Pest Control Products Sales Report for 2014

Canada

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Foreword

In November 2006, the Pest Control Products Sales Information Reporting Regulations came into force, making mandatory under the *Pest Control Products Act* the reporting of sales information by registrants to Health Canada's Pest Management Regulatory Agency (PMRA).

These regulations require registrants to submit annually to the PMRA the total volume of all their products registered with the PMRA and made available for sale to users (referred to as "sold" in the remainder of this report). These data are reported by calendar year (January 1 to December 31) and must be submitted by June 1 of the following year. The purpose of the sales information reporting program is to collect sales data that are used by the PMRA to better understand potential pesticide use in Canada.

Sales data are considered in risk assessments of pesticides, in policy decisions, in identifying trends in pesticide use, and in providing guidance for risk-reduction strategies. For example, sales data are used in the re-evaluation of older pesticides to help understand the presence and value of the pesticide in the Canadian marketplace, as well as the potential impacts if changes are made to the registration status of the pesticide. Sales data are also used to inform the Pesticide Incident Reporting Program on the market share of particular pesticides to help identify potential risks that may require attention.

Introduction

The seventh Pest Control Products Sales Report provides an overview of pesticides sold in Canada for the 2014 calendar year, and briefly discusses changes in pesticide sales over the last five years. Data are considered confidential business information and are presented in various combined ways to ensure confidentiality.

Overall Canadian Pesticide Sales Data

Overview

There were 6866 products registered with the PMRA for use in Canada in the 2014 calendar year. Registrants submitted sales data in different units depending on the product (for example, kilograms, litres). To standardize varying products, the data have been converted into kilograms of active ingredient (kg a.i.).

All technical grade active ingredient and manufacturing concentrate product information was excluded from calculation as the quantity is reported in the end-use products. Also, products where the data could not be converted to kg a.i., due to the reported units of measure, were excluded from calculation. This includes products that had unusual units, such as colony forming units and devices, which were counted in units. The majority of these products are devices or biopesticides; the biopesticides are discussed separately in this document.

Of the remaining 2638 products reported as sold, the overall pesticide sales in Canada in 2014 were 101 080 417 kg a.i., which is a 7% decrease from the 109 070 851 kg a.i. sold in 2013 (Figure 1). However, the general trend is for an increase in pesticide sales between 2010-2014.

