Pesticide Incident Reporting Program
Second Annual Report

April 26, 2008 - December 31, 2009

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Canada

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Foreword

Health Canada's Pest Management Regulatory Agency (PMRA) collects pesticide incident data under the authority of the *Pest Control Products Act*. If a pesticide manufacturer receives information about an incident involving one of their products, they are required by law to submit that information to the PMRA. All submitted incident reports are made publicly available on the Health Canada website, specifically, on the PMRA Public Registry at http://pr-rp.hc-sc.gc.ca/pi-ip/index-eng.php. The information presented in an incident report reflects the observations and opinions of the person reporting the incident, and does not include any assessment or validation by Health Canada, nor does it confirm an association between the pesticide and the effects reported.

This document, the Second Annual Report of the Health Canada Pesticide Incident Reporting Program, extends the reporting period by summarizing the incident reports received from April 26, 2008 to December 31, 2009. As well as providing an overview of reports received during the specified time frame, this document summarizes the PMRA's assessment of the more serious Canadian incident reports, the evaluation of signals detected in the incident reporting data, and continued outreach with registrants.

Executive Summary

Pesticide products are rigorously tested and evaluated for safety of use before and after they are registered. One way in which the PMRA continues to monitor the safety of pesticides after registration is by collecting and evaluating reports of incidents relating to pesticides. The purpose of the Pesticide Incident Reporting Program is to identify unforeseen risks to the health of Canadians and the environment from the use of pesticides and to take corrective actions in order to mitigate any identified risks.

The *Incident Reporting Regulations* have been in place since April 2007. Canadian pesticide manufacturers are required by law to report incidents whose effects relate to human or domestic animal health, the environment, pesticide residue, packaging failure or scientific studies which demonstrate an increased risk or new hazard. Additionally, American human death, human major and domestic animal death incidents in which the pesticide involved is related to a Canadian product must be reported to the PMRA.

From April 26, 2008 to December 31, 2008, 1205 incident reports were received by the PMRA. From January 1, 2009 to December 31, 2009, 1214 incident reports were received. In 2008, 36% of the incidents reported occurred in the United States, while in 2009 the percentage of incidents occurring in the United States was 46%.

In both 2008 and 2009, the majority of incident reports received by the PMRA were domestic animal incidents, followed by human, environment, packaging failure, and scientific study incidents. In the entire reporting period (April 26, 2008 to December 31, 2009), there were 1760 domestic animal incidents (889 Canadian and 871 American), 505 human incidents (386

Canadian and 119 American), 93 environmental incidents (89 Canadian and 4 American), 49 packaging failure incidents (all Canadian) and 24 scientific study incidents reported. As one incident report may contain multiple incident categories (i.e. packaging failure and human effects) the sum of the reports by category will be higher than the overall number of incident reports received.

The incident reporting database is used by scientific evaluators to look for trends and additional information about pesticides to support the risk assessment process. In addition to this work, two serious Canadian human incidents were evaluated for causality during the reporting period covered; no regulatory action was required as a result of the evaluation of these incidents. As well, in 2009 the PMRA undertook an extensive data analysis of the incidents reported for spot-on flea and tick control products with the goal of identifying the risks and potential causes in order to make appropriate changes to reduce the risk and, hence, the number of future incidents. As a result of the analysis, the PMRA published Regulatory Directive 2010-02 to strengthen the labels of spot-on pesticides used on companion animals for flea and tick control. It is anticipated that the measures outlined in the directive will be a positive step towards reducing the number of incidents that may occur from the use of these products. Finally, a survey of registrants was also conducted in 2009, in conjunction with PMRA's Compliance group, to determine registrants' understanding of the *Incident Reporting Regulations* and of their requirements to report. This project provided valuable contact with registrants regarding incident reporting. Overall, this project increased registrant awareness and understanding of the incident reporting requirements.

1.0 Introduction

In order to improve the capacity to monitor health and environmental incidents related to pesticide use and exposure, the Pesticide Incident Reporting Program (IRP) collects and evaluates information relating to pesticide incidents.

