

**A Survey of Toronto Residents'
Awareness, Uses and Attitudes
Towards Lawn Pesticides**

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EXECUTIVE SUMMARY AND KEY FINDINGS

In 2000 Toronto Public Health commissioned the York Institute for Social Research to conduct a telephone survey of Toronto residents to better understand their awareness, perceptions, uses, and attitudes towards lawn pesticides. The survey was conducted between December 2000 and February 2001. A total of 341 randomly selected residents, each of whom lived in a home with a lawn and was responsible for lawn care decisions, were asked a series of 64 standardized questions. Both the response rate (55%) and the refusal rate (32%) of the survey are better than the average rates of most one-time public surveys. The results are accurate within +/- 5%, 19 times out of 20, when the responses are from the entire sample.

The key survey findings are summarized below:

- The survey purposefully sought to include only respondents who were living in a house with a lawn and who were responsible for lawn care decisions. This group would be directly affected should there be a new by-law restricting use of pesticides on residential lawns, and therefore their awareness, perceptions, and attitudes towards lawn pesticides are of interest to public health officials and policy makers.
- Over 80 percent of the survey respondents were aware of the vulnerability of children to lawn pesticides and over 70 percent perceived these products to be a source of environmental pollution.
- About two-third of the respondents believed that lawn pesticides should be used as the last resort and that non-chemical alternatives were just as effective as chemical pesticides in maintaining a healthy lawn.
- About 50 percent of the respondents said that it was “somewhat important” and 30 percent said “very important” to have a lawn with no visible weeds or signs of insect damage.
- About one-third of the residential lawns in Toronto had been serviced by a professional lawn company between 1999 and 2000. People living in homes with a larger lawn were more likely to employ such a firm.
- Between 1999 and 2000, 24 percent of householders applied chemical pesticides on their lawns, 13 percent hired a lawn company to apply the pesticides, and 8 percent did both applying the pesticides themselves and hiring a lawn company to treat the lawn with chemical pesticides. This totals to 45 percent, or nearly one in two residential lawns in Toronto, that had been treated with chemical pesticides at least once between 1999 and 2000.
- Three factors were found to be associated with the use of chemical pesticides on residential lawns: (a) hiring of a professional lawn company, (b) the respondent’s value of a weed-free or an insect-free lawn, and (c) the size of the lawn.
 - (a) Households that had hired a lawn care company in the past two years were six times more likely to have had their lawns treated with chemical pesticides than those that had not hired such a firm.

- (b) Respondents who believed it was “very important” to have a weed-free lawn were almost five times more likely to use lawn pesticides than those who said a weed-free lawn was “not important”.
 - (c) Over 70 percent of lawns subject to a contract with a lawn care company were being treated with chemical pesticides, regardless of their size. On the other hand, lawns exclusively cared by the householders were more likely to be treated with chemical pesticides if they were larger, and less likely if they were smaller.
- About 11 percent of Toronto households relied solely on the use of organic or natural products to care for their lawns between 1999 and 2000.
 - Eleven (11%) percent of those who had hired a lawn care company between 1999 and 2000 did not know if pesticides had been used on their lawns. Of those who knew that chemical pesticides were applied to their lawns, about half of them stated that they were not told the specific types of chemical pesticides being applied, nor the precautions such as removing toys and garden furniture or closing doors and windows before the pesticide applications.
 - When asked about the different ways of obtaining information about alternatives to chemical pesticides, a large percentage of respondents (50% –60%) preferred brochures and information articles to other outreach methods such as attending a free information session, checking the City’s website, calling the City’s helpline, or being visited by an expert in alternatives.
 - Of the City’s five pesticide reduction initiatives, respondents reported being most aware of the initiatives to phase out City’s use of pesticides on parks and sports fields and the City’s advertisement in the newspaper that encouraged people to use less chemical pesticides on their lawns.
 - When given the statement “*When it comes to using chemicals on lawns, some people think that as long as what they’re doing is on their own lawn they should have the right to do whatever they want*”, 77 percent of the respondents did not agree.
 - The majority of respondents (78%) said that the City of Toronto should restrict the use of pesticides on golf courses, school yards, and university and college campuses. Female respondents were more likely than male respondents to support this restriction.
 - As to restricting use of pesticides on residential lawns, two-third (66%) indicated their support for such a restriction. Respondents who had not used lawn pesticides in the past two years were nearly three times more likely to support such a restriction than those who had used lawn pesticides during the same period.

This survey has presented some insights into Toronto residents’ awareness, uses and attitudes towards lawn pesticides, information that is essential to developing effective pesticide reduction programs and municipal policies. The survey findings can also be used as a set of baseline data against which future changes in Toronto residents’ use of lawn pesticides and their attitudes towards these products can be measured.

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1.0 INTRODUCTION

1.1 Definition

Lawn care pesticides, for the purpose of this report, are defined as manufactured chemical products that are applied to lawns and gardens to kill weeds, insects, fungus, and other unwanted living things. Lawn pesticides include herbicides (used to control weeds), insecticides (used to control insects), and fungicides (used to control fungi), and they are available in various formulations including sprays, dusts, powders, granulars, concentrates and liquids.

1.2 Health and Environmental Effects

An updated review of the literature addressing exposure and health effects from lawn pesticides has recently been conducted by Toronto Public Health (Toronto Public Health, 2002). The following describes some of the information summarized in this report. Recent biomonitoring studies in the United States suggest that exposure to some home-use pesticides is generally very low, but for some insecticides, exposure is apparently widespread. Although these low exposures have not been associated with health effects in individuals, the uncertainty about the potential for subtle, long-term effects if children are exposed at sensitive periods of development has raised public health concerns.

Epidemiological studies of those exposed occupationally to pesticides are found to be suggestive of moderately increased risks for some health effects such as testicular, prostate and cervical cancers, non-Hodgkin's lymphoma, multiple myeloma, and adverse reproductive and neurological effects. Limited epidemiological research has also assessed the associations between early exposure to pesticides and long-term effects in children. These studies show apparent modest increases in the risks of some cancers (leukemia, non-Hodgkin's lymphoma and neuroblastoma) and some birth defects with pesticide exposure around conception, *in utero* and in early postnatal life. Although these studies do not allow for clear conclusions about the effects specifically from exposure to lawn and garden pesticides, overall the data are compelling enough to call for prudent avoidance of lawn and garden pesticides.

Once applied, some pesticides can move into the air, soil groundwater and other natural waters, affecting other species of animals, plants and micro-organisms. For example, diazinon and 2,4-D have been detected in Ontario urban ponds and streams sometimes at levels exceeding those set by government to protect aquatic life (Toronto Public Health, 2002).

1.3 Currently Available Survey Information

National and Provincial Data

The 1994 Households and the Environment Survey, the last survey of this kind by Statistics Canada, provided pesticide use data for the country and each province. The survey reported that 34% of Ontario households with a lawn, yard or garden had used chemical pesticides in the previous twelve months (Statistics Canada, 1994).

In 2001 Ipsos-Reid Corporation conducted a national poll on consumer behaviours and attitudes regarding pest control products in and around the home (Ipsos-Reid Corporation, 2001). The poll was commissioned by the manufacturers of pesticides, and consisted of a national sample of 600 homeowners (excluding those living in condominium apartments) who were responsible for decisions about pest and weed control. Some of the findings are:

- (1) During the two years preceding the poll, 52% of Ontario homeowners had used weed control products, and 42% had used pest control products in their lawns and gardens.
- (2) Less than 20% of homeowners in Canada had employed a professional service for weed or pest control in their lawns/gardens in the past 2 years.
- (3) Over 80% of homeowners in Canada said that they wanted to keep their lawns and gardens free of pest and weed.
- (4) A total of 42% of Canadian homeowners supported the Federal government's proposal to prohibit the sale and use of weed control products for lawn, patio and driveway, and 38% supported prohibiting the sale and use of insect and plant disease control products.
- (5) People who had used a pest or weed control product in the past two years were less likely than those who had not used the products to support the prohibition.

