

2019

# STRUCTURAL PESTICIDE USERS COMPLIANCE AUDIT

*INTEGRATED PEST MANAGEMENT ACT*



Ministry of  
Environment and  
Climate Change Strategy

## EXECUTIVE SUMMARY

In 2019, the Ministry of Environment and Climate Change Strategy conducted an audit of structural pesticide users to gain a snapshot of compliance under the *Integrated Pest Management Act* (IPMA or Act) and Regulation (IPMR). The structural sector in B.C. includes pest control operators (PCOs) who are licensed to use pesticides in and around structures such as residences, commercial sites, and industrial buildings to control various pests such as rats, mice, bed bugs, ants and cockroaches.

The main objective of the audit was to verify compliance with the fundamental requirements of licensing, certification, and pesticide use. Each inspection included in-depth assessments for compliance with the requirements for pesticide use within an IPM context, pesticide storage, and pesticide disposal practices, specifically as they relate to protection of human health and the environment. In addition, the annual pesticide use data for 2018 submitted by all structural licensees across the province were analysed to gain a further understanding of the pesticide use practices in this sector.

A total of 36 inspections were conducted across the province. The results of this audit found:

- 17% of the inspected PCOs were fully in compliance. The audit resulted in six notices of compliance, 25 advisories, and five warnings.
- 56% of the inspected PCOs met pesticide storage requirements, 19% were compliant for pesticide record keeping requirements, and 36% of the inspected users complied with the requirements to practice integrated pest management.
- The structural sector used a total of 2,396 kgs of various active ingredients in 2018, of which 99.8% were insecticides and the remaining 0.2% were rodenticides.

Many of the non-compliances found were minor or administrative in nature, and these typically resulted in an advisory of non-compliance, the lowest level of enforcement response. The majority of these non-compliances could be corrected by focusing on the pesticide storage, record keeping, and IPM practices requirements. However, a small number of licensees received warning letters for more serious non-compliances that included storing and using pesticides inconsistent with the legislated requirements, and/or failing to demonstrate that they had adequate IPM programs in place that ensured that all uses of pesticides are justified. In all cases, appropriate corrective measures were communicated to each licensee both verbally and in writing.

The findings of this audit suggest that an amendment to the Regulation that would require a licensee to document all six elements of IPM that are currently required to be practiced for each pesticide use would enable ministry inspectors to verify these requirements more effectively. Finally, the ministry's compliance promotion team can help improve compliance in the future by continuing to provide regulatory updates, promotional materials, and updated templates for required documentation.

## ACKNOWLEDGEMENTS

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## CITATION AND FURTHER INFORMATION

This report should be cited as:

2019 Structural Pesticide Users: Compliance Audit Report, Integrated Pest Management Act. Regional Operations Branch, British Columbia Ministry of Environment and Climate Change Strategy.

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# INTRODUCTION

## BACKGROUND

The Ministry of Environment and Climate Change Strategy regularly conducts audits to verify compliance within a specific sector under the *Integrated Pest Management Act* (IPMA or the Act). Audits are typically conducted through a combination of onsite inspections and reviews of submitted records and associated pesticide use data.

The structural sector in B.C. includes pest control operators (PCOs) who are licensed to use pesticides in and around structures such as dwellings, commercial sites, and industrial buildings. The safe and appropriate use of pesticides in these locations is important, as this type of pesticide use often occurs in and around living quarters, in close proximity to areas where people sleep, work, and prepare food. All PCOs are required to comply with the IPM Act and Regulation (IPMR) to ensure pesticides are used in a manner that is protective of human health and the environment.

The Ministry of Environment and Climate Change Strategy conducted this audit of the structural sector to gain a snapshot of compliance with all relevant requirements, including the obligation to use pesticides according to the principles of integrated pest management (IPM). The specific objectives of the audit were to:

- Verify compliance with the fundamental requirements of licensing, certification, pesticide storage, and pesticide use meant to protect human health and the environment
- Assess whether structural sector licensees follow consistent IPM principles when using pesticides
- Determine the types and amounts of pesticides being used in B.C. structures
- Use the results of the audit to inform future management decisions and recommendations for amendments to the legislation
- Share the ministry's work with the public

This report covers the results of inspections of structural PCOs under the IPMA and IPMR conducted in 2019. Each inspection represents a point in time assessment of the compliance of a regulated party for multiple parameters. It is important to note that when a single non-compliance is found during an inspection, the whole inspection is deemed out of compliance, regardless of the seriousness of the violation. Many non-compliances could be minor or administrative in nature, with low or no impacts to the environment and human health.

The ministry uses a variety of compliance and enforcement tools to ensure compliance with regulatory requirements. When responding to non-compliance, the ministry considers:

- a) the severity of actual or potential impact to the environment and human health,
- b) the factual circumstances of the alleged contravention, and
- c) the compliance history of the offender.

When all parameters of an inspection are found in compliance, a notice of compliance is issued. An advisory, the lowest level of enforcement response, is issued advising the inspected party of the non-compliances and often recommending a course of action to achieve compliance. A warning is issued to warn of a possible escalated enforcement response if non-compliance continues. In cases where the impact to the environment and human health is more serious, or where there is a continued lack of regard for regulatory requirements, the ministry uses more serious actions, including but not limited to, administrative monetary penalties (AMP's). Further information on how the ministry responds to non-compliances can be found in the [Compliance and Enforcement Policy and Procedure](#).

## DEFINITION OF TERMS USED IN THIS REPORT

### INTEGRATED PEST MANAGEMENT (IPM)

Integrated pest management (IPM) is a science-based, stepwise decision-making process for managing pests in an effective, economical and environmentally sound way. IPM ensures that pesticides are only used when necessary and forms a cornerstone of the IPM Act and Regulation. Under Section 68 of the IPMR, all licensed pesticide users are required to follow the principles of IPM when using pesticides.

IPM includes the following six elements:

1. **Prevention:** planning and managing structures and habitats to prevent pests
2. **Identification:** identifying pests, their damage and their natural enemies
3. **Monitoring:** regular monitoring of pest populations using various methods (figure 1), pest damage, beneficial organisms and environmental conditions
4. **Injury Thresholds:** making control decisions based on potential damage, safety concerns, cost of control methods, and impact on beneficial organisms and the environment
5. **Treatment Decisions:** may include a combination of behavioral, biological, chemical, cultural and mechanical methods to reduce pest populations and damage to acceptable levels
6. **Evaluation:** conducting follow up evaluations to determine the effects and efficacy of management decisions



**Figure 1.** A few PCOs use trained canines for detection and monitoring of bed bugs

## PESTICIDES AND ACTIVE INGREDIENTS

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The following pesticide categories are referenced in this report:

1. **Insecticides** – used to control insects
2. **Rodenticides** – used to control rodents

Pesticide formulations are composed of two parts: active ingredient(s) and formulants. The active ingredients in a pesticide are what control the target pest, and a pesticide may contain one or more active ingredients. Formulants may aid in the stabilization, mixing, or application of the pesticide.

