ATTITUDES OF THE GENERAL PUBLIC TOWARDS PESTICIDES AND QUEBEC'S NEW PEST MANAGEMENT CODE

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ABSTRACT

Between November 2003 and early March 2004, a survey of two groups of Lennoxville homeowners with opposing views on pesticide use was conducted for the purpose of developing an in-depth profile of their social characteristics as well as their awareness levels, beliefs and attitudes towards pesticides. A secondary purpose was to investigate what particular characteristics might be useful in determining each group's level of support for Quebec's new Pest Management Code. The study was conducted in partial fulfillment of an honours thesis for the Department of Environmental Science and Geography at Bishop's University. In addition to describing the process leading up to the enactment of Quebec's new Pest Management Code, this paper describes some of the findings from the survey.

RÉSUMÉ

Entre le mois de novembre 2003 et le début du mois de mars 2004, un sondage a été réalisé auprès des propriétaires de résidences de Lennoxville au sujet de l'utilisation des pesticides. Le but de ce sondage était de dresser un portrait détaillé des caractéristiques sociales des propriétaires, et d'examiner leurs croyances, attitudes et niveaux de sensibilisation envers les pesticides. Un objectif secondaire de ce sondage était d'étudier les caractéristiques particulières de chaque groupe dans le but de déterminer quel soutien ils apporteraient au nouveau Code de gestion des pesticides mis en place par le gouvernement québécois. Cette étude a fait partie d'une thèse de baccalauréat pour le département des sciences environnementales et de géographie de l'Université Bishop's. Ce texte décrit donc le processus menant à la mise en place du Code de gestion des pesticides, et fait part aux lecteurs des résultats du sondage.

Introduction

In recent years there has been mounting pressure from environmental groups as well as an ever-increasing body of evidence on the harmful effects of pesticides to the environment and human health (Leiss and Savitz, 1995; Ewart and Baker, 2001). This pressure has caused all levels of government in Canada to respond by placing tighter controls on the use of pesticides by homeowners (Basrur, 2002; Halifax Regional Municipality, 2002; Brakeman, 2001). In 2001, the Federal government created an Action Plan on the Urban Use of Pesticides (Healthy Lawns, 2001). Although the Province of Quebec was a full participant in the federal plan, the Quebec Provincial Government decided to go ahead with its own plan to limit pesticide use amongst homeowners and created the "Focus Group on Pesticides in Urban Areas". Their mandate, similar to that of the Federal Government, was to make recommendations to reduce residential exposure to the risks of pesticides and find ways to educate people to use alternatives to pesticides.

In making their recommendations to the Minister of Sustainable Development, Environment and Parks, the focus group invoked three principles that formed the basis of their decision-making processes. The first was the Precautionary Principle which stated that in the face of scientific uncertainty pesticide products that could affect human health or adversely affect the environment should not be used, and that this principle should be applied immediately. Second, the focus group favoured a pro-environmental management approach. This meant that methods should be adopted to prevent pest infestations and that less harmful products should be used in place of pesticides. Their third principle was "leading by example": by using alternative products in municipal and provincial parks, green spaces and on the grounds of schools and daycare centres, citizens could see that they can still have control over pests without resorting to pesticides. In total, the focus group made nine recommendations in their report, and these in turn were fully accepted by the Quebec government and enacted into law – the New Pest Management Code. The new code, which came into force in April 2003, controls the sale of pesticides containing certain banned chemical substances and their use by the general public. The regulations for the new code, backed up by fines for any infractions, will be phased in over a three-year period.

Submissions by members of the general public at both the Federal and Provincial Stakeholder meetings were almost non-existent. These stakeholder meetings were dominated by groups with polarized views on pesticide use – either strongly for or strongly against. As a result,

there is little information on how private individuals feel about the Pest Management Code. Researchers like Petry (1999) and Coppin, et al. (2002) are of the opinion that the success of a restrictive public policy like the Pest Management Code depends in part on the willingness of private individuals and general consumers to abide by the new legislation. For example, if the public feels that pesticide use is acceptable then they will view a total ban on the sale of pesticides negatively. This reaction would then make it difficult to implement the new Pest Management Code and could then lead to increased public pressure to review the legislation.

