May 1989 Volume 2 Issue 1 2



# SPORTS TURF NEWSLETTER

## PRESIDENT'S MESSAGE

The Canadian Turfgrass Conference in Vancouver is now over and was, we are told, a success. Two of your Board members were there — Bruce Calhoun and Geof Corlett — and spoke with, among others, several members of the Western Turfgrass Association. In the course of these conversations, Bruce and Geof picked up some very worthwhile ideas.

As Ernie Pecore stated in his letter to the new Turf and Recreation magazine, we have a national Canadian forum which will help to address the problems faced by those involved with the maintenance of overused athletic fields. We couldn't agree more, and wish the editor of Turf and Recreation, Rud Kendall, every success in his new venture.

The Alberta Recreational Facilities Association is working on a Sportsfield Operator 1 course for April, 1989. The course is one week long and will cover not only turfgrasses and their maintenance, but also irrigation, scheduling of fields and related activities. This is a positive start, not only to having skilled people doing the work, but also as a means of recognizing the work that they do. Perhaps it is time for the other Provinces to follow suit. Another noteworthy item is that Fairview College, also in Alberta, is offering a one-year certificate course for Turfgrass Equipment Technicians to complement their 2-year Turfgrass Management program.

The Canadian Parks and Recreation Association has asked your Association to moderate a session at their Conference to be held at the Hamilton Convention Centre in August. The title of the session is "Trends in Sports Turf" and we have secured three excellent speakers: Dr. Eliot Roberts, Director of The Lawn Institute; Mr. Rod Thibodeau, a laywer specializing in Athletic Field and Recreation law suits; and Mr. Bill Metcalfe, Director for Facilities for Commonwealth Stadium in Edmonton. This event promises to be a most interesting one, and we hope to include a preview of videotapes produces by your Association.

In this issue of the Newsletter you will find a profile on James Boyce. It is our intention to do a profile on a leading figure in our industry in future issues, and hope to make this a regular feature.

Lastly, mark your calendar for June 15 — our Second Annual Field Day at River Oaks Community Centre in Oakville. There has already been a great deal of interest shown in this event, so don't delay — pre-register NOW for another informative program!

Yours for better, safer sports turf,

**Michael J. Bladon**

## WELCOME!
### To Our New Members

**John Cotton**
Municipality of the County of Inverness

**Don Harrison**
Town of Bradford

**Darryl Matthews**
University of Guelph

**Bill Murphy**
Cape Breton County, Nova Scotia

**City of London**
Public Utilities Commission

**Muskoka Board of Education**

## INSIDE THIS ISSUE

# LINE MARKING AT NORTH YORK'S ESTHER SHINER STADIUM

D.C. Hanson
City of North York Parks and Recreation Department

Amateur and professional sports groups that play at Esther Shiner Stadium increasingly demand, along with a high quality playing surface, quality line marking comparable to that provided for professional sports organizations elsewhere. Shiner Stadium (formerly named North York Civic Stadium) has kept abreast of this demand through the purchase and use of "state-of-the-art" line marking equipment.

Wet Line Marking that utilizes pigment from white field marking paint and powered equipment for application is the costliest method of line marking in our operation. However, it yields the most accurate and aesthetically pleasing field layout. Dry line marking, while economical, is less permanent and more difficult to apply accurately due to the nature of the product and equipment. But in a period of shrinking budgets it has its place at Esther Shiner Stadium on outside fields that are used infrequently.

The equipment used to apply the field marking paint consists of two "Smithco Easy Liners" and one "Smithco Easy Rider" which have been adapted by the factory to apply paint. The "Easy Liners" are clutch driven walk behind units with a 10 gallon carrying capacity. A small compressor which operates between 40 and 50 P.S.I. provides a uniform flow of paint to the surface. The easy rider has twin 5 gallon tanks and is equipped with an air pump. The tanks and pump can be removed easily and field grading attachments can be adapted quickly for surface maintenance. A spray gun, complete with fifteen feet of hose can be adapted readily to the "Easy Liner" for use when laying down team logos, numbers and/or hash marks. It is not uncommon for stadium staff to utilize three line markers simultaneously when laying out the stadium field for football. The constraints that result from tight scheduling and inclement fall weather often leave too little time in which to complete the lining function with one liner only. Thus the need for additional liners to supplement the operation and provide back-up in case of an untimely mechanical breakdown.

