Crestwood / Brookbanks Park Soccer Field, April 2005

ALL PHOTOS BY DOUG SMITH

ONTARIO Turfgrass SYMPOSIUM

Crestwood Preparatory College / Brookbanks Park Soccer Field

A CASE STUDY IN INTEGRATED PLANT HEALTH CARE BY DOUG SMITH AND ARTHUR BEAUREGARD

The realization of the soccer playing field located at Crestwood Preparatory College began in 2001 as a mutual collaboration between the City of Toronto, Parks and Recreation Division, the Toronto District School Board and the local community. The soccer field and surrounding six-lane running track were designed to complement the adjacent Brookbanks Park and provide positive recreational benefits for the Crestwood College Athletic program, permitted user groups as well as people from the immediate neighbourhood.

In response to the concern of deteriorating turf quality, a site assessment was conducted in September 2004. Background information about the site was that the field had been installed with an automatic irrigation system and then sodded. The assessment indicated that the turf was suffering from drought stress and compacted soil conditions. The turf was weak and inactive with shallow and minimal root systems and had only been cut twice during the 2004 season. What was being observed during the assessment were the results of a malfunctioning irrigation system as well as poor, biologically deficient and compacted soil lying underneath a thick layer of mat that had developed from the sod. The mat layer compounded by poor, compacted soil had effectively impeded root development.

Both the spirit of cooperation and the turf have been rejuvenated today under the auspices of an Integrated Plant Health Care (IPHC) program that was developed for turf management purposes by what is now the Parks, Forestry and Recreation Division of the City of Toronto.

The soccer field at Crestwood Preparatory College / Brookbanks Park provided an excellent opportunity to demonstrate the dynamics of an Integrated Plant Health Care program based upon the proper and timely application of key organic inputs. Best organic turf management practices included soil amendment / topdressing using quality compost, applications of organic fertilizers and applications of liquid compost / biostimulant (kelp) blends.

Integrated Plant Health Care (IPHC)

Toronto's urban greenscape is made up of the developed horticultural landscape as well as naturalized areas. In the urban setting, it is the greenscape that makes a city not only liveable but also a desirable place to locate business and to visit as a tourist.

In Toronto's urban greenscape, plants provide recreational, aesthetic, environmental and economic function and benefits contributing to the quality of life. The relationship between plant health and human wellness is recognized and incorporated into the ecological intent that defines IPHC. In nature, plants are left to manage themselves, however in the urban greenscape there are associated urban stresses whereby an IPHC approach is required to optimize plant health.

Integrated Plant Health Care is an active management strategy used by the City of Toronto, Parks, Forestry and Recreation Division that factors in human use as well as service level needs and community expectations. IPHC recognizes the unique set of demands and stresses that

these place upon plant health and provides a holistic understanding of how plants grow and function in urban settings.

An IPHC program provides the best opportunity to achieve a balance between human needs and plant health in relation to urban environmental stresses. IPHC also represents the best approach to develop plant management programs that are environmentally sound, responsive to community needs, healthy and sustainable. The IPHC strategy incorporates the best practices of Plant Health Care (PHC).

Plant Health Care (PHC)

Plant Health Care is a system that is used to establish and maintain optimum plant health. Healthy plants are a function of a number of complex interrelationships involving soil, air and water. Plant Health Care is the key operational system that is used to rejuvenate green-space that has gone into decline. Instead of accepting plant health decline as being inevitable due to continued stress pressures, the concept of PHC recognizes that such decline is an indication of underlying plant health problems and identifies the means for corrective action. A healthy plant becomes less susceptible to stress and is in a position to recover when stress conditions occur.

The operational components of a PHC system involve:

- Proper landscape design, site selection and plant selection for new projects including consideration of service level needs and related stresses from use, as well as urban environmental stresses on plant health.
- Soil health, with an emphasis on managing the physical, chemical and biological properties of the soil to optimize soil health. Management practices include aeration, proper watering and applications of compatible organic materials.
- Proper mowing height and frequency and overseeding for turf management.
- Proper timing for all management practices.

Plant ecology is an interconnected system of roots, soil particles, nutrients and microorganisms. For turf applications, PHC is predicated upon the principles of sustainability and biodiversity. Sustainability refers to the ability of the soil to become biologically dynamic, possess a high degree of natural fertility and thus become a self-perpetuating system of nutrient cycling in the soil and nutrient availability to the plant.

