

# 7th Annual Field Day held at GTI

Chris Mark, President, STA

On June 22 the Sports Turf Association in partnership with the Guelph Turfgrass Institute held the annual Field Day at the GTI. Once again this year we were treated to beautiful weather and superb facilities. The organizing committee of Mike Bladon, Jane Rivers, Roy Forfar and Bob Sheard put together an excellent program of lectures, table top product displays, and field demonstrations. The outdoor exhibits featured much of the latest technology in sprayer operation, techniques and efficiency. The day also gave delegates an excellent opportunity to see the development of the G.T.I and tour the facilities. Sincere thanks are extended to Mike Bladon for chairing the day's activities.

The first speaker was Mr. Larry Porter. Larry has over 40 years experience as an amateur sports official, holding offices such as Referee in Chief, Central Ontario Football Association. One of the main reasons Larry was invited to lecture was his special interest in the area of sports injuries and the role of the field in injuries and injury prevention. Mr. Porter presented an excellent overview of how a referee would like to see the field when he arrives to officiate a game. Ideally there is a thick sward of turf over the entire playing surface, the field is laid out correctly and lines are crisp, and goalposts are padded for player protection. Unfortunately such conditions do not exist at all locations. There are fields which exist (and Larry cited examples) where there is no grass, large ponds of water, ground conditions like cement, no lines, no field dimensions and obstacles such as trees in the end zone and bleachers too close to the field of play.

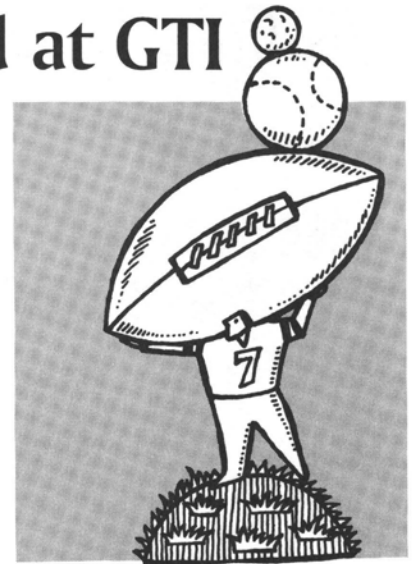
Larry presented a series of illustrations which showed the correct field dimensions for Canadian Football. When planning a field it is vitally important to locate the field away from all obstacles and ensure that end zones are included in your calculations since Canadian end zones are much larger than American. He stressed that many sports injuries and civil litigations he has witnessed, attended or heard

about through his involvement in amateur football relate to poor field design and substandard field maintenance programs. These days football players wear very good equipment from pads to helmets, but that is not enough to save many from injuries caused by poor playing conditions and hard compacted surfaces. To not only save athletes from injuries, and protect yourself and your institution from civil action, Larry stressed the absolute necessity to have a sports field management program. Even if it is basic program which only includes mowing, fertilizing, aerating once or twice per year, at least it is a plan of action. The first thing a legal representative will ask about after an injury is wanting to see your maintenance plan and records. If you do not have such documents it places you and the institution in a very unfavourable light and may cast doubt on competency.

The next speaker was Mr. Doug Morrow from the Ministry of Environment and Energy. Doug is a Regional Pesticides Control Officer for the Southwestern Ontario, based out of London. He is involved with the MOEE pesticides/pesticide container collection program and growers certification program. The main reason Doug was requested to speak at our Field Day is because of his involvement in the Ministry's Licence Streamlining Committee.

As most are aware the MOEE is embarking in the near future to drastically overhaul the existing licensing classifications and spraying regulations. Doug presented an excellent overview of existing licensing classes and procedures and compared it to the current direction the MOEE is taking in this matter. It seems that this new licensing plan has undergone many revisions from the outset as the Streamlining Committee has worked with and responded to the concerns of over 40 stakeholder groups. Each time a revision is made it must go before the various stakeholders.

One of the primary changes which will effect sports turf managers is the new Certified Assistants. Currently a licence



holder can have up to three (3) people spray under their licence and check on them every four (4) hours, this will no longer be the case. In future, if a person does not wish to obtain a MOEE licence, they can attend a one day in-class certification course to obtain the Certified Assistant classification which is valid for one (1) year. A Certified Assistant may work under indirect supervision and a log book must be kept by the certificate holder. A Certified Assistant may renew the designation for one (1) year, and then must obtain a MOEE licence.

