Letters

Ontario Turfgrass Symposium

My biennial trip to the Ontario Turfgrass Symposium this year was another fruitful exercise. This I should hasten to say was no different than expected. It is great for those of us who are counted upon to produce "Chicago Bear" type turf on fields that differ only from the surrounding turf in that they were crowned at one time. The very professional, up-to-date, well presented papers were of interest to us all.

I just wish that (a) the Symposium would continue to print the program talks, and (b) that I didn't live so far away.

On March 23-25,1997 we in Saskatchewan hosted a "Prairie Turfgrass Conference and Trade Show". This well attended function included papers on "Managing your Potential" by Chuck Evans, PhD, a corporate industrial psychiatrist, and "Managing the Turfgrass Rootzone Profile" by Al Turgeon of Penn State. Both were excellent presentations. Another talk enjoyed by all was by a former Saskatchewanian, Dr. Bob Sheard, on "Sports Field Renovation and Construction". It is too bad that Bob did not have more time. And finally, Drew Smith presented a paper on "Snow Mold".

Because of the distances on the prairies it is difficult to put together a function like this on a regular basis. As a result some of us who are a little more fortunate get to 'do' the Ontario Turfgrass Symposium from time to time.

Finally I must congratulate Mike Bladon on his retirement.

Greetings from University of Saskatchewan.

—Ken Turner

Scholarship Thanks

Please accept my gratitude in presenting me with the Sports Turf Association Scholarship on January 7th at the Regal Constellation Hotel.

It was a pleasure to enjoy such good company and meet members from the Association. I look forward to having future contact with the Association.

Thank you again for the award, the cheque for $200.00, the annual membership, the newsletter, and the dinner.

—Stuart Roberts

ON THE COMPUTER

A few words about spell checkers...
SPELLBOUND
I Have a spelling checker,
It came with my PC.
It plainly marks for my revue
Mistakes I cannot sea.
I've run this poem threw it,
I'm sure your please too no,
Its letter perfect in it's weigh,
My checker tolled me sew.

Courtesy of the Wellington County Literacy Council, April 1997

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SPORTS TURF ASSOCIATION OFFICE HOURS

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CANADA BLOOMS™

The Board of the Association decided to share a booth at the Canada Blooms garden show. The idea was to share in the cost with Landscape Ontario, the Sod Producers, Ontario Golf Superintendents, Professional Lawncare Association, the Guelph Turfgrass Institute and ourselves. The booth was manned by members of your board who handed out brochures and dispensed information on turf related problems. This medium was used to help the Association gain a greater profile or recognition with the public as a whole.

As one of those manning the display, I did not find the booth particularly eye-catching nor a great draw to the public and many people, if not drawn in by the booth occupants, would have walked by. It was difficult as well because the big sign said "Guelph Turfgrass Institute" (you do not have much time to talk to an individual and while they see 'GTI' highlighted, you still have to explain about the Sports Turf Association without losing their interest). On the plus side, many more people now know who the Sports Turf Association is.

—Michael J. Bladon

Did You Know?

In the spirit of our 10th Anniversary we will be sharing with our members some highlights of the Association's history.

Our first conference was held in conjunction with the Canadian Golf Superintendents Association in March 1988. The conference chair was Annette Anderson, then the first Turfgrass Extension Specialist. The event was held at the Harbour Castle-Westin Hotel in Toronto and attracted some excellent speakers. The first newsletter was published in October 1987, and there was only one issue that year. We also wish to salute the founding members of the Association, many of whom still support the Assocation today.

Patrick Tucker, Pat Tucker Associates
Everett Buntsma, Town of Pickering
Bruce Calhoun, Syniturf
John Watson, Waterloo County Board of Education
Peter Prakke, PAC Consultants
Brian Sutton, Havergal College
Paul Johnston, OSECO Seeds
Greg Brooking, City of Own Sound
Don Edworthy, Student
Ron Dubyk, Metro Parks & Properties
Robert Allen, City of Toronto
Doug MacMillan, Pickseed
Dick Raycroft, G.C. Duke Equipment
Rod Hermitage, AG-Turf Chemicals
Wayne McCutcheon, University of Alberta
Scott Richmond, Hutcheson Sand and Gravel
James Boyce, Agro Consulting Limited
Anne Witteveen, Nutrite Inc.
Bill Skerrett, City of Saskatoon
Jeff Corlett, Turf Drain Inc.
Charles Williams, Kelpmate Products
Mike Mayne, Ontario Turf Equipment
Darrell Cerminara, McMaster University
Glen Peister, MacLean-Peister Ltd.
M.K. Rittenhouse & Sons
Michael Bladon, University of Guelph.