Biodiversity refers to the variety of living things and the ecosystems that they inhabit. For turf plants, biodiversity is a function of utilizing different seed cultivars and promoting conditions that nurture a wide spectrum of beneficial macro and microorganisms in the soil. Having a biologically inactive soil is the key limiting factor to soil health and achieving biodiverse and sustainable plant management systems.

The City of Toronto, Parks, Forestry and Recreation Division has been active in utilizing an organic methodology that encompasses the key principles of sustainability and ecological biodiversity through the application of quality organic materials.

Organic Turf Management

A sustainable system of PHC recognizes the importance of best practices associated with soil biological health and involving applications of quality organic materials. The organic management component of PHC is designed to work with nature. By consistently employing a particular organic set of turf management practices, healthy growth is encouraged while having the least possible negative environmental impact. The naturally beneficial qualities of plants are maximized with a healthy plant becoming its own best defence against stress. Key organic inputs are utilized as a collective set of tools that

Rejuvenated Turf, April 2005

Turf establishment under protective tarp, April 2005

are involved in the consistent delivery of best PHC practices.

Crestwood Soccer Field: IPHC Program Components

The value that is placed upon parkland underscores the need for the practical application of IPHC programs. The Crestwood / Brookbanks Park soccer field is very much tied into the multi-cultural dimension of the City of Toronto and provides for a multitude of desired community sport opportunities. It is highly valued as a recreational resource for Crestwood Preparatory College, teams and individuals and provides an economic benefit by generating permit revenue required to fund Parks, Forestry and Recreation programs. Integrated Plant Health Care recognizes the soccer field as an asset and service levels are directed towards delivering a safe and playable surface facility.

The key components of the IPHC program that was initiated at Crestwood were as follows:

1. Irrigation

Once the irrigation system was made operational, the field was given a thorough and deep watering to facilitate aeration.

2. Aeration

The field was intensively aerated to relieve compaction, facilitate oxygen and water infiltration into the rootzone and provide an opportunity for soil amendment.

3. Overseeding

Overseeding was done in two directions with a perennial ryegrass mix developed for sports fields. A slit seeder was used to cut through the existing sod blanket and ensure good seed to soil contact.

4. Fertilization

An organic fertilizer was applied at the rate of 6.5 kg of organic matter per 100 square metres. At this stage of the rejuvenation process, the intent was to not over-stimulate the existing stressed turf nor the immature turf coming from the overseeding practice but to introduce a source of gradually available plant nutrients while at the same time feeding the soil with valuable organic matter.

5. Liquid Applications

Two applications of a liquid compost extract / biostimulant (kelp) solution were conducted over an eight week period. The City of Toronto Parks staff manufacture liquid compost on site using commercially sourced dry compost that is processed through specially designed extractor units. This process extracts the naturally occurring and beneficial microbes from the compost and puts them into a concentrated microbial solution. The solution is supplemented with a liquid kelp biostimulant and diluted with water prior to application. The liquid compost extract has intrinsic biological properties and is being used to improve soil health. The liquid kelp is technically referred to as a "biostimulant" because it supplements plant growth hormones that stimulate root development and which occur naturally in turfgrass. The application of the liquid compost / kelp mixture constitutes a best PHC practice that is intended to enhance the biological properties of the soil and for purposes of stress management.

6. Topdressing

The field was pneumatically topdressed with a mixture of good quality commercially sourced compost, seed and organic fertilizer about eight weeks after aeration and initial overseeding. Plant health can be improved significantly by enriching the soil with stabilized organic matter in the form of compost. Organic matter is like an engine that drives the soil to produce healthy turf. Compost is rich in beneficial microorganisms that are active in the soil and that are involved in the retention and cycling of nutrients as well as amending soil structure. The intent of the IPHC program is to maintain compost topdressing on an annual basis for the next three years so that the compacted soil becomes more friable over time. The compost also provides an excellent germination medium for the seed that was broadcast along with the topdressing in order to fill in any void areas left on the field. The organic fertilizer was included at the 6.5 kg per 100 square metres rate in order to facilitate late season carbohydrate storage in the root systems so that the turfgrass plant would be primed for energy demands during the natural peak growing cycle the following spring. The pneumatic application method was chosen because it minimized the movement of equipment across the field. The impact of conventional topdressing to an already stressed field was considered within a PHC context and the relatively less intrusive pneumatic procedure was chosen on this basis as well as its ability to incorporate seeding and fertilizing during the same application.

7. Turf Covers

Protective tarps were installed along the mid-length of the field during the fall to accelerate turf establishment and protect against winter induced damage. The tarps remained over winter and were removed during the early spring to accommodate play.