Toronto and Other Canadian Cities Data

Earlier information on Toronto residents' use of lawn pesticides was gathered by the 1988 Toronto Community Health Survey, commissioned by the Public Health Department for the former City of Toronto. The survey consisted of nearly 1,000 residents 15 years and older. It reported that 16% of residents in households with a lawn had hired or had a landlord who hired a company to keep their lawns free of weeds, and 20% had used chemical bug/weed killers outside their homes within the past 12 months (Former City of Toronto Public Health, 1990). These results are, however, dated and represent only the former City of Toronto area.

Two recent opinion polls of Toronto residents' uses and attitudes regarding lawn pesticides were commissioned by the Toronto Environmental Alliance (TEA) in 1997 and 2001 respectively:

- (1) In 1997, TEA subscribed to two questions in a Metropolitan Toronto survey consisting of 400 residents who were 18 years of age or older. The poll reported that 72% of the respondents supported banning pesticide spraying on public parks and 64% supported banning pesticide

spraying on private property (Oracle Research, 1997). No question about level of pesticide use was asked.

- (2) A total of 635 randomly selected Ontario residents who were 18 years of age or older were interviewed in 2001. About 130 respondents (21% of the total 605 respondents) were from Metropolitan Toronto but the Toronto-specific results are not yet available. According to the survey, 27% of Ontario residents used “cosmetic” pesticides and 82% supported a by-law restricting the use of “cosmetic” pesticides on residential properties (Oracle Research, 2001).

Unfortunately, both of TEA’s polls did not indicate whether the samples included only people living in a house with a lawn or also included those living in an apartment building without a lawn. This information is vital in determining the comparability of the polls’ results with other survey findings, as well as in interpreting the attitude findings. People living in an apartment building without direct ownership of a lawn would be less affected by a restriction on the use of pesticides on residential lawns, and hence their attitudes towards the restriction could be very different from those who would be directly affected (i.e. those who were living in a house with a lawn).

In 1999, a mail survey to 600 homeowners in the former Etobicoke and North York was conducted by a University of Waterloo graduate student (Cirillo, 2000) The study was intended to provide a “*snapshot of pesticide use and attitudes in suburban Toronto*”. Findings of this study are, however, subject to potential problems arising from sample selection, questionnaire design and data analysis.

Surveys of other cities in Ontario include:

- (1) The 1991 Environment Canada’s survey of about 160 households in two subdivisions in Guelph, Ontario found that 66% of households had either applied or had someone else apply pesticides on their property during the year, and 36% (of the total 160 households) used a professional lawn care service (Struger et al, 1994).
- (2) The 2000 public opinion survey of 210 voting age residents in Caledon, Ontario reported that 44% currently used “cosmetic” pesticides and 67% (of those with an opinion) supported a total ban on “cosmetic” pesticides on private residential property (Oracle Research, 2000).

While there have been several attempts to gather Toronto-specific information, the lack of up-to-date and relevant data continues to constitute a major information gap in developing effective public programs and policies aimed at reducing use of lawn pesticides.

2.0 STUDY PURPOSE

In 1999 Toronto Public Health contracted the York University's Institute for Social Research (ISR) to conduct a public telephone survey on pesticides. This report outlines the method and findings of the survey, and discusses the implications for the City's pesticide reduction programs and policies.

The purpose of the survey was to gain a better understanding of Toronto residents' awareness, uses, and attitudes regarding lawn pesticides. This information will help develop an effective lawn-pesticide reduction program in the City. Specifically, the survey sought information to answer the following questions:

- To what extent were the respondents aware of lawn pesticides' potential health and environmental impacts?
- How much did they value a "perfect" lawn?
- How often were pesticides used on residential lawns?
- What were the respondents' preferred ways of obtaining information about alternatives to lawn pesticides?
- Were the respondents aware of the City's current pesticide reduction initiatives?
- What were the respondents' attitudes towards regulatory control over the use of lawn pesticides on public and residential properties?
- What factors were related to respondents' awareness, uses, and attitudes regarding lawn pesticides?

3.0 METHOD

3.1 Overall Survey Design

Since Toronto Public Health was interested in both the outdoor use of pesticides for lawn care and the indoor use of pesticides for insect and rodent control, it contracted the ISR to conduct two separate surveys, each with a target sample of 400 residents in the amalgamated City of Toronto. To minimize the cost, these two surveys were administered through a single random digit dialing and interviewing process. Cost saving was achieved by reducing the number of ineligible respondents so that most of those reached would be eligible for participating in either the indoor or the outdoor pesticide survey. It was also more cost effective to generate all the random digit telephone numbers for both surveys at the same time. If the respondent lived in a house with a lawn, he or she would be asked the outdoor questions. Alternatively, if the respondent lived in a multiple occupancy dwelling such as an apartment, he or she would be asked the indoor pest control questions.

The findings and discussions in this report pertain only to the outdoor pesticide survey. Results of the indoor survey will be presented in a separate report at a later date.

3.2 Questionnaire Development

The questionnaire (survey instrument) was designed to be administered by means of a telephone interview. A standardized questionnaire was developed by TPH with input from the ISR. The questionnaire was also reviewed by the Pesticides Subcommittee of the Toronto Inter-Departmental Environment Team (TIE). The Subcommittee consisted of members from professional landscape companies, NGOs, and staff of Toronto Parks and Recreational Services, Public Works and Emergency Services, and Public Health.

The questionnaire was pilot tested among a random sample of 25 respondents, and several wording changes were subsequently made based on the results of the pilot. The final sample and analysis did not include the 25 interviews conducted as a part of the pilot.

Excluding the initial screening questions, 64 close-ended questions were included in the final version. The questions were organized into six groups:

- (a) Awareness, perception and belief regarding lawn pesticides
- (b) Lawn care practices
- (c) Sources of information and awareness of Toronto pesticide reduction initiatives
- (d) Attitudes towards more restrictions on use of lawn pesticides
- (e) Barriers to using alternatives to chemical pesticides
- (f) Social demographic factors

Questions for group (e) "barriers to using alternatives to chemical pesticides" were unable to discern the degree to which each barrier would be important to respondents, and the findings were consequently excluded from the final analysis.

The specific socio-economic characteristics examined were:

- (a) whether the respondents were living with children;
- (b) ages of their children (if any);
- (c) lawn size;
- (d) respondent's age;
- (e) respondent's gender;
- (f) respondent's highest education level;
- (g) annual household income.

3.3 Sample Selection

Only English was used to conduct the interviews. When an individual answered the telephone, the interviewer first asked about the type of housing (house vs. apartment), and whether the household had control over a lawn on the property. If the individual lived in a house with a lawn, the interviewer then asked if he/she could speak to the person in the household who made most of the lawn-care decisions.

3.4 Data Collection and Processing

All interviews were conducted by the ISR using the Computer Assisted Telephone Interviewing (CATI) System. All respondents were selected and interviewed according to ISR's protocol. ISR was responsible for the univariate analyses of the data. Further analyses, such as bi-variate analyses, stratifications, Chi-square analysis for statistical significance, and confidence intervals, were conducted by a researcher with TPH using the Statistical Package for the Social Sciences (SPSS).

3.5 Study Limitations

An inevitable shortcoming of any telephone survey is its inability to reach those who do not have a telephone. However the percentage of households in Ontario without telephones was estimated to be only 1.1% in 1997 (Statistics Canada, 1997). Due to resource and technical constraints, the survey was conducted in English only, and consequently, its results may not be generalized to represent the viewpoints of Toronto residents who do not speak English. Although we had originally planned to have the interviews implemented during summer or fall 2000, the preparation of the questionnaire and the scheduling of ISR delayed the interviews until the end of the year. All the interviews therefore took place during the winter months, and a higher response rate might have been obtained if the study was carried out during the gardening season.

4.0 Results and Discussion

4.1 Completed Interviews

All the interviews were conducted by ISR between December 2000 and February 2001 with the majority completed during January 2001. A total of 341 completed interviews were obtained for the outdoor pesticide survey.