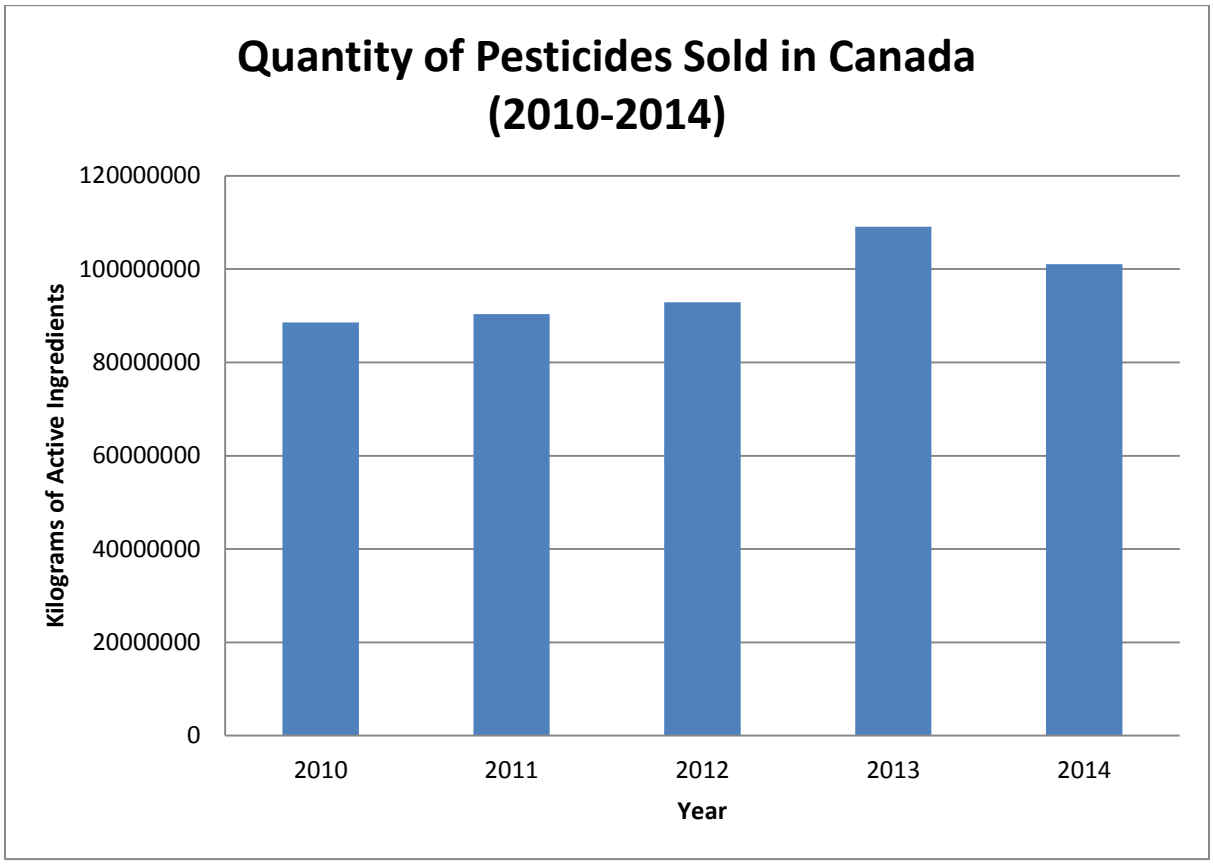

Figure 1: Quantity of pesticides sold in Canada between 2010 and 2014.

In the analysis of the overall quantity for 2014, it should be noted that the sum of the top 50 products from the total number of products for which sales reports were submitted made up 58.3% of the total kg a.i. sold in Canada in 2014 (58 952 342 kg a.i.). This was a decrease in the overall quantity and relative amount from 2013, where the top 50 products sold 74 154 281 kg a.i (68% of overall). The top 10 active ingredients sold, presented in decreasing order in Table 1, made up 66 834 300 kg a.i. or 66.1% of the total. A comprehensive list with the rankings for all active ingredients sold in Canada in 2014 is provided in Appendix I. Six active ingredients have remained on the top 10 list over the past five years (since 2010): glyphosate, available chlorine, present as sodium hypochlorite (appears as sodium hypochlorite in previous reports), 2,4-D, MCPA, surfactant blend, and mineral oil.

Table 1: Top 10 Active Ingredients Sold in Canada in 2014

Active Ingredient	Product Type
Glyphosate	Herbicide
Available chlorine, present as sodium hypochlorite	Antimicrobial
Creosote	Antimicrobial
Glufosinate ammonium	Herbicide
Tetrakis (hydroxymethyl) phosphonium sulfate (THPS)	Antimicrobial
MCPA	Herbicide
Mineral oil	Insecticide/Fungicide/Other
2,4-D	Herbicide
Surfactant blend	Other
Mancozeb	Fungicide

Sales Information by Sector

All products were grouped according to their areas of use into three sectors: Agricultural, Non-Agricultural, and Domestic. (Data from each of the sectors are discussed in more detail in the following sections.)

The groups were designed so there would be no overlap between the groupings. A product was placed into the Domestic sector if its classification was Domestic on its label. For the Non-domestic products, a product with any agricultural use on the label was grouped with the Agricultural sector, even if there were non-agricultural uses listed on the label. All remaining products were grouped as Non-agricultural. In some cases, if upon analysis, it was determined a product in the Agricultural sector had its main usage in the Non-agricultural sector, the product was moved to the Non-agricultural sector group.

Overall, 74.3% of pesticide sales in Canada were of Agricultural sector products (see Figure 2), whereas 21.0% of pesticide sales were of Non-agricultural sector products and 4.6% were of Domestic sector products. Agricultural sector products have constituted the largest amount of pesticides sold in Canada since data was collected, followed by Non-agricultural sector products and Domestic sector products. The relative sales of products in the Agricultural sector increased slightly between 2013 and 2014 (increasing from just under 74% of overall sales to just over 74%), while the Non-agriculture sector increased from 20% to 21%, and the Domestic sector decreased slightly from just under 6% in 2013 to just under 5% in 2014 (see Figure 3 for data for 2010 to 2014). Absolute product sales decreased in all sectors from 2013 to 2014: Agricultural by 7%; Non-Agricultural by 4%; and Domestic by 27%.