One final point Doug mentioned was the pesticide container collection sites which have been set up throughout the Province to recycle old plastic pesticide containers. Containers must be triple rinsed or jet rinsed. Dealers request that containers be air dried and the caps removed and brought in a separate box for recycling. There are over 100 dealers throughout the Province who will accept old containers throughout the summer until October, 1994, during normal business hours. Audience members noted that there appears to not be any locations in the Metro Toronto area which means that many turf managers from that area do not have access to these collection depots. Mr. Morrow indicated he would investigate and follow up on this point to see if a depot(s) could be sited close to Metropolitan Toronto.

Our third lecturer was Dr. Keith Solo-

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## Field Day, cont'd from page 2

mon who is Director of the centre of Toxicology at the University of Guelph and is also a Professor of Environmental Biology. He directs an active program in the area of the fate and effects of pesticides in the environment as well as exposure of humans to pesticides. Dr. Solomon was invited to participate in the Field day to update delegates on current research into fate of pesticides in the environment and effects on humans. An interesting research program he is currently conducting at the G.T.I is a study on the effect of chemicals (pesticides) on freshwater aquatic life. To conduct this research 32 round microcosm (swimming pools) have been constructed through which water is circulated. Water for the pools is drawn from the 2.2 million US gallon, irrigation reservoir. Dr. Solomon will be injecting pesticides to determine the effects on flora, fauna and animal life. This research project is still in its infancy and we plan to provide more information in future Newsletters on this important subject of the effect of pesticides on aquatic and plant life, when results are available.

Our final lecturer was Mr. Helmut Spieser who is an Agricultural Engineer with the Kidgetown College Agricultural Technology. He was invited to speak at the

field day because his primary interests are in the area of calibration of sprayer nozzles, nozzle wear and drift problems. Mr. Spieser brought a Patterator which he has developed and it provided an excellent demonstration of the effects of sprayer distribution patterns depending on the nozzle type and size. By catching the liquid from each sprayer tip, it was very interesting to note the inefficiencies in different nozzles and worn or improperly sized nozzles. In addition the significant difference between fan type nozzle tips was most informative. Helmut also gave a short presentation on sprayer calibration. He noted that calibration is vitally important since it is the only way of knowing exactly how much spray is being applied per unit area. He noted that there are still many industry people both agricultural and horticultural who are not calibrating their sprayers properly and that leads to a tremendous waste of product, turf damage, and can cause damage to non-target vegetation.

Our sincere thanks to Helmut for traveling the long distance to be with us at the Field Day.

The 7th Annual Field Day at the GTI was a very informative and educational event and we thank all the participants, speakers and suppliers. We hope to see you again next year.

## VIDEO AVAILABLE

A 26-minute video "Calibrating Golf Course Boom Sprayers" has been developed by the University of Illinois Agricultural Engineering Department for use in training pesticide applicators in the proper use of powered-boom sprayers while applying turfgrass protectants. The audience would be those employed with golf courses or parks managers. Nozzle selection, calibration, electronics, PPE and safety, and the environment are the topics covered. The video was supported through funds from Rhone-Poulenc Turf Division, the Illinois Dept. of Agriculture, and the Illinois Pesticide Applicator Training Program. Copies may be obtained from:

Robert E. Wolf,  
Dept. Agric. Engineering,  
360-Q Ag. Engineering Sci.  
Bldg.,  
1304 W. Pennsylvania Ave.,  
URBANA, IL. 61801

## STA SCHOLARSHIP AWARD WINNER

The Sports Turf Association is pleased to announce that our 1st Scholarship award winner is Ms. Lorelei Eckel-Braun. Lorelei received a cheque for \$200.00 plus a one year subscription to the Newsletter.

Lorelei finished fourth in the second section of the 25th Turf Managers Short Course '94 at the University of Guelph. She achieved the highest average (91%) in Soils and Nutrition, Turf Management, and Herbicides. These three subjects have been deemed of most value to a sports turf manager. Lorelei is employed with the City of Kitchener Parks and Recreation Department where she has several sports fields under her jurisdiction. Congratulations on your achievement and we wish Lorelei much success in all future endeavours!



The President of the Sports Turf Association presents Ms. Lorelei Eckel-Braun with her STA Scholarship Award.

UNDERSTANDING TURF MANAGEMENT  
The Thirteenth in a series by  
R.W. Sheard, P.Ag.

## SOIL COMPACTION

A major problem facing every manager of intensively used sports fields is compaction. While surface wear from intensive use will visibly remove above ground vegetation, simultaneously a non-visible problem may be occurring below the surface in the form of compaction.

