snow this past winter required excavators to remove all snow and frozen traprock from the ditches to prevent snow melt from flowing back onto the racing surface. Material removed from the track is recycled. Once the material is dry, it is screened, and if suitable, put back onto the track. If the consistency is not adequate, the material is then used on horse roads or as stall fill.

The stable area of about 40 barns is a major collection area. Most of the rainfall is collected from the stable rooftops, roads and a few asphalt parking lots. It is then directed into concrete gutters in the ditches that flow into catch basins on the storm sewer lines. The remaining areas are grass or gravel parking lots. Up to 2,200 horses stable at Woodbine from mid-February to early December. Each barn has outdoor wash areas for the horses. Approximately 75% of the horses will train or race each day. In warmer weather those horses would then be bathed or hosed off. At about 40 L per horse, this represents a significant amount of water to recapture in the grey water system.

The stable area comes with its own set of problems. The stable shed rows and horse roads are a mix of clay, sand and limestone. Horses track the material in their hooves everywhere they walk. Much


TRACK MAINTENANCE

GREY WATER DESIGN REQUIREMENTS



SETTLING PONDS

of it gets washed off the roads into the ditches and catch basins. Being an agricultural facility, manure collection and handling is a daily issue. Good handling prevents manure being washed into the storm water. Horse people are encouraged to use non-phosphate detergents/soaps to bathe the horses and wash equipment.

As a responsible corporate business, WEG's goal is to manage the grey water system so that it provides water of acceptable quality for reuse on the racing surfaces. In addition, the company needs to ensure that overflow from the Rexdale retention pond meets guidelines set by and monitored by the Ministry of the Environment. In the mid 1990s, WEG proceeded with a three-step plan to raise water quality standards. The first step was to upgrade the manure collection/transfer site. A new 150' x 150' concrete pad was built with catch basins drained into the sanitary sewer system. The site was birmed on four sides, with only the entrance and exit open. All on-site manure bins are emptied daily and the manure transferred to the collection site for removal. The second step was an ongoing stable improvement program to rebuild concrete wash pads and gutters at each barn. The third step was to make the horse people stabling horses on-site aware of environmental issues. All racing stables are independent businesses represented by their association – the Horsemen's Benevolent and Protective Association (HBPA). WEG in cooperation with the HBPA, encouraged members to switch to environmentally friendly soaps, clean up around the manure bins to reduce runoff, and ensure all hoses had working nozzles to eliminate waste of potable water.

After analysis, the benefits are positive and can be improved. There is better overall concern for the environmental issues involved. The wasting of potable water has declined. Contamination of grey water from poor housekeeping practices has definitely been reduced.

Based on this positive information, WEG decided to invest in two major initiatives to further improve grey water quality for on-site use and discharge, and to increase its storage capacity.

Stable Area Storm Water Diversion/ Settling and Storage System

Most of the water quality issues originate with the stable grey water. The first initiative was to divert this water into holding ponds and give it time to settle out the contaminants. To do this, a section was cut out of the four-foot storm waterline where it exits the stable area and replaced with a section of sewer pipe in the shape of a Y, placed so that all flow is diverted into a new underground pumping station. Only an extreme storm can push water over the bypass into the original storm line. Once in the pumping station two 20 hp pumps move the daily flow and moderate rains into two sewer lines pushing the water another 1/8 of a mile into three settling

chambers. In the event of heavy flow, two 40 hp pumps take over to move the water. Sediment in the pumping station is removed with a vacuum truck every six weeks and the settling chambers on an annual basis. From the settling chambers the water is pushed under the turf course into a new settling pond, (capacity 6.2 mil. gal.), the first of four ponds in series. As the water level builds to capacity in the first pond, it will overflow into pipes running under the dirt and standard bred tracks into pond 2 in the track infield. This in turn overflows into the 3rd or middle pond. If there is demand to irrigate, water is gravity fed into the pumping pond. If there is no demand, water will over flow from pond 3 into the main storm sewer line and drain into the Rexdale retention pond. At the same time, grey water in the retention pond is recycled back to the harrow yard, filling water trucks that will spray it on the dirt and traprock tracks, horse roads and stable roads and to water the non-irrigated flower beds around the property.

The step-by-step procedure to bring water across the ponds to the irrigation ponds allows for a number of settling stages and increases the dilution factor of any contaminants. In the last two years, all irrigation water for the E.P. Taylor turf course has come from this supply system. With heavier irrigation demands over the last two years, overflow from the retention pond has been reduced. More importantly, the quality of the grey water discharged has improved to an acceptable level.

Rexdale Retention Pond Cleanout

The second initiative was to clean out the Rexdale retention pond. This had been a collection site for 50 years. It was estimated to be half-full of track sand, limestone, clay and silt.

The project was undertaken between January and April of 2007. The water under the ice was pumped from the pond. The ice was pushed to the side and the sediment pumped up into agricultural tankers or excavated into heavy haul dump trucks. The material was tested and found to be acceptable to dump on-site. A new recovery pond was incorporated into the design of the pond, with clay being transported from the dumping site to build the walls of the recovery pond.

The pond reclamation created 7.5 mil. gallons of storage capacity. This resulted in cleaner water and meant less wear on the pumps, less clogging of nozzles in the water trucks, and has noticeably reduced the odour when applied. As a result, no potable water was used from May 1 to Nov. 1, 2007 for application on any of the tracks, dust control or watering of non-irrigated flower beds while the grey water system was in operation.

The Move to Polytrack

In the summer of 2006, Woodbine converted the main dirt racetrack from a sandy loam racing cushion to an all-weather poly track. While this was a major commitment to racing, and was done with a view to improve the consistency and safety of the racing surface for thoroughbreds, the indirect benefits to grey water quality and usage rates were significant.

Polytrack is a mixture of silica sand, carpet fibre, jelly cable and rubber crumbs all tumbled together in a vat and coated with hot wax. The construction design is very much like the turf course. Water drains vertically through the poly, continues through a layer of macadam (porous asphalt) into a drainage layer of clean stone. The material does not wash out like sand and with vertical drainage through to the tile lines, there is no erosion of sand into the ditches and sewer lines resulting in cleaner grey water. Poly does not require water to maintain its structure, therefore water usage on the thoroughbred racing surface has practically been eliminated.

