

June 2, 1999

To: Toronto Inter-Departmental Environment Team (TIE)

From: Joe Halstead, Commissioner of Economic Development, Culture and Tourism
Dr. Sheela V. Basrur, Medical Officer of Health
Barry Gutteridge, Commissioner of Works & Emergency Services

Subject: Toronto Inter-Departmental Environment Team (TIE) Pesticides Subcommittee:
Status Report

Purpose:

To provide a progress report, setting out the status of the work of the Toronto Inter-Departmental Environment Team (TIE) Pesticides Subcommittee in assisting the Corporation of the City of Toronto to phase out its use of pesticides on public green spaces in 1999.

Source of Funds:

City Council has approved the 1999 Public Health budget submission request for \$20,000 for a pesticides public education program. Funding for five new pieces of equipment, the "Aquacide" hot water weed control technology, is required from the Equipment Reserve for a total cost of \$75,000.00. In order to successfully implement the Integrated Plant Health Care program, replacement equipment is needed. This includes over seeders, top dressers, aerators, de thatchers and mulching mowers. The cost of this replacement equipment is estimated at \$400,000.00 and was included in our 1999 submission to purchase through the Equipment Reserve.

Recommendations:

It is recommended that:

1. The Toronto Inter-Departmental Environment Team (TIE) adopt this report;
1. The Toronto Inter-Departmental Environment Team (TIE) endorse the revisions to the phase-in plan outlined in this report to achieve an end to applying pesticides on public green space in 1999, except in emergency situations or other exceptions; and
1. The Toronto Inter-Departmental Environment Team (TIE) forward this

report with the reports noted below as attachments to the Board of Health, the Works Committee, the Economic Development and Parks Committee, the Policy and Finance Committee for consideration, and to the Environmental Task Force (ETF) and the Works and Emergency Services Stormwater Group for information:

- ◆ “Toronto Inter-Departmental Environment Team (TIE) Pesticides Subcommittee: Terms of Reference” (Medical Officer of Health, February 15, 1999); and
- ◆ “A Phase-in Plan to Achieve an End to Applying Pesticides on Public Green Space in 1999, Except in Emergency Situations Or Other Exceptions” (Commissioner of Economic Development, Culture and Tourism, February 15, 1999).

Background:

At its meeting of December 16-17, 1998, City Council had before it Clause No. 1 contained in Report No. 14 of the Board of Health headed “Phasing Out Pesticide Use in the City of Toronto” (October 30, 1998). City Council adopted with amendments the recommendations of this report.

City Council adopted in principle the banning of pesticides on all City property and recommended:

1. that the Commissioner of Economic Development, Culture and Tourism, the Medical Officer of Health, and the Commissioner of Works and Emergency Services be requested to submit a report to the Board of Health, the Works and Utilities Committee, and the Economic Development Committee no later than February 1999, on a reasonable phase-in that would aim to achieve an end to applying pesticides on public green spaces in 1999, except in emergency situations or other exceptions to be outlined in a report by the Commissioner of Economic Development, Culture and Tourism.
2. that staff ensure that the phased-in ban include an improved and modified lawn care program to balance the effect of eliminating pesticides.
3. that the proposed Pesticide Subcommittee, as amended by Recommendation No. (2) of the Board of Health (see below), be convened to assist the Chief Administrative Officer and the Medical Officer of Health in the development of their report.

“Recommendation No. (2) of the Board of Health:

- (a) establish a Pesticides Subcommittee, with representatives from the public, CUPE Local 416, relevant departments including personnel with

demonstrated expertise in pesticide reduction, and businesses with demonstrated expertise in pesticide-free horticultural practices. This Pesticide Subcommittee will develop a Corporate policy and action plan for the reduction and phase out of pesticides used on City-owned lands; and