The combined wear and compaction creates a double restriction on root development of the grass plant. Removal of top growth reduces photosynthesis, thus the food required for root growth. Compaction reduces the porosity of the soil, restricting normal exchange of oxygen and carbon dioxide and other potentially toxic gases. Under very compacted conditions root elongation may even be impeded. The total effect on root growth is thus much greater than would be expected through removal of top growth only.

Compaction occurs when the soil particles moved into closer fitting arrangements. Water is the lubricant which facilitates the movement. Thus play under wet conditions when the soil is near saturation is more likely to lead to compaction than when the soil is dry. Drainage to remove excess water rapidly from the root zone is the one step which may be taken to assist in long term correction of a compaction problem.

The clay content of the soil is another very important factor. While sand and silt particles may be spherical or angular in shape, clay particles tend to be flat; hence they are often referred to as clay plates. These plates easily slide over each other and tend to become layered under pressure at high moisture contents. As the layered arrangement becomes more prevalent, porosity decreases. In addition the much smaller clay particles tend to slide into the pores between the larger sand and silt particles, intensifying the reduction in porosity.

If you have ever observed a road being constructed you would have seen the water truck spraying on water, followed by the various types of rollers. The contractor is attempting to maximize compaction by providing heavy traffic at a high moisture content.

But a compacted roadbed is obviously not the media for growing grass.

Thus compaction results from traffic, whether it comes from the players foot or from the machines used in construction or maintenance. Most sports fields are seriously compacted at the end of the construction process; and to a significant depth. The size of the equipment used in moving the root zone into place, combined with the repetitive trips by the motor grader establishing the finished grade, invariably result in a compacted system before the turf is ever seeded or sodded.

Often the contractor is under time restraints. Thus some, or all of the work may be conducted with large machines under excessively wet conditions. The primary business of most earth moving contractors is in road construction; they just following their normal practices when they get a relatively small contract for a playing field.

It is important that the sports turf manager realizes that compaction may exist before the field is sodded and he should endeavour to correct the problem first. Deep tillage with heavy duty aerifiers or even the use of a farm-type chisel plough, operated in several directions will assist in reducing the compaction. For maximum effect the trick is to do the remedial aeration or tillage when the soil is somewhat less than field capacity; that is - *dry*.

Compaction is the cumulative effect of frequency and intensity of pressure applied to the soil surface. Pressure is the weight of the pedestrian or vehicle divide

by the surface area actually in contact with the soil. The area of contact should be as large as possible; thus the use of turf tires or flotation tires on turf maintenance equipment.

James Beard provides some interesting numbers in his book 'Turfgrass, Science & Culture' on the effect of the athletes' footwear on the pressure applied to the soil surface. A comparison is made of a 220-lb person wearing football shoes versus wearing regular street shoes. A street shoe contains approximately 32 sq. inches of effective surface area, thus in walking the 220-lb person would exert a pressure of 6.25 lb/sq. inch. In contrast, a football shoe has seven, 0.9-cm diameter cleats, providing an effective surface area of 1.3 sq. inches in contact with the soil surface. Thus the static pressure exerted by the 220-lb person increases to 150 lb/sq. inch under his running foot.

Compaction due to the athlete or to turf maintenance equipment is generally confined to the upper three inches. In many cases it may be a zone of one inch or less.

The remedy for compaction of existing turf is turf cultivation, often called aerification. The principle types of cultivation for the relief of compaction are coring, slicing, and spiking.

The three cultivation machines may be divided into two distinctly different systems based on their physical operation. Coring is the practice by which hollow tines or spoons are used to extract cores of soil to a depth of two to three inches. On the other hand, slicing is a procedure in which a solid knife, mounted on a rotating drum, is sliced into the top two to three inches of soil. Spiking is a similar procedure in which a solid spike or prong is forced into the soil up to six inches and withdrawn. The spike may be vibrated to a degree to cause some shattering effect to

the surrounding soil.

The two systems are distinctly different in operation because they involve two different principles. Coring involves the removal of an intact core of soil which is deposited on the surface or removed from site. It results in a minimum disturbance of the surrounding soil (Fig. 1). Compaction is alleviated by breaking up the removed cores and matting them back into the holes, or removing the cores from site and backfilling the holes with a suitable topdressing material. The procedure is best performed when the soil moisture is at field capacity to reduce the force required to penetrate the compacted soil and to assist in removing intact cores. Following two or three hours of drying of the cores on a sunny day, they may be easily broken and matted or vertical mowed back into the surface. On a clay soil, allowing the cores to completely dry may result in nearly rock-like objects which cannot be broken until the next rain or irrigation.