Dealing With Salt

Since 1994, Woodbine has been open for live or simulcast racing each winter. In 2000, the OLG opened their slots casino at Woodbine and is now open 24/7. The increase in patron traffic and the desire to remove slip and fall hazards has increased the use of salt. Naturally the result has been an increase in salt concentrations in the grey water. With less rainfall during the main growing season, irrigating with grey water has a less than optimal impact on the turf. Presently, gypsum is applied twice a year to help neutralize the salt concentrations.

The Future of Grey Water Use at Woodbine Racetrack

Certainly salt will continue to be an issue. The level of service expected at a gaming-entertainment destination dictates that the fastest method to ensure slip-free walkways and roads be utilized. Certainly better methods of removing snow and effective alternatives to salt need to be considered. Treatment of irrigation water prior to application is a definite possibility.

Expansion of the grey water system to supply irrigation water to the turf training course's rain fed pond, located at the south end of the property, is under review. Additional pond reclamation projects remain under consideration.

Woodbine's goal is to manage the grey water system so that it provides water of acceptable quality for reuse on the racing surfaces. In addition, the company needs to ensure that overflow from the Rexdale retention pond meets Ministry of the Environment quidelines.

The most anticipated development is Woodbine Live, adding a hotel, shopping, dining, entertainment, residential and business areas to the racing and casino facilities. Rainwater recovery will be very important and investment at this scale opens up the possibilities for the design of innovative recovery systems to capture salt-free water from roof tops, store it and use it for irrigating green space and gardens within the development. Similarly, methods to collect, store and treat grey water to acceptable quality standards need to be explored. These will allow for recycling within the public areas of the new development.

The original design of the grey water system at Woodbine is the foundation for the expansion and development that has taken place over the last 15 years. Woodbine's use of this resource will be increasingly important in the coming years as environmental and economic realities demonstrate the benefits of effective grey water use. ♦

MAKING THE MOVE TO GREY WATER IN BURLINGTON

OTS HIGHLIGHT ARTICLE • TOM BRAIN, SUPERINTENDENT • BURLINGTON GOLF & COUNTRY CLUB

The use of grey water at Burlington Golf & Country Club was predicated by the need for a new maintenance building. We had simply outgrown our existing building and there were a number of health, safety and staff issues that needed to be addressed, along with equipment storage space requirements. Planning for the new building was a long, intricate process taking almost ten years. Approval for the project was received in 2004, with construction set to begin in December 2005. The new facility afforded us the opportunity to incorporate some up-to-date design concepts and environmental initiatives.

Due to the proximity of Falcon Creek and the steep ravine, we had very little space to work with in order to place the new building. A number of alternate locations on the property were investigated. However, none were suitable without interfering with the golf course or neighbouring properties. Eventually, permission was granted by the Halton Conservation Authority and the City of Burlington to expand our maintenance building at the existing site.

While preferable in terms of aesthetics and access to the property, the expanded building at the existing location would not leave much space for more than parking and vehicle traffic.

Designing the New Grey Water System

Our existing wash pad had been in place for approximately 30 years. It consisted of a 10 x 10 concrete pad with a grate and water supplied from irrigation water. All the wash water filtered through the grate and ran, essentially untreated, into Falcon Creek. Although we had always intended to incorporate a wash water treatment/recycling system into the design of the new facility to address our woefully inadequate wash pad, the question of the location of the wash pad became something of a challenge. We worked closely with John Glover, our sales representative from ESD Waste-2-Water during the design phase. ESD has many units operating in the United States, and a few operating in southern Ontario. Upon John's suggestion, the wash pad was located inside the building.

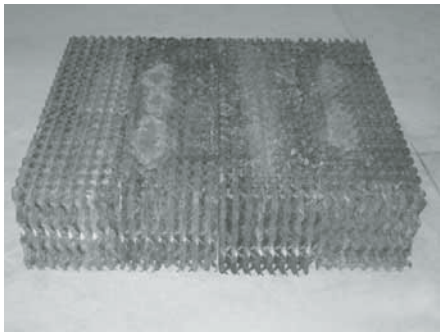
We had designed the building to maximize our access to equipment, and it only made sense to place the wash pad inside one of the two drive through entrances. Placing the system inside also had further benefits. One of the problems we had identified with outdoor systems was the tendency to overfill the system when it rained from water collecting on the wash pad. Having the wash pad under roof eliminated rainfall supercharging the system. Also, the system would be functional year round.

The main drawback was the potential for odour with the solid separator and the treatment unit itself. As it turned out, neither were issues. As long as the clipping cart is emptied regularly, odour is not an issue.

Use, Maintenance & Mechanics

The unit requires some minor daily maintenance, the addition of microbes weekly and some ongoing regular maintenance. Maintenance of the unit is the responsibility of our 2nd Assistant, Jeff Lockhart.

The system consists of a 20' x 20' wash pad with a main sump in the centre. There are two hoses on either side of the pad and the pad can accommodate two fairway mowers or two rough mowers at a time.

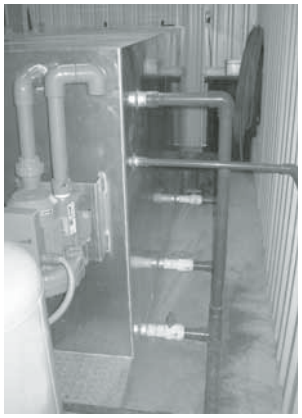


The wash water is pumped from the self cleaning sump to a solid separator. The clippings are separated out and collected in a draining wheel barrow and two additional chambers separate out fine particles.

The water is then pumped to the central unit which is housed in a separate heated room. The water is cycled through three aerated chambers and the unit is seeded weekly with microbes that feed on the organic and inorganic residues in the water. The microbes are shipped on a bi-monthly schedule from ESD in the U.S.