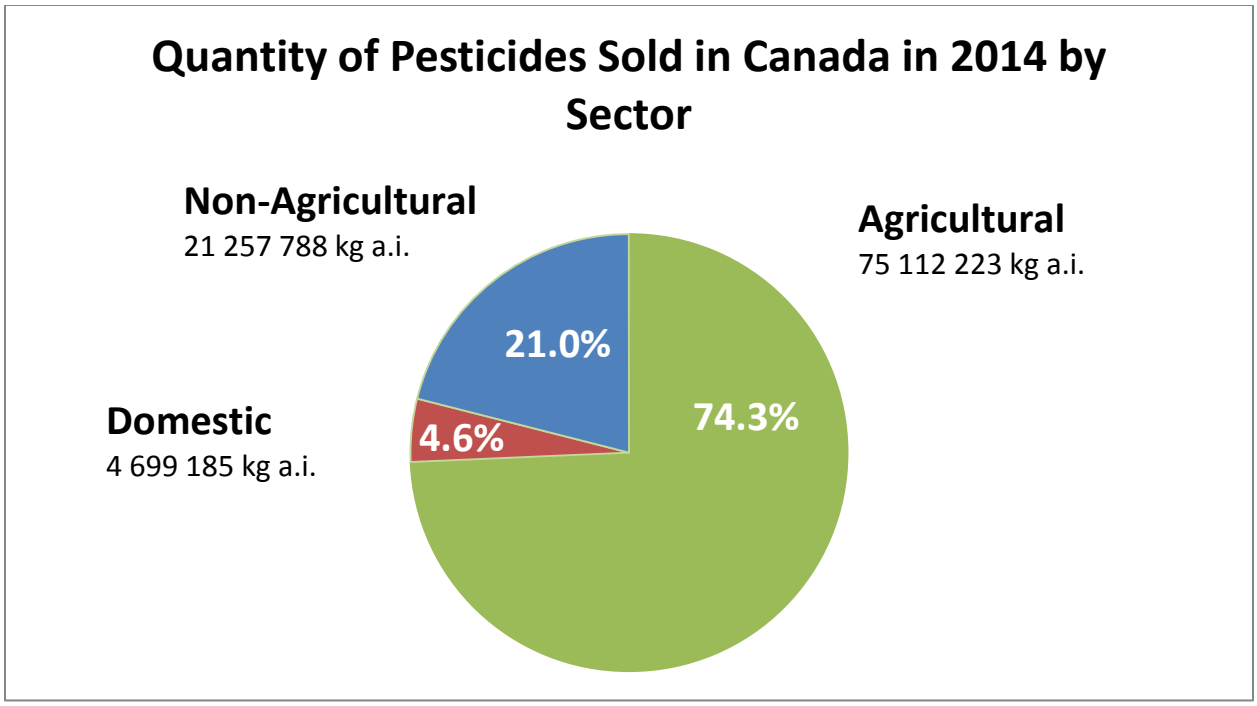

Figure 2: Quantity of pesticides sold in Canada in 2014 by sector.

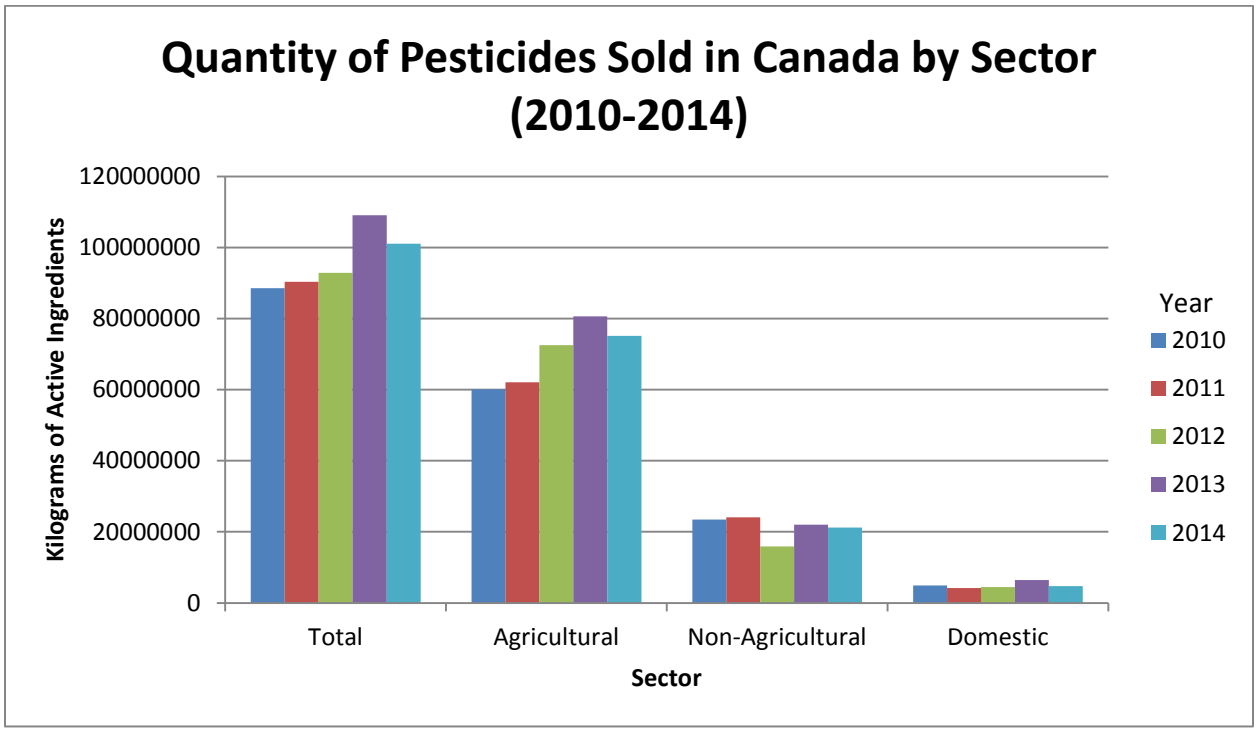

Figure 3: Quantity of pesticides sold in Canada by sector between 2010 and 2014.