Slicing and spiking involve forcing a knife or prong into the soil and opening a

slit or hole. The soil existing in the volume occupied by the slit or hole must be forced sideways or upward, thus increasing the density of the soil in the immediate vicinity of the slice or hole (Fig. 1). Relief of compaction occurs when there is a vibration effect associated with the penetration of the knife or prong which shatters the compacted zone. To maximize the vibration effect, the cultivation should be done under relatively dry conditions, which in turn requires more force to permit penetration of the knife or prong.

Slicing and spiking are generally less disruptive of the turf surface and are less labour intensive than coring. They are used, therefore, as a routine operation for entire fields whereas coring is restricted to high traffic areas where overseeding is to be done or the root zone is to be modified by the addition of a topdressing material.

Coring is a practice which should be integrated with overseeding as loose soil is provided to aid in covering of the seed and improvement of germination. At the same time it must be realized that weed

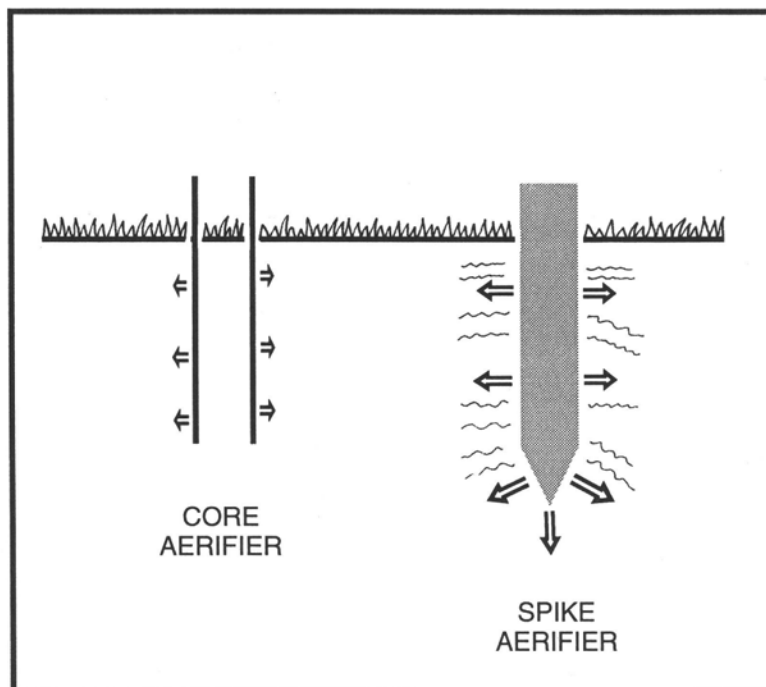
seeds are also encouraged to germinate, a factor which applies to all types of turf cultivation which disturb the dense canopy of turf. Scheduling turf cultivation to seasons when annual weed germination is not a significant factor, such as early fall, can reduce the problem.

The total removal of a compacted zone by coring will take a number of years. A 0.75 inch diam. core, on two-inch centres, will remove 11 sq. inches of surface area per square foot per operation. Assuming that the machine may be driven in each operation so that no recoring of the same hole occurs, it would take a minimum of 13 operations to remove the compacted layer.

It is generally recommended that cultivation not be performed when the turf is under heat or moisture stress. The other factors, such as irrigation, nitrogen fertilization and correct mowing height, which contribute to vigorous turf, should be in operation before cultivation occurs. Nevertheless, the need for relatively dry conditions to optimize the shattering effect of spiking should not be overlooked.

One of the principle reasons for the construction of all sand rooting zones for turf is to avoid the problems of compaction. Sands, selected according to the USGA specifications, do not compact to any significant degree beyond that which exists at the completion of construction. While the resulting porosity of all sand rooting zone may be ten percentage points less than that of a normal soil, one is assured that it will remain constant, as will the relationship between micro and macro porosity, even under a high level of use. The same can not be said for fields built with clay soils where the macro porosity will be reduced by compaction.

**Figure 1:** An illustration of coring versus spiking. The length of arrows represent the relative amount of compression of displaced soil into the surrounding soil. The wavy lines indicate the zone of shattering.