By phasing in the new Pest Management Code over a three-year period, the Quebec government hopes to cater to the increasing environmental concern of its citizens and alter the environmental behaviour of homeowners. However, Bamberg (2003); Rauwald, and Moore (2002) have noted that there is a weak link between environmental concern and specific environmental behaviour. Schultz and Zelezny (1999) and Stern and Dietz (1994) use a value-based theory for explaining the development of environmental concern in individuals. Their research shows that individuals develop environmental concern as a result of egoistic, social-altruistic, or biocentric values, and notes that the development of environmental concern is only the first step towards generating specific behaviour in an environmental situation. It is the attitude towards a specific behaviour that is the predictor for performing a certain environmental act. Ultimately, behavioural, normative, and control beliefs, when combined, strongly affect an individual's decision to conform to a particular environmental behaviour (Ajzen, 1991).

Methodology

The survey was conducted throughout Bishop's University's 2003–2004 academic year. In September and October of 2003, a Data Collection Guide was drafted along with an overview of the new Pest Management Code and its phased-in approach. The overview (www.menv.gouv.qc.ca – 2003) also contained the list of banned chemicals and products. The Data Collection Guide was divided into three sections. Respondents were required to read a prepared overview of the Pest Management Code prior to answering the survey. Both open-ended and closed-ended questions were used in the Data Collection Guide. Section One of the Guide addressed lawn and garden maintenance practices, the level of importance respondents placed on a weed-free lawn and garden, their beliefs about the effectiveness and need for pesticides as well as their attitudes towards pesticide use and

how they viewed the risk involved in using pesticides. Section Two of the Data Collection Guide focused on the respondents' awareness of the Pest Management Code and their level of support for the new code. Lastly, Section Three gathered demographic information on respondents such as gender, age, income, level of education and number of children living at home.

The samples used in the study were quota samples generated by placing an ad in a local newspaper and distributing flyers to local businesses in the Lennoxville area. The ad asked for people from the Lennoxville area willing to be interviewed on their views regarding pesticides, either for or against. Fifteen homeowners with pro-pesticide views and another fifteen individuals with anti-pesticide stances were interviewed. Distributive percentages from ordinal questions were used to enhance information gained from the in-depth interview process. The two groups were compared as to their similarities and differences to each other. A profile of the characteristics of each group was then created and served to determine their level of support for the Pest Management Code.

Findings

The quota sampling method used to obtain data provided several advantages. It allowed for an in-depth elaboration of individuals' feelings, beliefs and attitudes that a large-scale random sampling method would not always provide. As well, interviewing people in a home setting appeared to put them at ease and gave them sufficient time to reflect on their opinions. The disadvantage of obtaining the sample in this manner was that there was no control over the type of individuals who responded to the ads other than their stated view on pesticide use, either for or against. Therefore, the range of data for variables such as age, education and income may not be representative of the population for the Borough of Lennoxville as a whole. For example, the distribution of age categories for the pro-pesticide group contains a large number of individuals over age 64. However, in reviewing census data for Lennoxville and comparing this data with the Province as a whole, the Borough of Lennoxville has higher percentages for all age categories over 64 and these percentages increase dramatically with subsequent older age groups.

Demographic Data

Table 1 presents the demographic data for the survey. As can be seen, the anti-pesticide sample was dominated by young, well-educated

females. The majority of respondents in this group had an income varying from $40,000 to $79,000 and most had children still living at home. In contrast, the pro-pesticide group was made up mostly of males with the majority being over 55. Their education level was lower than the anti-pesticide sample and few had children living at home.

Lawn and Garden Maintenance

Table 2 presents the results for lawn and garden maintenance practices. The survey grouped questions on lawns and gardens separately as individuals tend to look after them in different ways. Members of the anti-pesticide group were more likely to look after both their lawn and garden themselves. As a result, 87% of the people in this group used alternatives to control weeds or chose not to spray their lawns. The garden practices for this group showed that they relied on alternatives or used no products at all on their gardens. Fully one third of this sample group had made a conscious decision to switch from pesticides to alternatives in their lawn or garden practices over a five-year period. In contrast, 87% of the pro-pesticide group sprayed their lawns themselves, or used a lawn-care company. They used a combination of alternatives and pesticides or alternatives only for garden use. No members from this group had made significant changes to their lawn and garden practices over a five-year period. Some members of this group had increased the percentage of alternatives to pesticides in lawn and garden maintenance.