Within each sector, data were further broken down into product type groupings. These include: herbicides, insecticides, fungicides, antimicrobials, vertebrate controls, and others (for the remaining products). A product may have a number of different uses on the label. As the sales reporting does not collect data on the relative amount of a product used for a specific label use, the data may not necessarily be separated into only one product type. This means that there may be overlap between the product type groupings and these numbers should not be summed to obtain total quantities sold in Canada in 2014, as an over-reporting would occur.

Agricultural Sector

Products with agricultural uses accounted for the largest amount of pesticide sales in Canada in 2014 at 74.3%. There was a 7% decrease in Agricultural sector pesticide sales from 80 612 067 kg a.i. in 2013 to 75 112 223 kg a.i. in 2014. While absolute quantities decreased in the Agricultural sector, when compared to decreases in Non-agricultural and Domestic sector sales, relative Agricultural sector sales remained relatively consistent (73.9% in 2013).

Of the quantity of pesticides sold having Agricultural sector uses, herbicides accounted for 77.8% of the pesticide sales, followed by fungicides at 12.4% and insecticides at 4.6% (Figure 4). Antimicrobials (1.5%) and vertebrate control (0.04%) accounted for very small quantities of agricultural pesticides sold in 2014 and have been included in the “others” category to account for 6.8% of agricultural sales. Within the Agricultural sector, sales by product type have been consistent, with only small changes seen in the percentage of sales in each type throughout the years reported.