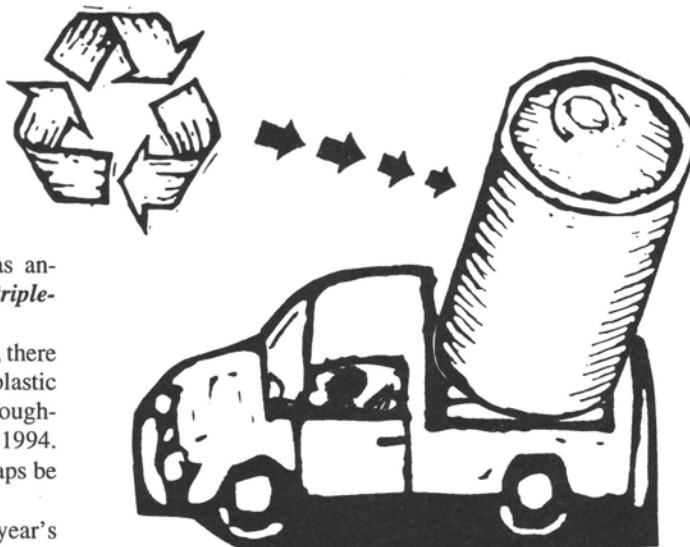
### Weather Retort

*If it is bright and sunny after two cold and rainy days, it is probably Monday.*

*- Hugh B. Brous, Jr.*



# EMPTY CONTAINER DISPOSAL



The Ontario Ministry of Environment and Energy has announced the list of pesticide dealers accepting *empty, triple- or jet-rinsed* pesticide containers for recycling purposes.

With over 100 dealers participating in this year's program, there is no excuse not to prepare and drop off your empty, plastic commercial pesticide containers. Drop offs are accepted throughout the summer during normal business hours until October, 1994.

Dealers ask that the containers be air dried and that the caps be removed and brought in a separate box for recycling.

The following is the list of dealers participating in this year's program:

DEALERSHIP	TOWN	TELEPHONE
Nutrite - Dixie & Egan	Addison	613-924-2632
Alexandria Co-op.	Alexandria	613-525-4416
Cardinal Farm Supply	Alliston	705-435-4368
Almonte Co-op.	Almonte	613-256-1633
M& R Feeds.	Arnprior	613-623-7311
Atwood Farm Supply	Atwood	519-356-9072
Future Farms.	Alymer	519-866-3446
Topnotch Feeds.	Alymer	519-659-4082
Waterloo-Oxford Co-op	Ayr	519-632-7481
Bainsville Fertilizer Ltd.	Bainsville	613-347-2554
Teeswater Co-op.	Belgrave	519-357-2711
Belmont Farm Supply	Belmont	519-644-1650
W.G. Thompson	Blenheim	519-676-5411
Agre Farms Limited	Bluevale	519-335-3093
Gibson Ag. Supplies	Bowmanville	905-623-3358
Bradford Co-op Storage	Bradford	905-775-3317
Waterloo Co-op Services.	Breslau	519-744-4941
Oxford Farmers Co-op.	Brigden	519-864-1011
Phillips Farms Supply	Brighton	613-475-2040
Brockville Co-op.	Brockville	613-342-4423
Hoegy's Farm Supply	Brodhagen	519-345-2941
Brussels Agromart	Brussels	519-887-6273
Cambellford Farm Supply	Cambellford	705-653-4884
Agrico Canada Ltd.	Cannigton	613-962-9204
Carp Co-op	Carp	613-839-2868
Agrico Canada Ltd.	Cavan	705-944-5777

DEALERSHIP	TOWN	TELEPHONE
Cook's	Centralia	519-262-2410
Lang Farms	Chepstow	519-881-1114
Nutrite Inc.	Chesterville	613-932-0275
Stoney Point Co-op.	Cottam	519-839-4861
Harvex Agromart Inc.	Crysler	613-987-5243
United Agri Products	Dorchester	519-268-8001
Clark Agri Services	Dunnville	905-774-7579
Topnotch Feeds Ltd.	Dutton	519-659-4082
Kent County Fertilizers	Eberts	519-352-2651
Embrun Co-op.	Embrun	613-443-2833
Fingal Farm Supply	Fingal	519-769-2070
Hazzards Farm Service	Fletcher	519-689-4246
Boyd's Farm Supply	Forwich	519-335-3539
Lakeside Grain & Feed	Forest	519-786-2106
Madoc Co-op.	Foxboro	613-962-9101
Midwestern Ont, Co-op Inc.	Grand Valley	1-800-265-2284
Hazzard's Farm Supply	Grande Pointe	519-352-2990
Ferme Lucien Beriault & Fils	Green Valley	613-347-2930
Sharpe Farm Supplies Ltd.	Guelph	519-837-0510
Woodrill Farms Ltd.	Guelph	519-821-1018
Arkay Ford Inc.	Hamilton	905-578-2411
Sprucedale Agromart	Hanover	519-364-4070
Cagill Ltd.	Harriston	519-338-2015
North Wellington Co-op Services	Harriston	519-338-2331