Plastic honeycomb type cores help the microbes to colonize the unit and increase the exposure of water to the microbes. The water works its way through the system and is then returned to the hoses, completing the cycle.

As I stated earlier, because the wash pad is under roof, our system never overfills, however some water is lost due to evaporation. The system uses a float valve to automatically top up when the water level gets low. A sump is also located in our mechanics work shop and is connected to the system with an air diaphragm pump for the occasional wash activities that take place in the shop.



Also installed at the time of construction was a wash and spill containment system in the mix load area for our sprayer. The system allows us to reclaim any water or products spilt while filling the sprayer or in the event of a serious leak. Spillage is directed to a sump by a beveled floor, pumped to a holding tank, filtered and returned to the sprayer to be applied on the golf course. Use of the system has been limited to testing and maintenance, but it is nice to know it is in place, should a spill occur, to contain contaminated water and prevent potential discharge to the environment.

Preserving the Natural Environment

The adjacent Falcon Creek ravine is a wonderful land feature that runs through and defines our property and characterizes our golf course. We want to do everything we can to protect and enhance the ravine and the creek for generations to come.

We feel we have made some major advancements to protect our immediate environment, including those down stream, and to reduce our impact on the environment as a whole.

I would encourage those of you considering improvements to your equipment washing facilities to consider installing a wash water recycling system and say, "Yeah to Grey!" ♦

— Green is Beautiful, Ontario Golf Superintendents' Assoc'n, May 08

Articles Welcome!

Contact Lee Huether at the STA office if you are interested in contributing to the *Sports Turf Manager*. We appreciate feature-length articles, column ideas and newsworthy items.

SARRITOR GRANULAR BIOHERBICIDE

OTS HIGHLIGHT ARTICLE • DR. ALAN WATSON • MCGILL UNIVERSITY • ALANWATSON@MCGILL.CA

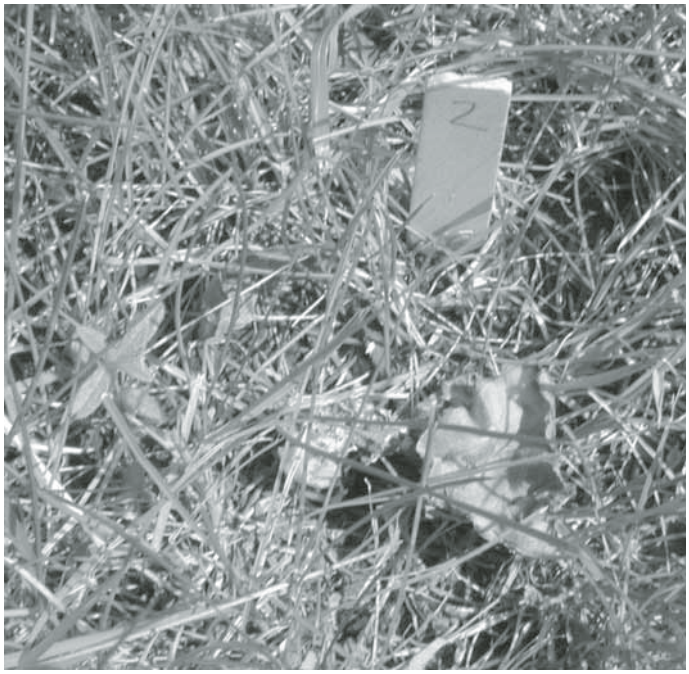
In the recent past, control of common dandelion and other broadleaf weeds in turfgrass has been readily achieved with phenoxy herbicides. The herbicide option has been revoked through municipal and provincial legislation across much of Canada, necessitating alternative approaches. Finally, there is an effective biological option. SARRITOR is the first bioherbicide developed for control of dandelion and other broadleaf weeds in turfgrass. SARRITOR granular bioherbicide has received temporary registration by Health Canada's Pest Management Regulatory Agency (PMRA) and is proceeding towards full registration. A limited amount of Sarritor was available for the 2008 season. Full production will not be achieved until 2009/10.

The active ingredient of SARRITOR is a naturally occurring fungal plant pathogen, *Sclerotinia minor* (IMI 344141). *Sclerotinia minor* is widespread in the environment, yet there are no published reports of disease associated with *Sclerotinia minor* in birds, wild mammals, earthworms, honeybees and other arthropods, aquatic invertebrates or fish. Many soil organisms, including nematodes, earthworms, mites, bacteria and fungi feed on or parasitize fungal sclerotia. Human and environmental toxicological studies have established that *S. minor* IMI 344141 is neither toxic nor pathogenic to non-target organisms. SARRITOR's active ingredient is not toxic or pathogenic to birds, honeybees and earthworms and SARRITOR granules have low dermal toxicity and are non- to minimally irritating to the skin and eyes.

The bioherbicide product is produced by growing the fungus on ground cereal grains followed by drying and vacuum packaging. The small (1.5-2.0 cm diameter) bioherbicide granules are broadcast or spot applied to weed infested turf in the spring and/or the autumn. To work, the fungus must grow out of the granules and invade and colonize dandelion and other broadleaf weeds. Favourable conditions for germination and infection are daytime high temperatures of 15-24ºC and rainfall or irrigation within 12 hours. The product should not be applied when temperatures are above 25ºC or during periods of dry weather. Disease develops quickly and complete kill of dandelion and other broadleaf weeds can be achieved within seven days, about twice as fast as the standard three-way chemical herbicide. The product is compatible with normal lawn maintenance operations such as mowing, fertilization and irrigation.

Foliar damage and dandelion mortality caused by SARRITOR are affected by plant age and the presence of grass competition. Dandelions of all ages are more severely affected by *S. minor* in the presence of grass competition. A healthy grass sward provides a microenvironment favouring the success of SARRITOR as a biological control agent of dandelion.

The active ingredient of SARRITOR is a naturally occurring fungal plant pathogen, *Sclerotinia minor*. It is widespread in the environment, yet there are no published reports of disease associated with the pathogen in birds, wild mammals, erathworms, honeybees and other arthropods, aquatic invertebrates or fish.