According to Section 1 (1) of the *Incident Reporting Regulations* (IRR), an incident is an effect that relates to health or environmental risks or to the value of a pesticide. Any incident must be reported by the manufacturer if it involves humans; domestic animals; the environment; packaging failure that could result in human exposure or injury; excessive residues in food; or scientific studies that indicate a new hazard, increased risk or the presence of a component or derivative at higher concentrations than previously known.

Furthermore, the IRR define severity classifications for human, domestic animal and environmental incidents. The severity categories are death (human and domestic animal incidents only), major, moderate and minor.

Detailed information regarding the Incident Reporting Program is available on the Health Canada website.

2.0 Incident Report Data

2.1 Explanation of Data

In the first year of the IRP (April 26, 2007 to April 25, 2008), 934 incidents were submitted to the PMRA, as described in the First Annual Report of the Health Canada Pesticide Incident Reporting Program at http://www.hc-sc.gc.ca/cps-spc/pubs/pest/_corp-plan/irp-rap-ann-rep/index-eng.php. In order to enable future reporting of incidents received by calendar year, this second annual report will cover the period in 2008 not included in the first report (April 26 – December 31, 2008) as well as all of 2009 (January 01 – December 31). All future annual reports will be based on the calendar year.

For the purpose of this report, data received by the PMRA between April 26 and December 31, 2008 is called '2008 data'. The term '2009 data' refers to all incidents received from January 1 to December 31, 2009. The data are presented for 2008 and 2009 separately unless otherwise indicated and, where appropriate, the data are compared with the number of incidents reported in the first annual report.

2.2 Number of Incident Reports Received

During the entire reporting period (April 26, 2008 to December 31, 2009), there were 2419 incident reports submitted to the PMRA. From April 26 to December 31, 2008, 1205 incident reports were received by the PMRA, representing 81% of all incident reports received in the calendar year of 2008 (i.e., 1487 incident reports). In 2009, 1214 incident reports were received by the PMRA.

In both 2008 and 2009, the majority of incident reports received by the PMRA were domestic animal incidents, followed by human, environment, packaging failure, and scientific study incidents. In the entire reporting period (2008 and 2009), there were 1760 domestic animal incidents (889 Canadian and 871 American), 505 human incidents (386 Canadian and 119 American), 93 environment incidents (89 Canadian and 4 American), 49 packaging failure incidents (all Canadian) and 24 scientific study incidents reported. As one incident report may contain multiple incident categories (i.e. packaging failure and human effects) the sum of the reports by category will be higher than the overall number of incident reports received.

In 2008, 36% of the incidents reported occurred in the United States, while in 2009 the percentage of incidents occurring in the United States was 46% (in the first year of the program 39% of the incidents reported occurred in the United States). Pesticide manufacturers are only required to report a subset of American incidents to the PMRA (human death, human major and domestic animal death incidents in which the pesticide involved is related to a Canadian product), therefore the number of American incidents reported to the PMRA does not reflect the total number of incidents that are reported in the United States annually.

The majority of human incidents that occurred in Canada were moderate or minor in nature (Table 1). Canadian domestic animal incidents in both 2008 and 2009 were also predominantly moderate and minor. The majority of environment incidents reported were minor.

Table 1: Reported Canadian Incidents by Severity

Category	Death		Major		Moderate		Minor	
Year	**2008**	**2009**	**2008**	**2009**	**2008**	**2009**	**2008**	**2009**
Human	1		1	1	29	29	179	176
Domestic Animal	21	34	19	20	155	156	338	220
Environment				1	4	12	44	32

2.3 Number of Incident Reports by Application Site

The majority of human incidents were associated with the use of pesticides in and around the home. Personal use pesticides (i.e. insect repellents) also accounted for a significant number of human incidents. More than two thirds of the domestic animal incidents involved the application of pesticides directly to the animal, in particular, the flea and tick control products used on cats and dogs. Environmental incidents, the majority of which were minor, were predominantly associated with the application of pesticides in residential settings outside of the home.

2.4 Type of Product Reported

From April 26 to December 31, 2008, 58% of all incident reports identified a specific pesticide product registration number. This number dropped to 46% in the 2009 reporting period. In both 2008 and 2009, the majority of end-use products reported were domestic class products used to control fleas and ticks on cats and dogs. Domestic class weed and insect killers were also reported frequently.