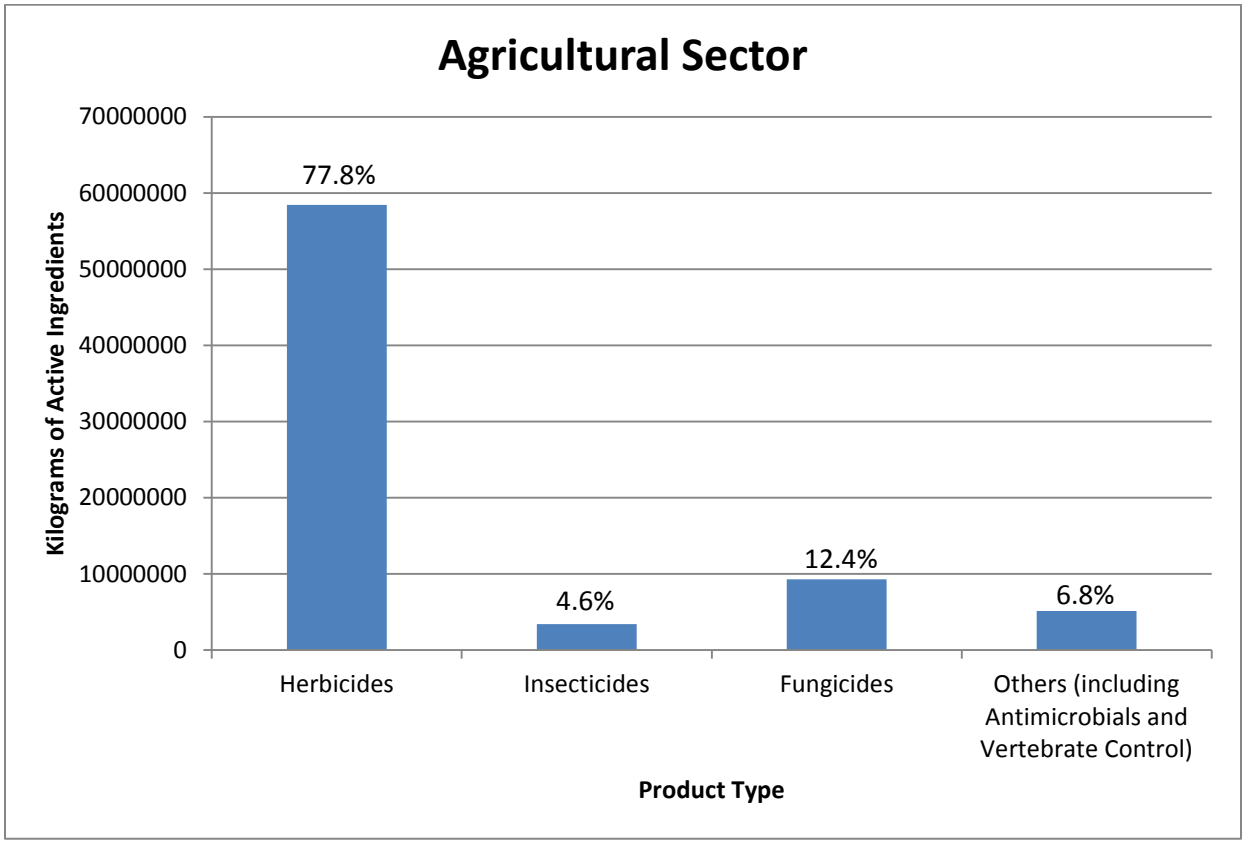

Figure 4: Kilograms of active ingredients sold in Canada in 2014 in the Agricultural sector.

The top 10 active ingredients sold with agricultural uses are shown in Table 2 in decreasing order. Nine of the top 10 agricultural active ingredients were herbicides and adjuvants that are used in conjunction with herbicides. These top 10 active ingredients accounted for 74% of the Agricultural sector pesticides sold. Of the top 10, seven have remained consistent over the last five years of reporting: glyphosate, 2,4-D, MCPA, mineral oil, surfactant blend, mancozeb, and bromoxynil.

Table 2: Top 10 Active Ingredients Sold in Canada in 2014 in the Agricultural Sector

Active Ingredient	Product Type
Glyphosate	Herbicide
Glufosinate ammonium	Herbicide
Surfactant blend	Other
MCPA	Herbicide
2,4-D	Herbicide
Mancozeb	Fungicide
Mineral oil	Insecticide/Fungicide/Other
Triallate	Herbicide
Bromoxynil	Herbicide
S-metolachlor and R-enantiomer	Herbicide

Non-Agricultural Sector

Commercial products with non-agricultural uses accounted for the second-largest amount of all pesticides sold in Canada in 2014 at 21.0% (compared to 20.2% in 2013). Non-agricultural sector pesticide sales decreased 3.6% from 2013 to 2014 (from 22 050 284 kg a.i. to 21 257 788 kg a.i.). Over the past few years, there has been some fluctuation in Non-agricultural sector sales, with a big drop in some years (2012) and smaller increases and decreases in other years.

Of the total pesticides sold with Non-agricultural sector uses, antimicrobials accounted for 96.3%, followed by herbicides with 2.3%. Fungicides (1.4%), insecticides (0.6%), vertebrate control (0.2%) and other product types (0.003%) were combined due to the low quantities of pesticides sold (Figure 5). Fluctuations within the product type groupings have been evident since the start of pesticide sales reporting. However, antimicrobials consistently account for the majority of Non-agricultural sector pesticide sales (with a low of 86% to a high of 96.3%).