## CLEANFARMS PROGRAM

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Cleanfarms is a non-profit environmental stewardship organization that accepts and collects pesticides and other agricultural waste materials for safe disposal. For more information: <https://cleanfarms.ca/>

# METHODS

## STRUCTURAL SECTOR INSPECTIONS

Thirty-six structural licensed pesticide users across the province were inspected by ministry IPM Officers for compliance with the IPMA and IPMR. Licensees were selected and prioritized for the audit inspections based on both their recent compliance history and their historic use of pesticides. Inspectors were unable to inspect the entire structural sector due to limited resources, budgets, and time constraints. Regardless, the compliance determinations made under the IPMA and IPMR are expected to be a good representation of the overall compliance rate of PCOs licensed in the structural sector in the province.

The inspections primarily focused on the following regulatory requirements:

- Pesticide user license requirement (*IPMR Section 44*)
- Pesticide applicator certification requirement (*IPMR Section 50*)
- Pesticide storage requirements (*IPMR Sections 33, 65 & 66*)
  - Pesticide containers and labels
  - Storage facility
- Pesticide use record-keeping requirements (*IPMR Section 35*)
  - Client's name and address/site of the pesticide use
  - Applicator's name and certificate number
  - Date and time of the pesticide use
  - Target pest or purpose of the pesticide use
  - Trade name of each pesticide used and its registration number under the federal Act



- Application method, rate of application and the total quantity of each pesticide used
- Pest monitoring methods and injury thresholds used to fulfill the IPM requirements
- Prevailing meteorological conditions, if applicable
- Precautionary advice given to the client (e.g. safe re-entry time)
- IPM use requirements (*IPMR Section 68*)
  - Prevention
  - Identification
  - Monitoring
  - Injury thresholds
  - Treatment decisions
    - Consideration/use of pesticide alternatives
    - Consideration of protection of human health and the environment when selecting and applying pesticides
  - Evaluation of treatment efficacy

Each inspection included compliance verification with the fundamental requirements of licensing, certification, pesticide storage, and pesticide use records, as well as in-depth questions to assess whether licensees follow consistent IPM principles when using pesticides. PCOs were also asked about their professional association memberships, continuing staff training, top 5 pests, and specifically how they deal with rodenticide waste products (e.g. moldy and/or partially consumed baits).

Upon completion of the compliance inspections, licensees were issued an inspection report using ministry's Natural Resource Inspection System (NRIS), a provincially standardized database to house and capture inspection records. In each inspection report, the inspector detailed the requirement measured, findings and assessment of whether the licensee was in or out of compliance with the requirement. If a non-compliance was noted, the report outlined actions to be taken in order to correct the non-compliance. All inspection reports are available in the [Natural Resource Compliance & Enforcement Database](#).

## PESTICIDE USE EVALUATION FOR STRUCTURAL LICENSEES

To complement the inspection results, ministry staff compiled and analysed the annual pesticide use data reported by structural licensees for the calendar year of 2018. Under section 39 of the IPMR, an annual summary of pesticide use is required to be submitted to the ministry by all licensed pesticide users by January 31<sup>st</sup> for the previous calendar year. For each pesticide used, licensees are required to report the product name, the active ingredient(s), the federal *Pest Control Products Act* registration number (PCP number), and the total quantity of product used in kilograms.

This report summarizes the 2018 annual use data for the active ingredients used by all structural licensees across the province, as well as the subset of PCOs that were inspected as part of this audit. 2018 annual use data were analysed as the 2019 annual use data were not yet available at the time this report was written.

# RESULTS

## NUMBER OF INSPECTIONS BY REGION

The 36 inspections were conducted across the province in the following regions: Vancouver Island, Lower Mainland, Southern Interior (Thompson-Nicola and Okanagan), and Omineca (figure 2). Some of the inspected PCOs operate in multiple regions of the province, but for the purpose of this report they were included in the region where the inspection took place.



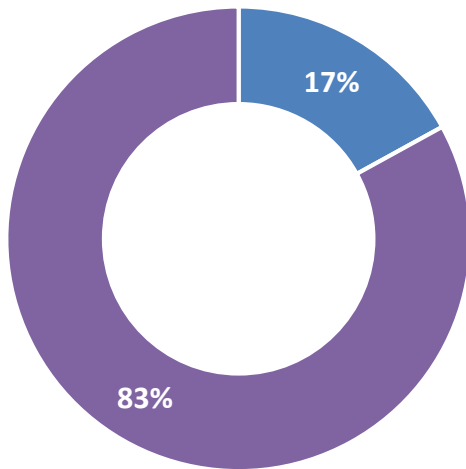
Figure 2. Number of structural pest control operators inspected by region of the province

## COMPLIANCE OUTCOMES

### COMPLIANCE RATE AND REGULATORY RESPONSES

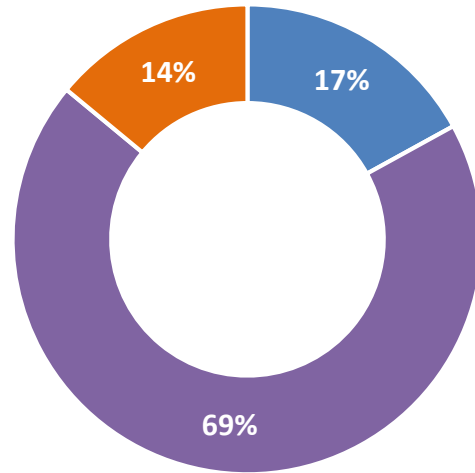
Of the 36 structural pesticide users inspected, six were found to be fully in compliance and 30 were out of compliance with at least one aspect of the Regulation (figure 3a). A detailed list of all inspected PCOs and their compliance determination is presented in Appendix A.

Pest control companies in compliance with the IPMR were issued a notice of compliance, whereas non-compliant companies were issued either an advisory or warning in accordance with the ministry's Compliance & Enforcement Decision Matrix. Overall, the audit resulted in six notices (17%), 25 advisories (69%), and five warnings (14%) (figure 3b).