2.5 Summary of Human Incidents

In 2008 there were 257 human incident reports submitted with 269 people affected. In 2009, 248 human incident reports were received with 267 people affected.

In both 2008 and 2009, the majority of human incident reports were the result of the application of a pesticide in a non-occupational setting. The majority of subjects were between 19 and 64 years of age, using the product in or outside the home. The most common routes of exposure were respiratory and skin.

The most frequently reported symptoms were all minor in nature (minimally bothersome symptoms that typically resolved rapidly). Skin and respiratory effects were most commonly reported, followed by gastrointestinal and nervous and muscular effects. During the entire reporting period, eye irritation, nausea, rash, headache and shortness of breath were the most frequently reported symptoms.

2.6 Summary of Domestic Animal Incidents

In 2008 there were 876 domestic animal incident reports submitted with 1595 animals affected. In 2009, 884 domestic animal incident reports were received with 1226 animals affected.

In both 2008 and 2009, the majority of animals affected were cats and dogs following direct treatment with a pesticide, usually to control fleas and ticks. As expected, the most common route of exposure was via the skin. The outcome of the majority of domestic animal incidents was death; however, as mentioned in Section 2.2, this is a result of the IRR requiring registrants to submit all American domestic animal death incidents. For Canadian domestic animal incidents, the outcome of the majority of incidents was 'fully recovered'.

Many of the symptoms experienced by domestic animals were minor in nature. The majority were gastrointestinal or general effects. Nervous and muscular system effects such as convulsions and tremors were also observed, and are considered moderate in nature. In both 2008 and 2009, lethargy, vomiting, anorexia, abnormal behaviour and tremors or convulsions were among the top symptoms reported.

2.7 Summary of Environmental Incidents

In 2008 there were 49 environmental incident reports submitted. In 2009, 44 environmental incident reports were received. Most environmental incidents involved only one type of organism, except for two reports which identified three different types of organisms affected.

The majority of environmental incidents involved effects on herbaceous plants and were associated with the application of pesticides in a residential setting. Visible injury and plant death were the most common symptoms reported. Although the number of incidents involving other types of organisms was low, a few incidents involved a large number of a particular type of organism (i.e. fish, honeybees).

3.0 PMRA Assessment of Incident Reports

Health Canada collects and assesses pesticide incident data to determine if there are any potential previously unidentified health or environmental risks associated with the use of a pesticide by (1) evaluating serious incidents individually to assess the likelihood that the pesticide caused the reported effect; (2) analyzing the complete database of incident reports for signals indicating potential risk; and (3) incorporating incident reports into the decision making process for the regulation of pesticides.

The information provided in a single incident report is generally not sufficient to determine if the level of risk associated with the use of the pesticide in the marketplace is greater than the risk established at the time of registration. Scientific data and/or multiple incident reports are usually required to establish reasonable grounds that the risk of a pesticide is unacceptable and to recommend appropriate action, if required. Such action could include regulatory measures

ranging from amending the pesticide product label to discontinuation of the product; as well, preventative actions such as outreach, education, or compliance follow-up may be implemented.

3.1 Evaluation of Individual Incidents

A report of a particular effect does not necessarily mean that it was caused by exposure to a pesticide. Health Canada conducts a detailed evaluation of the more serious incident reports (such as Canadian human death, human major, environment major and environment moderate incidents) to determine if the reported effect could be attributed to the pesticide. Evaluation reports summarizing these detailed reviews are posted on the Health Canada website at http://www.hc-sc.gc.ca/cps-spc/pubs/pest/_decisions/index-eng.php#epir-edirp.

To determine if there is a relationship between the reported effects and exposure to the pesticide, several factors are taken into consideration, such as the detection of pesticide residues through laboratory analyses, the timing of the effect relative to the reported exposure, whether the effect is expected from exposure to a particular pesticide, other potential causes of the reported effect, and whether other incidents with similar effects have been reported for the same pesticide.