- (b) implement the action plan by Spring 1999 and report to the Board of Health.”
4. that funding for the proposed public education program be included for consideration in the 1999 budget, amending Recommendation No. (3) of the Board of Health:
- “the Medical Officer of Health and the Toronto Inter-Departmental Environment Team (TIE)
- (a) investigate the feasibility of regulating the use of pesticides on private property as is presently done in the City of Westmount, Quebec; and
 - (b) develop and implement, in collaboration with community organizations, a coordinated pesticide public education program to help residents reduce their exposures and assist them in making informed decisions about pesticide use and report to the Board of Health.”
5. that the Commissioner of Works and Emergency Services be requested to develop a pilot project to engage the use of the various beneficial use products arising from the biosolids management initiatives from the Main Treatment Plant.
6. that the appropriate staff be requested to submit a report to the appropriate committee on a program similar to the Plant Health Care Program of the City of Waterloo that involves horticultural practices to lead to the near elimination of pesticide use on City of Toronto properties.
7. that the submission by Councillor Shiner, consisting of a report dated November 1996 which was before the former City of North York Environment Committee, entitled Pesticide Use/Alternatives to Pesticides - 1996, and detailed recommendations with respect thereto, be referred to the Chief Administrative Officer, the Toronto Inter-Departmental Environment Team, the Medical Officer of Health and any other staff reviewing pesticide use, to review in context with the final reports.

As follow-up to recommendation #3 from City Council, the Medical Officer of Health submitted a report, “Toronto Inter-Departmental Environment Team (TIE) Pesticides Subcommittee: Terms of Reference” to TIE for its meeting (February 15, 1999). The report recommended that

the Subcommittee include one representative of the ETF. On recommendation of ETF staff, TIE recommended that the ETF act in a consultative role and be kept informed rather than have representation on the Subcommittee. TIE also recommended the addition of a representative from the School Board (Board of Education), and the Works and Emergency Services Wastewater Group, respectively. Representatives from the Toronto District School Board, and the Works and Emergency Services Stormwater Group respectively have been added to the membership.

As follow-up to recommendation #1 from City Council, the Commissioner of Economic Development, Culture and Tourism submitted a report, "A Phase-in Plan to Achieve An End to Applying Pesticides on Public Green Space in 1999, Except in Emergency Situations Or Other Exceptions" to TIE for its meeting (February 15, 1999). TIE amended recommendation #6 of this report:

"That a copy of this report be sent to the Economic Development Committee, the Board of Health, and the Works and Utilities Committee."

to include the "Storm water Group and the Environmental Task Force" and suggested that these groups could provide any comments to the Pesticides Subcommittee.

TIE added an additional recommendation:

"Report be referred to Pesticide Subcommittee for consideration during its development of a corporate policy and action plan."

TIE members were in favour of referring the Parks and Recreation report to the Economic Development Committee, the Works and Utilities Committee, and the Board of Health.

Comments:

The TIE Pesticides Subcommittee was convened in March 1999 to assist the Corporation of the City of Toronto to phase out its use of pesticides on public green spaces in 1999 and beyond. The Subcommittee has met three times and reviewed the Subcommittee terms of reference proposed by the Medical Officer of Health in her report (February 15, 1999).

The Subcommittee is comprised of representatives of business, labour, school, and non-governmental environmental groups who have a demonstrated ability and expertise to make significant contributions to the City's efforts to phase out its use of pesticides on public green spaces and demonstrated expertise and commitment to reduced pesticide use horticultural practices. The Subcommittee is chaired by senior management from Public Health and Parks and Recreation and is supported by participating staff from Parks and Recreation, Public Health, and Works and Emergency Services. Appendix A contains a list of Subcommittee members.

The Subcommittee shall dissolve and be disbanded by City Council upon successful completion

of its mandate and submission of a final report to TIE and City Council.

A. A Phase-in Plan to Achieve An End to Applying Pesticides on Public Green Space in 1999, Except in Emergency Situations Or Other Exceptions

The Subcommittee has considered the phase-in plan proposed by the Commissioner of Economic Development, Culture and Tourism in his report (February 15, 1999) and the Scarlett Woods Golf Course Working Group report on pesticide reduction opportunities for Scarlett Woods and other City-owned golf courses (Appendix B).

The phase-in plan to achieve an end to applying pesticides on public green spaces except in emergency situations or other exceptions was developed by staff from the Parks and Recreation Division of Economic Development Culture and Tourism. The phase-in plan outlines specific program areas and strategies to reduce pesticide usage. A comprehensive Integrated Plant Health Care program is the key method employed to sustain a healthy parks and green space system by introducing new techniques and alternative maintenance practices to reduce reliance on pesticides.