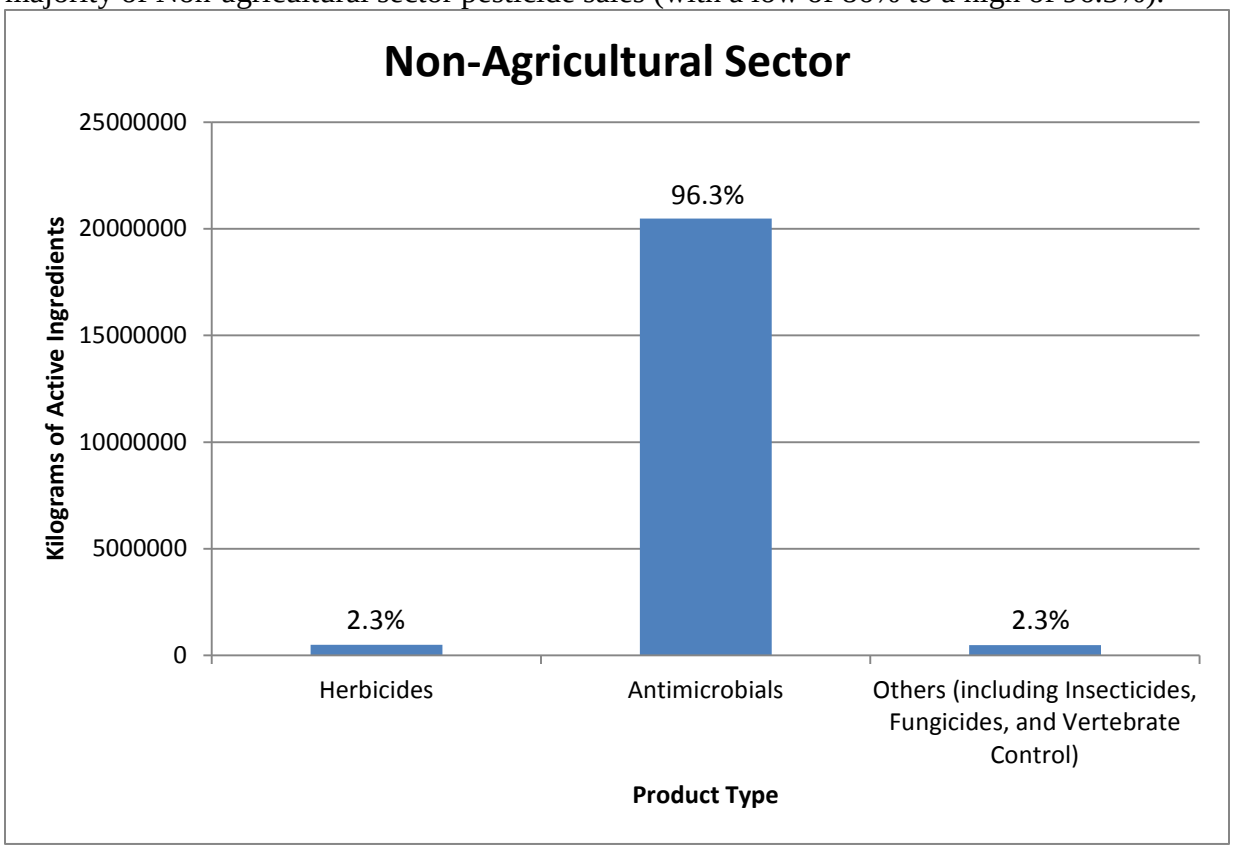

Figure 5: Kilograms of active ingredients sold in Canada in 2014 in the Non-agricultural sector.

The top 10 active ingredients sold with Non-agricultural sector uses were antimicrobials. These are presented in Table 3 in decreasing order. One of the active ingredients also had other product types in addition to the antimicrobial type (copper). Non-agricultural sector products would be used predominantly in the wood preservation industry and for water treatment. The top 10 active ingredients accounted for 81% of the Non-agricultural sector pesticides sold. Six active ingredients have remained on the top 10 list for Non-agricultural sector pesticides over the last

five years: available chlorine, present as sodium hypochlorite (appears as sodium hypochlorite in previous reports), chromic acid, glutaraldehyde, arsenic pentoxide, copper as elemental, and sodium bromide.

Table 3: Top 10 Active Ingredients Sold in Canada in 2014 in the Non-agricultural Sector

Active Ingredient	Product Type
Available chlorine, present as sodium hypochlorite	Antimicrobial
Creosote	Antimicrobial
Tetrakis (hydroxymethyl) phosphonium sulfate (THPS)	Antimicrobial
Glutaraldehyde	Antimicrobial
Pentachlorophenol	Antimicrobial
Copper as elemental	Antimicrobial/Herbicide/Fungicide
Chromic acid	Antimicrobial
Ammonium bromide	Antimicrobial
Sodium bromide	Antimicrobial
Arsenic pentoxide	Antimicrobial

Domestic Sector

The Domestic Class products accounted for 4.6% of overall pesticide sales in Canada for 2014. There was a 27% decrease from 2013 (6 408 499 kg a.i.) to 2014 (4 699 185 kg a.i.) in Domestic sector pesticide sales. This decreased total is within amounts that have been seen in previous years of reporting.

Antimicrobial products accounted for 56.6% of domestic pesticides sold in Canada (Figure 6) mainly due to the sales of swimming pool and spa products. This was a decrease from amounts sold in 2013 (from 3 249 194 kg a.i. to 2 661 695 kg a.i.). Insecticides accounted for 33.6% of the Domestic sector sales (a marked increase from 12% in 2013). Fungicides and vertebrate controls accounted for 6.7% and 5.9% of Domestic sector sales, respectively. Herbicides accounted for 3.7% of the Domestic sector sales and were combined with “other “products (0.06%). The Domestic sector has seen fluctuation from year to year in the product-type groupings.