4.2 Response Rate

Since the indoor and outdoor pesticide surveys were administered through a single interviewing process, it was not possible to calculate an individual response rate for each survey. When an interviewee refused to participate in the survey, there was no way to tell whether that individual lived in a house or an apartment (which could in turn inform the interviewer for which survey the individual would have been eligible).

Data on the final disposition of the telephone numbers were supplied by ISR. The response rate of the combined surveys was 55% and the refusal rate was 32%. Both are better than the average response and refusal rates of most one time public surveys (average response rate =18.3%, and refusal rate = 58.7%) (PMRS, 1997). Table 1 below lists the disposition of the survey sample.

Table 1. Final disposition of telephone numbers for the pesticide outdoor survey, Toronto 2001

A. Total Numbers Attempted	2,029
1. Not in service and non-residential	273
2. Not an eligible household (e.g. renting a room, everyone in the household under 18 years old)	273
B. Total Eligible Numbers	1,483
1. No answer and always busy	66
2. Call back scheduled	97
3. Ill/aged/absent	120
C. Total asked	1,200
1. Refusals	388
D. Completed interviews	812 (341 for outdoor pesticide survey 471 for indoor pesticide survey)

Source: Outdoor pesticide telephone survey, Toronto Public Health, 2001

$$\begin{aligned} \text{Response Rate} &= \text{Completed Interviews (D)} / \text{Total Eligible Numbers (B)} \\ &= 812 / 1,483 = 55\% \end{aligned}$$

$$\begin{aligned} \text{Refusal Rate} &= \text{Refusals (6)} / \text{Total Asked (C)} \\ &= 388 / 1,200 = 32\% \end{aligned}$$

4.3 Description of Respondents

Two issues are worthy of pointing out in assessing the survey sample's representation of the general population:

- (a) The census data for Toronto population included people 15 years or older while the survey only included those 18 years or older.
- (b) Because of the survey's screening criteria (those living in a house with a lawn and household members responsible for lawn care decisions), it would be reasonable to anticipate that the survey respondents could be different from the general population in certain socio-economic characteristics such as income and age.

Geographic representation

- Each respondent was asked to provide the first three digits of the postal code, which show the municipality in which the respondent resided.
- Table 2 displays the percentage distribution of the respondents' residences across the six former municipalities along with the percentage distribution of all houses in the City (including single-detached, semi-detached and row houses). The distribution within the sample is fairly consistent with that of the City with the exception of a slight under-representation from the former City of Toronto.

Table 2. Distribution of respondents' residences by municipality compared to distribution within the City, Toronto 2001

Former municipality	Survey sample (%)	City (%)
Scarborough	25	25
Former Toronto	19	25
East York	6	5
North York	25	24
York	7	6
Etobicoke	18	15
Total	100	100

Source: Lawn pesticide telephone survey, Toronto Public Health, 2001

Gender

- Fifty-two percent (52%) of the survey respondents were male and 48% were female.
- The survey sample consisted of a slightly higher percentage of male respondents and a lower percentage of female when compared with the distribution of gender in the City (i.e. 47% male and 53% female) as determined in the 1996 census (Table 3).

Table 3. Gender distribution of the survey respondents and the City population

Gender	Survey respondents (%) ¹	City (%) ²
Male (18+)	52	47
Female (18+)	48	53
Total	100	100

¹ Survey respondents 18 years and older

² City population 15 years and older

Source: Lawn pesticide telephone survey, Toronto Public Health, 2001

Age

- Overall, the survey sample consisted of considerably more people between 40 and 59 years old and fewer between 18 and 39 when compared to the City population (Table 4). As indicated above, the youngest age group 18-29 was not comparable as the survey only included respondents older than 17 years while the 1996 census data included people older than 14 years.
- The sample's over-representation of the older age groups (i.e. 40-59) could be a result of the survey's selection criterion which specifically sought respondents who were responsible for lawn care decisions. This may suggest that lawn care responsibility in most households in Toronto generally falls on the older adults such as parents or grandparents instead of the younger generations.

Table 4. Age distribution of the survey respondents and the City population

Age group	Survey respondents (%)	City (%)
18-29	11 ¹	22 ²
30-39	18	24
40-49	24	18
50-59	22	13
60-69	13	11
70-79	9	8
80+	3	4
Total	100	100

¹ Survey respondents 18 years and older

² City population 15 years and older

Source: Lawn pesticide telephone survey, Toronto Public Health, 2001

Education

- Towards the end of the survey, each respondent was asked to report the highest level of formal education that he or she had completed. The results are presented in Table 5.
- Nearly 40% of the respondents reported having less than grade 9 education and only 19% had some or completed university or equivalent training.
- The survey sample consisted of substantially more people with a lower level of formal education when compared to the 1996 census data. Again this could be due to the sample selection criterion (i.e. household members who looked after the lawn) that resulted in a sample containing a higher percentage of older people who many years ago might not have had the same opportunity as the younger people today to pursue higher levels of education. Indeed, the Special Census Tabulations from the Canadian Council of Social Development showed that in 1996 the percentage of people with post-secondary education was highest (52%) among the 25-34 age group, and lowest (15%) among the 75+ age group.

Table 5. Highest level of education of the survey respondents and the City population

Highest level of schooling	Survey respondents (%) ¹	City (%) ²
Less than grade 9	38	12
Some or complete high school	43	33
Some or complete university/certificate or higher	19	55
Total	100	100

¹ Survey respondents 18 years and older

² City population 15 years and older

Source: Lawn pesticide telephone survey, Toronto Public Health, 2001

Household Income

- Compared to the City population, the survey sample under-represented the very low income groups (<\$20,000) and over-represented the high income groups (\$80,000 and over) (Table 6). Note that over one-third (36%) of the respondents did not provide information about their household income.
- Several factors might have accounted for the difference in household income between the survey respondents and the City population:
 - (a) The 1996 census data included the 15-18 age group who would be expected to have a lower income, whereas the survey sample included only those aged 18 or older.
 - (b) Since the survey intentionally sought respondents who lived in a house with a lawn, it is quite likely that in general, those who could afford to live in a house with a lawn had a higher income than those living in apartment buildings or other forms of housing.
 - (c) It has been observed in many studies that individuals with very low incomes are less likely than those with average or higher incomes to respond to public surveys.

Table 6. Household income of the survey respondents and the City population

Household income	Survey respondents (%) ¹	City (%) ²
<\$20,000	4	24
\$20,000-\$39,999	21	25
\$40,000-\$59,999	21	19
\$60,000-\$79,999	13	14
\$80,000-\$99,999	18	7
\$100,000 and over	23	11
Total	100	100

¹ Survey respondents 18 years and older

² City population 15 years and older

Source: Lawn pesticide telephone survey, Toronto Public Health, 2001

4.4 Awareness and Perception

- Respondents were asked two questions pertaining to their awareness of children’s vulnerability to lawn pesticides, one question about their awareness of a simple measure that can reduce the amount of pesticides tracked indoor, and two questions to ascertain their perception of lawn pesticides as environmental pollutants. The questions and the responses are shown in Table 7.
- Over 80% were aware that children were more likely than adults to be exposed to and to be harmed by lawn pesticides, and over 70% perceived lawn pesticides as a source of water and air pollution.
- Studies have shown that simple safety measures such as removing shoes before entering the house or placing a door mat at the entry to the house can effectively reduce the amount of lawn pesticides tracked inside (Nishioka et al, 1996). Sixty percent (60%) of the respondents appeared to be aware of or believed in removing shoes upon entry as a measure to reduce exposure to pesticides indoors.
- No consistent statistically significant relationship was detected between the socio-economic factors (gender, age, education, household income, living with young children) and the responses pertaining to awareness and perception.