Beliefs and Attitudes

As shown in Table 3, the majority of the anti-pesticide group attached no importance to a weed-free lawn or garden, nor did they feel that chemicals were necessary for a healthy lawn. This group was inclined to define a healthy lawn as being one with a variety of vegetation types and they viewed using chemicals as a way of destroying organisms that would normally be found in a healthy environment. They were happy with the success they achieved with alternatives. In contrast, the pro-pesticide group attached great importance to a weed-free lawn and found it necessary to use chemicals to keep their lawns weed-free and green all season long. Many from this group felt that the physical appearance of their lawn reflected on them as individuals. Some members of the pro-pesticide group believed that alternatives to chemicals were more expensive to use as they required repeated applications to work properly and the products themselves were expensive.

	Anti-Pesticide Group	Pro-Pesticide Group
Sample Size		
	15	15
Gender		
Female	11 (73%)	6 (40%)
Male	4 (27%)	9 (60%)
Age		
18-24	0	0
25-34	0	0
35-44	5 (33%)	1 (7%)
45-54	5 (33%)	4 (27%)
55-64	1 (7%)	3 (20%)
64 and older	4 (27%)	7 (47%)
Education		
Elementary school	0	0
Some high school	1 (7%)	1 (7%)
Graduated high school	0	10 (67%)
Some college	0	2 (13%)
Graduated College	3 (20%)	0
Some university	1 (7%)	1 (7%)
Graduated University	5 (33%)	0
Post Graduate	5 (33%)	1 (7%)
Income		
Less than $20,000	0	1 (7%)
$20-39,000	0	2 (13%)
$40-59,000	5 (33%)	6 (40%)
$60-79,000	5 (33%)	1 (7%)
$80-99,000	1 (7%)	2 (13%)
$100+	3 (20%)	0
Refused to answer	1 (7%)	3 (20%)
Children living at home		
No children	4 (27%)	1 (7%)
None at home	3 (20%)	9 (60%)
1 child at home	2 (13%)	3 (20%)
2 or more children at home	6 (40%)	2 (13%)

Table 1
Comparative Distributive Percentages for Demographic Characteristics
Anti-Pesticide and Pro-Pesticide Groups (figures rounded)

	Anti-Pest. Group	Pro-Pest. Group
Lawn/Garden Maintenance		
Look after maintenance myself	12 (80%)	10 (67%)
Have friend or relative do work	1 (7%)	2 (13%)
Hire lawn company to do work	2 (13%)	3 (20%)
Spraying of Lawn		
Spraying by lawn company	2 (13%)	6 (40%)
Does own spraying	0	7 (47%)
Does not spray lawn	13 (87%)	2 (13%)
Lawn-care practices		
Use chemicals only	0	9 (60%)
Use chemicals and alternatives	2 (13%)	4 (27%)
Use alternatives only	8 (53%)	0
Don't use either chemicals/alternatives	5 (33%)	2 (13%)
Garden-care practices		
Use chemicals only	0	1 (7%)
Use chemicals and alternatives	2 (13%)	6 (40%)
Use alternatives only	7 (47%)	4 (27%)
Don't use either chemicals/alternatives	6 (40%)	4 (27%)
Methods Used for Past Five Years		
Used pesticides only (no change)	0	8 (53%)
Pesticides and alternatives (no change)	2 (13%)	6 (40%)
Alternatives only (no change)	5 (33%)	0
Switched from pesticides to Alternatives (made change)	3 (33%)	0
Switched from alternatives to Pesticides (made change)	1 (7%)	0
Don't use pesticides or alternatives (no change)	2 (13%)	1 (7%)
Note: Percentages may not total 100% due to rounding		

Table 2
Lawn and Garden Maintenance Practices

Risk

Members of the anti-pesticide group viewed the risk of exposure to pesticides as being high, and long-term. Members of this group were aware that pesticides remain in the environment for many years once they have been used. While not using pesticides themselves, they still feel they are at risk to exposure from pesticides from those who do use them. The pro-pesticide group viewed their risk level from pesticide use to be low or moderate and felt they were only at risk during the time that they were actually applying the pesticides. Spraying once or twice