Thus proper management of the turfgrass environment is complementary to the efficacy of *S. minor* as a biocontrol for dandelion and other broadleaf weeds.

Most broadleaf plants are susceptible to infection with *Sclerotinia minor* strain IMI 344141 following broadcast or spot treatment with SARRITOR granules. SARRITOR destroys all above-ground plant foliage and reduces root biomass, but dandelions with large tap roots may resprout and need re-treating. Variation in damage amongst weed species is a reflection of different growth habit (upright vs. prostrate vs. creeping); leaf size, leaf orientation – all features that affect the degree of direct product contact onto plant stem and leaf surfaces. Plants with the rosette form of growth intercept more bioherbicide particles than do plants with upright growth habit. Less bioherbicide product achieves direct contact with upright plants. SARRITOR granules and *Sclerotinia minor* strain IMI 344141 do not persist in the environment and are not readily dispersed from the site of application. Mycelia of the fungus do not survive beyond 11 days in the turfgrass environment. Thus SARRITOR does not persist and has no residual activity, although SARRITOR will kill dandelion seeds that the fungus contacts on the soil surface. Turf grasses are not harmed by SARRITOR. Kentucky bluegrass, creeping red fescue, perennial ryegrass, annual ryegrass, creeping bentgrass, colonial bentgrass, chewing's fescue, tall fescue and hard fescue are resistant to infection following both pre- and post-emergent applications of SARRITOR. The risk to non-target plants is limited to those growing in or adjacent to treated turf. Users are advised to avoid direct application to desirable broadleaf species. ♦

Adjacent Page Left: Spring after 40g/m^2 SARRITOR in previous fall.

Adjacent Page Right: Spot application of 0.4g on bull thistle.

Above Left: Three days after spot application of 0.4g of SARRITOR on broadleaf plantain.

Above Right: Seven days after spot application of 0.4g of SARRITOR on broadleaf plantain.

TURNING UNUSED GREEN SPACE INTO THE 'ULTIMATE' FIELD

DUANE CHRIS • COMMUNICATIONS DIRECTOR • WATERLOO ORGANIZATION OF DISC SPORTS

The Waterloo Organization of Disc Sports (WODS) is an organization in its sixth year of promoting disc sports in Waterloo Region (Kitchener, Waterloo, Cambridge and surrounding areas). The primary activity enjoyed by its members is the game of Ultimate, sometimes called Ultimate Disc or Ultimate Frisbee, a fast-paced cross between soccer, basketball and rugby played with a flying disc on grass or turf fields.

Having been invented in the late 1960s, and only enjoying widespread recognition since the 1990s, Ultimate has faced an uphill battle in competing for field space against long-established sports like soccer and football. Worse, a regulation Ultimate field is slightly longer than a regulation soccer field, making it difficult to find appropriate, established and well-maintained playing locations. Goal posts and running tracks are further obstacles to a good game of Ultimate when played on most existing fields. While soccer players tend to want grass cut to a maximum height of two inches, Ultimate players prefer longer grass for greater padding on dives and slides. Indeed, these are dilemmas faced by Ultimate players and organizations across Canada and North America.

In Waterloo Region, WODS historically has operated its summer recreational Ultimate leagues on soccer and football fields scattered throughout the City of Kitchener. The ongoing quest for quality field space sparked an intensive search in 2007 with WODS members looking beyond traditional sports fields to consider alternative green spaces. An inquiry to the City of Kitchener regarding Kiwanis Park arrived at an opportune time, with the City looking to fulfil a new mandate to increase uses at that park. Several meetings and proposal discussions later, WODS and the City established the beginning of a new relationship, with both parties committing to rehabilitate a large area of open and relatively flat green space in the park for use as dedicated, full-sized, lined Ultimate fields for WODS league activities.

The problem? This green space had spent the past 30-plus years as unused and un-maintained land. The grass (for lack of a better word) consisted of a variety of grass species – Kentucky bluegrass, annual bluegrass, fine fescue and other grasses and weeds – and had been allowed typically to grow to 12" or more before being cut with a thresher. Though generally flat, the turf had divots, ruts and moderate swales throughout. A large-scale, invasive landscaping effort was out of the question, with budget constraints and the City's desire to maintain the natural appearance of the park as much as possible.

The solution was readily accepted by both parties: a multi-year effort of gradual improvement through natural restorative techniques and cultural practices.

The grass is now cut weekly to semi-

monthly to a minimum length of 3-4". This serves the dual purpose of providing the cushion that Ultimate players prefer, and allowing a healthier turf with better drought resistance.

An initial heavy topdressing will be followed by several more applications throughout the year to improve the ruts and divots. Initial spring aeration and overseeding will be followed by multiple subsequent applications. This topdressing and aeration schedule is more intensive than might otherwise be necessary for established sports fields, and is done to speed up the process of levelling and thickening the turf.

The field will be overseeded with perennial ryegrass, a strong grass with good root growth that tolerates drought and cleat wear well. The goal is to obtain a comfortable mix of perennial rye and the existing Kentucky blue. These grasses blend well together and are expected to provide suitable footing for the intense back-and-forth running and "cutting" motions typical to Ultimate.

There is currently no irrigation system in place, which presents some challenges for rehabilitation. But both the type of grasses used and the ability to keep the grass at longer lengths than traditional sports fields are expected to reduce the negative effects of this factor.

Weed control efforts will be moderate and will use cultural practices as opposed to spraying for weed eradication, owing to the location of the park near the Grand River and residential areas. In any event, Ultimate players tend to be environmentally conscious and have little aversion to weeds.

All of this work is overseen by Dan Dychuck, City of Kitchener's Supervisor of Sports Fields and the man who responded first to WODS' inquiries about open park spaces. Dan recognized the mutual benefits that such an arrangement would offer, and has remained involved throughout.

For their part, WODS members contribute as much as they can to the process of improving the field space, clearing rocks, branches and other debris, and generally leaving the fields in a better condition than when they arrive each week. WODS Ultimate players are content to tolerate short-term imperfections in turf quality for the benefit of securing a single, large-scale facility where multiple games can be played simultaneously. Both WODS and the City of Kitchener expect that turf conditions will improve significantly over the course of the 2008 summer season and subsequent years, with the expectation of reaching the quality of most other city-run non-irrigated fields within three to four years.