Some of the former municipalities that comprise the new City of Toronto (i.e., North York, Metropolitan Toronto, City of Toronto) reduced pesticide usage from 75% - 90% of the levels used in the early 1990's. Data on pesticide use reductions were not available from East York, Scarborough, and Etobicoke. Further reductions are targeted for 1999 in specific program areas. These reductions are outlined in the report from Parks and Recreation, "A Phase-in Plan to Achieve An End to Applying Pesticides on Public Green Space in 1999, Except in Emergency Situations Or Other Exceptions" (Commissioner of Economic Development, Culture and Tourism, February 15, 1999).

The first three Subcommittee meetings showed high commitment and expertise from members. Much valuable advice was given. Based on this discussion and further staff assessment, the establishment of a comprehensive Integrated Plant Health Care program described in the Parks and Recreation report (February 15, 1999) report is being adjusted to include the following initiatives:

- (i) Develop a list of authorized pesticides, identifying active ingredients and inert ingredients (where information is available), and categorizing pesticides by human health and environmental impacts (e.g., pesticides with greater potential for spills);
- (ii) Investigate opportunities to further eliminate pesticide use, particularly those harmful to human health and the environment (e.g., smog precursors);
- (iii) Investigate procurement procedures for purchase of pesticides to ensure that pesticide purchases comply with the list of authorized pesticides;
- (iv) Develop procedural guidelines for pesticide usage;
- (v) Conduct an inventory of all pesticides and where they are located;

- (vi) Prior to approval for a pesticide application, alternative strategies must have been attempted and documented. Only licensed applicators will be allowed to apply pesticides;
- (vii) Develop and implement a pesticide usage reporting system, including: documenting the type of pesticide requested, the target, the location, the applicator, the device, the supervisor's approval and the weather conditions;
- (viii) Carry out a water quality monitoring program in partnership with Dr. John Struger, Ecosystem Health Division, Environment Canada. The purpose of the program is to determine the amount of pesticides (herbicides, fungicides and insecticides) that wash off during rainstorms into receiving waters. Water samples will be taken from rivers and creeks adjacent to Scarlett Woods Golf Course during dry periods to establish base line conditions and during rainfalls to determine runoff effects. Staff from Works and Emergency Services will obtain the samples and carry out analysis for basic chemistry and nutrients. The pesticide analysis will be carried out at the University of Guelph and the results sent to Dr. Struger. Other data required includes rainfall intensities and the details of recent pesticide applications at the golf course;
- (ix) Review requirements and procedures for notification of pesticide use. Ensure that the proposed public education campaign addresses notification of pesticide use;
- (x) As part of public education, promote a phone number at the City of Toronto to provide expert staff information about the Integrated Plant Health Care program and alternatives to chemical pesticide use;
- (xi) Educate staff about alternative pest control methods and the components of the Integrated Plant Health Care program;
- (xii) Develop a pesticide alternatives database;
- (xiii) Establish pilot projects to test the effectiveness of alternative pest control techniques;
- (xiv) Purchase and test equipment that uses alternatives to pesticides such as the "Aquacide" unit that utilizes super-heated water; and
- (xv) Develop a plan for disposal of existing stocks of pesticides whose use is reduced.

B. Budgetary Implications of Phase-in Plan

1. Estimated Costs

An effective Integrated Plant Health Care program requires more intensive

maintenance activities and cultural controls. In order to maintain plant vigour and increase resistance to pest populations, a scheduled program of aeration, dethatching, over seeding, top dressing and regular mowing is required. The current equipment inventory is aging and replacement units are needed to insure an Integrated Plant Health Care program can be sustained. An estimated sum of \$400,000.00 for specific Integrated Plant Health Care equipment was identified and submitted to Central Fleet with our 1999 request for departmental equipment. In addition to this, five new "Aquacide" units, one for each district, are required to reduce our reliance on Roundup. The total cost of these units is \$75,000.00.

Additional labour costs necessary to implement and sustain an Integrated Plant Health Care program will be incorporated into our new parks harmonized service delivery structure provided there are no further staff cuts. Changes in maintenance standards and policies will allow for the redeployment of labour to Integrated Plant Health Care activities. Any cost savings identified in the reduction of pesticide applications will assist in offsetting the increased cost of implementing the program.