The choice of field marking paint is crucial to the quality of line and subsequent turf damage that may result from overuse of the wrong paint. The paint should be water soluble and free of chemical pigments. But it should be well mixed by the manufacturer so as to reduce the amount of on-site mixing and enhance the flow characteristics of the paint. If your supplier offers quantity discounts it is advantageous to purchase 20-litre pails of paint. They stack easily for long-term storage and can be used to mix paint with water to obtain the optimum spray mixture for your operation.

The ideal spray mixture is one that is affordable for your use and yields the highest quality of line. Other considerations one would take into account would be:

1. The length of time between subsequent applications.
2. Time available to complete the line operation.
3. Will the event be televised?
4. Is the event high-profile?

Shiner Stadium staff use a mixture of one part paint to one part water which is mixed in a separate container. The mixture is added to the tanks through a wire mesh screen to filter out lumps and impurities that may clog spray nozzles.

Wet line marking should only be attempted when you are assured of at least 2 hours of dry weather. This period will be longer in times of high humidity and prolonged dampness.

# WHERE TO START ON SPORTS TURF IMPROVEMENT

FIRST —

Carefully inspect the field or play area. Look for low spots that collect runoff water, have hard compacted soil and on which grass fails to grow. These indicate that a change in grade, a filling and leveling is necessary. Soil used should be the same as that already there.

SECOND —

Carefully inspect the field or play area to see that there is a slight slope to allow drainage of water from the playing surface. If this is not evident, a regrading of the field will be necessary to provide surface drainage. Specifications will need to be established and followed.

THIRD —

Carefully inspect the field or play area to see that there are no small holes or depressions that players might trip on. Those found should be filled with soil that is the same as that already on the field. Also, remove all stone and other debris that might interfere with play or cause injury if fallen on.

FOURTH —

Carefully inspect the field or play area to see that the soil drains well; i.e., that water moves down through the soil rapidly enough to allow the surface to provide reasonably good footing following rain or irrigation. Should this not be evident, drainage title and/or soil modification may be required. Specifications must be developed and carefully followed.

FIFTH —

Carefully inspect the field or play area to see that an irrigation system is in place that can water the turf surface evenly with a reasonable amount of water. Should this type of system not be evident, specifications must be developed and carefully followed to assure satisfactory results.

SIXTH —

Carefully inspect the field or play area to see what condition the turfgrass cover is in. If grass is thin over the entire area, replanting will be necessary. If grass is thin or non existent in some areas but not in others, the thin or bare areas must be planted. The likelihood of grass persisting is improved as soil conditions are made more favorable for grass growth. However, on most sports fields and playgrounds use wears out the grass even where soil conditions are favorable. Thus, replanting of grass to fill in bare spots and prevent takeover by weeds is standard practice.

# COOL HUMID REGION TURFGRASSES FOR SPORTS TURF AND PLAYGROUNDS

Several different types of turfgrass cover are suitable for northern football, soccer and baseball fields and playgrounds. The following may be considered:

Bluegrass blends —
— Blends of bluegrasses may be seeded.

Bluegrass – fine fescue mixtures —
— Mixtures of bluegrasses and fine fescues may be seeded.

Bluegrass – fine fescue – ryegrass mixtures —
— Mixtures of bluegrasses, fine fescues and turf type perennial ryegrasses may be seeded.

Bluegrass – ryegrass mixtures —
— Mixtures of bluegrasses and turf type perennial ryegrasses may be seeded.

Ryegrass blends —
— Blends of turf type perennial ryegrasses may be seeded.

Tall fescue blends —
— Blends of turf type tall fescues may be seeded.

Reprinted from the Lawn Institute
Special Topic Sheets

# PROFILE OF . . . JAMES H. BOYCE

A native of Stamford Centre (now part of Niagara Falls), Ontario, James H. Boyce received his B.Sc.A. in Field Husbandry from the University of Toronto (O.A.C.) in 1932. During the following five-year period he worked as a graduate assistant in turfgrass and pasture research at the Division of Forage Crops, Central Experimental Farm, Ottawa, Ontario. From March 1937 to June 1939 he was employed as a research assistant in turfgrass management under the direction of Dr. H.B. Sprague at the New Jersey Agricultural Experiment Station, New Brunswick, New Jersey.

He received his M.Sc. degree in agronomy and botony from Rutgers University in 1939. He then returned to Ottawa, Ontario where he directed the Canada Department of Agriculture plant introduction and turfgrass research programs until 1962.

Since that time he has been self-employed as a consulting agronomist specializing in turfgrass, soil stabilization and related agronomic problems.