The relationship between the exposure to a pesticide and the reported effects (i.e. causality) is expressed in terms of highly probable, probable, possible, unlikely, unrelated, or insufficient information (see Appendix 1 for definitions). If it is determined that the pesticide exposure may have contributed to the reported effect (i.e., for a classification of possible, probable or highly probable), then the potential risk from use of that pesticide is evaluated and action is taken to mitigate those risks, if appropriate.

One Canadian human death incident and one human major incident were received in 2008, although the human major was reclassified to moderate by the PMRA based on the symptoms experienced and the length of hospital stay, and as such is not discussed further. One Canadian human major and one environment major incident were reported in 2009. The environment major incident is related to an incident that was reported in 2007 and was addressed in the First Annual Report; therefore, it will not be discussed further. A description of the two incidents evaluated in 2008 and 2009, along with the causality level, is presented in Table 2.

Table 2. Assessment of the relationship between the pesticide exposure and the reported effect(s) for serious Canadian incidents

Incident Report Number	Active Ingredient	Category and Severity	Details of Incident	Causality Classification
2008-5998	Permethrin; pyrethrins	Human Death	Caller claimed apartment treated by professional applicator with insecticide; concerned about subsequent emission of CO and CO_2 if pesticide applied near heat source. Caller did not report health effects but claimed several occupants of building had died over past year, and was worried was result of gases	Insufficient Information
2009-5394	2,4-D; mecoprop-p; dicamba	Human Major	Exposed on two separate occasions through drift into home and walking past spray. Experienced seizures and exacerbation of a previous skin condition; follow-up report indicated trouble breathing, tachycardia, chronic bronchitis, chest pain, emphysema, and loss of consciousness	Unlikely for serious effects (Possible for minor symptom of exacerbating skin condition)

3.2 Evaluation of Signals – Flea and Tick Control Product Incidents

Health Canada uses the entire collection of incident reports to identify patterns or signals that may indicate links between exposure to a pesticide and reported effects. When conducting this analysis, all available toxicological, environmental, epidemiological, and poisoning information are considered, as well as the amount of product sold in Canada.

In the First Annual Report, a signal relating to the number of reported domestic animal incidents concerning flea and tick control products was identified. The number of incidents reported suggested that there may be a potential for adverse reactions in cats and dogs from the use of dermally applied flea and tick control products, particularly spot-on type products. As a precautionary approach, Health Canada issued an advisory in April 2009 alerting the public and veterinary community about the concerns related to use of these products, and advising pet owners of important safety tips while continuing to investigate the issue.

In 2009, the PMRA undertook an extensive analysis of the incidents reported for spot-on products with the goal of identifying the potential causes in order to make appropriate changes to reduce the risk and, hence, the number of future incidents.

Between April 2007 and December 2009, the PMRA received 1084 domestic animal incident reports (660 Canadian and 424 American) involving spot-on products used to control fleas and ticks. There were a total of 1255 animals affected. Most of the Canadian incidents were classified either as minor or moderate in severity.

For most spot on products, the incident rate exceeded a threshold of one incident or more per 10,000 units of product sold per year. This threshold is used as a trigger by other pharmacovigilance programs[1] [2] for the further investigation of post-market surveillance data.

3.2.1 Causality Assessment

The incidents reported were evaluated to determine if there was a causal relationship between the types of effects reported and the product involved in the incident. The evaluation was conducted by comparing the symptoms reported in each incident with the toxicological data for the active ingredient(s) and formulants contained in the product, as well as reports of known symptoms of overexposure observed in cats and dogs.

The results of the causality assessment revealed that 48% of reports were determined to be probable, 43% were assigned a causality level of possible, 7% were deemed unlikely, 0.3% was determined to be unrelated, and 1.4% had insufficient information to assess causality. Therefore, over 90% of the incidents reported were considered to be possibly or probably caused by the applied pesticide.

In most instances, a pyrethroid insecticide or a formulant was implicated as the component responsible for the reported effect. Incident reports involving species misuse on cats (i.e. the use of a dog product on cat) were most often associated with the active ingredient permethrin, which is known to be toxic to cats.

Overall, the causality evaluation indicated a fairly high degree of association between the effects reported for incidents involving cats and dogs and exposure to flea and tick spot-on products.