Opportunities to decrease pesticide usage and lower maintenance costs by re-designing greenspace areas and introducing areas of naturalization will be investigated throughout 1999 and submitted for consideration in the capital budget for the year 2000. Projects will be identified such as irrigation systems, naturalized areas along roadways and pathway development, which reduce pesticide usage yet do not incur increased maintenance costs.

The implementation of the Integrated Plant Health Care program for 1999 will include an evaluation component which will assist in identifying costs associated with the program as well as its effectiveness.

2. Health and Environmental Benefits of Implementing an Integrated Plant Health Care Program

The implementation of an Integrated Plant Health Care program is an investment for the future of Toronto residents and for City green spaces. The health and environmental benefits of implementing such a program will likely outweigh expenditures associated with its implementation. An overview of the benefits of such a program is provided in Clause 1 contained in Report No. 14 of the Board of Health, "Phasing Out Pesticide Use in the City of Toronto" (October 30, 1998) adopted by City Council at its meeting of December 16 -17, 1998.

By taking a leadership position in implementing an Integrated Plant Health Care program, the City can act as a model for homeowners, other commercial, industrial and governmental sectors to reduce and phase out pesticide use. For example, the implementation of pilot projects and increased naturalization of City green spaces will enable the City to showcase alternatives to chemical pesticides. Some of these plant health care methods are likely adaptable to home gardens and lawns and will be promoted through a pesticides public education program.

As the City publicizes its efforts to phase out pesticide use on public green spaces, the parks and other City green spaces will increasingly be viewed as one of the City's environmental assets. The City will be able to count as one of its assets, green space that does not rely on chemical pesticide use.

The Integrated Plant Health Care program is an example of the City's commitment to environmental sustainability. As with any policy or program that promotes environmental sustainability, it is difficult to quantify the net benefits of implementing an Integrated Plant Health Care program. It is reasonable, however, to expect both short-term and long-term benefits.

Principal short-term benefits include enhanced quality of life, particularly among children and individuals who have not been able to enjoy City parks and green spaces due to chemical sensitivity, and reduced likelihood of pesticide residue run-off into Toronto streams and Lake Ontario. The latter could also be considered a long-term benefit. Other long-term benefits include an overall reduction of the health and environmental risks associated with chemical pesticide use. This includes for example, reduced exposure of City staff (e.g., gardeners, recreation workers), citizens, and pets who use City green spaces to the potential adverse impacts of chemical pesticides.

Additional benefits include potential cost savings and community development opportunities through initiatives such as naturalization. For example, the United States Environmental Protection Agency (1998) publication, "A Source Book on Natural Landscaping for Public Officials" indicates that the combined costs of installation and maintenance for natural landscape over a ten year period may be one fifth of the costs for conventional landscape maintenance. The publication also identifies public parks as opportunities for public involvement in naturalization.

The benefits of an Integrated Plant Health Care program are likely to be demonstrated incrementally as Parks and Recreation continues to implement its program over the next several years. The year-end report of the TIE Pesticides Subcommittee will document the successes and lessons learned.

C. Evaluation

The proposed phase-in plan contains features such as the following that will enable the completion of an evaluation of the effectiveness of the implementation strategy:

- (i) evaluation criteria for each program in which reduction targets have been specified;
- (ii) a monitoring system, complete with documentation;
- (iii) the development of a database to track pesticide use;

- (iv) written records of a request for pesticide use;
- (v) a water quality monitoring program carried out by Works and Emergency Services in partnership with Environment Canada to determine herbicide, fungicide and insecticide residues in receiving waters adjacent to the Scarlett Woods Golf Course; and
- (vi) pilot projects for programs such as forestry.

The TIE Pesticides Subcommittee will include in its year-end report, an evaluation plan and the findings of the evaluation.

D. Communications/Public Education

City Council has approved the 1999 Public Health budget submission request for \$20,000 for a pesticides public education program. Public education activities will focus initially on low-cost initiatives. For example, the Subcommittee will be exploring potential opportunities to promote pesticide-free horticultural practices through partnerships with existing programs such as City of Toronto-sponsored community gardens and pilot projects involving local elementary school gardens.