■ IN ■ OUT

**Figure 3a.** Compliance summary of inspected structural pest control operators



■ NOTICE ■ ADVISORY ■ WARNING

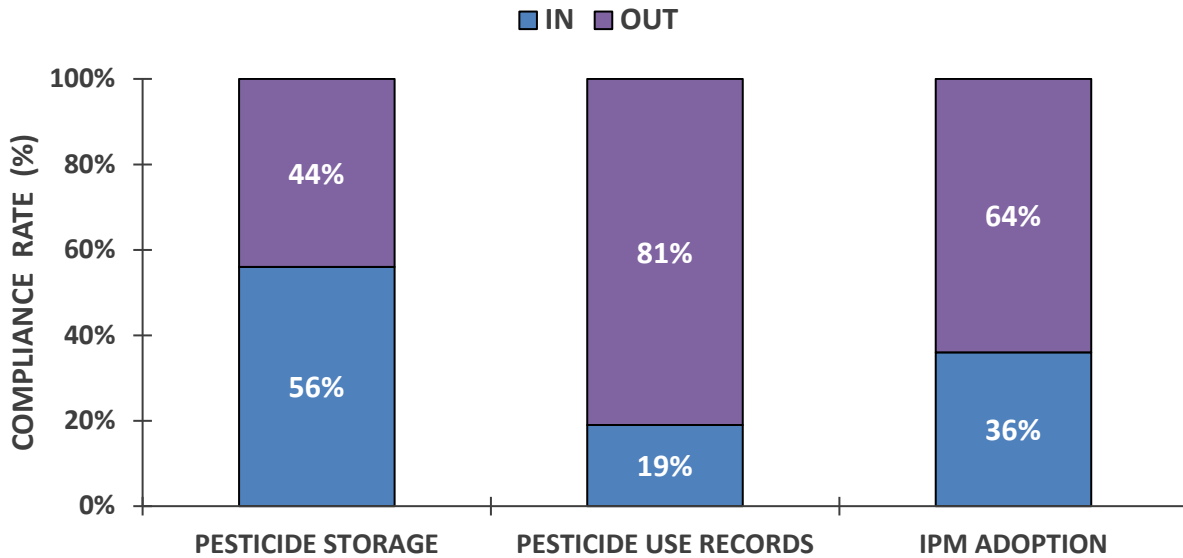
**Figure 3b.** Compliance response of inspected structural pest control operators

#### COMPLIANCE RESULTS FOR SPECIFIC REQUIREMENTS

For pesticide storage, 56% of the inspected PCOs complied with the requirements assessed under Sections 33, 65 and 66 of the IPMR (figure 4). The most common non-compliances for pesticide storage included storing food items alongside pesticides, missing or illegible pesticide labels, lack of ventilation, and missing “warning” signage on the pesticide storage facility.

For pesticide use records, 19% of the inspected PCOs complied with the requirements assessed under Section 35 of the IPMR (figure 4). The most common non-compliances under record keeping requirements included failure to record the monitoring methods and injury thresholds, missing precautionary information, and missing meteorological conditions for outside treatments.

For overall IPM adoption, 36% of the inspected PCOs complied with the requirements assessed under Section 68 of the IPMR (figure 4).



**Figure 4.** Compliance results of inspected structural pesticide users for specific requirements under the IPMR (Sections 33, 35, 65, 66, and 68)

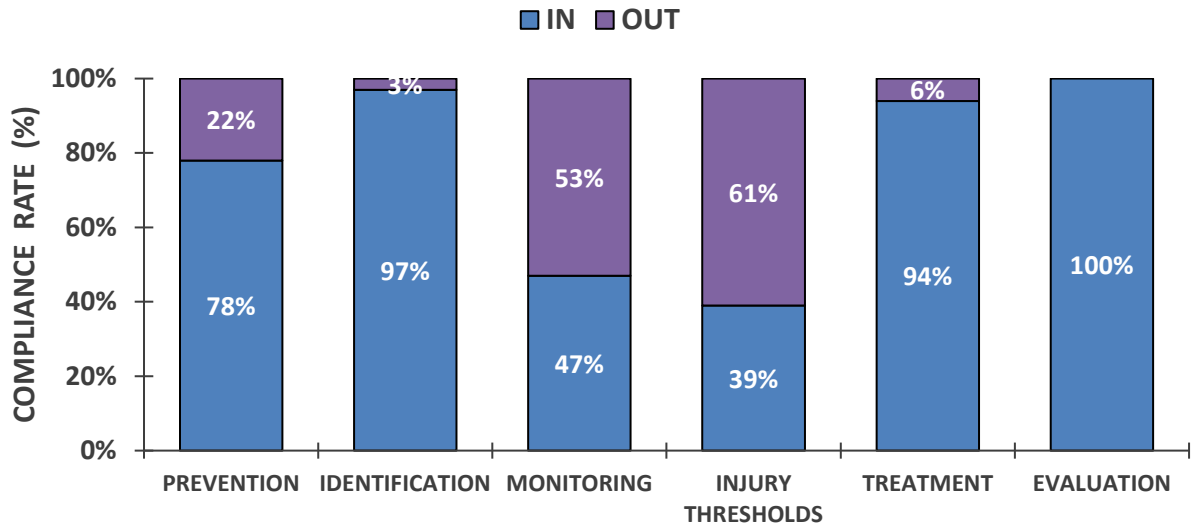
#### COMPLIANCE RESULTS FOR IPM REQUIREMENTS

Ministry inspectors assessed the following IPM requirements for compliance under Section 68 of the IPMR: pest prevention, pest identification, pest monitoring, injury thresholds, treatment decisions, and evaluation (figure 5).

For pest prevention requirements, 78% of the inspected PCOs complied with Section 68 (1)(a). The most common pest prevention practices reported by PCOs included: pest-proofing of the premises, removing food sources, and advising clients on good housekeeping.