Table 7. Respondents’ awareness and perception re: lawn pesticides

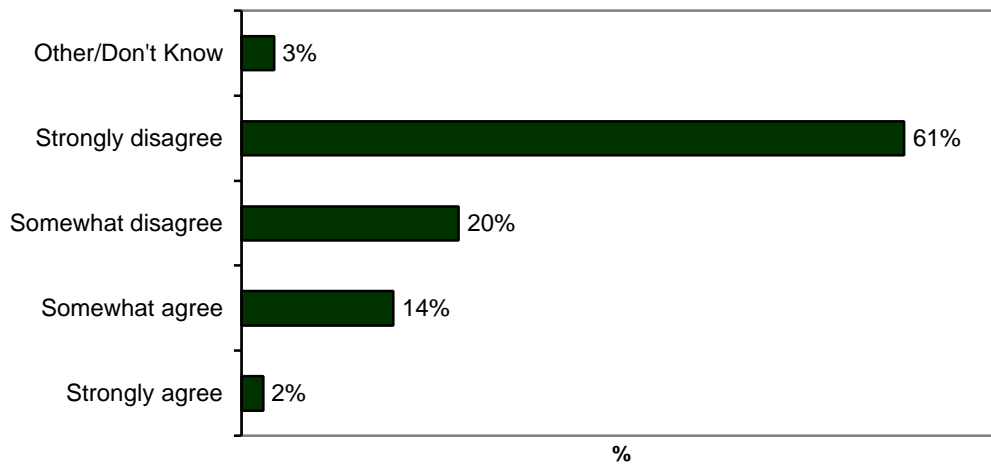
	Questions	Responses (%)
1	Children are less likely, about as likely, or more likely than adults to be exposed to lawn care pesticides?	81% more likely
2	Children are less likely, about as likely, or more likely than adults to be harmed by lawn care chemical pesticides?	82% more likely
3	People who walk over lawns treated with pesticides can reduce their chances of being harmed by taking off their shoes when they get home?	60% yes
4	Lawn care pesticides are a source of water pollution.	81% yes
5	Lawn care pesticides are a source of air pollution.	74% yes

Source: Lawn pesticide telephone survey, Toronto Public Health, 2001

4.5 Belief

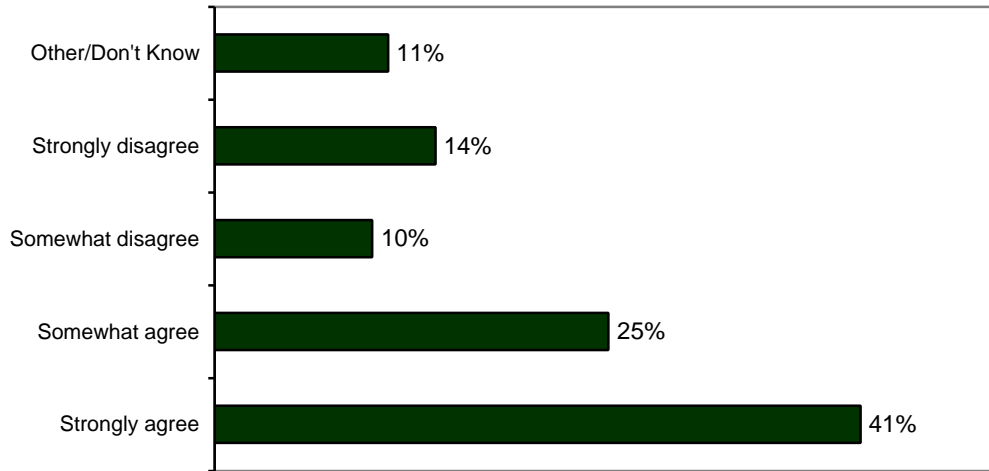
- Respondents were presented with three statements related to their beliefs in the necessity of lawn care pesticides in maintaining a healthy lawn, and were asked if they “strongly agreed”, “somewhat agreed”, “somewhat disagreed”, or “strongly disagreed” with each of the statements. Figures 1, 2 and 3 show the percentage responses to each question.

Figure 1. Percentage responses to statement “To maintain a healthy lawn, you must use chemical pesticides”, Toronto 2001



Source: Lawn pesticide telephone survey, Toronto Public Health, 2001

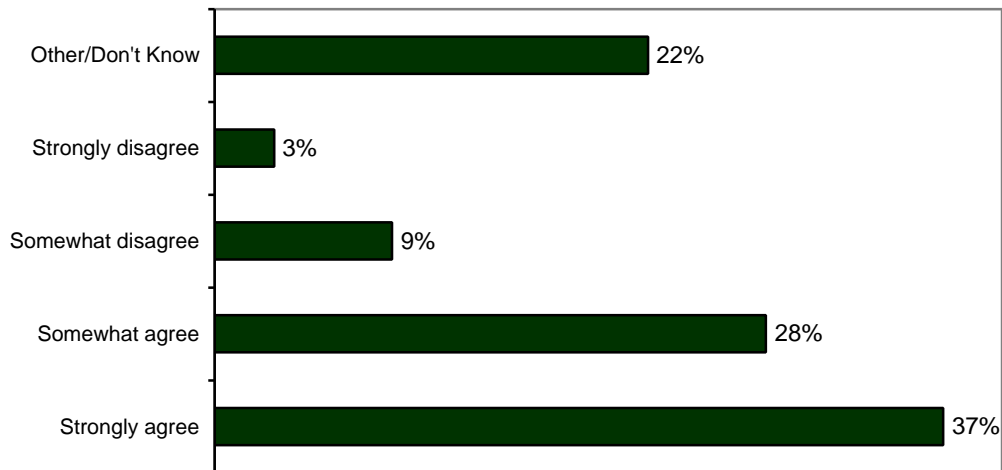
Figure 2. Percentage responses to statement “Lawn care pesticides should be used only when other methods of pest control have failed”, Toronto 2001



Percentages may not total to 100 due to rounding

Source: Lawn pesticide telephone survey, Toronto Public Health, 2001

Figure 3. Percentage responses to statement “Non-chemical alternatives are just as effective as chemical pesticides in maintaining a healthy lawn”, Toronto 2001*



Percentages may not total to 100 due to rounding

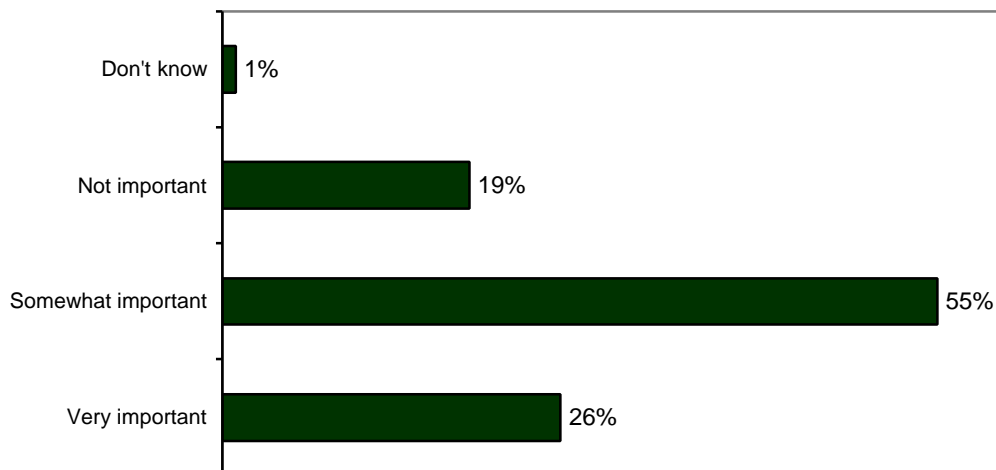
Source: Lawn pesticide telephone survey, Toronto Public Health, 2001

- The responses to these three statements are consistent with each other. The majority of the survey respondents did not believe that chemical pesticides were essential in maintaining a healthy lawn. Rather, most of them believed that lawn pesticides should be used as the last resort, and non-chemical alternatives were just as effective as chemical pesticides in maintaining a healthy lawn.
- Respondents who had had no formal education were less likely than those with some formal education to agree with the statement “non-chemical alternatives are just as effective as chemical pesticides in maintaining a healthy lawn” ($p < 0.01$, $OR = 0.4$, $95\% CI - 0.2, 0.79$). Also worth pointing out is the relatively high percentage (22%) of respondents who answered “other” or “don’t know” to the statement.