8. Field Management

Goalmouths were closed and temporary goals and play were established across the width of the soccer field during school practice. Access to the field from the school is also being varied in order to minimize localized wear and stress that result from concentrated foot traffic.

Results

The results to date have been excellent in that a healthy and dense stand of turf was encouraged across the length of the field during the latter part of 2004. The implementation of the IPHC program has stopped the deterioration of a valuable asset within the community. While improving the playing surface for field users, the life of the soccer field has been prolonged and the need for costly renovations reduced. Improved turf density has produced a definite competitive advantage over weeds.

The challenge now is to maintain and improve on plant health. The field rejuvenation process that was initiated in 2004 has provided an excellent foundation from which to build during the 2005 season. Phil Santomero, Athletic Director at Crestwood Preparatory College, has stated that, "We have taken a newly built field that was looking more like a concrete slab and with the use of compost, tarps and hard work, we now see the benefits of the efforts with some new growth and a recognizable soccer field that will make a full recovery over the next year."

Despite the best PHC practices however, and with the constant demand for play throughout the season, it is anticipated that localized turf loss in areas such as goalmouths will continue to be an issue. This turf loss is not a function of poor soil but rather a result of the abrasive effects of play that are specific to soccer. The amount of abrasive stress that these areas are subject to will simply not sustain viable turf for any length of time. The use of protective tarps and proper drainage combined with field management provides a temporary solution. From the

players' perspective, it is good optics and an indicator of service delivery by having turf cover in goalmouth areas to start the season.

IPHC – A Formula For Success

The success at Crestwood soccer field has not only been predicated upon the technical merit of a customized IPHC program but moreover upon the human resource element that was necessary to deliver the program. All staff from the Parks, Forestry and Recreation Division and from the Crestwood Preparatory College who have been involved and committed to the planning, development and implementation of the program have been instrumental to its current success.

Integrated Plant Health Care is a fresh and unique concept that fosters commitment, communication and co-operation. For Vince Pagano, Chief Administrator at Crestwood Preparatory College, the commitment happened when he agreed to fund half the cost of materials once he understood the intent of the program and could observe first-hand the improvements that were happening on the field. City of Toronto Parks Supervisor Andy Svanenberg commented, "We have collaboration within the division and an outside agency that will produce meaningful results and actually see a noticeable benefit for our user groups, the school itself and especially the tax paying residents of the area."

In the City of Toronto, IPHC has raised the bar with regards to parks management. Parks Supervisor Andy Svanenberg, Lead Foreperson Greg MacDonald and their staff were quick to embrace the challenge and demonstrate their professionalism and expertise. The program has provided the means for bottom-up input from staff and the potential for significant impact and change in how our urban greenscape resources such as the Crestwood soccer field are perceived and managed. Plant Health Care represents the best strategy in managing the greenscape to prevent substantial loss or damage that can result from weeds, insects and disease and as such becomes the primary means of complying with the City of Toronto Pesticide Bylaw.

The liquid compost extract that is manufactured by Parks staff and applied to the soccer field is an excellent example of how innovation can empower employees and enhance staff motivation, morale and cooperation. The protective tarps were sourced through the municipal golf course sector and this is an example of intra-divisional support for the program. Through an ongoing training / education component, it is anticipated that staff will become more fully aware of the importance of their responsibility and their collective efforts to the overall success of the program and the realization of environmental objectives using IPHC. ♦

Doug Smith is the Program Standards and Development Officer, Integrated Plant Health Care Section, City of Toronto, Parks, Forestry and Recreation Division. Arthur Beauregard is the Manager of Natural Environment and Horticulture, City of Toronto, Parks, Forestry and Recreation Division.

ONTARIO Turfgrass SYMPOSIUM

Sports Fields: Water Assessment Management

UNDERSTANDING THE TRUE VALUE OF WATER BY GREGORY SNAITH, ENVIROIRRIGATION ENGINEERING INC.

Ever wonder how much water a sports field actually uses. Perhaps there is a better question. How much water does a sports field actually require to sustain a healthy playable turf surface?