Content Deadline for September Issue
July 13, 1997

Spring Maintenance and Start-Up of Irrigation Systems

The "Window of Opportunity" for opening an irrigation system is fairly short. Whether the irrigation (sprinkler) system is a golf course, a sports park, or just a residential system, the service and maintenance opportunities are the same, just on a different scale and value.

It is not advisable to open a system too early. Firstly, the system in Canada is usually not needed until the end of May—any earlier, is very exceptional. Secondly, opening and performing maintenance on the system is hard work and unpleasant when carried out too early. The valve boxes containing the valves and wire connections are usually the last to thaw, and ideally should be empty of water if possible. If you do have to dig to make repairs, a dry soil is easier to make a fast and quality pipe or wire repair.

When an irrigation system is closed (and empty) for the winter, usually the master (main) valve is shut off, but, all other isolation (manual) valves are left open. This is to ensure that any water that might find its way into the system does not back up against a closed valve and therefore break the pipe and usually the valve. Also, ball valves must remain open during freezing weather.

Before the system is filled with water, some precautions must be made because high pressure water and air mixed together can do a great deal of damage. All isolation valves must be closed. This is to ensure that when the master valve is opened slowly only a section of the system is filling with water. That area should be visibly checked for leaks. If any are found, get them repaired immediately, or if only minor, mark the place with a flag, and continue opening and checking.

It was mentioned earlier about opening the main valve slowly. This is to allow the main lines to fill gently. If the main valves are opened quickly, the water (under pressure) will thunder down the lines at very high speed and eventually when the water hits a stop or a 90 degree turn, it could blow the pipe fitting apart or dislodge the solvent weld of the pipe.

Once the system is charged with water under pressure, the following checks and procedures should be done.

- ✔ Check for leaks. Walk the site and allow a few hours for small leaks to show themselves in the ground.
- ✔ Check inside the valve boxes for manifold leaks and any obvious wiring problems.
- ✔ Check the back-flow-preventer which should be regularly checked by an authorized inspector.
- ✔ Plug in the controller and re-set date and time.
- ✔ Replace the battery (unless it is a rechargeable type).
- ✔ Check all exposed wiring around the controller to ensure that winter damage or vandalism has not occurred.
- ✔ Check to make sure that the programmes are still resident, day, time, duration, etc.
- ✔ Turn on Zone One (only) at the controller and visibly check that zone carefully while it is running. The following zone checks should be done:
  a) solenoid valve leaks
  b) other valve box and line leaks
  c) sprinkler heads - chech they are perpendicular and level with the ground; undamaged, operating, and turning properly; and reversing at the correct setting.

  Note: Nozzle performance is the most important and vital part of the whole system. It must give the correct distribution and coverage. Poor individual nozzle performance usually means debris in the head or nozzle.
- ✔ Turn on each zone and make the required checks, one zone at a time. If the controller is easy to change, it can be a good idea to put each zone on for perhaps 5 or 10 minutes and then while in the field, the zone changes will occur automatically. This will save walking back to the controller for every zone change.
- ✔ Finally, it is a good idea to run the first programmed cycle of the system when someone can be in attendance to watch its progress.

A few tips about controller schedules

In Canada "over-watering" is a problem, especially with commercial landscapes. This is because most controllers are programmed for the hottest and driest period, August. If it is not changed for May, June, July, and September, it is often in an over-watering mode. Most controllers today are much lower priced and have more features than 8 - 10 years ago. One feature found on most controllers today is water budgeting.

The Water Budget feature allows the operator, usually with the touch of a button, to increase or decrease the programmed water times by a specific percentage without having to reprogrammes the controller.