Staff resources from Public Health, Parks and Recreation Division, and Works and Emergency Services will be identified to develop and implement a communications strategy. The communications strategy will address among other issues, mechanisms for citizen participation. The strategy will also define types and methods of information sharing, such as the development of a TIE Pesticides Subcommittee site on the City of Toronto website.

Conclusions:

The TIE Pesticides Subcommittee was convened in March 1999 to assist the Corporation of the City of Toronto to phase out its use of pesticides on public green spaces in 1999 and beyond. The Subcommittee endorses the phase-in plan developed by the Parks and Recreation Division of Economic Development, Culture and Tourism to reduce pesticide use on public green spaces.

The Subcommittee will submit to TIE in January 2000, a report concerning the findings of the evaluation of the implementation strategy, a communications/public education strategy and a plan for further pesticide use reductions on public green spaces in year 2000.

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Appendix A

Toronto Inter-Departmental Environment Team (TIE) Pesticides Subcommittee Membership

Connie Clement, Director, Public Health Policy and Planning, Toronto Community and Neighbourhood Services, Toronto Public Health (Co-chair)

Claire Tucker-Reid, General Manager, Parks and Recreation, Toronto Economic Development, Culture and Tourism, Parks and Recreation Division (Co-chair)

Tony Di Giovanni, Executive Director, Landscape Ontario

John Green, Plant Manager, Toronto District School Board

John Hannah, President, Ontario Parks Association

John Hopkins, Works & Emergency Services Storm Water Group

Peter Leiss, Vice President, Toronto Civic Employees' Union Local 416, Canadian Union of Public Employees

Ian Lintott, Owner/President, The Green Brigade Inc.

Scott Martin, Director, Audubon Cooperative Sanctuary System of Canada

Janet May, Pesticide Campaign Director, Toronto Environmental Alliance

Cheryl Shour, President, Healthy Home Services Inc.

Staff:

Siu Fong, Research Consultant, Toronto Community and Neighborhood Services, Public Health Division

Doug McDonald, Operations Support Co-ordinator, Toronto Economic Development, Culture and Tourism, Parks & Recreation Division

Ted Bowering, Manager, Soil/Water Quality Improvement, Toronto Works & Emergency Services, Technical Services Division

Arthur Beauregard, Manager, Horticultural Services, Economic Development, Culture and Tourism, Parks & Recreation Division

Fred Hendriks, Environment Committee Co-ordinator, Works & Emergency Services, Technical Services Division

Appendix B

Scarlett Woods Golf Course Working Group

Report to Toronto Council on Pesticide Reduction Opportunities for Scarlett Woods and other City-Owned Golf Courses

Introduction:

Public concerns have been raised regarding the use of pesticides on golf courses owned and operated by Metro Parks and Culture. In response, on February 10, 1997, the Metro Environment and Public Space Committee requested the Acting Commissioner of Parks and Culture to work with environment and golf-related parties to examine strategies to reduce pesticide use at the Scarlett Woods Golf Course. Accreditation in the Audubon Cooperative Sanctuary Program was also a goal. At the committee meeting of March 26, 1997, it was recommended that a working group be established to review the use of pesticides at the Scarlett Woods Golf Course, comprised of:

- Metropolitan Councillors from the area and
- Representatives from the following:
 - Metro Parks and Culture;
 - Metropolitan Toronto and Region Conservation Authority;
 - Action to Restore a Clean Humber;
 - Toronto Environmental Alliance;
 - Parks Departments of the Cities of Etobicoke and York;
 - Royal Canadian Golf Association;
 - Canadian Golf Superintendents Association; and
 - Crop Protection Institute (Urban Pest Management Council of Canada)

Additional representatives included Councillor Ila Bossons, Julia Langer from the World Wildlife Fund, and Harold Van Gool from Plant Products Co. Ltd.

The Working Group also invited Scott Martin, national co-ordinator of the Audubon Co-operative Sanctuary System of Canada and Paul Dermott, superintendent of Oakdale Golf and Country Club to speak about the Audubon program.

Scarlett Woods is a very popular and busy golf course with over 46,000 rounds of golf played in 1998. It was recognized that a balance needed to be found between changes in maintenance practices and the economic viability of the golf course.