The additional benefits for WODS members are many. The single location provides a much more social atmosphere, with up to 10 teams gathering together for their weekly matches. Having a single, central location eases scheduling difficulties for league coordinators and reduces travel requirements for players. It is expected that many more players will be able to bike and carpool than in prior years. And players are able to make use of the other park amenities such as washroom and change room facilities, swimming pool and volleyball courts.

At the other end, the City of Kitchener sees benefits as well. The Ultimate fields expand the uses at the park and are expected to increase overall park attendance in 2008. These new uses and attendance remain compatible with the natural appearance and family atmosphere of the park setting. Indeed, the sport of Ultimate is unique in this regard. Ultimate players don't require professionally-graded, carefully-manicured sports fields. All they really need is relatively flat, open space. An Ultimate field doesn't need goalposts, foul poles, fences, or any of the other visual obstacles that typically announce loudly the presence of a sports field. A casual glance by the couple walking their dog or the family enjoying a picnic likely will reveal little or no evidence of the Ultimate activities played there several nights per week.

In addition, the City will benefit from the release of many soccer and football fields, formerly used for Ultimate games, back into the rental pool for those other sports groups.

This new endeavour remains a work in progress, but WODS and the City of Kitchener have high hopes for this marriage of a unique sport with a unique park location. At this time, WODS is one of only a handful of organizations in Canada with access to dedicated, full-sized Ultimate fields. Perhaps other cities and Ultimate organizations might be inspired by this relationship to seek out alternative, previously unconsidered sites to receive "the Ultimate treatment." ♦

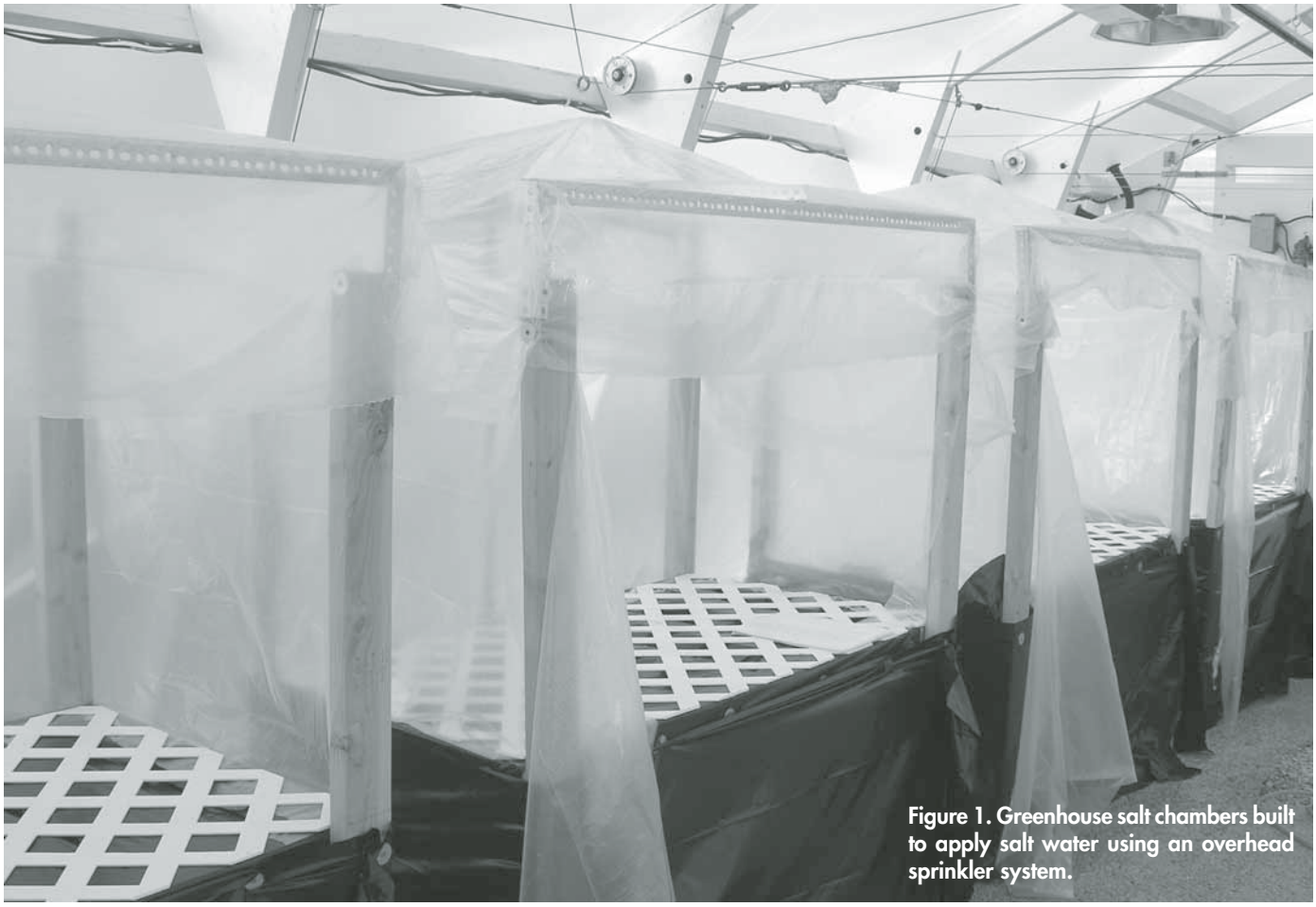


Figure 1. Greenhouse salt chambers built to apply salt water using an overhead sprinkler system.