Most sports turf requires about 1 1/4 inches of water per

ANDREW GAYDON

week, but this again depends upon the season, the weather, and the quality of turf. Two to three applications per week is best for the turf (depending on soil type). Watering a little every day only encourages shallow roots and this leads to other problems.

All sprinklers and their corresponding nozzles are rated for gallons per minute (or m^3/L) and precipitation in inches per hour (or mm/hr).

If the reader requires to know more about his/her particular sprinklers rated performance, your supplier or manufacturer can provide this information.

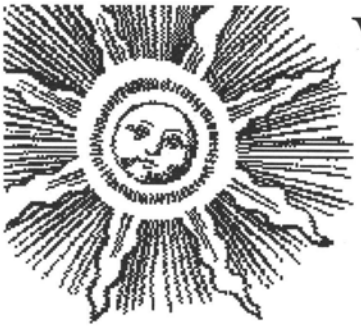
The author has only described spring maintenance on the most basic type of system. As technology improves and water conservation becomes more and more important, there are many worthy features that are gaining acceptance because of the amount of money they can save in operational expenditures. For example:

Moisture Sensing Devices
Rain Sensing Devices
Matched Precipitation Sprinklers
Pressure Regulating Devices
Cycle & Soak Control Feature
Weather Stations
Computerized Central Control Systems

After spring start-up, there needs to be a continuous commitment on behalf of the maintenance crew to perform routine maintenance.

An irrigation system is a sizeable investment—just like the grounds maintenance equipment, it needs regular check-up and care.

Andrew Gaydon is the Manager of the Turf Division of Vanden Bussche Irrigation (VBI Distribution). VBI is a design and supply company to the Golf and Turf industry in Ontario. Before emigrating to Canada 12 years ago, Andrew was the Sales Manager of a Combine Harvester company in his native U.K. Prior to that, he farmed sugar cane and citrus in Central Africa for the Anglo American Corporation. He is past President of Canadian Irrigation Association, and is a respected Guest Speaker on irrigation with various organizations. The Sports Turf Association is pleased to welcome Andrew to the Board of Directors and look forward to his expertise.



WORKING UNDER THE SUN

A Health & Safety Issue

Outdoor workers are exposed to dangerous levels of ultra-violate radiation sun exposure which, over the years, can cause premature skin aging, skin cancer and cataracts in older people.

Personal Protection

Workers exposed to excessive U.V. radiation should use the following personal protective equipment:

1. Wear a broad brimmed hat.
2. Wear U.V. blocking safety glasses.
3. Wear tightly-woven clothing covering on as much of the body as practicable.
4. Wear sunscreen with a minimum SPF15 (Sun Protection Factor) and effective against UV-A, UV-B on all exposed skin.

NOTE: The use of UV-safety measures should not lead to other safety risks. The risk of head injuries from using hats with inadequate impact protection, for example, or the risk of heat stress from wearing heavy clothing in hot environments.

Sun screens must be applied at least 15 and preferably 30 minutes before going out into the sun. This allows the active ingredients to bind with the skin and achieve the protection level. This is especially important with water-proof sunscreens.

Blockage of U.V. rays solves only part of the problem. Anytime the skin is exposed to the sun, it also loses a tremendous amount of moisture. This moisture loss is a major cause of skin peeling and flakiness, regardless of the amount of *"sunburn"*. Choose a sunscreen with a quality moisturizer and Vitamin E to rejuvenate the skin.

Simple precautions by outdoor workers can certainly go a long way in reducing the occupational hazard of UV over-exposure to those who work under the sun

Courtesy John Marlatt, Solar Bear

Machinery for Turf

ROLLERS

BY MICHAEL BLADON

Rollers are useful in turf establishment and maintenance operations in the following ways:1) in soil preparation for seeding or sodding; 2) for firming and leveling newly seeded or sodded areas and 3) in established areas to counteract heaving caused by freezing and thawing.