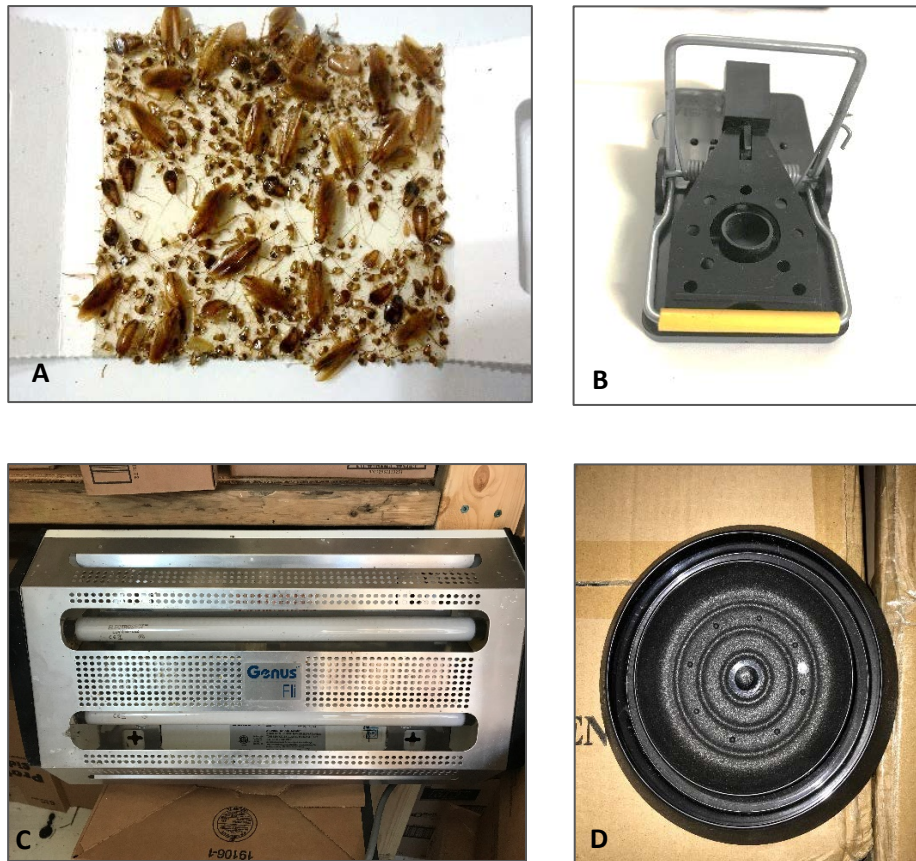
For pest identification requirements, 97% of the inspected PCOs complied with Section 68 (1)(b). The most common identification tools reported by the inspected structural licensees included: using identification manuals or technical handbooks, contacting local experts, and web searches.

For pest monitoring requirements, 47% of the inspected PCOs complied with Section 68 (1)(c). Non-compliant companies typically either did not record monitoring methods used or were unable to demonstrate that adequate monitoring was conducted for pesticide uses. The most common pest monitoring methods reported by the compliant licensees included: visual inspections, sticky monitors, and rodent snap traps (figure 6). Pest control companies reported that monitoring frequency varied according to the pest situation, depending on the contract type and direction from their clients.



**Figure 5.** Compliance rate of inspected structural pesticide users with each IPM element listed in Sections 68(1) and 68(2) of the IPMR

**Figure 6.** Examples of tools commonly used by PCOs for monitoring and trapping: **A)** sticky trap for insects, **B)** snap trap for rodents, **C)** light trap for flying insects, and **D)** pitfall trap for crawling pests, such as bed bugs



For the requirement to use injury thresholds, 39% of the inspected PCOs complied with Section 68 (1)(d). Non-compliant companies typically either did not record injury thresholds used or were unable to demonstrate that any injury thresholds were in place for pesticide uses. The majority of compliant pest controllers reported that their injury thresholds were based on a combination of client tolerance, safety or damage potential (e.g. harm to humans, damage to structure), and the location of the pest.

For treatment decision requirements, 94% of the inspected companies complied with Section 68 (1)(e). These PCOs reported practical alternatives to pesticide use, and methods to protect human health and the environment under this section. For insects and other arthropods, licensees reported trapping (figure 6), vacuuming, and exclusion (e.g. installing barriers) as the most common practical alternatives to pesticide use. For rodent control, trapping and exclusion (e.g. sealing entry holes) were the most commonly reported methods (figures 6 and 7). For birds and wildlife, pest controllers most commonly reported the use of exclusion (e.g. netting, spikes) and trapping. Personal protective equipment used by staff, restricted entry intervals, and application methods used were the most common considerations to protect human health reported by the licensees. The most common environmental protection considerations made by pest controllers included: considering the pesticide application method, pesticide toxicity to non-target species, and the weather conditions.



**Figure 7.** Example of exclusion work, an alternative to pesticides, for control of rodents performed by a technician

All the inspected companies were compliant with the evaluation requirements of Section 68 (2) (figure 4). For assessing the effectiveness of pesticides used on pests, post-treatment inspections by company technicians, along with follow up calls to clients, were the most common evaluation techniques reported by the structural PCOs.



## TOP 5 PESTS REPORTED BY THE STRUCTURAL SECTOR

Top 5 pests reported by the inspected structural licensees are presented in figure 8. Among the respondents, 51% ranked rodents (rats and mice) as their top pest (figure 9), while 33% ranked ants (e.g. carpenter ants, pharaoh ants, odorous house ants) first, 18% ranked bed bugs first, and 8% ranked cockroaches first. Wasps also ranked high, as 13% of PCO's ranked wasps as their second most common pest problem (figure 8).