DEALERSHIP	TOWN	TELEPHONE
La Cooperative de Pointe aux Roches	Harrow	519-738-2223
Hensall District Co-op	Hensall	519-262-3002
Hensall District Co-op	Ilderton	519-262-3002
Cold Springs Agri Services Ltd.	Ingersoll	519-485-2950
Nutrite - Rooney's Fertilizer Ltd.	Iroquois	613-652-4382
Miller Farms	Jerseyville	519-647-2107
Vineland Growers Co-op	Jordon Station	905-562-4133
Harvex Agromart Inc.	Kemptville	613-258-3448
Cargill Grain Co. Ltd.	Kerwood	519-247-3301
Topnotch Feeds Ltd.	Kingston	613-546-9152
Lawn-X	Kitchener	519-748-5454
Munro Agromart Ltd.	Lancaster	613-347-3063
Leduc Farm Supply	Limoges	613-443-5344
Kawartha Consum's Co-op Inc.	Lindsay	705-324-7761
Hensall District Co-op	Londesborough	519-523-4470
H&B Elphick Chemicals Ltd.	Lucknow	519-395-5307
Lucknow District Co-op	Lucknow	519-529-7953
Waterloo - Oxford Co-op	Lynden	519-647-3451
M&R Feeds	Micksburg	613-735-3689
Topnotch Feeds Ltd.	Milverton	519-595-4928
W.G. Thompson & Sons Ltd.	Mitchell	519-348-8433
North Wellington Co-op	Mount Forest	519-323-1271
Oxford Farmers Co-op	Muirkirk	519-678-3381
Niagara Grape & Tender Fruit Distributors Ltd.	Niagara On The Lake	905-646-5777
Norval Farm Supply	Norval	905-846-2057
Cold Springs Agri Services Ltd.	Norwich	519-468-3720
Oakwood Agromart Ltd.	Oakwood	705-953-9666
Agrico Canada Ltd.	Orangeville	519-941-0450
Graham farm Elevators	Orton	519-928-2130
Hensall District Co-op	Parkhill	519-294-6252
Peterborough District Co-op Services	Peterborough	705-745-4607
Lakeside Grain & Feed Ltd	Petrolia	519-882-2240
County Farm Centre Ltd.	Picton	613-476-2171
Prince Edward Co. Fruit Growers Co-op Ltd.	Picton	613-476-5895
W.G. Thompson & Sons	Pontypool	905-676-5411
Port Perry Feeds Ltd.	Port Perry	905-985-7363
Doerksen Farm Supplies Ltd.	Port Rowan	519-586-3901
Kent County Fertilizers Ltd.	Ridgetown	519-674-5491

DEALERSHIP	TOWN	TELEPHONE
W.G. Thompson & Sons Ltd.	Rodney	519-676-5411
Hazzard's Farm Service Ltd.	Rutherford	519-692-3918
Scotland Agromart Ltd.	Scotland	519-446-2218
Milton J. Dietz Ltd.	Seaforth	519-522-0608
Shelburne Potato Co. Ltd.	Shelburne	519-925-3127
Elliot Bros. Grain & Feed Ltd.	Shetland	519-695-2643
Cold Springs Agri Services	Silverhill	519-875-4870
Co-op Agricole de St. Isidore Ltee.	St. Isidore de Prescott	613-524-2828
Topnotch Feeds Ltd.	St. Thomas	519-659-4082
Stoney Point Co-op	Stoney Point	519-798-3011
Beechwood Grain & Seed	Stouffville	905-640-1583
Stouffville Co-op Association	Stouffville	905-640-1550
Stratford District Co-op Inc.	Stratford	519-271-7660
Caramet Farms Ltd.	Strathroy	519-289-5885
Sprucedale Agromart Ltd.	Tara	519-934-2340
Oxford Farmers Co-op	Thamesville	519-692-3957
Lakeside Grain & Feed Ltd.	Theford	519-786-2106
Thorndale Farm Supplies Ltd.	Thorndale	519-461-0280
Temiskaming Grain Marketing Co-op	Thornloe	705-647-6639
Agrospray Chemicals Ltd.	Tillsonburg	519-842-8408
Tri-County Agromart Ltd.	Trenton	613-394-3371
Hazzard's Farm Services Ltd.	Tupperville	519-627-3311
Co-op Regionale de Nip Sudbury Ltd.	Verner	705-594-2354
Max Underhill's Farm Supply Ltd.	Vienna	519-866-3632
Teeswater District Co-op	Walkerton	519-392-6862
Hazzard's farm Service Ltd.	Wallaceburg	519-627-1491
L&M Grain & Feed Co. Ltd.	Watford	519-876-2350
Peninsula Grain & Elevators Ltd.	Wellandport	905-386-6293
Hutton Farm Supplies	Webum	519-461-0020
Agrico Canada Ltd.	Winchester	613-774-2209
Waterloo - Oxford Co-op	Woodstock	519-539-6151