The Mandate:

The mandate of the group had been to discuss options and develop recommendations to reduce the reliance on pesticides at Scarlett Woods Golf Course.

In concurrence with the spirit of Report no. 14 of the Board of Health, this Working Group submits the following report as a proposed plan for the management of the Scarlett Woods Golf Course and ultimately, all city-owned golf courses.

Public and Golfer Attitudes:

The Royal Canadian Golf Association conducted a golfer attitude survey in conjunction with the World Wildlife Fund and the Audubon Cooperative Sanctuary System of Canada, during the 1998 golf season. The survey was distributed in two Canadian golf publications and in boxes of golf balls. A response rate of approximately 2% of the total distribution of 300,000 surveys provided a glimpse of the attitudes of over 5,000 Canadian golfers toward the relationship of golf with the environment.

The results of the survey were encouraging in that 96% of the respondents stated they enjoyed seeing and hearing wildlife during a game of golf and 90% would encourage golf courses where they play to increase naturalized areas for wildlife. However, almost half the respondents (49%) still prefer greens, tees and fairways to always be flawlessly green. Also, 46% of those enjoying wildlife during a game of golf preferred the golf course to be flawlessly green. This contradiction was further exposed when 41% of those who stated a concern for the amount of chemicals being used on golf courses also preferred the greens, tees and fairways to always be flawlessly green.

The survey results show the dilemma facing golf course managers who are still required to

provide near-perfect, green playing surfaces to attract the golfing public. Golf courses are still rated on their appearance and level of manicuring. Educating the golfer to change their expectations will take time. However, public awareness projects can be conducted at city-held golf courses.

Recommendations:

Audubon Cooperative Sanctuary Program

The Working Group suggests that the Audubon Cooperative Sanctuary Program (ACSP) for golf courses could act as an initial template for environmental improvements at Scarlett Woods and all the city-owned golf courses. The program is administered by the Audubon Cooperative Sanctuary System of Canada Inc. (ACSSC) of Collingwood, Ontario. It combines ecologically sound land management and the conservation of natural resources. Golf courses work towards certificates of recognition in six categories. More than 100 facilities in the US and 14 in Canada, including seven in Ontario have received full certification by fulfilling requirements in all six categories. All five City of Toronto-owned golf courses are now registered in the Audubon program.

Recommendations and the Action Plan for Scarlett Woods are presented in the context of the six categories of the Audubon Cooperative Sanctuary Program for golf courses.

1. Environmental Planning

An environmental plan including a written policy and procedures is mandatory to ensure the success of an environmental improvement program. It also enables course staff to provide consistent, accurate answers to the public. The plan will include specific environmental enhancement projects and will establish protocols for determining if and when chemicals will be used. The protocols will be based on the latest scientific research with the ultimate goal of maintaining or improving the health of water resources, golfers, workers, neighbours and wildlife.

1. Integrated Pest Management

Integrated pest management (IPM) programs were originally developed to improve insect, weed and disease management and reduce chemical use in field and horticultural crops. IPM will represent Integrated Plant Management at Scarlett Woods as the Working Group believes proper management of the whole plant ecology system will result in fewer chemicals being required.
Current Use of Pesticides:

Poa annua and creeping bentgrass are the closely mowed turfgrass species used on tees and greens. The low mowing height combined with wear stress predisposes the plants to diseases. Fungicides are required periodically throughout the season.

A breakdown of chemicals used from 1991-1997 include:

<u>Chemical Name</u>	<u>Trade Name</u>
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Anilazine	-	Dyrene 50WP
Chloroneb	-	Terraneb SP
Chlorothalonil	-	Daconil
Iprodione	-	Rovral Green
Thiophanate-methyl	-	Easeout WP
Quintozene	-	Turfco

All products are fungicides for the control of disease. Fungi can develop resistance, therefore products must be varied through out the season. Phenyl mercuric acetate (PMAS) and thiram are no longer used at Scarlett Woods to control turf disease.

Unfortunately, the biggest factor determining fungicide requirements remains weather. Most pathogenic fungi are always present in the soil. They will only become active when the climatic conditions are correct and if the host plant is susceptible. Susceptibility can be reduced with proper plant species selection and stress reduction. However, some diseases will become active even with good management. This is when the “last resort” of chemical application is required.