He has developed several correspondence courses for the University of Guelph, has taught on a part-time basis for Algonquin College in Ottawa and acts as an examiner (for applicators' licences) for the Ontario Ministry of the Environment. He also represents Brookside Farms Laboratory Association Inc. of New Knoxville, Ohio in Canada.

He was executive director of the Canadian Golf Superintendents Association and editor of "The Greenmaster" during 1970-73. From 1973 to 1980 he was manager of the Ottawa brach of O.J. Company, Sherrington, Quebec on whose behalf he still acts as consultant.

He has been closely associated with Rothwell Seeds Limited ever since that company was formed in 1972 and with its president, Norman M. Rothwell, for many years before that. He acts as technical advisor for that company.

He has also acted as consultant to Tib Szego Associates, Lindsay, Ontario; Swaan & de Wiljes, Scheemda, Holland; Petwin Industries Limited, Weston, Ontario; Bay Bronze Industries Ltd., Winnipeg, Manitoba, and numerous sod farms, golf courses and similar organizations.

He is Honorary Life Member of the Canadian Golf Superintendents Association, the Ottawa Valley Turfgrass Association, the Western Ontario Turf Superintendents Association, the Ontario Golf Superintendents Association and the Manitoba Golf Superintendents Association. He is also a member of numerous other similar associations including Quebec, Atlantic Provinces, Mid-West, U.S.A., Ohio, New York, New Jersey, Virginia and Alabama and is a founding member of The Sports Turf Association.

He was Canadian Director of the Musser International Turfgrass Foundation for several years and still sits on the advisory board for that organization.

During his years with the Canada Department of Agriculture, Boyce was intimately associated with the development of such turfgrass varieties as Delta Kentucky bluegrass, Chieftain Canada bluegrass, Duraturf creeping red fescue and Norlea perennial ryegrass, as well as several forage-type cultivars.

In addition to the desirable agronomic features such as mildew resistance in Delta and winter hardiness in Norlea, all cultivars produced by the then Forage Crops Division had one characteristic in common viz., high seed production.

Among the varieties for which he has had the responsibility of securing licences or registration for sale in Canada on behalf of Rothwell Seeds Limited are *Penneagle* and *Prominent* creeping bentgrasses; *Adelphi, Argyle, Classic, Eclipse, Glade, Harmony, Midnight, Regent, Scenic* and *Welcome* Kentucky bluegrasses; *Ensylva* creeping red fescue; *Barfalla* and *Luster* Chewing's fescue; and *All Star* and *Pennant* perennial ryegrass.

# NEWS ITEMS

Oseco Seed will be celebrating it's 50th Anniversary in 1989. Congratulations to Oseco.

The new 1989 OMAF Publications 75 – Guide to Chemical Weed Control and 383 – Recommendations for Ornamentals and Turf are now available from the Ontario Ministry of Agriculture and Food.

*On behalf of the Sports Turf Association, it gives me great pleasure to announce the date and location for the upcoming*

# *Educational Athletic Turf Field Day*

*Thursday, June 15, 1989*
*8:30 a.m. to 4:30 p.m.*

*River Oaks Recreation Centre*
*2400 Sixth Line*
*Oakville, Ontario*

- *Guest Speakers*
- *Renovation/Maintenance Equipment*
- *Lunch Provided*

*Specific program details included in this newsletter*

*Doug Rigg*
*Director*
*Oakville Parks and Recreation*

*1225 Trafalgar Road*
*Box 310*
*Oakville, Ontario L6J 5A6*

# ATHLETIC TURF

It's important for a school or park athletic field manager to know the age of people using a baseball field. The height of the pitcher's mound and the age of the athlete can make a difference in injuries, according to sports physical therapist Allan Brown, of Brunswick, Maine.

If you're working with young kids, "keep it flat," Brown says. "Encourage no kicking out the hole in front of the mound."

The higher the mound, or the deeper the hole, the more speed on the ball. But higher mounds or deeper holes also create a higher torque for the arm. Such a powerful thrusting motion can cause shoulder injuries, especially in younger athletes.

Brown encourages turf managers to work closely with coaches and trainers. "If a kid complains of a painful arm, go look at the mound," he says. "Suggest to the coach that the kid throws on a flat surface for a while."

Brown also encourages turf managers to work closely with coaches in repairing divots and holes on a football field which can cause ankle injuries. "Eighty-six percent of ankle sprains rotate outwards, often because of uneven terrain," Brown explains. The nerve endings in previously sprained ankles "forget" to stay balanced. When the foot comes down in a divot, the ankle will twist again.