3.2.2 Assessment of Incident Report Data

The information reported in incidents involving proper use of the spot-on products was further analyzed to identify potential factors contributing to the reported effects. Incident report data such as age, weight of animals, number of animals reported, symptoms reported and amount of product applied relative to the animal weight were some of the key elements examined. Incidents involving product misuse and oral exposure were excluded from this analysis.

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1 Guideline on a Strategy for Triggering Pharmacovigilance Investigations Preceding Regulatory Actions by EU Competent Authorities, EMEA/CVMP/900/03 – Final, April, 2005.

2 Report of Adverse Experiences for Veterinary Medicines and Agricultural Chemicals – 2008. Australian Pesticides and Veterinary Medicines Authority. Published September 2009

3.2.2.1 Analysis of Age and Body Weight

Age and weight were analyzed in relation to the severity of the symptoms reported (minor, moderate, major or death) for both cats and dogs.

The mean age of cats reported in incidents was 4.8 years. When considering incident severity, there was no statistical difference between the ages of cats in the severity groups of minor, moderate, major or death. The analysis indicated that cats experiencing adverse effects from the application of spot-on products tended to be young considering that the average lifespan of a cat is approximately 15 years or more.

The average weight of the cats was 4.2 kg, which is representative of the general cat population. When considering the severity of the incidents, cats that died had a significantly lower weight (mean weight 3.9 kg) compared to the cats reported to have minor, moderate or major effects (mean weight 4.4 kg).

The mean age of dogs reported in incidents was 3.7 years. When considering incident severity, the mean age of dogs that died was 2.9 years, which was significantly lower than the age of the dogs that did not die (i.e. those exhibiting minor, moderate or major effects). Overall, the age and weight analysis indicated that dogs experiencing adverse effects from the application of spot-on products tended to be very young relative to the general dog population (the general dog population has an average life expectancy of approximately 13 years depending on the breed of dog). It is important to consider that pet owners may not re-treat an older animal that exhibited adverse effects when treated at a younger age.

The average weight of dogs reported in the incidents was 14.6 kg. When considering incident severity, dogs that died had a significantly lower weight (mean weight 10.4 kg) when compared to dogs reported to have minor, moderate or major effects (mean weight 16.4 kg).

Although the specific breed of dog reported in incidents was not determined to be a factor, analysis of breed by standard criteria for classification by size revealed that smaller breeds (46% of dogs reported) were more frequently reported in incidents compared to medium (10% of dogs reported) or larger, more popular breeds (29% of dogs reported). Such associations provide further credence to the relation between dog weight and incident effects.

3.2.2.2 Symptom Analysis

Symptoms generally occurred within 24 hours following application of the product. Skin effects were the most frequently reported effects (36% of all symptoms reported), followed by neuromuscular effects (20%), general effects[3] (19%), and gastrointestinal effects (17%). The frequency of skin effects may be due to the fact that the product is dermally applied.

[3] General effects relate to symptoms reported as: Lethargy, abnormal behavior (e.g. running around, vocalizing etc.), restlessness, hiding, discomfort etc.

Overall, the top 10 symptoms reported were itchy skin, alopecia (loss of fur), lethargy, skin irritation, vomiting, loss of appetite, rash, agitation, abnormal behaviour, and convulsions. Toxicology data on the active ingredients and the formulants were examined, along with end-use product irritation, sensitization, and companion animal safety studies to identify potential associations with the symptoms in the incident reports. Symptoms from the incident reports were found to be consistent with the toxicological profile of only one active ingredient, permethrin. However, it is possible that formulants may have also played a contributory role.

Both the dermal reactions identified in irritation and sensitization studies conducted with the end use products, and the effects observed in companion animal safety studies conducted at exaggerated doses were inconsistent with symptoms reported in incident reports. These studies appeared to be of limited predictive value in the analysis, suggesting the need for further improvement in the design of the companion animal safety studies.