4.6 Value

- Two questions were asked to assess how much value respondents placed on a weed-free and insect-free lawn. A minority of respondents (less than 20%) said it was “not important” for their lawns to be weed-free or insect-free. Figures 4 and 5 show the percentage responses to these two questions.
- There were no significant differences in the socio-economic or demographic factors considered (gender, age, education, household income, living with young children) or size of lawns between respondents who valued weed-free or insect-free lawns and those who did not.

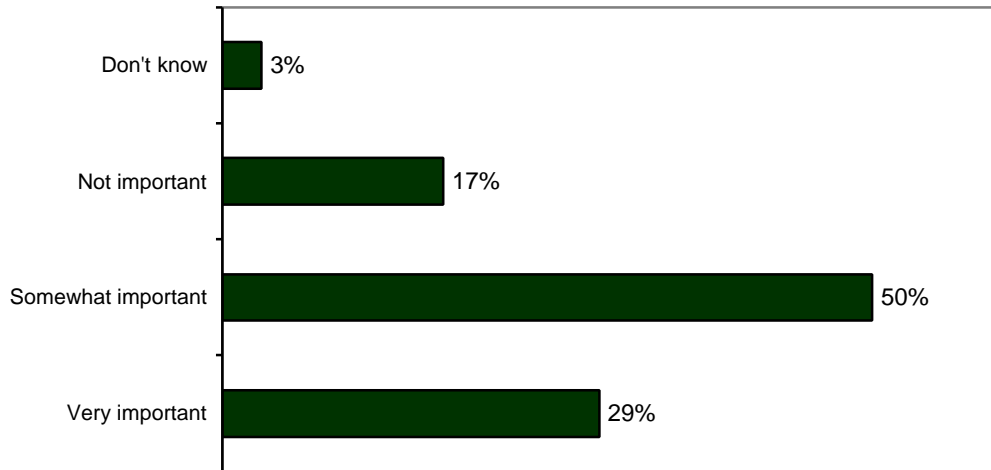
Figure 4. Percentage responses to question “How important is it to you that your lawn has no visible signs of weeds...?”, Toronto 2001



Percentages may not total to 100 due to rounding

Source: Lawn pesticide telephone survey, Toronto Public Health, 2001

Figure 5. Percentage responses to question “How important is it to you that your lawn has no visible signs of insects...?”, Toronto 2001



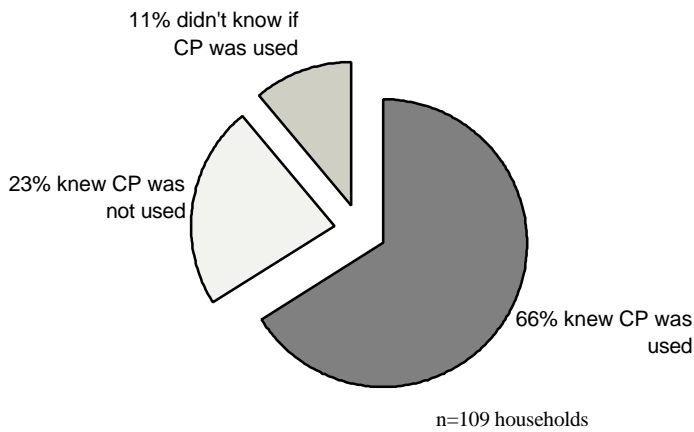
Percentages may not total to 100 due to rounding

Source: Lawn pesticide telephone survey, Toronto Public Health, 2001

4.7 Use of Professional Lawn Care Company

- About one-third (109 of total 341) of the respondents indicated that their lawns had been serviced by a professional lawn care company between 1999 and 2000.
- Among these 109 respondents, 66 percent (72 respondents) knew that the companies used chemical pesticides on their lawns, 23 percent (25 respondents) knew that the companies did not use pesticides, and 11 percent (12 respondents) did not know if pesticides had been used on their lawns (Figure 6).

Figure 6. Percentage of householders knowing if chemical pesticides (CP) had been used by their lawn companies, Toronto 2001

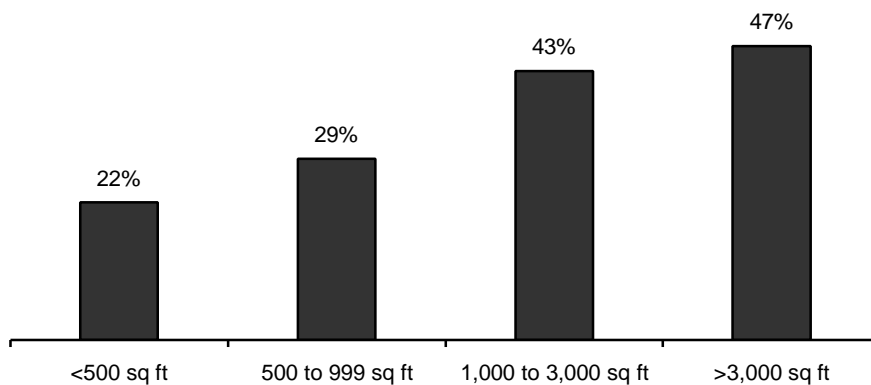


CP=Chemical Pesticides

Source: Lawn pesticide telephone survey, Toronto Public Health, 2001

- Figure 7 shows that lawn size is closely associated with the hiring of a lawn company. Respondents having a lawn greater than 1,000 sq. feet were three times more likely than those with a lawn smaller than 500 sq. feet to hire a lawn company ($p < 0.001$, OR=2.9, 95% CI-1.5,5.8).

Figure 7. Percentage of households hiring a lawn company by size of lawn, Toronto 2001