Importance of Weed-Free Lawn and Garden					
	Don't Know	Not Important	Somewhat Important	Very Important	
Anti-Pesticide	0	12 (80%)	3 (20%)	0	
Pro-Pesticide	0	1 (6.6%)	7 (46.6%)	7 (46.6%)	
Chemicals are Necessary for a Healthy Lawn and Garden					
	Don't know	Strongly Disagree	Somewhat Disagree	Somewhat Agree	Strongly Agree
Anti-Pesticide	1 (6.6%)	9 (60%)	5 (33.3%)	0	0
Pro-Pesticide	0	0	3 (20%)	10 (66.6%)	2 (13.3%)
Non-Chemicals are as Effective as Chemicals					
	Don't know	Strongly Disagree	Somewhat Disagree	Somewhat Agree	Strongly Agree
Anti-Pesticide	5 (33.3%)	0	1 (6.6%)	0	9
Pro-Pesticide	4 (26.6%)	2 (13.3%)	4 (26.6%)	5 (33.3%)	0
Level of Risk Exposure to Pesticides					
	Don't Know	No Risk (Don't use them)	Low Risk	Moderate Risk	High Risk
Anti-Pesticide	0	0	2 (13.3%)	3 (20%)	10 (66.6%)
Pro-Pesticide	1 (6.6%)	1 (6.6%)	9 (60%)	2 (13.3%)	2 (13.3%)
Pesticides as a Cause of Pollution					
	Pesticides a Source of Water Pollution	Pesticides not a Source of Water Pollution	Pesticides a Cause of Air Pollution	Pesticides not a Cause of Air Pollution	
Anti-Pesticide	15 (100%)	0	13 (87%)	2 (13%)	
Pro-Pesticide	7 (47%)	8 (53%)	4 (27%)	11 (73%)	
Pesticide Use Harms Health and Environment					
	Don't Know	Strongly Disagree	Somewhat Disagree	Somewhat Agree	Strongly Agree
Anti-Pesticide	0	0	0	0	15 (100%)
Pro-Pesticide	1 (6.6%)	0	1 (6.6%)	10 (66.6%)	3 (20%)
Level of Awareness of Pest Management Code					
	Aware of	Somewhat Aware of	Not Aware of		
Anti-Pesticide	4 (26.6%)	6 (40%)	5 (33.3%)		
Pro-Pesticide	3 (20%)	8 (53%)	4 (26.6%)		
Homeowners Have the Right to Use Pesticides					
	Don't Know	Strongly Disagree	Somewhat Disagree	Somewhat Agree	Strongly Agree
Anti-Pesticide	0	13 (86.6%)	2 (13.3%)	0	0
Pro-Pesticide	0	2 (13.3%)	1 (6.6%)	11 (73.3%)	1 (6.6%)
Support for Pest Management Code					
	Don't Know	Strongly Against	Somewhat Against	Somewhat Support	Strongly Support
Anti-Pesticide	0	0	0	1 (6.6%)	14 (93.3%)
Pro-Pesticide	1 (6.6%)	1 (6.6%)	6 (40%)	5 (33.3%)	2 (13.3%)

Table 3
Beliefs and Attitudes Towards Pesticides
Awareness of Pest Management Code

a year, they felt, was not a great risk if the pesticides were applied according to instructions on the label. Those who had their lawns sprayed by a lawn-care company felt that it was the company employee who sprayed their lawns that was exposed to risk and not the homeowners.

Awareness of Pesticide's Role in Pollution

Table 3 points to a difference between each group's awareness of how pesticide use pollutes our environment. The anti-pesticide group was aware of how pesticides enter environmental systems and how they can affect the life cycles and growth of many species and was aware of the difficulties of getting rid of pesticides once they are in the environment. This group's high awareness of the problems of pesticide pollution coupled with their views on pesticide use as being high-risk meant that they fully supported the statement that pesticide use harms our health and environment. The pro-pesticide group, in contrast, had a small-scale spatial view of damage to the environment from pesticide use. This group could only somewhat agree that pesticides were harmful to the environment. While they conceded that "pesticides are poisons", the majority of members from this group believed that individuals could control risk by careful handling of the product when they used it.