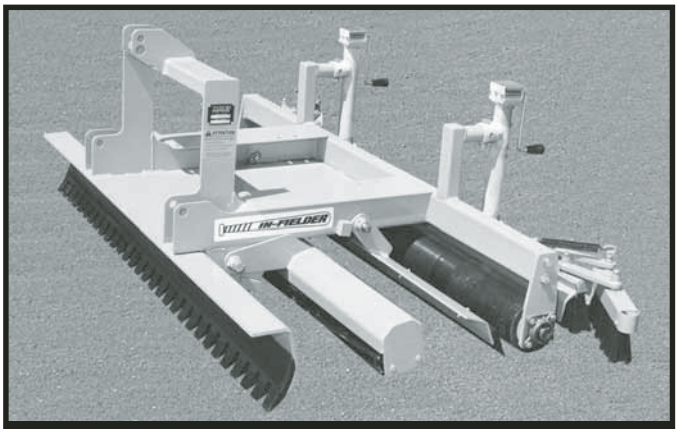
SCREENING COOL SEASON TURFGRASSES FOR SALT TOLERANCE

STACY A. BONOS, MATHEW KOCH, BINGRU HUANG & THOMAS GIANFAGNA • RUTGERS UNIVERSITY • NEW JERSEY

Salinity has been recognized as a major agricultural problem on more than 20 percent of irrigated agricultural land around the world. Turf managers can support water conservation efforts by using non-potable water sources for irrigation of turfgrass areas. However, non-potable water sources can contain high levels of dissolved salts, which can cause salt stress injury and reduce turf quality. The goal of this research project is to develop screening methods to assess the salt tolerance of cool-season turfgrasses and identify cultivars and selections with increased levels of salt tolerance. Two screening techniques (one greenhouse and one field) were developed to evaluate Kentucky bluegrass, Texas x Kentucky bluegrass hybrids and bentgrass cultivars for salinity tolerance.

A greenhouse salt chamber system was developed to apply saltwater with overhead irrigation. This screening method is unique in that it simulates real world stresses that a turfgrass manager would face if irrigating with water containing high levels of salt. This method results in both salt stress injury directly to the leaf tissue from overhead irrigation as well as salt stress injury to the whole plant from an accumulation of salt in the water and growing medium. Previous greenhouse salt screening studies have evaluated turfgrasses under hydroponic conditions. This method involves exposing the roots to high concentrations of salt water, but it does not include salt stress injury to the leaf tissue.

Re-circulating salt spray chambers (Figure 1) were constructed and used to overhead irrigate turfgrass plants in sand trays with four concentrations of salt water. The salt water concentration measured in EC (EC = Electrical Conductivity) was evaluated at EC concentrations of 1 dS/m (control – treatment 1), 3 dS/m (treatment 2), 6 dS/m (treatment 3), and 9 dS/m (treatment 4). Salt solutions were made by adding a product called Instant Ocean to the water filled reservoirs beneath each chamber. Instant Ocean, was chosen due to its high similarity to ocean water which contains various types of salts. In addition to the salt, 1/4 strength Hoagland's nutrient solution was added to the salt



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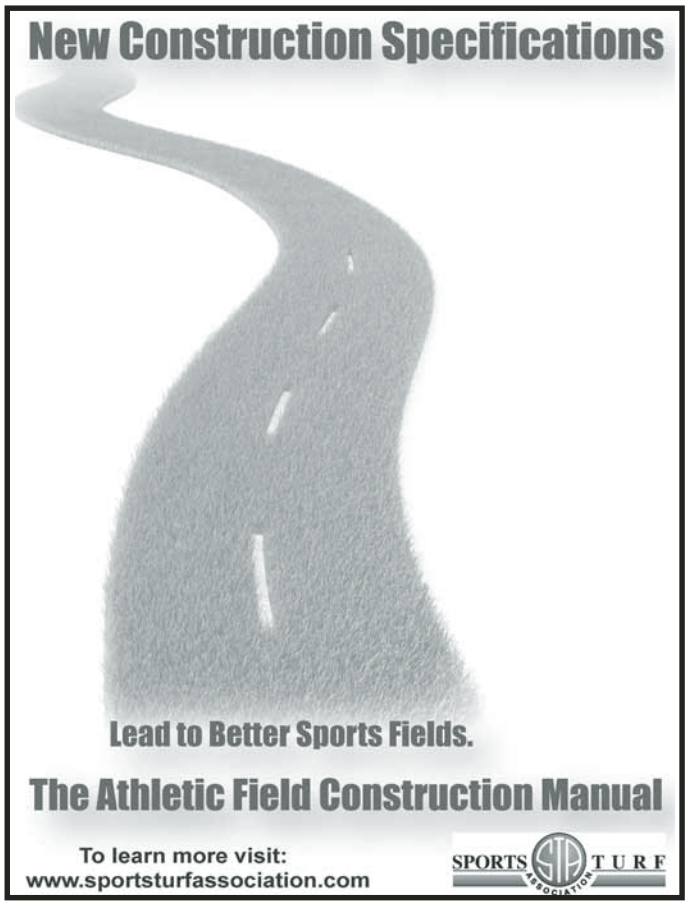

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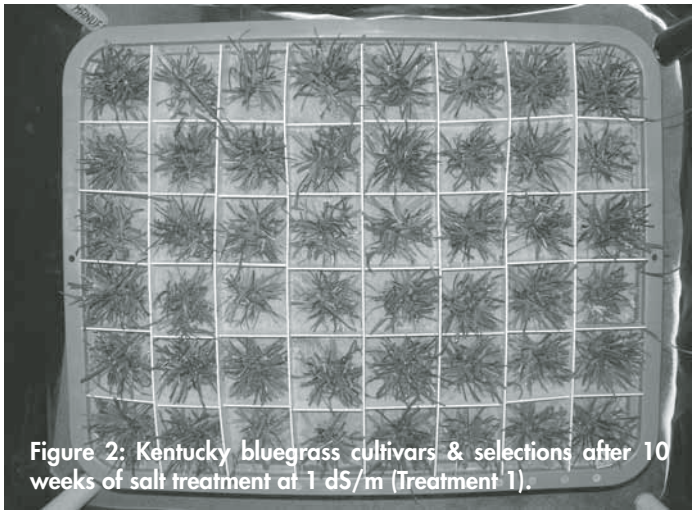

Figure 2: Kentucky bluegrass cultivars & selections after 10 weeks of salt treatment at 1 dS/m (Treatment 1).