**[EDITORS' NOTE: M.O.E.E. has been contacted regarding depots within Metro Toronto, Windsor, Hamilton and Ottawa. They will be seeking to develop depots in these areas for 1995]**



# PESTICIDE USE SURVEY OF CANADIAN MUNICIPALITIES



During the spring of this year, the Urban Use Committee of the Crop Protection Institute conducted a survey by mail of municipalities in Ontario, British Columbia and Quebec in order to determine their current usage of pesticides, their knowledge and use of Integrated Pest Management (IPM) programs, and their awareness of the Crop Protection Institute as an information provider with respect to pesticide issues.

Based on 87 completed questionnaires, which represented a response rate of 15%, these were the survey's major findings:

- Herbicides and insecticides were the most widely used pest control tools (used by 86% and 85% of those who responded), followed by fungicide (58%) and other biological controls (30%). The use of all types of pest control tools increased with the size of the municipality. Only 3% of the respondents did not use pesticides, and the majority of these were from smaller municipalities with populations of under 30,000.
- Most respondents acknowledged that they had been under pressure over the past five years to explain their use of pesticides. This was particularly the case for the larger municipalities - those with over 100,000 people. The most common response to the pressure was to reduce the use of pesticides.
- All respondents from municipalities of over 100,000 were aware of Integrated Pest Management, compared to 90% from municipalities of 30,000 to 100,000, and 62% from centres under 30,000.
- Familiarity with the Crop Protection Institute was 33% overall. However this awareness increased with the size of the municipality - 14% for centres under 30,000, 42% for centres of 30,000

to 100,000 and 53% for those of 100,000 or more.

The survey revealed that in smaller centres the responsibility for making final decisions was more likely to rest with the respondent (i.e. Park Superintendent, Groundskeeper, etc.), while in the larger centres, Council and management were more apt to be involved in the decision making.

When asked whether municipal, provincial or federal regulations and/or legislation were having an impact on their pesticide management practices, three-quarters of Ontario respondents, two-thirds of Quebec respondents and 43% of those in B.C. answered in the affirmative. Again, the likelihood of a positive reply increased with the size of the respondent's municipality. 54% of those from centres under 30,000 said yes, compared to 74% of those from centres of 100,000.

## PRESSURE OVER PESTICIDE USE

While all respondents agreed that they had been under pressure over the past five years to explain their use of pesticides, the pressure was greater in larger municipalities - and consequently, greater in Ontario than the other two provinces.

### Proportion of Respondents Under Pressure to Explain Use of Pesticides in Past 5 Years.

Under 30,000 (n=35) . . . . .	46%
30,000 to 100,000 (n=31) . . . . .	65%
Over 100,000 (n=19) . . . . .	90%

Person or Body Responsible for Final Pesticide Decision by Size of Municipality

Decision made by	Size of Municipality		
	Under 30,000 (n=33)	30,000 to 100,000 (n=28)	Over 100,000 (n=18)
Park Superintendent	82%	39%	39%
Council	27%	25%	44%
Director of Parks	12%	43%	33%

## AWARENESS OF INTEGRATED PEST MANAGEMENT PROGRAMS

As defined by the Urban Use Committee of the Crop Protection Institute, Integrated Pest Management is "the use of multiple tactics in a compatible manner to maintain pest damage below economic injury level while providing protection against hazards to humans, animals, plants and the environment (multiple tactics defined as including the integrated use of cultural practices, plant host resistance, and pesticides)."

Those respondents who indicated that they were aware of IPM were able to explain the use of pesticides, and encompassed a variety of methods including cultural and biological controls. Most commonly, they thought that pesticides were utilized to control situations that had not responded to other methods.

**AWARENESS OF THE CROP PROTECTION  
INSTITUTE AS A SOURCE OF PESTICIDE  
INFORMATION**

Of the 29 respondents who were aware of the institute, 12 became familiar with it at a seminar, the rest cited mailings, pamphlets, publications, or membership in other organizations as their method of introduction.

When asked how the Institute could assist them with respect to pesticide issues, the most common response was to provide information regarding new products and methods. The following shows the percentage of respondents desiring information in specific topic areas:

IPM	85%
Environmental impact/rate	82%
New developments	80%
Safe handling/storage/use	54%
Human toxicology	53%
Pesticide registration	34%

The respondents indicated their preference for information presented in booklets, followed by seminars and newsletters.