In seedbed and sodbed preparation, the roller is useful in establishing proper grades and levels. Alternate raking or harrowing and rolling will serve to "iron out"minor depressions and the rolling serves to provide the desirable firm seedbed that is essential to permit capillary water to rise to the seeded or sodded surface. For the same reason, rolling after seeding or sodding is desirable under most circumstances. Rolling the heavier types of soils prior to and after seeding and sodding operations must be done with extreme caution since puddling and compaction may result. Seedlings and sod roots have great difficulty in penetrating the compacted layer of over-rolled clay soil.

In established turf, rolling is necessary once and only once a year; this in the early spring after the frost has left the ground. The purpose of this rolling is to counteract soil and plant heaving caused by frost action. This rolling should be carried out at a time when the soil is dry enough that the roller does not cause puddling and yet still moist enough to permit the roller to accomplish its purpose. Heaving is seldom a problem in sandy soils.

Rolling is all too frequently carried out to the detriment of turf. The classic example of this is the bowling green. It appears that the majority of lawn bowlers believe that daily rolling with a heavily weighted roller is essential to the maintenance of a true bowling surface. Nothing could be further from the truth. All that such rolling accomplishes is a heavily compacted surface that makes maintenance almost impossible. When these circumstances are encountered, advice concerning rolling may take three forms: 1) drop the roller in the nearest deep body of water; 2) chain it to a substantial post on the property and have the greenskeeper retain the key (if the greenskeeper doesn't roll the greens the members often will!), or 3) if the members absolutely insist that the greens be rolled daily, have the greenskeeper use an empty roller while appearing that he is pushing a heavily weighted one; this appears to have the necessary psychological effect on the players without extreme compaction to the green.

Most rollers now available are of the water-weighted type whether they be hand-propelled or motor-driven. These consist of steel drums that hold water and can be weighted to suit soil conditions, the weight being determined by the quantity of water put in the roller. Such rollers may be hand-propelled, self-propelled or tractor drawn. Rather than the long, single type formerly used with tractors, tractor drawn rollers now consist of three or more smaller rollers hitched in tandem. Some have table tops to permit the addition of extra weight.

Most power rollers for turf are self-propelled units of varying size. A typical example consists of two rollers, one following the other. Another consists of a 30 to 36" front roller and followed by two smaller rollers. On the frame joining the front and rear rollers is a riding seat. In the latter the engine is mounted directly over the front roller and drives a chain fitted onto a sprocket at the side of the front roller. Front and rear rollers are easily detached and the front one may be used as a single power-driven unit for steep slopes with the operator walking behind. Other models are driven by the engine fitted by chain drive to the rear roller. Most rollers have scraper bars that prevent sod, soil or paving materials sticking to the rollers thus assuring a smooth finish.

GTI UPDATE

Researchers and staff are gearing up for a busy summer season at the Guelph Turfgrass Institute. Plans include the construction of a new bentgrass evaluation green. Proposals for new sports field research projects are also in the works.

Our annual Research Field Day is scheduled for August 14, 1997. The day has been expanded to a full day with research plot tours in the morning, an informal question and answer session around lunch and a hands-on clinic in the afternoon. Turf Management clinics with Dr. Jack Eggens are also being planned for later this summer in eastern Ontario at Kemptville and in southwestern Ontario at Ridgetown. A public open house is also planned for August 16, 1997. Watch your mail for information about these events. If you do not receive GTI mailings, please let us know and we will insure that you are informed about GTI activities.

This season marks the second year of *The GTI Advisor*, our popular advisory bulletin. *The GTI Advisor* is published every two weeks through the growing season and includes long range weather information and weather records, research summaries, an *Ask the Expert* question and answer section as well as current conditions and recommendations for the management of turf, woody plants and annual and perennials. Subscriptions are available by mail, fax or electronic mail.

The Ontario Ministry of Agriculture, Food and Rural Affairs are now charging for most of their turf and landscape publications. The GTI has made arrangements to distribute all OMAFRA publications that relate to turf and landscape management. These include Insect and Disease Control in the Home Garden (Pub 64), Guide to Weed Control 1997 (Pub 75), Diseases and Insects of Turfgrass in Ontario (Pub 162), 1997-98 Production Recommendation for Nursery and Landscape Plants (Pub 383), Recommendations for Turfgrass Management (1997) (Pub 384), Pruning Ornamentals (Pub 483), Ontario Weeds (Pub 505), and Weed Control in Lawns & Gardens (Pub 529).