"You can help as a turf professional by keeping the terrain even," Brown says. He also suggests that coaches advise athletes to wear 15-spike molded shoes whether they play on artificial or natural surfaces. That type of shoe distributes the friction between the leg and the surface.

The turf manager gets off easy on the problem of shin splints, however. Brown says most cases are not caused by the surface but by a "biomechanical problem in the athlete's lower extremities.

Brown spoke at the Maine Turf Conference in Portland, Maine.

Reprinted from Landscape Management
June 1988

# NATURAL GRASS ATHLETIC FIELDS

by Dr. Henry W. Indyk

A natural grass athletic field too often consists of a barren soil surface with remnants of a turfgrass cover infiltrated by knotweed, crabgrass and goosegrass. In dry weather, this playing surface is hard from compaction, rough from previous activities, dusty from lack of a grass cover and resistant to the penetration of an athlete's spikes or cleats. In rainy weather, the surface becomes slippery, muddy and soft. Fields in this condition justifiably stimulate visions of miracle grasses, super products of synthetic grass surfaces as effective ways to provide an ideal playing surface.

Synthetic surfaces composed of fibres manufactured to approximate a turf cover have been frequently used to alleviate the difficulties encountered with a natural grass surface. However, experience with these synthetic surfaces has proven them to be costly in installation, maintenance, replacement and player injuries.

**Athletes prefer natural grass**

The surface is hard, harsh and hot in high temperatures. It becomes a horizontal water slide in heavy rain and, if the temperature hovers around freezing with a light drizzle, it reverts to a skating rink. Admittedly, some success has been achieved with these surfaces in difficult situations under very intensive use. However, if given the choice, athletes generally prefer a natural grass surface.

A dense, vigorous and wear-resistant turf can be a suitable athletic field surface. It forms a cusion that helps protect the player from injuries, aids his footing and improves conditions of play by eliminating mud and dust. It also has a more pleasant appearance than synthetic turf.

Because a turf cover has greater potential to fulfill these functions than do other surfaces, interest is developing in natural grass as a superior surface for athletic fields. With proper procedures in planning, construction, establishment, maintenance and use, a highly satisfactory performance by a natural grass field can be expected.

**Common Problems**

Failure of turf areas to support the rigorous activities of various athletic events commonly occurs because of:

**Improper Specifications.** The same standard specifications are used repeatedly in the original construction of an athletic field, which does not take into account the varying conditions relating to the specific site. A critical evaluation of each proposed site should be the basis for formulating accurate specifications. If this approach is not properly implemented, it is highly possible the field will have built-in problems that are very difficult or impossible to correct, even using the best maintenance procedures.

**Improper Enforcement of Specifications.** The best specifications are useless unless construction procedures adhere to the stipulated requirements. Frequently, athletic fields are built without proper supervision. Without supervision the temptation to bypass or eliminate critical procedures becomes too great for proper construction, particularly when the contracts are awarded to the lowest bidder.

**Improper or Inadequate Maintenance After Successful Establishment.** Once a satisfactory turf of properly selected grasses has been established, its future performance depends upon the type and amount of attention devoted to a maintenance program. The investment in establishing a turf cover is wasted unless it receives proper maintenance. A well-planned program should include an adequate budget and appropriate equipment, materials and personnel. In addition, supervisory responsibilities should be entrusted to an individual knowledgeable in turf management principles and techniques.

**Abuse in Use of the Field.** A well-established and maintained turf can withstand a considerable amount of use without serious damage. However, there are limits to the turf's tolerance of continued intensive use. Serious damage can result from heavy daily use with no allowance for recuperation. Damage will be most serious when proper connstruction procedures have been bypassed, particularly in situations of excessive soil moisture. Under such conditions, use should be reduced or minimized to limit turf damage.

**Inadequate Facilities:** The surging interest in outdoor athletic activities has increased pressures on existing facilites; economic reasons and the unavailability of open space for construction reduce the likelihood of building new facilities. Most of the existing fields are improperly constructed and are unable to accommodate more intensive use without serious deterioration of the turf cover. As the intensity of use increases, the survival and wear tolerance of the turf depends more heavily on proper field construction.

**Restoration**

When the construction of an athletic field does not meet the required or desired standards and the field has become severely scarred from intensive use, a dense, vigorous mat of natural grass can restore the field. Recent advances in turf breeding have made available superior varieties of turfgrasses, particularly among the Kentucky bluegrasses and fine-textured turf-type ryegrasses, that can be effectively established in existing fields with renovation techniques.