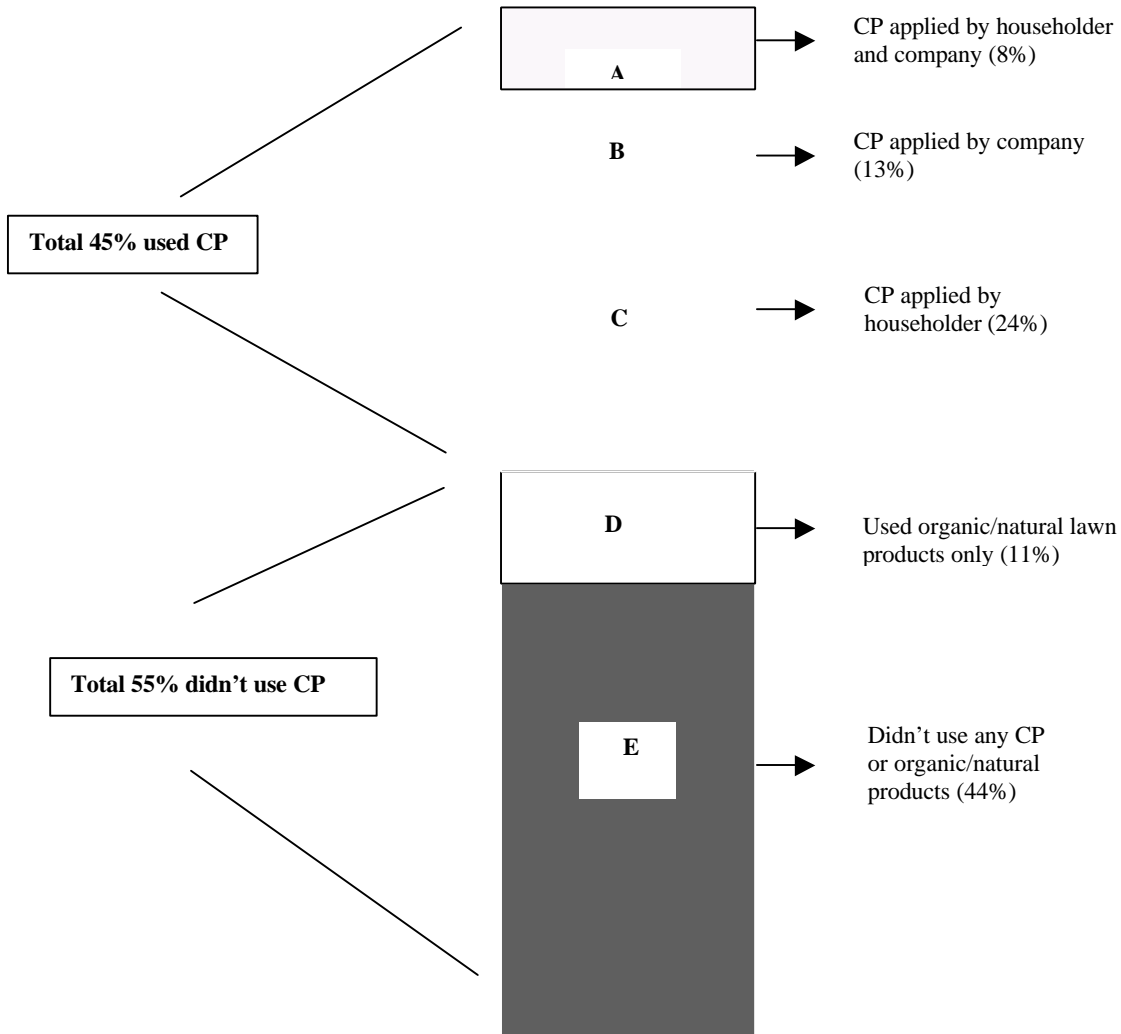


Source: Lawn pesticide telephone survey, Toronto Public Health, 2001

4.8 Use of Chemical Pesticides on Lawns for Weed or Insect Control

- One of the important findings of this survey is the percentage of households in Toronto using chemical pesticides on their lawns. Figure 8 displays the percentages of households using lawn pesticides or organic lawn products.
- Of the 341 households living in a house with a lawn, a total of 45% (i.e. A, B, and C in Figure 8), or nearly one in every two houses, had their lawns treated with chemical pesticides between 1999 and 2000. This could represent a substantial amount of chemical pesticides being released into the environment annually.
- Where there was treatment with chemical pesticides, 24% applied the pesticides themselves (C), 13% relied on the services of a professional lawn company (B), and 8% did both (A).
- The 45% pesticide application rate is, however, probably an under-estimate of the true pesticide application rate because:
 - (i) Among those who applied the chemical pesticides themselves, some might have used products such as “weed and feed” but were not aware that these products contain active pesticide ingredients;
 - (ii) Among those who hired a lawn care company in the past two years, 11% reported that they did not know if the company had used any chemical pesticide on their lawns.
- Of the 55% which did not use any chemical pesticides in the past two years, 11% used organic or natural lawn products (D), and 44% did not treat the lawn with either chemical pesticides or organic/natural lawn products (E).

Figure 8. Percentage of households using chemical pesticides (CP) or organic lawn products on their lawns, Toronto 2001



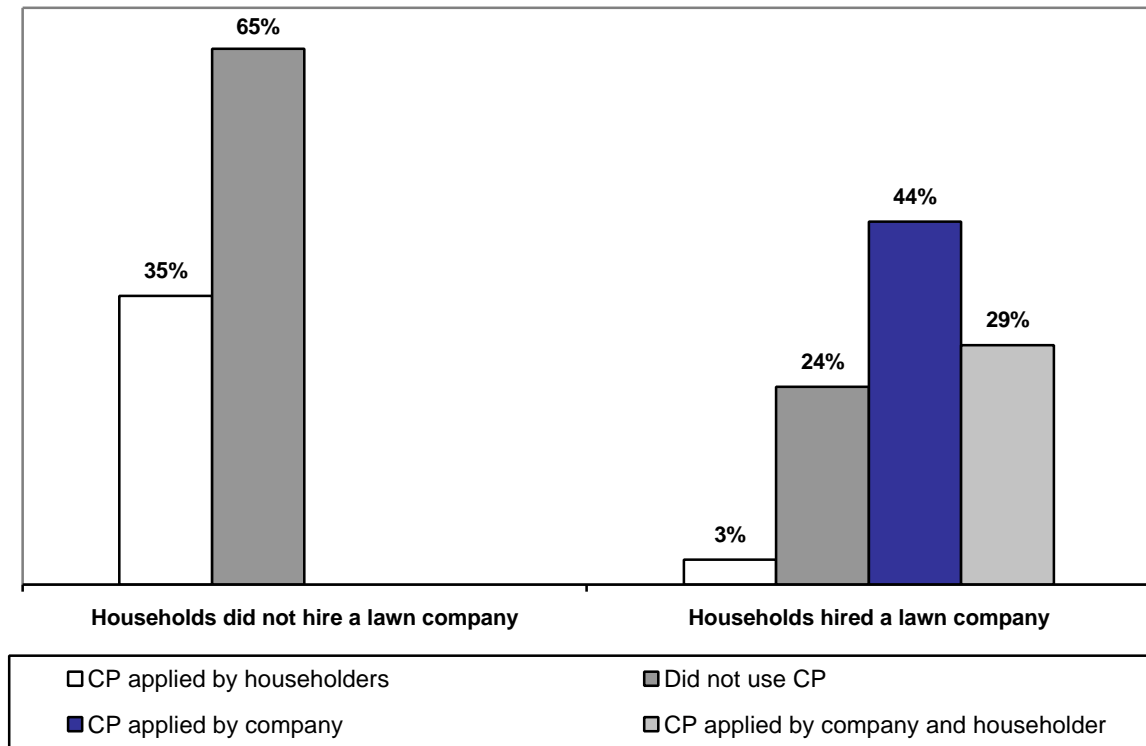
CP= Chemical Pesticides

Source: Lawn pesticide telephone survey, Toronto Public Health, 2001

4.9 Factors Associated with Use of Lawn Pesticides

- Respondents whose lawns had been treated with chemical pesticides in the past two years did not differ significantly from those whose lawns had not been treated in terms of their gender, age, education level, household income, and whether the respondents were living with children.
- How much value respondents placed on a weed-free or an insect-free lawn was significantly associated with their use of lawn pesticides. For example, 60% of those saying that it was “very important” to have a weed-free lawn used lawn pesticides, compared to only 23% of those indicating that it was “not important” to have a weed-free lawn used lawn pesticides ($p < 0.0001$, $OR = 4.9$, $95\% CI = 2.2, 10.9$).
- In addition, hiring of a professional lawn company was significantly associated with use of lawn pesticides. Households hiring a lawn company in the past two years were six times more likely to have their lawns treated with pesticides than those not hiring a lawn company ($p < 0.0001$, $OR = 6.1$, $95\% CI = 3.4, 10.8$). Figure 8 below compares the percentage of lawns treated with chemical pesticides between households hiring and not hiring a lawn company.

Figure 9. Use of chemical pesticides (CP) on lawns between households hiring and not hiring a lawn company, Toronto 2001

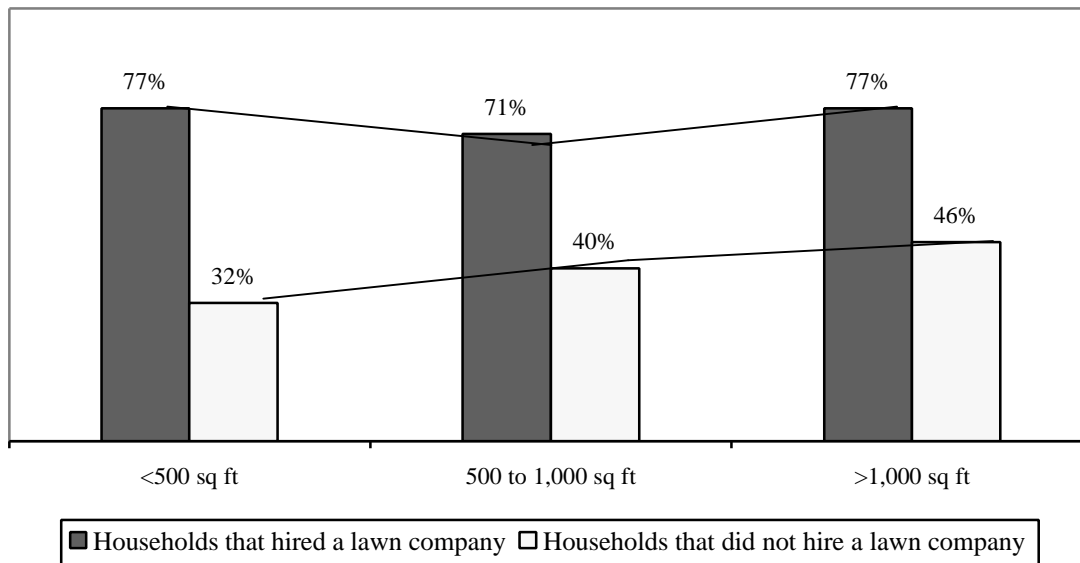


CP= Chemical Pesticides

Source: Outdoor pesticide telephone survey, Toronto Public Health, 2001

- Among households that hired a lawn company, regardless of the size of their lawns, over 70% of them used chemical lawn pesticides. On the other hand, for households that did not hire a lawn company, the larger the lawn, the more likely the householders were to have applied lawn pesticides themselves. This is better illustrated in figure 10.