For information about GTI programs, publications and services, please call (519) 767-5009, fax (519) 766-1704 or e-mail info@gti.uoguelph.ca.

GRASS SEEDS
Available from Rothwell Seeds

The Sports Turf Association strongly recommends to athletic managers that they use only improved cultivars that have been tested and found superior under local conditions

SPECIES	SUPPLIER ROTHWELL SEEDS	
Kentucky Blue	Adelphi	Huntsville
	Argyle	Julia
	Asset	Midnight
	Buckingham	Nustar
	Chateau	Ram I
	Classic	Raven
	Cynthia	Regent
	Eclipse	S21
	Estate	Suffolk
	Glade	Welcome
Ryegrass	Elegance	
	Imagine	
	Pegasus	
	Boardwalk	
	Manhatten II	
	Yorktown III	
Fescue: Creeping Red	Dawson	
	Finelawn I	
	Ensylva	
Fescue: Chewings	Luster	
	Dignity	
Fescue: Hard	SR3000	
	Saxon	
Fescue: Tall	Minx	
	Palisade	
	Shenandoah	
Bentgrass Colonial	Highland	
Bentgrass Creeping	Penncross	
	Pennlink	
	Penneagle	
	Prominent	
Poa trivialis	Sabre	
Poa compressa	Canada Blue	
Weeping alkali	Fults	

This is an updated excerpt from the table of grass seeds and suppliers printed in the March 1997 issue (page 9) of Sports Turf Manager. Note that all seed types listed previously for Rothwell Seeds are not available.We apologize for any inconvenience this may have caused to Rothwell Seeds.

Sports Field Turf

CHARLES PICK, PICKSEED CANADA, INC.

Maintaining healthy, lush turf is a challenge for any manager. If the turf is subject to a regular rigorous pounding by a stampede of cleated feet, the challenge becomes infinitely more difficult. Rugby, soccer, football and to a lesser extent, baseball, all take a heavy toll upon the turf on which they are played. As the caliber of the teams increase, not only does the pressure on the turf become more intense, but so too do the expectations of the turf quality by the same athletes that are out there pounding it into submission.

Professional turf managers go to great lengths to keep their sports fields in top quality shape. The higher profile the venue, the more dramatic their efforts become. Commonwealth Stadium in Edmonton is a beautiful, "real-turf" field that is home to the Edmonton Eskimo Football Team. The Eskimos play hard on their field and often play in late November, long after the turf in Commonwealth has gone dormant. To keep the field in top shape, the managers at Commonwealth overseed extensively and, every few years, they rip up the entire field and lay high quality sod grown from a blend of America, Alpine, Banff and Touchdown Kentucky bluegrass.

Rugby, soccer, football and to a lesser extent, baseball, all take a heavy toll upon the turf on which they are played.

Sometimes, even the best sports turf is only meant to be temporary. A few years ago when the United States hosted the World Cup Soccer Tournament, the Silverdome in Michigan wanted to hold one of the games. Real turf had never been used in a domed stadium. In order to accomplish this feat, sod was laid on hundreds of honeycomb-shaped units on one of the parking lots outside the Silverdome. The sod was given time to set down roots and then, one by one, the honeycombs were moved into the stadium by forklift, fastened together and then given time to let the turf knit over the units. By the time the World Cup contestant teams arrived for their match, the field was in superb shape and won rave reviews from the players.

What can you, as a turf manager, do to keep your sports fields in good shape? The soil upon which you seed your field is very important. A sandy loam is quite desirable since it will facilitate drainage and resist compaction from the considerable traffic the field will eventually have to endure. Perhaps the most important aspect of creating and maintaining a quality sports field is using the best possible seed mixture that you can. An ideal mixture is one with a high proportion (50% or more) of Kentucky bluegrass. Not only is it important to use a lot of bluegrass but the varieties that you use also make a difference. At least 25% of the mixture should consist of Touchdown Kentucky bluegrass. This variety is extremely durable to high traffic and has a very aggressive spreading root system that fills in damaged and thin areas quickly. The other Kentucky bluegrass component should be a dark coloured, disease resistant variety such as Indigo or America. The rest of the mixture should include a good quality fine fescue such as Jasper Creeping Red fescue and an elite turf-type Perennial ryegrass such as Cutter or Lowgrow.