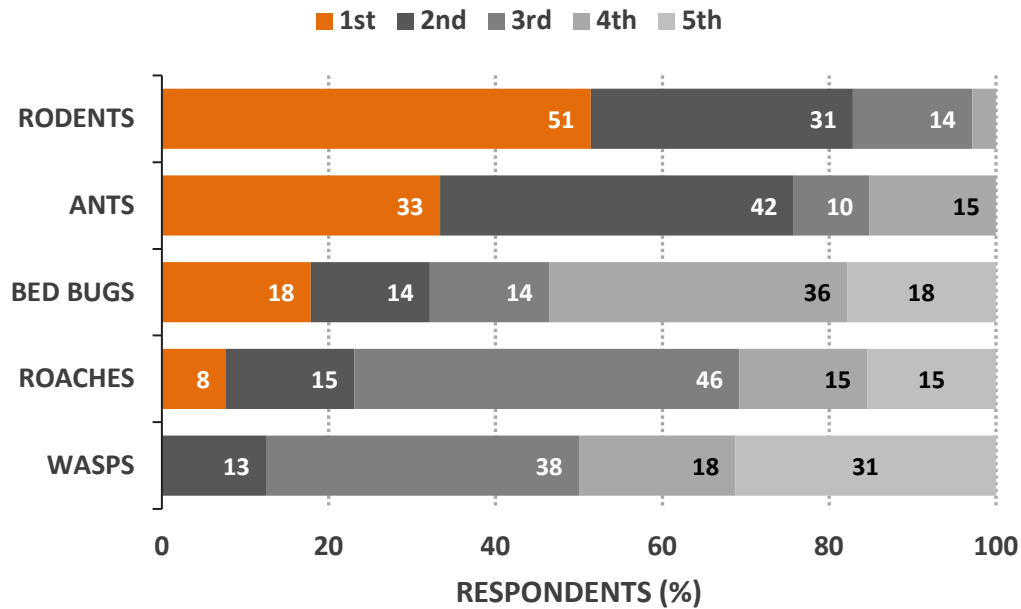
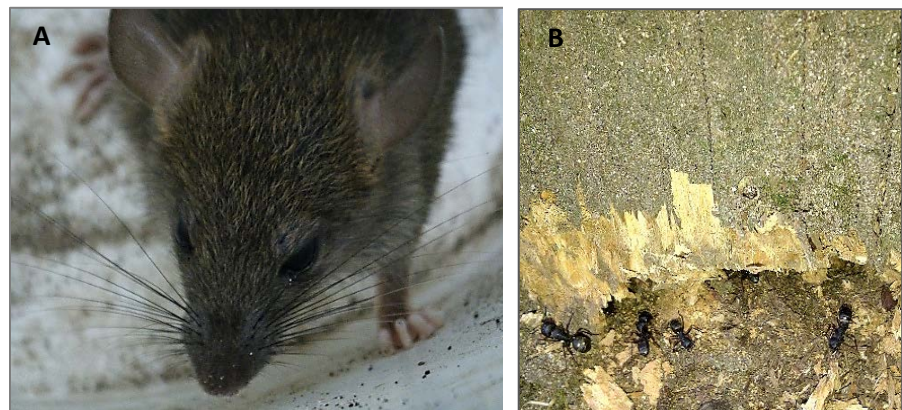


Figure 8. Top 5 pests reported by the inspected structural licensees

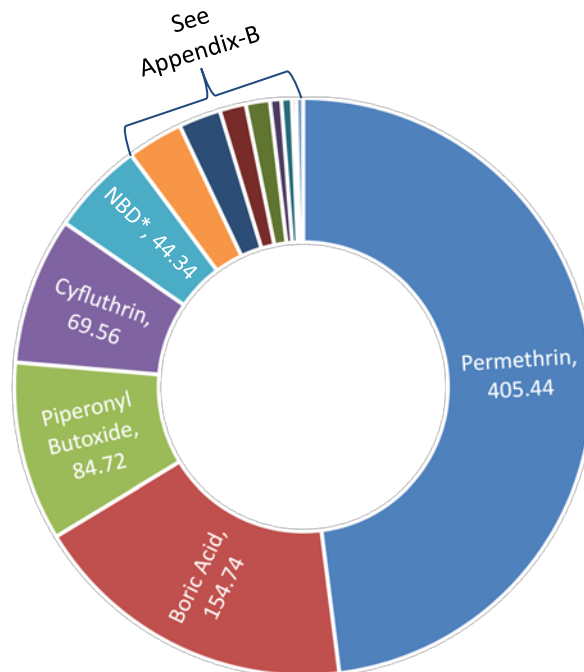
Figure 9. PCOs ranked rodents and ants as their top most common pest problem: **A)** Rat (Photo by Earth's buddy, Wikipedia), and **B)** Carpenter ants infesting a wooden structure



## ANNUAL PESTICIDE USE IN THE STRUCTURAL SECTOR

### PESTICIDE USE REPORTED BY THE INSPECTED LICENSEES

Analysis of the annual use summaries submitted by the 36 inspected structural users indicated that they used a total of 847 kgs of various active ingredients in 2018 (Appendix B). A total of 845 kgs of insecticide and 2 kgs of rodenticide active ingredients were used. The top 5 insecticide active ingredients were: permethrin, boric acid, piperonyl butoxide, cyfluthrin, and n-octyl bicycloheptene dicarboximide (figure 10 and Appendix B). For rodenticides, bromadiolone was used the most, followed by difethialone and brodifacoum (Appendix B).



**Figure 10.** Total amounts (kgs) of insecticide active ingredient reported used in 2018 by the 36 inspected structural licensees (\*NBD= n-octyl bicycloheptene dicarboximide). See Appendix B for detailed data.

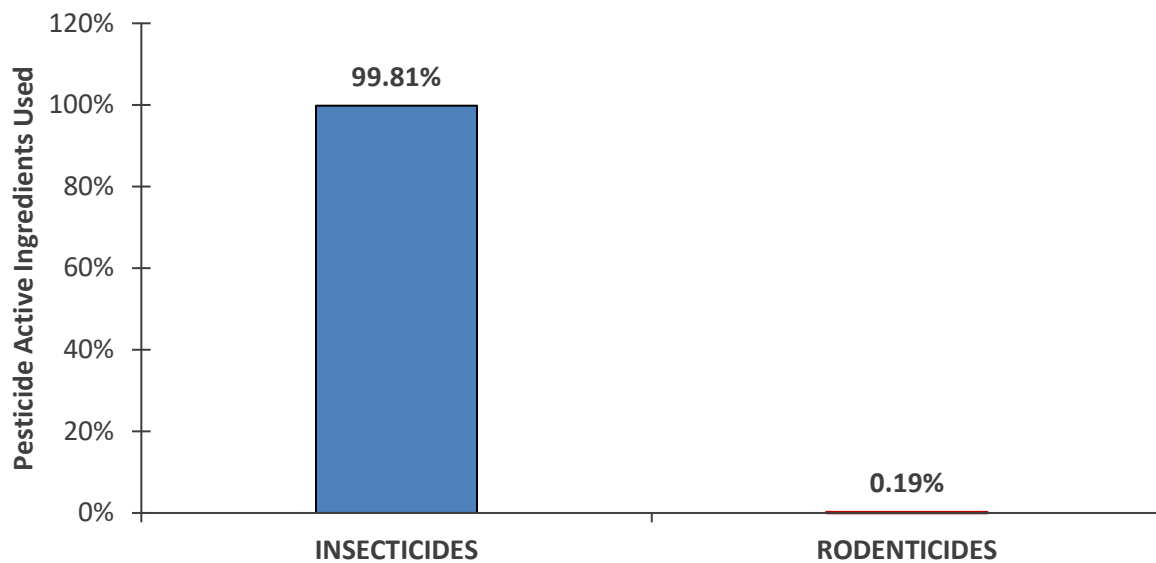


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## PESTICIDE USE BY ALL STRUCTURAL LICENSEES IN THE PROVINCE

Analysis of the annual use summaries submitted by all structural licensees across the province indicated that the sector as a whole used a total of 2,396 kgs of various active ingredients in 2018 (Appendix C).