Figure 10. Relationship between lawn size and use of lawn pesticides between households that hired and did not hire a lawn company, Toronto 2001



Source: Outdoor pesticide telephone survey, Toronto Public Health, 2001

4.10 Precautionary Information Regarding Use of Lawn Pesticides

- Of the 72 respondents who knew that the companies used chemical pesticides on their lawns, four additional questions were asked to assess what precautionary information (if any) they had been given. The results are illustrated in Table 8.

Table 8. Precautionary information received from lawn care companies

Questions		Yes (%)
1	Did they tell you the specific types of chemical pesticides they used on your lawn?	43%
2	Did they tell you the specific reason they used chemical pesticides on your lawn?	58%
3	Were toys, garden tools, lawn decorations and easy to move garden furniture removed from the lawn before the pesticides were used?	46%
4	Were you told to close your doors and windows before the pesticides were used?	60%

Source: Lawn pesticide telephone survey, Toronto Public Health, 2001

- The 109 respondents who had applied chemical pesticides on their own lawns in the past two years were asked three additional questions to determine if they had taken certain precautions. (Table 9).

Table 9. Precautions taken by homeowners when using chemical pesticides on their lawns

Questions		Answered Yes (%)
1	Did you make sure that young children did not walk over the lawn after you used the pesticide?	83%
2	Were toys, garden tools, lawn decorations and easy to move garden furniture removed from the lawn before the pesticides were used?	74%
3	Were efforts made to keep pets from walking across the lawn after the chemical pesticides were applied?	63% (of those who have pets)

Source: Lawn pesticide telephone survey, Toronto Public Health, 2001

4.11 Sources of Information

- Six questions were asked to help Toronto Public Health determine the best way of providing residents with information about the use of alternatives to chemical pesticides. Sending a brochure or putting an article in a newsletter, newspaper or magazine were favoured as a source of information over other sources (Table 10).

Table 10. Respondents' preferred sources of information

Questions		Very Likely	Somewhat likely	Not likely	Other/don't know	Total
1	If a brochure about using alternatives to chemical pesticides on lawns was sent to you, would you be very likely, somewhat likely, or not likely to read it?	63%	24%	11%	1%	100%
2	How likely is it that you would attend a free information session about using alternatives to chemical pesticides on your lawn, would you say very likely, somewhat likely, or not likely?	13%	22%	62%	4%	100%
3	How likely is it that you would read an article in a newsletter, newspaper or magazine about the use of alternatives to chemical pesticides on lawns?	52%	34%	12%	2%	100%
4	What about checking the City of Toronto web site?	12%	23%	44%	21%	100%
5	Calling a City of Toronto helpline for information or to ask a question about using alternatives to chemical pesticides on the lawn: would you be very likely, somewhat likely or not likely to do this	15%	25%	58%	2%	100%
6	What about having someone from the City or a community group with expertise on using alternatives to chemical pesticides visit your home to provide free information and answers to any questions you might have?	25%	24%	48%	4%	100%

Percentages may not total to 100 due to rounding

Source: Lawn pesticide telephone survey, Toronto Public Health, 2001

- When responding to question 4 regarding using the City's website, about 19% or 64 respondents pointed out that they either did not have a computer or internet access, or they did not use a computer.
- Age of the respondent was related to how they would like to receive the information. Overall, respondents 40 years or older were two to three times more likely than their younger counterparts to read a brochure ($p < 0.001$, $OR = 2.4$, $95\%CI -1.4, 4.1$) or a printed article ($p < 0.001$, $OR = 3.0$, $95\%CI -1.7, 5.1$).
- The three sources of information: attending an information session, checking a City website, and calling a City hotline, that were favoured by only a minority of respondents were also mechanisms that would require the respondents to play a more active role in obtaining the information, when compared to receiving information in mail or reading a newspaper or magazine article.

4.12 Awareness of City's Pesticide Reduction Initiatives

- Nearly half of the respondents were aware of the City's recent initiative to phase out the use of pesticides on parks and sport fields. The helpline on composting and advertisement in newspaper that encouraged people to use less chemical pesticides on their lawns were known by over 40% of the respondents, whereas the pesticide-free lawn sign and the helpline on lawn care were known by less than 20% of the respondents (Table 11).

Table 11. Respondents' awareness of the City's pesticide reduction initiatives

Questions		Yes (%)
1	Did you know that the City of Toronto offers a free sign that residents can post on their lawn or garden to indicate it is "pesticide-free"?	18%
2	Did you know they have a helpline that provides information on lawn care?	12%
3	A helpline that provides information on composting?	40%
4	Did you know that the City of Toronto is phasing out its use of pesticides on parks and sports fields?	47%
5	Did you recall seeing a City of Toronto advertisement in newspaper that encouraged people to use less chemical pesticides on their lawns?	42%

Source: Lawn pesticide telephone survey, Toronto Public Health, 2001

- Age appears to be a factor relating to respondents' awareness of certain information. Respondents who were 60 or older were more likely than the younger group to be aware of the City's initiative to phase out pesticides on parks and sport fields ($p < 0.01$, $OR = 1.9$, $95\%CI -1.3, 3.3$). The 60 or older age group was also more aware of the newspaper advertisement encouraging people to use less pesticide on their lawns ($p < 0.05$, $OR = 1.9$, $95\%CI -1.1, 3.3$) as compared to the younger age groups.

4.13 Attitudes Towards Restrictions in Use of Lawn Pesticides

- Respondents were given a statement in relation to their attitudes towards use of lawn pesticides as a matter of property rights. Table 12 lists the percentage responses to the statements.

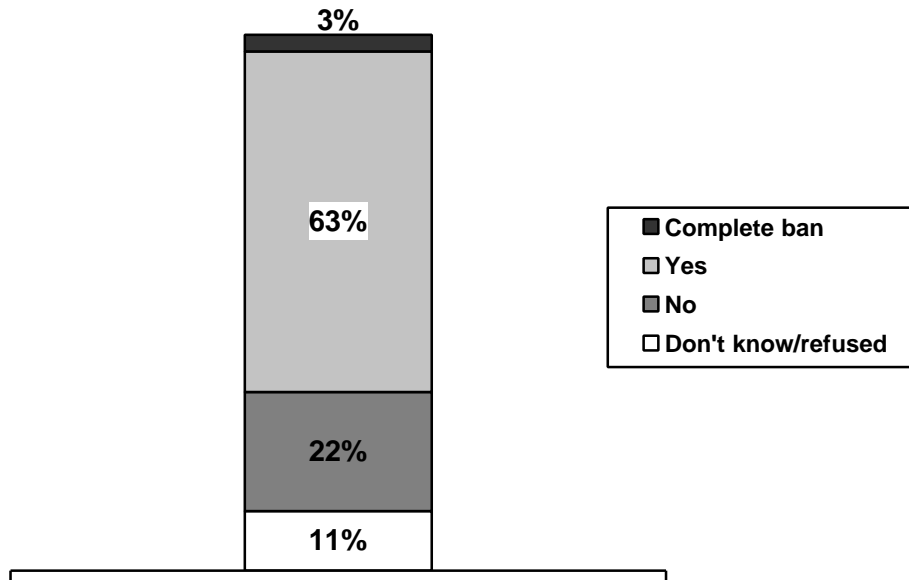
Table 12. Respondents' responses to a statement about using lawn pesticides as a private right matter