Awareness and Support of the New Pest Management Code

All respondents were asked to read an overview of the Pest Management Code before responding to this segment of the survey. The anti-pesticide group showed slightly higher levels of unawareness, and 33% were not aware of the new regulations at all until they read the overview statement of the code prepared for the survey, in contrast with 27% from the pro-pesticide group. A smaller percentage of anti-pesticide people were somewhat aware of the new code compared to the pro-pesticide group. In the interview process, it became apparent that while many of the people in the anti-pesticide group remembered hearing about or seeing articles about the new code, most of this group felt that these regulations did not apply to them as they did not use pesticides. Several of the anti-pesticide group were well aware of the new legislation and were delighted with it as it validated their present practices and beliefs. The rates of awareness of the new code amongst the pro-pesticide group can be attributed to the fact that they had been informed by their lawn-care company that they would not be able to use the same products next year as they would be illegal. Others

reported finding it difficult to find their favoured Weed and Feed products in the Spring of 2003 and had been informed by salespeople that they would not be able to purchase these products in the Spring of 2004. So while some people in the anti-pesticide group had read of the new changes in the news, on the radio or in magazines, most people in the pro-pesticide group had been informed of the new code when they either purchased pesticides or had their lawns sprayed. Members of the anti-pesticide group felt that controls should be put in place with regard to home pesticide use. Several individuals felt that "people don't have the right to harm others". Comments made by both the anti-pesticide and pro-pesticide groups indicate that pesticide use can be a source of friction between neighbours. The majority of pro-pesticide people somewhat agreed with the statement that homeowners should have the right to use pesticides on their private lawns. Interestingly, only one pro-pesticide member could strongly agree with this statement. The expressed views of many pro-pesticide people on this topic indicated that they had more difficulty with the idea of a government foisting a regulation on them than with the actual content of the legislation itself. After reading the pest management overview, several pro-pesticide people were angered that the law only applied to homeowners. Many were incensed that there was a delay for golf courses, and the fact that the law would not affect farmers or orchard owners to any great extent. In short, individuals from the pro-pesticide group were offended by a law that applied to some people, but not to others. Both groups, however, strongly agreed with the statement that pesticides should be banned in school yards, daycare centres, hospitals and public green spaces.

As was to be expected, the anti-pesticide group were strong supporters of the new code (93.3%). The pro-pesticide group had diverse opinions when ranking their level of support for the new code. While many were frustrated by the way the law would be applied, when it came down to the law in its entirety, most members of the pro-pesticide group realized that they did support some portions of the law.

Profiles and Characteristics That Indicate Level of Support for the Pest Management Code

As a result of surveying and interviewing members of both the anti-pesticide and pro-pesticide groups, it was possible to develop a profile for each group to establish them as types of respondents. As well, several characteristics for each group stand out as having an impact on whether these types of respondents will have a high or low level of support for the pest management code.

Anti-Pesticide Group

This particular group is dominated by women, who either look after lawn and garden maintenance themselves, or who have a strong input into lawn maintenance decisions. The anti-pesticide group was composed of individuals young enough to look after lawn maintenance themselves and the age categories of 35–44 and 45–54 dominate. These younger individuals (both male and female) are more supportive of the new code and are more aware of and more open to trying alternatives to pesticides. Individuals in this group are well educated with most having at least graduated from college and many having university and post-graduate degrees. The survey found that there was strong approval of the Pest Management Code amongst the anti-pesticide group which supports the research results of Bogner and Wiseman (1997), Sachs, et al. (1987) and Grieshop, et al. who have consistently found that young, well-educated urban dwellers display a higher level of support for environment regulations, thereby matching their behaviour with their attitude towards the environment. Due to their younger age levels, individuals from this group are apt to have at least one child living at home. Basrur (2002) found that families with younger children can be characterized as being strong supporters of environmental regulations. Members of this group have stopped using pesticides on their own lawns and gardens as a means of protecting their children from negative health problems, and therefore view the pest management code positively as a means of extending that protection. While placing little importance on having a perfect weed-free lawn, these individuals tend to look after their garden and lawn by alternative practices and do not favour chemical spraying but instead are aware of many simple, yet effective methods for controlling pests. Their successful use of alternatives obviates the need for chemicals. They view the risk with regard to pesticide use as long-term, and they see damage or harm occurring from pesticides as a cumulative process that takes many years. Well-read on research findings that attribute many health problems to pesticide use, they are knowledgeable on how pesticides cause water and air pollution by entering environmental systems. As such, they see the damage caused to the environment by pesticides as occurring on a large spatial scale. Therefore, types of individuals in this survey who view pesticide use as having large-scale impact with long-term risk were strong supporters of the new Pest Management Code. This group agreed that the provincial government did have the right to control pesticide use. They favoured educational methods to inform the public about the harm done by pesticides and published lists of suitable alternatives as

a means by which the Government could encourage general consumers to comply with the new code.