3.2.2.3 Analysis by Application Rate (Dose)

For each spot-on product, the amount of product applied to the animal is a fixed volume (e.g. 1 ml) for a range of animal weights. As such, smaller animals might have received a higher dose (mg active ingredient/kg body weight) of product compared to larger animals. The dose of product applied to the animal appeared to be directly proportional to the severity of effects that the animals experienced, as described in the incident reports. Animals that experienced minor symptoms typically received a lower dose of product compared to animals that experienced more serious effects (moderate, major or death). All of these findings tend to suggest that the dose range found on some spot-on product labels (listed for a range of companion animal weights) may be too broad.

3.2.2.4 Misuse of Spot-On Products

Misuse of flea and tick control products was found to be of concern for cats. According to the label directions for each product and information reported in the incidents, 36% of all reported cats were treated with a product that was intended for use on dogs only. Of these, most animals (94%) were treated with a product that contained the active ingredient permethrin which is highly toxic to cats.

3.2.2.5 Other Available Information

The PMRA also solicited the opinions of small animal veterinarians through a survey administered by the Canadian Veterinary Medical Association. Results of the survey echo the findings from the PMRA's trend analysis of incident reports. In addition, the United States Environmental Protection Agency (USEPA) found similar results in the examination of their incident reports.

3.2.3 Mitigation Strategies

As a result of the analysis, the PMRA published Regulatory Directive 2010-02 to strengthen the labels of spot-on pesticides used on companion animals for flea and tick control. It is anticipated that the measures outlined in the directive will be a positive step towards reducing the number of incidents that may occur from the use of these products. The key label amendments stipulated under the directive require product labels to specify additional precautionary language to prevent overdosing in small animals. In addition, the labels of spot-on products that contain permethrin will include pictograms and stricter statements to prevent exposure of cats to dog products. Hazards associated with grooming behaviors were also addressed in the label amendments.

The PMRA is also pursuing additional activities to mitigate potential risk associated with the use of spot-on products. These include working in collaboration with the USEPA to improve protocols used to assess the safety of products used on companion animals, narrowing the range of companion animal weights on product labels, working with registrants to eliminate the use of formulants in spot-on products that demonstrate potential toxicity to dogs and cats, and increasing outreach efforts to consumers and veterinarians.

The PMRA will continue to analyze incident report information concerning spot-on products for the next few years to ensure that the risk mitigation strategies proposed are effective in reducing the number of incidents occurring from the use of these products.

3.3 Using Incident Reports in PMRA Risk Assessments

Health Canada also uses incident reporting information as part of the weight of evidence in the evaluation of new pesticides and the re-evaluation of older pesticides. Factors such as the relevance of a particular incident to the Canadian use pattern, whether the product was used in accordance with the label directions, and whether the reported effects are consistent with the known toxicity of the active ingredient are taken into consideration. During this reporting period, the evaluation of flea and tick control products resulted risk mitigation strategies, as previously mentioned. The analysis of incident reporting information did not have a significant impact on any other registration decisions.

4.0 Compliance with the Incident Reporting Regulations

Ensuring compliance with the IRR is an important aspect of the IRP. An essential element in the compliance process is education. In cases where it was apparent that the regulations were not being complied with, the IRP took the opportunity to educate the registrants on the requirement to report incidents.

When a question on a specific section of the IRR was raised by a number of registrants, a general information memo was sent to all registrants to ensure that the section in question was interpreted correctly. In cases where the IRP learned that a registrant was informed of an incident but had failed to report, the IRP contacted the registrant to confirm that they were aware of their

requirements under the IRR and asked them to follow up with the submitted report. The IRP also conducted a comparison of the number of American domestic animal deaths submitted to the USEPA with the number of American domestic animal deaths submitted to the PMRA. Where discrepancies in the numbers were found, the registrants in question were contacted; the relevant sections of the IRR were reviewed and the registrant was asked to address the discrepancy.

In 2009, the IRP initiated an investigation into the number of registrants with greater than 10 products who had not reported any incident reports since the program was initiated in 2007. The Compliance group at PMRA then conducted a telephone survey with all registrants who met this criteria, as well as registrants of spot-on flea and tick control products; registrants were queried on their knowledge of the IRR as well as the systems they had in place to receive and submit incidents. In general, the level of awareness and understanding of incident reporting requirements was high, especially among registrants of spot-on flea and tick control products. When registrants were not aware of all incident reporting requirements, the issues were generally related to not understanding all categories of incidents that need to be reported.