In the process, core aerifiers are used to relieve compaction. Vertigrooving machines prepare an ideal seed bed without destruction of grade or established turf. With adequate lime, fertilizer, supplemental irrigation, mowing and restrictions on use, the newly introduced seedlings can be nurtured to a mature dense turf. If needed, protection can be provided against weeds, insects and diseases.

With a restricted-use period of at least 6 months, such efforts can provide a fully restored field. If the time necessary to develop the seedlings into a turf capable of supporting athletic activities cannot be sacrificed, restoration with a high quality sod can provide instant results.

As effective as these renovation procedures may seem, another important factor needs to be considered – the use of the field. When subjected to use, the field will again exhibit symptoms of poor construction: low wear tolerance of the turf; a hard, compacted surface when dry; a soft, soggy surface when wet, and a rapid deterioration in the turf cover. Repeated renovation efforts will follow this same pattern.

When basic construction problems exist, renovation procedures are somewhat cosmetic and at best can provide only temporary results. Reliance on such procedures to overcome weaknesses in initial construction over a period of years will prove to be discouraging and costly.

**Drainage Systems**

Improper drainage can be singled out as the most inf-

luential factor contributing to poor quality athletic fields. Inadequate drainage not only affects the playability of the field but also has a strong negative influence on the growing conditions for the turf, contributing to increased maintenance costs.

Various reasons can be cited for overlooking drainage as a critical factor in athletic field construction. Perhaps the most important reason is a lack of understanding of its importance in formulating the field's specifications. Unfortunately, in many instances economic considerations prevail in the decision-making process, eliminating provisions for adequate drainage — a relatively insignificant saving that will prove to be costly.

In some cases, poor drainage conditions prevail in spite of efforts to improve the system. Such failures can usually be attributed to improper specifications or deficiencies in construction. Some of the common faults contributing to inefficient or ineffective performance of drainage systems are:

**Provision for surface drainage only.** A crowned or turtle-bakced field with a few catch basins on the sidelines can facilitate removal of surface runoff but will do very little to improve internal drainage.

**Improper design of the drainage system.** This problem involves pipe spacing, depth, grade and outlet.

**Installation of drainage pipe on an improper grade.**

**Backfilling of drainage trenches** with heavy textured material that restricts percolation of water to the drainage pipes.

**Improper texture of topsoil above the drainage system.**

The physical condition of the topsoil is a major factor limiting proper functioning of a drainage system. Soils containing excessive amounts of silt, clay and very fine sand are commonly used above the drainage system as the ideal growing medium for turf. These soils restrict proper drainage because they slow water percolation.

Consequently, during rainfall the soils become soft and soggy in spite of a properly installed drainage system. These soils also compact very readily when subjected to traffic. Air porosity is reduced not only because of the increased likelihood of moisture saturation but also because of increasing compaction. The result is a less favorable environment for proper root growth that is reflected in a shallow root system, weakened topgrowth, reduced wear tolerance, turf deterioration and eventually a barren athletic field.

Soils containing excessive amounts of fine particles can be improved and made suitable for athletic fields by adding appropriate amounts of sand with the proper texture. The resulting mixture should contain at least 80 percent sand which is predominantly medium textured. Such a soil will drain more quickly and resist compaction.

Increasing recognition of the advantages of natural grass as a desirable playing surface is generating greater interest in proper construction techniques. A concept receiving increased attention involves the use of uniformly graded sand as the soil medium. Different approaches are being used with varying degrees of success in the construction of natural grass athletic fields. Hy-Play Systems, based upon the concept of using uniformly graded sand as the soil medium, was selected for reconstruction of the Los Angeles Coliseum in preparation for the 1984 Olympics. Fulfilling these basic requirements in construction provides a foundation which in combination with proper maintenance procedures is the bsis for superior natural grass playing surfaces.

# ORGANISMS THAT CAUSE TURF DISEASES

Most diseases of turfgrass are caused by fungi. There are some bacteria and viruses that also incite disease. By and large, they live within the thatch and within the upper levels of topsoil all the time. Most of the time healthy grasses are not greatly affected by the presence of these pathogens. Often when infections occur they are of such minor nature that the turfgrasses recover with only limited injury. However, at other times, weaknesses within the turfgrasses and highly favorable conditions for the pathogen result in disease outbreaks of major proportion. At these times turf damage may be severe.

Unfortunately, by the time the disease is recognized and the pathogen identified, the infection has often run its course, the damage is done and no amount of fungicide can bring back the dead tissue. At best, the fungicide may reduce the spread of the disease.