Two types of pesticides were used: insecticides and rodenticides (figure 11). A total of 2,391 kgs of insecticide and 5 kgs of rodenticide active ingredients were used. The top 5 insecticide active ingredients were: permethrin, boric acid, orthoboric acid, piperonyl butoxide (commercial), and cyfluthrin (Appendix C). For rodenticides, bromadiolone was used the most, followed by difethialone and brodifacoum (Appendix C).



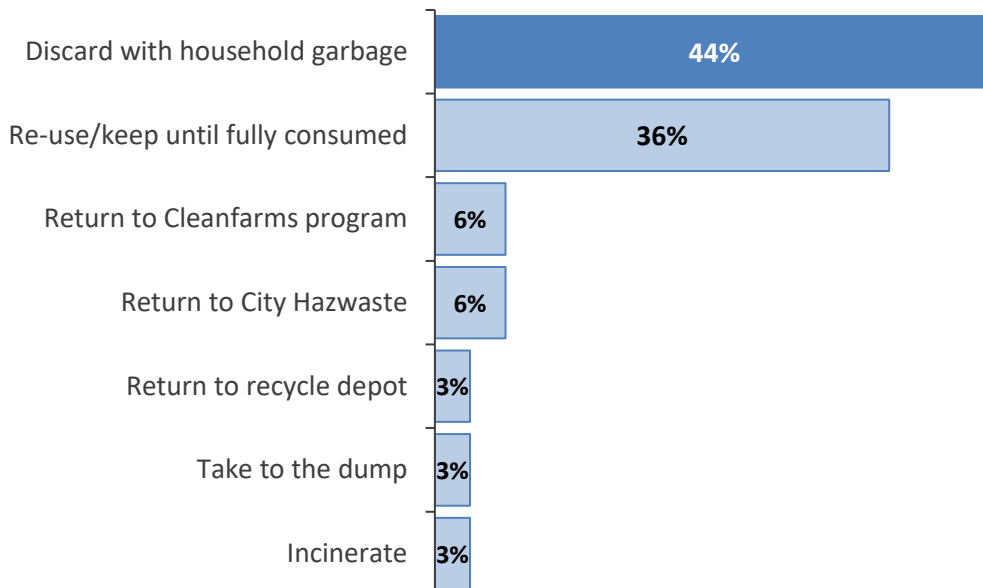
**Figure 11.** Total percentage of each type of pesticide active ingredients used by the structural sector in 2018 across the province

## DISPOSAL OF RODENTICIDE WASTE PRODUCTS

Various rodenticides are used to control rats and mice in B.C. structures (figure 12). However, unsafe disposal of rodenticide waste (e.g. moldy and/or partially consumed rodenticide baits) can pose a serious risk to humans, pets, wildlife and other non-target species, as well as the potential for secondary poisoning to predator animals. Of the 36 inspected PCOs, 44% reported disposing of rodenticide waste along with household garbage, whereas 36% reported re-using rodenticides in bait stations until fully consumed. Others reported returning used rodenticide baits to collection sites such as Cleanfarms and municipal hazardous waste programs (figure 13).



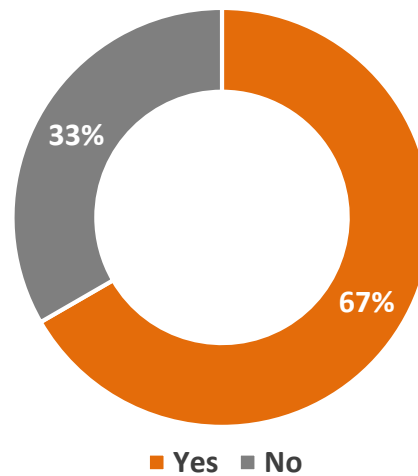
**Figure 12.** Examples of various rodenticides frequently used in and around B.C. structures



**Figure 13.** Fate of moldy and/or partially consumed rodenticide baits as reported by the inspected structural licensees

## PROFESSIONAL ASSOCIATION MEMBERSHIPS

Inspected structural licensees were also asked about their membership in professional or industry associations. Sixty seven percent of the licensees reported being a member of the Structural Pest Management Association of British Columbia (SPMABC) (figure 14). While membership in an industry association is not a requirement of licensed companies in BC, the ministry encourages membership as a means of ensuring that companies are staying abreast of current developments in pesticide registrations, application technology, and other regulatory developments.

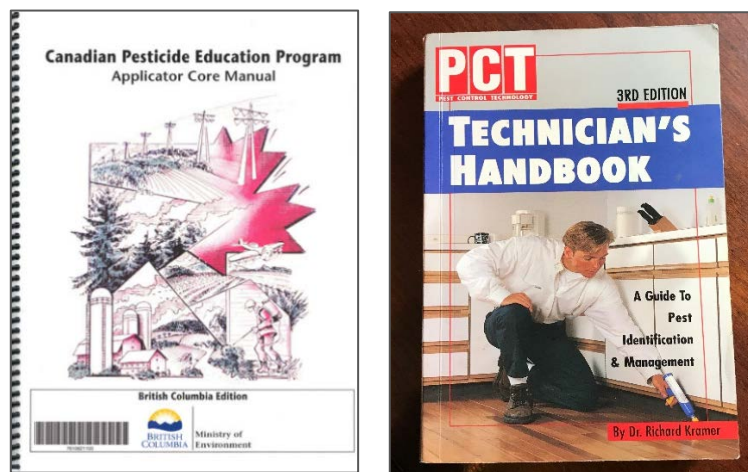


**Figure 14.** Membership in Structural Pest Management Association of BC

## PROFESSIONAL TRAINING AND EDUCATION RESOURCES

All inspected structural pesticide companies maintained certified staff. Inspected PCOs were asked about their training and education resources. In addition to the ministry's applicator certification program, the most common sources of professional training included: conferences (e.g. SPMABC), apprenticeship, websites, and in-house workshops.

Most of the inspected licensees reported that they receive regulatory updates from sales representatives, professional associations, websites, magazines, and handbooks (figure 15).