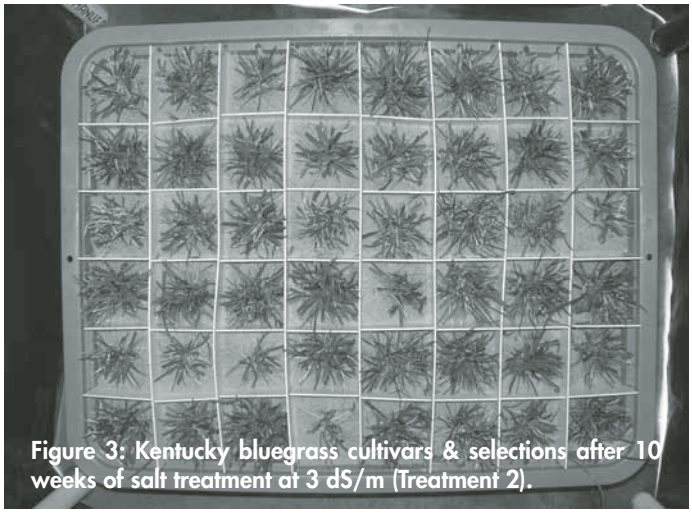

Figure 3: Kentucky bluegrass cultivars & selections after 10 weeks of salt treatment at 3 dS/m (Treatment 2).

Figure 4: Kentucky bluegrass cultivars & selections after 10 weeks of salt treatment at 6 dS/m (Treatment 3).

Figure 5: Kentucky bluegrass cultivars & selections after 10 weeks of salt treatment at 9 dS/m (Treatment 4

water tanks to provide the plants with nutrients needed for normal growth.

Twenty-one Kentucky bluegrass cultivars and selections were evaluated in the greenhouse salt chamber screening including Jefferson, Langara, Argos, Liberator, Diva, Bedazzled, Fairfax, P105, RSP, A03-84, Moonshadow, Bewitched, Julia, Baron, Eagleton, A00-1400, A99-2559, Lakeshore, Rhythm, Midnight and Cabernet. Three Texas x Kentucky bluegrass cultivars and selections were also evaluated (Bandera, A03TB-676 and A03TB-246). Treatments were replicated three times. Plants in each of the trays were randomized and separated with plastic inserts to minimize interactions. Plants were irrigated every other day with fresh water and the nutrient solution for a week before salt treatments were initiated. Salt was added at 1.5 dS/m each irrigation day until the maximum EC was reached in order to prevent shocking the plants with the full strength salt solution. After the final salt treatment was reached, plants were exposed to the salt treatments for 10 weeks. Throughout the study, all plants were maintained at 1.5 inches.

Percent green ratings were collected weekly on the Kentucky bluegrass plants. Additionally, every other week, dried clipping weights, relative water content, photochemical efficiency, and chlorophyll content were measured on the Kentucky bluegrass plants. At the end of the 10 week study, roots were washed free of all sand particles and final root lengths, dried root weights, and dried shoot weights were measured. All of these measurements were then analyzed as a proportion of the control plants in order to take into account the innate differences in growth habit between cultivars. In order to determine the final EC of the sand for each treatment, samples were removed from each tray and analyzed at the Rutgers University Soil Testing Laboratory for soil EC.

Significant differences were observed between treatments (Figures 2-5) and cultivars indicating that this method should be useful for evaluating salinity tolerance of Kentucky bluegrass. Under greenhouse conditions after 10 weeks of overhead irrigation at 9 dS/m (treatment 4), the cultivars exhibiting the highest percent green ratings were Eagleton, Liberator and Cabernet. The cultivars and selections with the lowest percent green were a Texas x Kentucky bluegrass selection, A03TB-246, Baron and the Kentucky bluegrass selection A03-84. The limitation of this greenhouse research is that it is being conducted under controlled environmental conditions. Therefore, we are also exploring the possibility of screening cool-season turfgrass cultivars for salt stress tolerance under field conditions.

For the field study, 19 of the 21 Kentucky bluegrass cultivars and selections and all three Texas x Kentucky bluegrass hybrids were replicated and established as spaced plants in a sandy loam soil at the Plant Biology Research and Extension Farm, Adelphia, NJ. All plants were mowed at 2.5 inches once a week with a

STM CORRECTION

Turn Off the Pesticides and Turn on the Vacuum (Spring 2008 *Sports Turf Manager):* The adult chinch bug (shown below) was mistakenly identified in the photo on page 9. The photo is actually its predator, the adult big-eyed bug (pictured above). The two are similar in size and are often confused when seen in the grass. The big-eyed bug is usually brown in colour and has very large eyes (hence the name); the chinch bug's head and eyes are much smaller and its adult colouration is typically black and white. We apologize for any confusion this may have caused.

Toro Groundsmaster. Equal parts of sodium chloride (NaCl) and calcium chloride (CaCl) was used to make a salt solution with a concentration of EC = 10 dS/m. A 500 gallon pump-tank was used to apply the salt water solution. Each plant received 0.125 gallons of this salt solution three times a week. A total of 36 separate salt applications were made to the field grown spaced plants. Each week, soil tests were taken from various points throughout the field and analyzed for soil EC by the Rutgers University Soil Testing Laboratory. Visual percent green ratings were taken throughout the summer to identify the level of salt tolerance of each of the cultivars included in the trial (Fig. 3).

By the end of the season, the soil EC reached levels above 3 dS/m which caused significant stress on the turfgrass plants. Significant differences were observed among cultivars and selections under field conditions. Bewitched, the experimental selection, A03-84, Langara, Bedazzled, Jefferson, Diva, P105, Rhythm and Liberator had the highest percent green leaf tissue under these conditions while Julia had the least.