The IRP continually works with outreach and communications groups to inform pesticide users on the importance of reporting pesticide incidents.

5.0 Changes to the Incident Reporting Program

In 2009, the Incident Reporting Form was updated to Version 2.0. A number of functional and language changes were made that allowed for easier completion of the form by registrants and more precise data analysis by the IRP.

6.0 Responsible Use of Pesticides

For incidents in which a product was applied, it was reported that the product was not used according to the label directions approximately 15% of the time. Notably, in both years, it was unknown if the product was used according to the label directions in more than 50% of the reported incidents. The following five examples of incident reports highlight the importance of using pesticides responsibly.

1. Carefully read all label instructions and precautions before using pesticides.

EXAMPLE: Incident Report 2009-5252. An animal owner applied a product containing s-methoprene and permethrin to her cat. The cat was suffering tremors at the time of the call. The product is not labelled for use on cats, and the caller was advised that use of permethrin on cats can result in tremors seizures, and death. Unfortunately, the cat had died upon follow up with the caller.

2. Read the label directions and safety precautions before buying the product. The label must include the name of the pest to be controlled and the treatment location.

EXAMPLE: Incident Report 2008-4630. A caller purchased an ant and grub killer containing carbaryl. On the advice of a nursery worker he applied the product to his onions and peppers. He ate them approximately one week later and developed nausea and vomiting the following day. The caller was advised to stop eating the produce from these gardens, and to not apply the product to anything meant for consumption. The product is not registered for use on food or feed crops.

3. For many pesticides, the labels indicate that persons and pets should vacate the area during treatment and/or should not be permitted to contact treated areas until surfaces are dry.

EXAMPLE: Incident Report 2009-4888. A caller sprayed a product around a door in his home. Two children who were playing around the door a few hours after application experienced vomiting. The children recovered.

4. Always wipe clean all surfaces that come in direct contact with food. Always store pesticides out of reach of children and pets and away from food and beverages.

EXAMPLE: Incident Report 2009-5038. A bait station was placed inside a dishwasher. Dishes were washed in the dishwasher and a child drank from a glass that had been washed with the bait. The child developed vomiting and diarrhea. The child fully recovered.

5. Dispose of pesticides by following the product label instructions or contacting provincial authorities for disposal of pesticides.

EXAMPLE: Incident Report 2009-4024. An aerosol canister of a product that was at least 18 years old spontaneously discharged into the caller's basement. When he removed the can, he had pain in his lungs.

Further information on the proper use of pesticides can be found on the Health Canada website at http://www.hc-sc.gc.ca/cps-spc/pest/part/protect-proteger/use-utiliser/index-eng.php.

Appendix 1: Definitions of Causality Levels Assigned to Individual Incident Reports

Causality Level	Definition
Highly probable	The circumstances of the incident or confirmatory evidence, such as residue analysis or medical testing, indicate that exposure to the pesticide definitely occurred, and knowledge of the properties of the pesticide or history of previous incidents give strong support that the pesticide was the cause.
Probable	The circumstances of the incident and properties of the pesticide or history of previous incidents give strong support that this pesticide was the cause, but information confirming exposure to the pesticide is lacking.
Possible	Information may be ambiguous, although there is some correlation between the pesticide and the effect. The pesticide could have caused the effect, but there are other explanations that are at least as plausible. This level of causality is often used when an incident involves more than one pesticide and information confirming exposure to the pesticide is lacking.
Unlikely	Evidence exists that factors other than exposure to the pesticide caused the incident, but the evidence is not conclusive or the effect reported is not typical for the pesticide. However, the possibility that exposure to the pesticide caused the effect cannot be ruled out.
Unrelated	Conclusive evidence demonstrates the effect was caused by factors other than the pesticide, or the effect occurred before exposure to the pesticide.
Insufficient Information	The information available regarding the reported exposure or effect is insufficient or conflicting such that a determination as to whether the effects were related to a pesticide exposure cannot be made.