Any condition that weakens the vigor of turfgrasses predisposes them to disease. It may be:

— too much water
— too little water
— too much fertilizer
— too little fertilizer
— too acid a soil
— too low a clipping height
— too much thatch
— hard, compacted soil – poor aeration
— use of too much pesticide
— a combination of two or more of these.

The most common turf pathogens are described briefly as follows to provide an indication of how they function within the ecological structure of the turf.

**Dollar Spot** – *(Sclerotinia homeocarpa* F T Bennett)

Dollar spot infection is more likely to occur during moderate temperatures and dry soil conditions. High humidity within the turf is needed to activate the fungus. Low levels of nitrogen in the soil make grasses more prone to infection. Light tan lesions that band the leaf create small patches of bleached turf – less than 3 inches in diameter.

**Helminthosporium** –
*Netblotch — (Helminthosporium dictyoides* Drechsl);
*Leafblotch — (Helminthosporium cynodontis* Margil);
*Leafspot — (Helminthosporium sorokinianum* Sac);
*Melting Out — (Helminthosporium vagans* Drechsl);

There are several blotch and spot diseases caused by one or more Helminthosporium fungi. Infection usually starts in cool, moist weather on lawns that are fertilized with too much nitrogen, irrigated too frequently, and cut at lower than recommended heights. As the weather gets warmer, root rots may develop and the turf

thins out drastically. Usually some resistant plants survive but lawn weeds become easily established during periods of Helminthosporium infection.

**Fusarium Blight** – *Fusarium roseum* [LK]) Snyd and Hans; *(Fusarium tricinctum* [Cda]) Snyd and Hans

Fusarium blight occurs during moderate temperatures of summer whenever the grass is placed under stress. This might be too much water or too little water; too much nitrogen or too little nitrogen. It is often most damaging where the lawn has formed thatch above the soil surface. This fungus infects grasses already weakened and causes the development of tan blotches starting at the leaf tip. These develop into circular patches with some living grass left in the center. The patches are often up to 2 feet in diameter and have a "frog-eye" appearance (dark center and lighter edges).

**Brown Patch** – (Rhizoctonia solani Kuhn)

Brown patch disease develops on turf during warm wet weather. High nitrogen fertilizer predisposes the grass to disease as does excessive irrigation. Lawn areas with poor air circulation have prolonged periods of high humidity. These are especially prone to brown patch. Grass leaves turn light brown in circular patches up to 3 feet in diameter. A black ring of spores is often seen around the outer edge of the circular patches.

Note: Diseases are especially difficult to differentiate by eye and thus in drawings, signs and symptoms are often similar. Laboratory analysis is often the most definitive diagnosis.

## UPCOMING EVENTS

| | |
|---|---|
| **Ontario Golf Superintendents Association Field Day**<br>University of Guelph / Galt Country Club | **June 1** |
| **P.R.F.U. Conference**<br>(416) 495-4080 | **June 8, 9** |
| **Sports Turf Association Field Day**<br>Oakville, Ontario | **June 15** |
| **Ontario Parks Association Annual Conference**<br>St. Catharines, Ontario | **July 19 - 21** |
| **OTRF Fundraising Golf Tournament and BBQ**<br>Woodbridge, Ontario | **Aug. 14** |
| **CPRA Conference**<br>Hamilton, Ontario | **Aug. 14 - 17** |
| **GTI/ORF Research Field Day**<br>Cambridge Research Station, Cambridge, Ont. | **Aug. 24** |
| **GTI 2nd Annual Educational Symposium**<br>University of Guelph, Guelph, Ont. | **Nov. 6, 7** |
| **Sports Turf Assoc. / CGSA Conference**<br>Metro Convention Centre, Toronto, Ont. | **Dec. 10 - 13** |

## OMAF TURF HOT LINE (519) 767-1211

Beginning **APRIL 27, 1989** the OMAF Turf Hot Line will be available to the commercial turf industry. This is a 3 minute recorded message that will be updated Thursdays each week from April to September giving timely information on turf management and upcoming events in the turf industry throughout the season.

## MAILING LIST UPDATE

We are currently compiling a mailing list for the OMAF Turf Newsletter. This newsletter will contain information relevant to turf production and management for the commercial turf industry. If you would like to receive this newsletter complete the form below and return it to:

**Annette Anderson**
**Ontario Ministry of Agriculture & Food**
**Horticulture Department,**
**University of Guelph**
**Guelph, Ontario N1G 2W1**

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