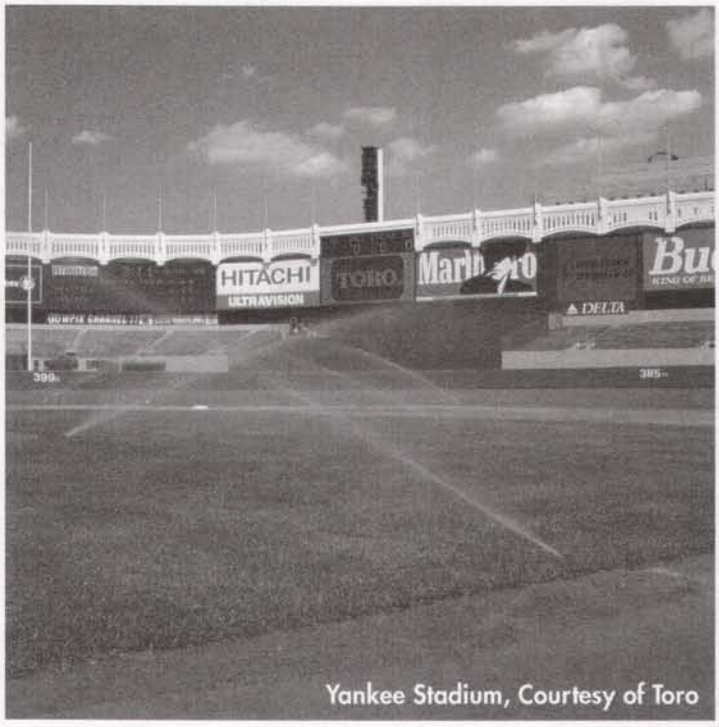
The summation of evaporation from the soil and transpiration from the turf is defined in the irrigation industry as the evapotranspiration rate (ET rate). This rate can be measured in mm per day, week, month or over the whole season.

The challenge for any sports field manager is relying on a traditional irrigation controller with a set daily schedule in minutes of run time. The reality is the ET rate fluctuates with the weather on a day-to-day basis, depending on wind, temperature, humidity and solar radiation.

The amount of water applied on a daily basis is a direct correlation to the run time of irrigation. The difficulty is allocating the labour to alter this run time as the weather changes. This is why the irrigation industry is heading toward state-of-the-art "ET based" irrigation controllers as endorsed by the Irrigation Association and irrigation professionals.

Experience in applying ET based irrigation scheduling has generally shown from 30-50% in water savings with some case studies even higher! This is a huge savings by any standard and certainly catches the eye of every municipality and region that is making efforts to reduce the necessary infrastructure for peak water demand during the summer months.

But the value of this savings is not just in the water and water infrastructure alone. It also provides benefits including increasing longevity in any irrigation system with moving parts, including rotors. If a booster pump is on site, there are also power and pump operation savings.



Yankee Stadium, Courtesy of Toro

To calculate the estimated monthly water use of a sports field, simply multiply the area of the sports field in m^2 times the monthly ET value in mm. The answer will be equivalent to litres which can easily be converted to gallons, cubic feet or unit water charge of choice.

For example, a turf soccer field in Ottawa (see Table 1 on the following page) is capable of using 125 mm water for the month of June. If the field is 60m x 100m, then the total potential water used is 750,000 litres (calculated by 60m x 100m x 125 mm ET month). If 40% savings in water was applied to this case, a savings of 300,000 litres would be available. This is equivalent to 300 cubic metres and at a water cost of $1.25 per cubic metre, the dollar value in water savings alone is approximately $375 for the month of June for one soccer field!

So what is the next step for a sports field manager wanting to reduce the water use on sports fields? As an intelligent irrigation specialist once said, "you cannot manage what you cannot measure" (W. Chinn, AAFRD). There are trained irrigation auditor professionals who can provide both an irrigation water audit and implement an irrigation management program.

The key is to first establish the baseline water use, set a realistic water savings goal, and then monitor to find the results. Striving towards sustainable management means making the most of a very precious resource we often take for granted – water. ♦

Gregory Snaith is a professional engineer and certified irrigation designer and irrigation water auditor. Gregory will be a guest speaker at the Field Day on Sept. 14th in Milton and will be discussing some interesting case study results in sports field water savings. For a copy of his "Water Asset Management" presentation made at OTS 2005, email gsnaith@enviroirrigation.com.

Handy water unit conversions (note that the irrigation industry uses US gallons).