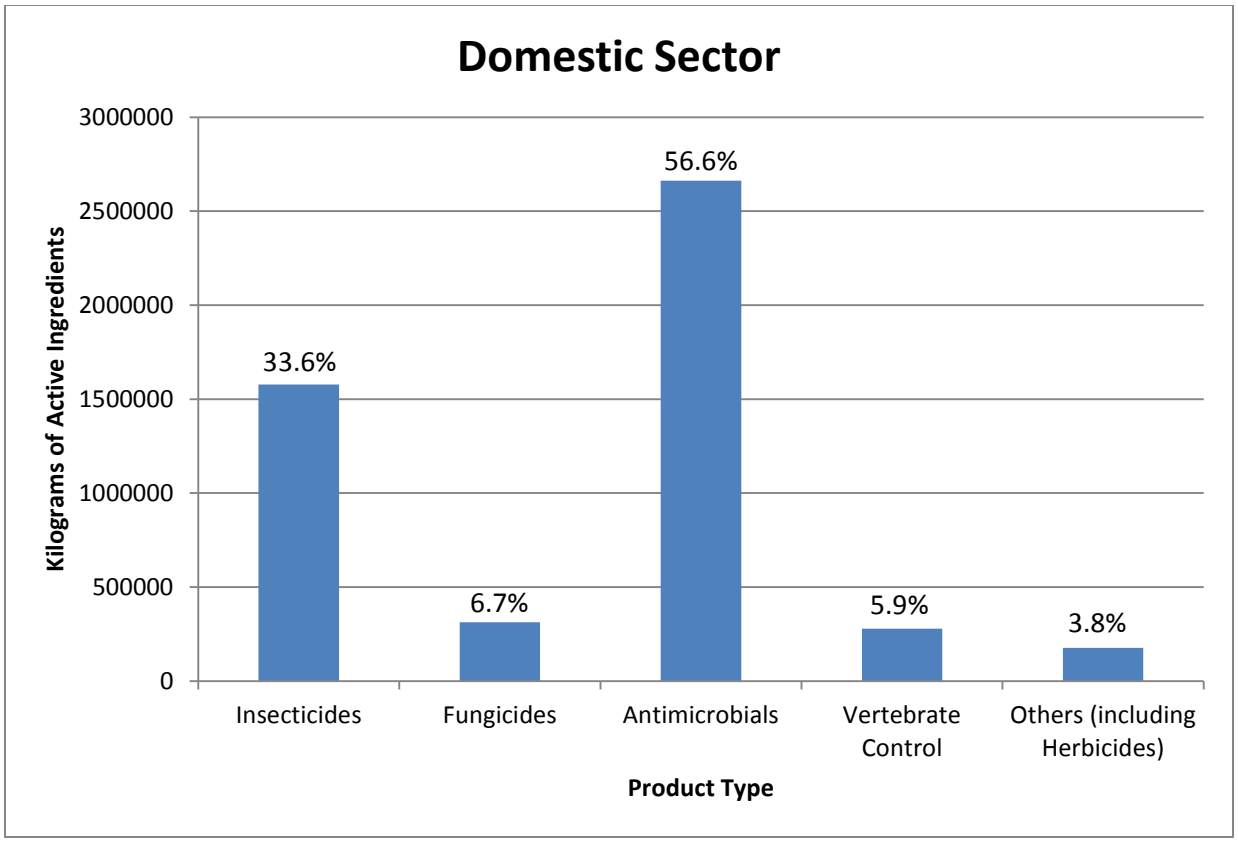

Figure 6: Kilograms of active ingredients sold in Canada in 2014 in the Domestic sector.

The top 10 active ingredients sold for use in the Domestic sector are from four product type groups: antimicrobials, fungicides, vertebrate control, and insecticides. They are presented in Table 4 in decreasing order. Of the top 10 products, five are used for swimming pools and spas, and accounted for 62% of the amount sold of the top 10 Domestic sector list. The top 10 active ingredients accounted for 80% of the Domestic sector pesticides sold. Six actives remained in the top 10 over the last five years: available chlorine, present as calcium hypochlorite (as calcium hypochlorite in previous reports), available chlorine, present as trichloro-s-triazinetrione (as trichloro-s-triazinetrione in previous reports), n-alkyl (40% C12, 50% C14, 10% C16) dimethyl benzyl ammonium chloride, Poly[oxyethylene(dimethyliminio)ethylene(dimethyliminio) ethylene dichloride], DEET, and available bromine present as 1-bromo-3-chloro-5,5-dimethylhydantoin and related hydantoins (as halobrom in previous reports).

Table 4: Top 10 Active Ingredients Sold in Canada in 2014 in the Domestic Sector

Active Ingredient	Product Type
Available chlorine, present as trichloro-s-triazinetrione	Antimicrobial
Available chlorine, present as calcium hypochlorite	Antimicrobial
Mineral oil	Insecticide
Available bromine, present as 1-bromo-3-chloro-5,5-dimethylhydantoin and related hydantoins	Antimicrobial
Lime sulphur	Fungicide, Insecticide
N-alkyl (40% C12, 50% C14, 10% C16) dimethyl benzyl	Antimicrobial

Active Ingredient	Product Type
ammonium chloride	
Poly[oxyethylene(dimethyliminio)ethylene (dimethyliminio)ethylene dichloride]	Antimicrobial
Cellulose (from powdered corn cobbs)	Vertebrate control
DEET*	Insecticide
Piperonyl butoxide	Insecticide

*Since DEET is an insect repellent, it has been grouped with the insecticides.