Herbicide use is restricted as much as possible. From 1991 to 1996, 2,4-D, mecoprop, and dicamba, for control of broad leaf weeds were not used. A spot-spray was required in 1998 to control clover. Glyphosate is used to control weeds on hard surfaces such as the parking lot and curbs.

To continue the reduction of the use of pesticides at Scarlett Woods and all city-operated golf courses, the following measures will be implemented:

- Preventative measures to reduce plant stress will always be practiced to reduce susceptibility to pests and diseases.
- More precise irrigation control and fertilizer application will be used in consideration of disease and pest control.
- Annual soil testing for nutrient requirements will help to ensure plant health.
- Scouting for pests and diseases through visual inspection and climate data collection will be conducted. Computerized disease predictive software should be employed.
- Thresholds for disease and insect populations will be established for all known pests and treatment will begin only when these thresholds have been surpassed.
- Least toxic and most effective products will be selected.
- Alternative treatments to chemical applications will always be tried first.
- Mowing heights will be raised during periods of plant stress.
- Only regionally adapted, disease-resistant species and cultivars of turfgrass will be planted.
- Grass clippings will be reused on the golf course.
- Staff training and development will include training in IPM and alternative practices.
- All city-operated golf courses will stay abreast of scientific developments at the Guelph Turfgrass Institute and will offer their properties for potential demonstration sites or collaborative trials.

3. Wildlife and Habitat Management

- Potential naturalized areas will be identified and mapped. Naturalization and native species selection to commence in 1999.
- Bluebird, purple martin and swallow houses to be erected starting in 1999.

- Native species and perennial plants will gradually replace some of the annual bedding plants commencing 1999. Native plant nursery to be established in 1999.
- All ponds and water courses will have adequate buffer strips of, reeds, sedges, taller grasses or other filtering plants established in 1999.

4. Member/Public Involvement

- Bird watching stations to be identified and established with information about the program by 2000.
- Educational display including an explanation of the pesticide reduction and environmental enhancement programs to be placed in clubhouse and pro shop to be created in 1999.
- Fact sheets about Integrated Plant Management and the Scarlett Woods Environmental Enhancement programs to be provided in the clubhouse and pro shop by 2000.
- Launch the project with an event such as a golf challenge with local councillors, the mayor, local business leaders, environmentalists; (Spring 1999)
- Organize two public tours/demonstration days for the local community; (1999)
- Walking trails in out-of-play areas through some of the native vegetation on the course property to be established by 2001.
- Establish a local school program using the trails for closer study and appreciation of the native vegetation and wildlife by 2001.
- *Greening of Scarlett Woods* committee including representatives from users of the golf course and the community to be established in 1999.

5. Water Conservation

- Irrigation controls to be improved to provide water based on weather data and evapotranspiration rate by 2001.
- Drainage system to be evaluated for maximum recycling in 1999.

6. Water Quality Management

- A water quality monitoring protocol to be established in 1999. Samples from the Humber River and selected sites on the golf course will be analyzed for heavy metals, inorganics, pesticides, PCBs and nutrients before and after pesticide and fertilizer applications. Samples will be taken upstream and downstream of the golf course.
- Irrigation and fertilizer applications will correspond with the plant's ability to absorb both to avoid excess run-off or leaching.
- Fertilizer formulations will be chosen to minimize run-off or leaching.
- Areas of potential wetland will be identified and develop or retained as such, where possible.

The Authority's interest in the management of the Scarlett Woods Golf Course and Working Group is both general and specific. The Authority owns the land on which the course is located, with these lands being managed under agreement by the City of Toronto. Consequently, we have an interest in ensuring that the best practices available are being used at Scarlett Woods. This is with a view to protecting the asset which we hold on behalf of the public.

In a more general sense, the Authority's objectives include maintenance of healthy watersheds and public environmental education. Implementation of integrated pest management and other

measures in the Audubon program will help meet our objectives by:

- _ reducing the likelihood of ground and surface water contamination;
- _ enhance wildlife habitat and diversity;
- _ increase the number of wetland areas and amount of riparian vegetation;
- _ allow for the enhancement of native plant species at Scarlett Woods; and
- _ expose the public to the benefits of regeneration activities and appropriate management of green spaces.