Workshops were, relatively speaking, the least preferred format. As a general trend, interest in receiving information in all categories increased with the size of the municipality, and was higher among those who were familiar with the Crop Protection Institute, Integrated Pest Management, and who had, or were considering, an IPM program.

(Reproduced from the Summer, 1993, release of the Crop Protection Institute, 627 - 21 Four Seasons Place, ETOBICOKE, ON. M9B 6J8)

**The lighter side of the lawn**

***The Wonders of duct tape***

There was a time in my life when I did not know about duct tape. I slaved over repairs with string and sticky glue. There was a time when I felt less than competent in the home and auto repair department. Not anymore. I've discovered duct tape, the miracle silver mender — the crazy glue of the adhesive tape world.

I first learned about duct tape during a white water canoe course. The instructors demonstrated the use of duct tape after a rock leapt in front of a canoe. They patched the hole and we continued leak-free down the river. I was amazed.

New converts to duct tape often call it "duck" tape. No need to be embarrassed. How would you know that heating ducts get taped with the same stuff that mends canoes?

Since my initiation, I've learned to use duct tape to repair just about anything. Here's a list of my recent efforts:

- patching rain gear, coats and camping equipment
- repairing cracked plastic fridge shelves
- covering rust holes in vehicles
- repairing books

The list could go on and on. Make sure the surface is clean and dry. Then plaster on the tape. It's that easy. If it's an outdoor repair, you'll have to replace the tape every year or so.

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# Necrotic Ring Spot of Turfgrass

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The patch diseases of turfgrass are among the newer diseases causing concern to the turfgrass industry throughout North America. In the early 1980's, one of these diseases, necrotic ring spot was separated from the Fusarium Blight Complex, which was a troublesome and highly controversial disease and particularly damaging to Kentucky bluegrass. Although there were reports concerning necrotic ring spot disease from bordering American States, very little was known about their incidence and distribution in Ontario. The overall goal of this research was the study of the incidence, impact and management of necrotic ring spot in turfgrasses of Southern Ontario.

## Two major objectives

During the first year of a three year study (1991 -1992), there were two major objectives, the first of which was to confirm the causal agent of necrotic ring spot as *Leptosphaeria korrae* in Ontario. This objective was satisfied when we were able to isolate the fungus in pure culture, and then induce sexual spore production, which defined the pathogen conclusively as *Leptosphaeria korrae*, the causal agent of necrotic ring spot. Aside from reports

from British Columbia, this was the first large-scale confirmed report of the disease in Canada.

As part of resolving this objective Prof. Hsiang and Mr. O'Gorman developed laboratory techniques for the isolation and culture of the fungus. These procedures now serve as guides for diagnosis and confirmation of the disease in turfgrass.

The second major objective was to determine the incidence of necrotic ring spot in Ontario through a written survey and field isolations. This objective was conducted during the summers of 1992 and 1993. A total of 56 responses to necrotic ring spot had been received by the fall of 1993: 4% from home owners, 77% from lawn care companies, 14% from golf clubs, and 5% from sod farms. The reports came from 17 different counties throughout southern Ontario from Windsor to Ottawa (Fig. 1) When the respondents were asked (1) did they consider the Fusarium Patch disease a serious problem, and (2) is necrotic ring spot a serious problem, 97% considered Fusarium to be a serious problem and 74% indicated necrotic ring spot to be a serious problem.

## A method for quick identification

In the second year a project was undertaken to develop a method for quick identification of the necrotic ring spot fungus. Previous procedures could take eight

weeks or longer. Hsiang and O'Gorman devised a biotechnological technique which quickly and accurately fingerprints the necrotic ring spot fungus from turfgrass roots in less than two working days.

## Managing the disease

Research currently under way is aimed at investigating biological and chemical methods to manage necrotic ring spot disease. Although there are no fungicides registered for use on necrotic ring spot in Canada, fungicide applications are often made because the disease is unsightly and can be devastating. The problem is that none of our fungicides currently registered and available for use in the control of turfgrass diseases is known to satisfactorily control necrotic ring spot - not to mention the problem of non-registered use of fungicide.

There is thought to be differences in susceptibility of Kentucky bluegrass cultivars to necrotic ring spot disease. In August of 1992, 16 cultivars of Kentucky bluegrass were obtained from seed companies with the request that these cultivars be dominant or projected to be important in the near future. These cultivars were seeded in Sept. 1992, and in June, 1993, they were inoculated with the necrotic ring spot fungus. Data from this inoculation will be collected during 1994 and 1995.



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