The field results were not strongly correlated to greenhouse salt chamber results. The greenhouse is an extremely controlled environment – temperature, humidity and other stresses are controlled – while under field conditions, plants are exposed to other stresses such as heat, drought, mowing, etc. in addition to salinity stress. Salinity tolerance is a complex trait that is affected by other environmental factors including both air and soil characteristics. Therefore it is not surprising that there was little correlation between the greenhouse and field experiments. We hope to use this information to identify the critical factors influencing salinity tolerance under field conditions in order to develop efficient selection techniques for improving salinity tolerance in cool-season turfgrasses.

This research indicates that it should be feasible to evaluate salt tolerance of Kentucky bluegrass under greenhouse and field conditions. We are in the process of screening bentgrass cultivars and selections for salinity tolerance under both greenhouse and field conditions. We are hopeful that this research will provide practical recommendations to sod growers, golf course superintendents and turfgrass managers attempting to grow and establish Kentucky bluegrass and bentgrasses under salt stress conditions. In the upcoming year, we hope to expand correlation studies between greenhouse and field screening techniques to determine the most useful screening technique for evaluating salt tolerance in cool-season turfgrasses. Additionally, we have initiated inheritance studies to determine the genetic component of salt tolerance in cool-season turfgrasses and we are also testing experimental selections on salt-affected sites to validate our screening techniques. The information generated from all of these trials will prove useful for turfgrass managers and sod growers interested in using non-potable water for irrigation of cool-season turfgrasses. ♦

Stacy Bonos can be reached at 732-932-9711 x255, bonos@aesop.rutgers.edu.
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STA Member Profile

Bruce Hay • Manager of Parks Maintenance • City of Brampton

1. What is your role with the City of Brampton? Manager of Parks Maintenance.

2. What kind of team do you work with? I work with a dedicated team of parks maintenance professionals who are often called on to produce excellence on the spur of the moment. I have learned this positive trait is not just unique to Brampton, but is industry wide.

3. What are you and your team responsible for? Sportsfield maintenance and renovations, litter control, pathway maintenance, playground maintenance, winter snow operations at recreation facilities.

4. What is the biggest challenge in your job? Translating what our customers want in an athletic field and using the best turf practices possible to provide superb field conditions during unpredictable weather events.

5. What is the most satisfying part, what makes the job worthwhile for you? I enjoy the people I have met in this business. They remain lifelong friends and accomplices. Also there is nothing like a dense, green sward of grass on a soccer field or a perfectly cut infield on a ball diamond.

6. What is the biggest misconception about your job? That I don't enjoy it

7. What is your educational/employment background?

- 3 yr. Landscape Technologist with Honours, Humber College
- Business Administrative Studies, York University.
- 5 yr. private sector landscaping maintenance
- 3 yr. City of Etobicoke Arborist
- 29 yr.City of Brampton Gardener, Cemetery Manager, Parks Foreman/ Supervisor, Urban Forestry Supervisor, Parks Manager

8. Tell us about your family. Married for 29 years with two lovely daughters.

9. What do you enjoy doing outside of the workplace? Hobbies, favourite past times? Playing music on piano, organ and guitar and travelling abroad.

10. How has the industry changed and in what direction(s) would you like to see the industry, as a whole, move towards? The industry has benefited much more from science than in the past to provide excellent turf. I think that the industry continues to learn how to strike a balance between new cultural practices and what we have known all along. I have learned that without an underground irrigation system it is very difficult, nearing impossible, to have a good field that has lots of use.

11. What do you consider to be the biggest benefit of being a member of the STA? There isn't just one. The generosity of the STA members to share information on what has worked and what has not worked in the business of turf; the dedicated number of professionals that have served and continue to serve on the STA's executive board: and a quality publication and excellent conferences. ♦

The *Sports Turf Manager* isn't your only member resource. Why not visit…

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View a listing of all *Sports Turf Manager* articles from 1987 to the present. Go to the "publications/ Sports Turf Manager" link and click on "cumulative index."

Go further afield via the Michal J. Bladon Education Link to the Michigan State University's Turfgrass Information File in the "Member's Only" section of the website.

STA Facility Profile

Donald M. Gordon Chinguacousy Park • City of Brampton

1. Name, location of facility. Donald M. Gordon Chinguacousy Park, located at the northwest corner of Queen Street East and Bramalea Road.

2. General information regarding the facility. Chinguacousy Park is home to: Mount Chinguacousy Ski Hill, Chinguacousy Curling Club, Brampton Firelife Safety Facility, animal farm and petting zoo, formal gardens and greenhouses, ponds, children's playgrounds, and cenotaph.

3. What types of sports fields are on site? Soccer, football, baseball, beach volleyball, and track and field.

4. How many employees are involved with turf care at this facility? Two.

5. How many acres of turf are maintained at this facility? How many acres of sports turf? 65.

6. What percentage of this acreage is irrigated? 50%.

7. What is the primary type of turfgrass? Name of varieties. Kentucky bluegrass and perennial ryegrass.

8. Is yearly overseeding part of your sports turf maintenance program? Yes.

9. How many times do you fertilize?
Irrigated fields – 4 times per year
Non-irrigated – 2 times per year

10. Do you aerate? Topdress?
Irrigated fields – 4 times per year
Non-irrigated – 2 times per year

11. Has your municipality banned the use of pesticides? No, we have had a Pesticide Use Policy in place since 2002 that regulates our pesticide application and is based on the principles of Integrated Pest Management. As a municipal, industry stakeholder, Brampton staff are prepared, through public consultation, to provide input to the Province of Ontario and produce revisions to our Pesticide Use Policy, based on the new legislation banning the use of Cosmetic Pesticides.

12. Are community user groups involved or have they been involved in the construction/maintenance of this facility? In what manner? Community groups are consulted and provide comments (more so than ever) into the quality of design and maintenance of their sportsfields.

13. How many hours per year are the fields permitted? Who permits them? Are the fields ever closed during the season to give them a rest? How much input do you have in the amount and timing of use? The City of Brampton's Sports Division (Recreation Division) permits all city, public and school board fields in our inventory. We have very little input into the amount and timing of use, however we do close each major field two days per month for turf maintenance and are working with our Sports Division to renovate and rest fields by the season. ♦

STA ANNUAL FIELD DAY

This year's popular event will be held in Brampton. See page 4 for info…

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