**Figure 15.** Structural licensees consult with a variety of technical education materials

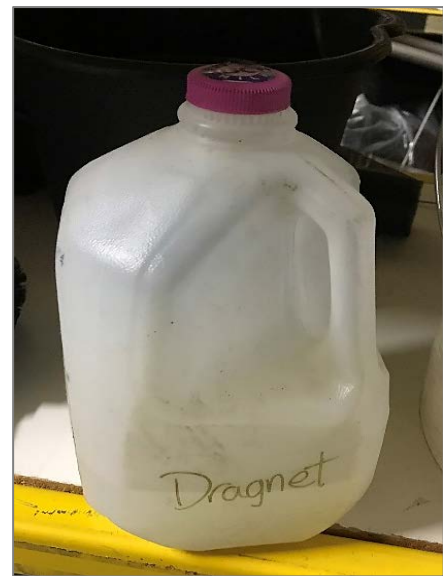
## DISCUSSION

### COMPLIANCE WITH IPMA AND REGULATIONS

The overall compliance rate of the structural licensees inspected was relatively low, as only 17% were fully compliant with the Regulation. However, the majority of the non-compliances were minor or administrative in nature, with low potential risk to human health and the environment. Accordingly, 69% of the non-compliant PCOs received an advisory, the lowest level of enforcement response.

A small number of licensees received warning letters for non-compliances that included storing and using pesticides inconsistent with the IPMA requirements, and/or failing to demonstrate that they had adequate IPM programs in place. For example, a licensee had stored a pesticide in an empty milk container (figure 16), and pet food in an empty pesticide container. In contrast to IPM principles, some of the non-compliant licensees were found to heavily rely on pesticide uses. Further, some PCOs used chemicals in a manner not permitted by the product label. Most of the non-compliant licensees in receipt of warning letters responded with the corrective measures to address non-compliances and actions taken to prevent similar issues in the future.

The six elements of IPM (prevention, identification, monitoring, injury thresholds, treatment decisions, and evaluation) are considered cornerstones of the legislation. It should be noted that Section 68 of IPMR requires licensees to practice all six elements of IPM for each pesticide use, however Section 35 of the IPMR only requires licensees to strictly record three elements (pest identification, monitoring methods, and injury thresholds). The results of this audit suggest that an amendment to the Regulation that would require a licensee to record all six elements of IPM conducted for each pesticide use would address this issue, enabling inspectors to verify these requirements more effectively.



**Figure 16.** Dagnet pesticide was stored in an empty milk container

### PESTICIDE USE IN THE STRUCTURAL SECTOR

Analysis of the annual use summaries for 2018 submitted by all licenced structural users across the province indicated that a total of 2,396 kgs of various active ingredients was used, of which 99.8% were insecticides and the remaining 0.2% were rodenticides (Appendix C). Among insecticides, permethrin

was the most-used active ingredient primarily from two pyrethroid insecticides (Dragnet FT and Prelude 240 EC) frequently used in B.C. structures for control of various insect pests, mainly bed bugs and ants. Among rodenticides, bromadiolone was the most-used active ingredient, primarily from two rodenticide baits (Contra Blox and Resolve Soft Bait, figure 17) frequently used for control of rats and mice.

A similar pattern was observed in the 2018 pesticide use data of the inspected PCOs who used a total of 847 kgs of various active ingredients, of which 99.7% were insecticides and the remaining 0.3% were rodenticides (Appendix B). Permethrin was the most-used active ingredient primarily from Dragnet insecticide, whereas bromadiolone was the most-used active ingredient resulting from two main rodenticide baits (Contra Blox and Resolve Soft Bait, figure 17). The 36 inspected licensees used about half of the total quantity of rodenticide and one-third of the total quantity of insecticide active ingredient reported by the entire structural sector.



**Figure 17.** Soft bait rodenticide placed in an exterior bait station

The inspected licensees indicated that 4 of their top 5 target pests were insects (ants, bed bugs, cockroaches and wasps), which may explain their use of relatively high quantities of insecticide active ingredients. Most of the inspected PCOs reported rodents as their number one target pest and indicated using large quantities of rodenticide baits. It is important to note that rodenticide baits used by the PCOs contain very low concentrations of active ingredients, which translates into relatively low quantities of rodenticide active ingredients observed in our analysis. Nevertheless, these products are quite toxic to mammals at very low concentrations and can also pose a risk to non-target organisms, such as children, pets and wildlife.

## DISPOSAL OF RODENTICIDE WASTE PRODUCTS

Many of the inspected structural licensees reported that they double-bag the moldy and/or partially consumed rodenticide baits and dispose them of with the household garbage. This disposal practice is not environmentally safe, as the rodenticide waste will likely end up in a landfill, which in turn may pose a risk to the wildlife and other non-target species.

From the results of this audit, it is recommended that structural PCOs develop and implement IPM programs for rodent control which should limit the use of rodenticides, with practically no pesticide to be discarded. In addition, selecting mold-resistant baits and re-using the partially consumed baits when possible (as indicated by 36% of the respondents in this audit) would also help to reduce rodenticide



waste products. Finally, PCOs should also access Cleanfarms or municipal hazardous waste programs for the collection and disposal of any rodenticide waste generated.

## PROFESSIONAL MEMBERSHIP, TRAINING AND EDUCATION

Structural licensees rely on sales representatives and professional associations for information on new pest control products and regulatory updates. In addition, they utilize various available print and web resources to keep their staff informed. The results of this audit showed that inspected licensees develop and maintain standard operating procedures and classroom or field training for staff that go beyond ministry requirements.

This audit indicated that 67% of the inspected PCOs were members of the SPMABC. The association works in collaboration with the ministry to offer industry-related training sessions, with an option for its members to collect ministry-approved certified education credits (CECs) that they can use towards renewal of their certificates. Ministry staff regularly participate in industry meetings and conferences for compliance promotion (figure 18). Licensees' participation in professional/industry associations may contribute to a better overall IPM program and continuous improvement, as pesticide regulatory information is commonly distributed through these associations throughout the province.



**Figure 18.** Ministry inspector presenting results of this audit at SPMABC conference held in Burnaby in 2020

## RECOMMENDATIONS AND NEXT STEPS

From the results of this audit, the ministry is recommending the following:

- That all PCO's focus on staff training to ensure that each pesticide use is conducted within an IPM context, and that records are complete and in full compliance with the Regulation.
- That an amendment to the IPMR be considered to require documentation of all six elements of IPM that are currently required to be practiced with each pesticide application. This change would further ingrain the use of IPM with each pesticide application and enable ministry inspectors to verify these requirements more consistently and effectively.
- That ministry staff continue to conduct compliance promotion in this sector. This should include the development of a fact sheet or brochure, aimed at structural PCO's, on disposal best practices for used rodenticides. This could help encourage structural rodenticide users to choose more appropriate disposal options for the used baits currently being discarded in household garbage.
- That ministry inspectors continue to conduct compliance inspections of licensed pesticide users and ensure that all the regulatory requirements are being followed. It is expected that future inspections of the structural sector should result in higher compliance rates, as this audit has promoted awareness of the IPM and other regulatory requirements under the Regulation.