- 1 cubic foot = 7.48 gallons (US)
- 1 acre-inch = 27,154 gallons (US)
- 1 acre-foot = 325,848 gallons (US)
- m^2 x mm water applied = litres
- 1,000 litres = 1 m^3
- 1 m^3 = 264 gallons (US)

Table 1. Evapotranspiration rates (potential ET rate mm/month) for selected Canadian cities (source: LEED® Canada-NC 1.0)

City	May	June	July	August	Sept.
Victoria	91	106	121	97	55
Vancouver	97	113	128	104	60
Calgary	122	133	135	109	69
Edmonton	122	131	131	98	63
Saskatoon	130	145	150	126	78
Regina	131	152	163	145	86
Winnipeg	134	147	150	126	79
Toronto	102	125	138	110	72
Ottawa	109	125	134	105	67
Montreal	103	122	132	101	63
Quebec	100	118	125	97	59
St. John	70	88	104	83	53
Fredericton	93	112	119	97	60
Halifax	84	102	109	93	59

INDUSTRY NEWS

ENVIROIRRIGATION LAUNCHED

ENVIROIRRIGATION ENGINEERING INC.

Following two successful years, Gregory Snaith, P.Eng., has resigned as a Principal from Creative Irrigation Solutions Inc. to specialize in water management by launching, Enviroirrigation Engineering Inc. Creative Irrigation Solutions Inc. will continue to provide the essential service of independent irrigation design and specification consulting.

Enviroirrigation Engineering Inc. provides a unique expertise within the landscape industry to evaluate and manage efficient water use for existing and new parks, sportsfields and commercial sites with irrigation systems. Professional services include alternative water sources and water demand management and creating natural park hydrologic regimes through environmental considerations:

1) irrigation system inventory & management
2) park & sportsfield daily irrigation scheduling
3) premium water efficiency program
4) reducing city peak water use

Gregory Snaith, P.Eng., is also a Certified Irrigation Designer (CID - Commercial, Golf, Residential), Certified Landscape Irrigation Auditor (CLIA) and a Certified Golf Irrigation Auditor (CGIA). Contact Enviroirrigation Engineering Inc. at 416-577-2610, gsnaith@enviroirrigation.com, 1750 The Queensway, Suite 1204, Toronto, Ontario, M9C 5H5.

STA Member Profile

Chris Mark • Director of Parks and Open Space • Town of Oakville

What is your role with the Town of Oakville?
Director of Parks and Open Space

What kind of team do you work with?
I am proud to work with a very dynamic, professional and dedicated group of people: 3 landscape architects, 3 managers and 1 administrative assistant.

What are you and your team responsible for?
Park planning and development as well as operations, including parks and open space, forestry, cemeteries and harbours.

What is your biggest challenge?
Ensuring operational requirements keep pace with development and managing continual growth.

What is the most satisfying part, what makes the job worthwhile for you?
Diversity – moving projects from planning and development through to completion.

What is the biggest misconception about your job?
There are two: 1) that municipal parks sections are soft services playing a secondary role within the municipal structure, and 2) that there is a slow (off) season and this is an 8:30 to 4:30 "government" job.

What is your educational/employment background?
BA in History, Associate Diploma in Agriculture, ODH. City of Brampton, York University Grounds and Fleet, Town of Oakville

Tell us about your family.
I have one amazing wife, Mary, and four children ages 3 to 14 years old. We're very active in rep ball.

What do you enjoy doing outside of the workplace? Hobbies, favourite past times?
Four children ages 3 to 14 years old. Very active in rep ball… what else need I say?

What direction(s) would you like to see the industry, as a whole, move towards?
Environmental stewardship should be high on everyone's priority list. Recognizing that making the "green" decision is the best choice.

What do you consider to be the biggest benefit of being a member of the Sports Turf Association?
Networking! Having the expertise of many professionals at my fingertips and the opportunity to assist others in maintaining and developing their sports fields. ♦

CONTRIBUTIONS 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. Updates on innovative research or equipment are also welcomed. This is a great way to both support your professional association and enhance your resume!

Sentinel™ Water Management System

Sentinel Computer System

The Toro Sentinel "smart" control system provides a range of modular options for outstanding flexibility. Whether it be maintenance equipment like PDAs and hand-held radios, or our vast communication mode offerings—such as radios, ethernet, phone and fiber optics—Sentinel has you covered.

Sentinel employs updated weather service reports and daily ET values so you can instantly respond to changing conditions—increasing or decreasing the moisture you apply as needed. Being able to adjust irrigation controllers so quickly and conveniently pays big dividends in water conservation and cost-savings.

- Computerized central control assembly programs your system and gathers data for reporting, but each site is managed by field satellites; the computer and software are not required for system operation
- True two-way communications between the controller and the central unit, as well as a hand-held radio, allows you to make programming changes or stop the program in the field
- Both field satellites and MapTo controllers have flow monitoring as a standard feature

TURF CARE

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