Pro-Pesticide Group

Male individuals in the 55–64 and older age bracket are characteristic of this group. Relatively few individuals have more education than high school and few have children living at home. They either have their lawn sprayed by a lawn-care company or spray their own lawns. Individuals in this survey who rely on lawn-care companies to look after their lawns are heavier users of pesticides. With regard to garden-care practices, they are more likely to use alternatives as well as pesticides. However, there is a tendency over the past several years to use more alternatives than pesticides in their gardens. These individuals attach a great deal of importance to the physical appearance of their lawn and garden, and link the way their yard looks to how people see them as individuals. As a result, they believe that pesticides are necessary to maintain the kind of lawn they desire. Fewer individuals in this group have tried lawn-care alternatives, and those who have see them as ineffective, too costly or too time-consuming. Individuals in this group view the potential risk from using pesticides as occurring at the time of use and have a limited understanding of risk occurring over a longer term accumulation period. They also view any environmental damage that can occur from pesticide use as being localized to a small area. The view that pesticide use has small-scale impact and short-term risk is characteristic of pro-pesticide individuals in this survey. Further, their view that they can control and minimize any danger from pesticides by proper use of the products encourages the belief that the small amount of risk they encounter is well worth the benefit of a good-looking lawn. These pro-pesticide individuals have a limited knowledge of how pesticides enter environmental systems and therefore have an incomplete awareness of how pesticides cause water and air pollution. While they agree that pesticides are poisonous and could harm the environment and people, they feel that only those individuals who don't use pesticides properly or overuse them are guilty of causing harm. There are other individuals from this group however, who continue to use pesticides out of habit, even though they believe pesticides do cause air and water pollution. Pro-pesticide individuals are strongly against the government interfering in the maintenance of their own property. While pro-pesticide members strongly support portions of the Code like the ban on pesticide use in schools, public places and daycare centres, they are less accepting of the Pest Management Code in its entirety.

Conclusion

Overall, the Lennoxville anti-pesticide group expressed similar values and beliefs to those of the representatives of the anti-pesticide stakeholders at both the Federal and Provincial Stakeholder meetings, and they strongly supported the new Pest Management Code. The Lennoxville pro-pesticide group, while not as supportive of the new code as the Lennoxville anti-pesticide group, was divided between being somewhat against the new code or somewhat supportive of it. Only one pro-pesticide group member could state that they were strongly against the code and two members of this group did in fact support the new law. The majority of this group of Lennoxville homeowners was supportive of the main thrust of the new legislation (the protection of children), and as a result was able to extend some support for the new law. This is in comparison with the strong aversion to the code expressed by Pro-Pesticide Stakeholders during government hearings on the subject.

The majority of the members of the Lennoxville anti-pesticide group had developed an egoistic pro-environmental attitude based on their beliefs that environmental degradation through pesticide use could affect them and their families personally. They viewed pesticide use as presenting large-scale environmental damage with long-term high risk leading to health problems. Only one individual in the anti-pesticide group exhibited a biocentric pro-environmental attitude developed through her belief that nature has intrinsic value. This group's situation-specific environmental behaviour can be attributed to their behavioural beliefs. Most members of this group were well educated on the consequences of pesticide use. Their satisfaction with alternatives to pesticides enhanced their control beliefs or conditions that lent support to their original decision not to use pesticides.

Several members of the Lennoxville pro-pesticide group expressed a pro-environmental attitude developed through egoistic or social altruistic values. Their situation-specific behaviour was controlled by their behavioural beliefs that pesticide use caused limited environmental degradation (small scale), had limited (controllable) short-term risk, and was cheaper and more effective to use than alternatives. There is indication that the shifting normative and control beliefs of these individuals may lead them to develop a more positive level of support for the Pest Management Code. Changing normative beliefs of the Lennoxville pro-pesticide group were reflected in their observations with regard to the expectations of other homeowners. Several members of this group were aware that their continued use of pesticides, especially when spraying their lawns,

caused friction between their neighbours and themselves. The fact that in 2006 fines will be charged for continued pesticide use will affect the control beliefs of these individuals by creating a hindrance for continuing with their present behaviour.

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