## APPENDICES

**Appendix A:** List of inspected structural pest control operators and compliance determinations made under the IPMA and IPMR in 2019.

<b>Structural PCOs Inspected</b>	<b>Region/Inspected Site</b>	<b>Compliance Determination</b>
Abell Pest Control Inc.	Vancouver Island	OUT
Allpest Pest Control Ltd.	Vancouver Island	IN
Rentokil Canada Corp.	Vancouver Island	IN
VI Pest Control	Vancouver Island	OUT
Kevin William Tryon	Vancouver Island	IN
Olympic Pest Control	Vancouver Island	OUT
Orkin Canada	Lower Mainland	OUT
Ecolab Company	Lower Mainland	OUT
JR Pest Control Ltd.	Lower Mainland	OUT
Alpha Pest Management	Lower Mainland	OUT
VIP Pest Control	Lower Mainland	OUT
Lower Mainland Pest Control	Lower Mainland	OUT
SLC Contracting Ltd.	Lower Mainland	OUT
Local Pest Control Ltd.	Lower Mainland	OUT
Gilpins Pest Control	Lower Mainland	OUT
Bugs Plus Pest Services	Lower Mainland	OUT
New Chelsea Society	Lower Mainland	OUT
Canforce Pest Control	Lower Mainland	OUT
XPC- X-terminator Pest Control	Lower Mainland	OUT
AA Happy Pest Control	Lower Mainland	OUT
Terminix Canada	Lower Mainland	OUT
Planet Green Pest Management	Lower Mainland	OUT
Blitz Pest Control	Lower Mainland	OUT
Bugs Gone Pest Control	Southern Interior	OUT
Canada West Pest Control Ltd.	Southern Interior	IN
Lake Country Pest Control	Southern Interior	OUT
Assured Pest Solutions/Bugmasters	Southern Interior	OUT
Budget Pest Control	Southern Interior	OUT
Bugsense	Southern Interior	OUT
The Bugman Pest Control Services	Southern Interior	OUT
Can Guard Pest Solutions	Southern Interior	OUT
Actual Pest Control	Southern Interior	OUT
QFI Pest Control	Southern Interior	OUT
Guardian Pest Control	Southern Interior	OUT
1st Defence Pest Control Services	Omineca	IN
DeBug'Em Pest Solutions	Omineca	IN



**Appendix B:** Types and quantities of pesticide active ingredients used in 2018 reported by the 36 inspected structural pest control operators.

<b>Pesticide Active Ingredient</b>	<b>Pesticide Type</b>	<b>Quantity of Active Ingredient Used (Kgs)</b>
Permethrin	Insecticide	405.44
Boric Acid	Insecticide	154.74
Piperonyl Butoxide	Insecticide	84.72
Cyfluthrin	Insecticide	69.56
N-Octyl bicycloheptene dicarboximide	Insecticide	44.34
Lambda-cyhalothrin	Insecticide	26.45
Pyrethrins	Insecticide	19.94
Chlorantraniliprole	Insecticide	12.40
Imidacloprid	Insecticide	11.40
Beta-cyfluthrin	Insecticide	5.31
Orthoboric Acid	Insecticide	4.95
Hydramethylnon	Insecticide	2.02
Disodium Octaborate Tetrahydrate	Insecticide	1.30
Acephate	Insecticide	< 1
D-phenothrin	Insecticide	< 1
Clothianidin	Insecticide	< 1
Deltamethrin	Insecticide	< 1
Methoprene	Insecticide	< 1
Methomyl	Insecticide	< 1
Abamectin	Insecticide	< 1
Borax	Insecticide	< 1
Thiamethoxam	Insecticide	< 1
Muscalure	Insecticide	< 1
Spinosad	Insecticide	< 1
Bromadiolone	Rodenticide	2.24
Difethialone	Rodenticide	< 1
Brodifacoum	Rodenticide	< 1
Bromethalin	Rodenticide	< 1
Diphacinone	Rodenticide	< 1
Chlorophacinone	Rodenticide	< 1
<b>Grand Total</b>		<b>847 kg</b>

**Appendix C:** Types and quantities of pesticide active ingredients used in 2018 reported by all licenced structural pest control operators across the province.

<b>Pesticide Active Ingredient</b>	<b>Pesticide Type</b>	<b>Quantity of Active Ingredient (kgs) Used</b>
Permethrin	Insecticide	1,450.17
Boric Acid	Insecticide	221.91
Orthoboric Acid	Insecticide	182.08
Piperonyl Butoxide	Insecticide	147.69
Cyfluthrin	Insecticide	100.61
N-Octyl bicycloheptene dicarboximide	Insecticide	69.30
Lambda-cyhalothrin	Insecticide	62.90
Imidacloprid	Insecticide	46.56
Pyrethrins	Insecticide	31.18
Chlorantraniliprole	Insecticide	24.43
Beta-cyfluthrin	Insecticide	22.26
Malathion	Insecticide	16.72
Hydramethylnon	Insecticide	4.13
Novaluron	Insecticide	2.27
D-trans Allethrin	Insecticide	2.16
Disodium Octaborate Tetrahydrate	Insecticide	2.02
Clothianidin	Insecticide	1.76
D-phenothrin	Insecticide	1.41
Acephate	Insecticide	< 1
Methoprene	Insecticide	< 1
Deltamethrin	Insecticide	< 1
Methomyl	Insecticide	< 1
Bendiocarb	Insecticide	< 1
Abamectin	Insecticide	< 1
Thiamethoxam	Insecticide	< 1
Borax	Insecticide	< 1
Spinosad	Insecticide	< 1
Muscalure	Insecticide	< 1
Bromadiolone	Rodenticide	4.18
Difethialone	Rodenticide	< 1
Brodifacoum	Rodenticide	< 1
Diphacinone	Rodenticide	< 1
Chlorophacinone	Rodenticide	< 1
Bromethalin	Rodenticide	< 1
Zinc Phosphide	Rodenticide	< 1
<b>Grand Total</b>		<b>2,396 kg</b>