When establishing a new sports field, a good quality starter fertilizer (ratio should be roughly 1-2-1) should be worked into the soil. The higher phosphorous component will help promote healthy root growth. Remember that, unlike nitrogen, phosphorous does not travel easily through the soil so working it into the root zone before the field is established is better than trying to spread it on after the grass has grown. Once your field is established, regular applications of a high nitrogen fertilizer will keep it healthy and lush.

As with establishment, high quality seed is a key factor in maintaining your sports field. No matter how much you fertilize and irrigate, the heavy traffic is going to wear out your turf, especially around the goal mouths and at centre field. A diligent turf manager will usually overseed twice a year—once in April or May and again in August or September. If it is at all possible, try to coordinate your overseeding schedule with a break in play on the field. If you can give the new grass a 3-4 week reprieve from heavy traffic you will help it immeasurably. If you have more than one field, try to rotate play in such a way as to give the newly overseeded field a rest for a few weeks.

Your overseeding mixture should contain a lot of turf-type Perennial ryegrass. Ryegrass germinates and establishes fast. It blends well with bluegrass and is very durable to heavy traffic. Many managers use Futura 3000, a blend of Cutter, Edge and Express, three high performance Perennial ryegrasses. Not only do these varieties produce lush, dense turf but they are high in endophyte, a naturally occurring fungus that provides resistance to many crown feeding insects such as Chinch bugs. Alternatively, managers use Futura Blue for their overseeding. This product is a mix of Cutter Perennial ryegrass (80%) and Touchdown Kentucky bluegrass (20%). This mix still has a lot of ryegrass for rapid establishment, but it also allows you to keep the bluegrass portion of your field rejuvenated. If the field becomes too dominated with Perennial ryegrass over the years, it could be subject to some cold damage after a particularly harsh winter. By comparison, Kentucky bluegrass is far more winter-hardy.

In conclusion, remember that managing a sports field is very similar to building a successful sports team. It requires a lot of diligence and hard work and it usually works best if you start with a roster of talented, quality players.

TURF

Rootzone Construction and Drainage Principles

By Steve Baker

We were pleased that Dr. Steve Baker was able to join us for the 1997 Ontario Turf Grass Symposium. He is an Associate with the Sports Turf Research Institute in Bingley of Yorkshire, England. The Institute started in 1929 and is situated on a 5-hectare site. A staff of 50 conducts research on a whole range of sports. They receive 1000 mm of rain per year. Lowest winter temperature would be just above or below 0C. The following article contains excerpts from his talk on turf rootzone construction and drainage principles for sand playing fields.

On soccer fields, wear is concentrated in the goal mouths and in the centre area. Play with rugger, soccer and field hockey is from early May to August, and very little grass growth occurs between September and April. Shade problems exist in many stadia due to low sun angles; thus, some stadia can receive almost no sun for a three month period. Wear is contributed by players and by maintenance machinery. Under these conditions, a well structured soil is required with sufficient pore space and air. With heavy compaction, the pore space becomes much smaller.

Uncompacted soil is composed of 25% air, 25% water, and 50% solids. In contrast, compacted soil contains 25% water, 5% air, and 65% solids. In a compacted state, soil becomes anaerobic, and root penetration suffers. Root zone material is sand-dominated. Larger pores are lost, the soil drains poorly, and the soil becomes waterlogged. Why? Because the compacted top layer of 2.5 cm in depth does not allow rainfall to disperse. Another characteristic common to natural soil fields is a significant decrease in ball bounce with longer playing seasons. All of the above result in player dissatisfaction, poor playing conditions and cancellation of games.