Statement: <i>When it comes to using chemicals on lawns, some people think that as long as what they're doing is on their own lawn they should have the right to do whatever they want. What about you? Do you think people have the right to decide about this or do you think the use of chemicals on lawns should be controlled?</i>	
Responses:	
"People should have the right to decide"	18%
"Use of chemicals on lawns should be controlled"	72%
"Should be banned completely"	3%
"Should be controlled but enforcement impossible"	2%
"Don't know/not sure"	5%

Source: Outdoor pesticide telephone survey, Toronto Public Health, 2001

- When asked if they thought that the City of Toronto should restrict the use of pesticides on golf courses, school yards, and university and college campuses, 78% said that they would support such a restriction. This percentage finding is accurate within +/- 4%, 19 times out of 20.
- When asked if they thought that the City of Toronto should restrict the use of pesticides on residential lawns, 66% supported the restriction (i.e. 63% answered "yes" and 3% voluntarily said "complete ban"). This percentage finding is accurate within +/- 5%, 19 times out of 20. Figure 11 shows the percentage distribution of responses to this question.
- Gender appears to play a part in respondents' attitudes towards restricting pesticide use on golf courses, school yards, and university and college campuses. Female respondents (90%) were more likely to support such restrictions than male respondents (81%) ($p < 0.05$, OR=2.2, 95% CI- 1.1,4.6).
- Whether respondents used lawn pesticides in the past two years was directly related to their attitudes towards restricting use of lawn pesticides on public and residential properties. Those who did not use lawn pesticides were more likely to be supportive of the restrictions: 84% of those who didn't use lawn pesticides supported the restriction on residential properties, whereas only 67% of those using lawn pesticides were supportive ($p < 0.001$, OR=2.6, 95% CI-1.4,4.7).

Figure 11. Percentage responses to question: “What about using pesticides outdoors on residential properties, do you think the City should restrict this?”, Toronto 2001



Percentages may not total to 100 due to rounding
Source: Lawn pesticide telephone survey, Toronto Public Health, 2001

5.0 IMPLICATIONS ON PUBLIC HEALTH PROGRAMS AND POLICIES

A number of this survey's findings are consistent with the findings of the 2001 national poll conducted by Ipsos-Reid on behalf of the pesticide manufacturers (Ipsos-Reid Corporation, 2001). The two surveys are comparable in a number of areas: both were randomized public telephone surveys, both specifically targeted people who lived in a house and who were responsible for lawn care decisions, and both used the two years preceding the survey as the reference time in their questions. The findings on the percentage of households using lawn pesticides compare well between the current Toronto-specific survey (45%) and the Ontario data from the national poll (52% and 42% of Ontario households used weed control and pest control products respectively). Also, both the Toronto survey and the national poll found that over 80% of those interviewed wanted to have a lawn and garden free of weeds or insects. Discrepancies were noted between the current survey and the national poll in two areas:

- (1) A higher percentage of Toronto households (32%) had used the professional lawn services compared to less than 20% of Canadian households as reported by the 2001 national poll;
- (2) Two-third of the respondents to the current survey supported the City restricting uses of pesticides on residential lawns. The Ipsos-Reid poll reported that 42% would support the Federal government's proposal to prohibit the sale and use of weed control products. There are however major differences in the questions asked by the two surveys; for example, the current survey used the word "restriction" while the Ipsos-Reid poll used "prohibition".

The present Toronto-specific survey has shown that the conventional North American desire for a "perfect" lawn is still a strong social norm in today's Toronto population; about 50% of the respondents said that it was "somewhat important" and 30% said "very important" to have a lawn with no visible weeds or signs of insect damage. The survey also found that those who valued a perfect lawn most (i.e. those answered "very important") were more likely to use lawn pesticides than those who didn't. This suggests that one of the priorities for the City's pesticide reduction program should be to shift the public's expectation from a conventional "perfect" lawn to other landscape options such as naturalized gardens and turf alternatives that require less maintenance and pesticides.

The survey found that the use of lawn pesticide was strongly associated with hiring of a professional lawn company, suggesting that the application of chemical pesticides was still the most common service currently offered by lawn companies. The survey also suggests that the professional lawn care companies need to improve the relaying of precautionary and other information to their residential clients.

According to the survey, the majority of Toronto residents were aware of lawn pesticides' potential impacts on health and the environment. It is therefore possible that householders might not have chosen chemical pesticides were they given the choice of non-pesticide alternatives, particularly if they are comparable in cost and effectiveness to pesticide methods. The City's pesticide reduction initiatives should, therefore, (1) demonstrate to the public and the lawn care industry that non-pesticide methods can be as effective as the chemical pesticide methods in terms of preventing and controlling insect and weed infestations; (2) promote and help encourage professional lawn care companies to offer their customers pesticide-free programs that are comparable to the pesticide methods with respect to cost and effectiveness.

Findings from this survey have helped characterise the target population to whom the City's pesticide-reduction initiatives should be directed. In Toronto, and probably in most other cities and suburbs in Canada, lawn care decisions are mostly made by the older adults such as parents or grandparents in a household. This subset of the population as a whole has higher household income but lower education level when compared to the general population in Toronto. The higher income level is probably a result of the survey's selection criterion which included only respondents who could afford to live in a house with a lawn. It is known that the older cohorts tend to have an overall lower education level than the general population probably because years ago they did not have the same education opportunities as the younger generations enjoy today. Understanding the characteristics of the target population has a major bearing on the success of any effective public education or social marketing programs. For example, when asked how they would like to receive information about pesticide alternatives, most of the target population preferred printed education materials (such as newspaper articles and brochures) to internet or workshops.

According to the survey, the majority of Toronto householders supported restricting outdoor use of pesticides on golf courses, school yards, and university and college campuses, and 66% supported restricting pesticides on residential lawns. In addition, almost 80% of the respondents disagreed with the belief that people should have the right to do whatever they want as long as it was on their own lawns. While there appears to be strong public support for the City to enact a by-law(s) regulating use of lawn pesticides on public and private properties, the extent of the legislative control and its implementation (e.g. phase-in vs. overall ban) need to be carefully examined and planned. Stakeholders, including the lawn care industry and the environmental and community groups, need to be consulted in the development of the options for the by-law. A subsequent public survey may be necessary to assess the public's opinions towards different by-law options and proposed implementation plan. Finally, any public education program or public policy aiming at reducing pesticide use should be evaluated for its effectiveness and efficiency. The survey findings can be used as a set of baseline data against which future changes in residents' use of lawn pesticides and their attitudes towards these products can be measured.

6.0 CONCLUSION

The survey has provided baseline data and information essential to the consideration of a by-law restricting use of lawn pesticides on public and residential properties in Toronto. According to the survey, nearly one in every two houses in Toronto had used chemical lawn pesticides in 1999-2000.

The survey has also suggested a discrepancy among Toronto householders, between what they believe and what they actually do. On one hand, they are aware of the harmful effects of lawn pesticides on health and the environment, and of the fact that a healthy lawn can be maintained without using pesticides. On the other hand, keeping a perfect or close to perfect green lawn is so desirable that many of them resort to chemical pesticides. This is particularly true if they own a large lawn, or if they hire a professional lawn company. There is, however, strong public support to regulate the use of lawn pesticides on public as well as private residential properties.

With regard to what the City can do to help reduce use of lawn pesticides, the survey results emphasize that householders would benefit by having more information about alternatives to use of chemical lawn pesticides, and information about landscape options other than the traditional green lawns. Professional lawn care companies should also be encouraged to offer their customers alternative lawn care programs that do not involve the use of chemical pesticides.

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