Not surprisingly, many more sand fields are coming into play. They require less laborious mixing of sand and soil, and result in better drainage and consequently, better plant growth. Advantages to the sand root zone are superior drainage, airfilled pore spaces, increased root development and consistencies of playing conditions. The major disadvantage is that natural soil fields are prone to the vagaries of weather. Potential problems with sand that Baker noted were drought, lack of balanced nutrition, and decreased stability—particularly if grass cover is lost.

Tips for constructing sand playing fields

- sand topdressing - use sand that has been carefully selected for size and uniformity of grains - this allows for a high rate of drainage and adequate aeration for plant and/or root growth
- slit drainage - get the water off the surface by way of slit drainage - this is usually negated if no sanddressing has been applied to the surface

Specifics

- Pipe drainage - install 5-15 m apart, 60 cm in depth, backfill gravel close to surface, then add 15-20 cm sand
- Slit drainage (50 mm diameter) - sand at surface, gravel underneath, heavy sand topdressing (150 tons), trenching 30 cm deep, remove the material taking caution not to cap slits

Research Abroad

In England, they use a mixture of three different ryegrasses, and an angular type of gravel rather than rounded (not limestone).

In 30 soccer fields that have been built, an underheating system was installed consisting of pipes filled with water connected to a heating system, and seeding was used instead of sod.

The Research Institute has tried several plastic support systems which help to reinforce the surface when grass cover is lost. Their mesh element trial is the first ever. Care must be exercised as cleats get locked in the material. Desso System from Holland, a polypropylene, is recommended.

With slit drainage and heavy application of sand, fields were usually still in good condition after three months (using once a week aeration). 225 kg/ha of nitrogen per year was proposed for sand-dominated root zones—applications much above this figure are considered wasteful and promote excessive top growth and very little root growth. Below this level, growth is too weak to counter the rigors of play.

Publications & Videos

Colour Atlas of Turfgrass Diseases

by Dr. James Beard
250 pages, 1996
Order Code 030-1, $79.95

Dr. James Beard has now completed work on the *Colour Atlas of Turfgrass Diseases*.

This latest project boasts over 450 unique high-quality colour photographs—many of which have never been published until now. This is significantly more than any other publication. Originally specific to diseases found on turfgrass in the Pacific Rim and available only in Japanese, the book presented such extraordinary photos that Dr. Beard negotiated with the Japanese publisher and author to expand the book. The *Colour Atlas of Turfgrass Disease* now covers all major diseases worldwide, including 19 new ones, and increases the total number of colour photos from 300 to 450.

In it's first edition, the *Color Atlas of Turfgrass Diseases* sold 3,000 copies alone. Now international in scope, and particularly useful for turf managers and superintendents in North America, the book is expected to become the standard colour-guide to disease identification and control.

Available from:
Ann Arbor Press Inc.
121 South Main Street
P.O. Box 310
Chelsea, MI 48118
Tel. (800) 858-5299 or (313) 475-8787
Fax (313) 475-8852
Add $3.50 per copy (US funds) for shipping/handling in the U.S. and Canada. All others add $10.00 per copy.

Integrated Pest Management for Turf (video)

OMAFRA, as part of their effort to reduce pesticide use in Ontario by the year 2002, has released a video called *Integrated Pest Management for Turf*. The video is 18 minutes long and introduces the principles of IPM, the importance of proper cultural practices, the basics of monitoring for turf pests, some specific insect monitoring techniques, and the importance of record keeping.

Also featured is the concept of degree days and key indicator plants for predicting insect life cycles and using this information to properly time pesticide applications. This video is an excellent training tool for golf course employees, municipal employees, lawn care applicators and master gardeners.

The video is available on loan from:
OMAFRA Audio Visual Library
Visual Communications Services
52 Royal Road
Guelph, ON N1H 1G3
Tel. (519) 767-3681
Fax (519) 824-9521.
It may be purchased for $18.00 (includes shipping, handling, and taxes) from The Guelph Turfgrass Institute, 328 Victoria Road South, Guelph, ON N1H 6H8.

Guidelines for Special Event Planning

Available from:
The City of Hamilton
Special Events Liaison, Parks Division
Peter J. Booker
City Hall, 71 Main Street West
Hamilton, ON L8N 3T4
Tel. (905) 546-2814
Fax (905) 546-3972