Sales Information by Product Type

In the following sections, all pesticides are discussed according to their product type (including herbicides, insecticides, fungicides, antimicrobials, vertebrate controls, and other product types). As previously discussed, a product may have a number of different uses on the label. As the sales reporting does not collect data on the relative amount of a product used for a specific label use, the data may not necessarily be separated into only one product type. This means that there may be overlap between the product type groupings and these numbers should not be summed to obtain total quantities sold in Canada in 2014, as an over-reporting would occur.

Herbicides

Herbicides accounted for 58.4% (59 085 239 kg a.i.) of all pesticides sold in Canada in 2014. This is a slight decrease in proportional representation from 2013 when herbicides accounted for 60.1% of all pesticides sold. There was an overall decrease of 10% in the quantities of herbicides sold from 2013 (65 569 883 kg a.i.) to 2014 (59 085 239 kg a.i.) and a return to quantities seen in 2012.

The top 10 herbicides sold in 2014, as listed in Table 5 in decreasing order, accounted for 89.3% of all herbicide sales in Canada and 52.2% of pesticide sales overall. Six of the top 10 active ingredients have remained in the top 10 over the last five years: glyphosate, 2,4-D, MCPA, bromoxynil, S-metolachlor and R-enantiomer, and atrazine.

Table 5: Top 10 Herbicide Active Ingredients Sold in Canada in 2014

Active Ingredient
Glyphosate
Glufosinate ammonium
MCPA
2,4-D
Triallate
Bromoxynil
S-metolachlor and R-enantiomer
Corn gluten meal
Atrazine (plus related active triazines)
Metam-sodium

Insecticides

Insecticides accounted for 5.1% (5 138 580 kg a.i.) of all pesticides sold in Canada in 2014. Insecticide sales have remained relatively low during the years of reporting, with the highest quantities sold in 2014 and the lowest in 2010 (3 796 725 kg a.i.). Many of the insecticides are used in agricultural settings, though the sixth-most sold insecticide (DEET) is used only in the Domestic sector.

The top 10 insecticides sold in 2014, as listed in Table 6 in decreasing order, accounted for 80.8% of all insecticides sales in Canada and 4.1% of pesticide sales overall. Six of the top 10 insecticides have remained on the top 10 list during all years of reporting: mineral oil, hydrogen peroxide, chlorpyrifos, DEET, sulphur, and clothianidin.

Table 6: Top 10 Insecticide Active Ingredients Sold in Canada in 2014

Active Ingredient
Mineral oil
Hydrogen peroxide
Lime sulphur
Chlorpyrifos
Sulphur
DEET*
Piperonyl butoxide
Silicon dioxide
Clothianidin
Paradichlorobenzene

*Since DEET is an insect repellent, it has been grouped with the insecticides.

Fungicides

Fungicides accounted for 9.8% (9 939 107 kg a.i.) of all pesticides sold in Canada in 2014. Fungicide sales have remained relatively low throughout the reporting years, with a high in 2014 and a low in 2010 (5 784 829 kg a.i.). The vast majority of fungicides are used in the Agricultural sector (94%).

The top 10 fungicides sold in Canada in 2014, as listed in Table 7 in decreasing order, accounted for 68.2% of fungicide sales and 6.7% of pesticide sales overall. Six of the top 10 active ingredients have remained consistent in the last five years of reporting: chlorothalonil, mancozeb, metam-sodium, prothioconazole, chloropicrin, and sulphur.

Table 7: Top 10 Fungicide Active Ingredients Sold in Canada in 2014

Active Ingredient
Mancozeb
Chlorothalonil
Metam-sodium
Chloropicrin
Prothioconazole
Sulphur
Pyraclostrobin
Tebuconazole
Propiconazole
Lime sulphur

Antimicrobials

Antimicrobials accounted for 24.0% (24 234 394 kg a.i.) of all pesticides sold in Canada in 2014. While most of the antimicrobial active ingredients are used in the Non-agricultural sector, there are a number where the majority of the active ingredient is sold in the Domestic sector. This is true of some of the active ingredients containing available chlorine and available bromine. The high volumes are due to large quantities used in swimming pools and spas, which are mostly for Domestic use.

The top 10 antimicrobial active ingredients sold in 2014, as listed in Table 8 in decreasing order, accounted for 79.6% of all antimicrobial sales in Canada and 19.1% of pesticide sales overall. Seven of the top 10 active ingredients have remained consistent in the last five years of reporting: available chlorine, present as sodium hypochlorite, as calcium hypochlorite, and as trichloro-s-triazinetrione (appearing as sodium hypochlorite, calcium hypochlorite, and trichloro-s- triazinetrione, respectively, in previous reports), available bromine present as 1-bromo-3-chloro-5,5-dimethylhydantoin and related hydantoins (appears as halobrom in previous reports), chromic acid, glutaraldehyde, and copper as elemental.

Table 8: Top 10 Antimicrobial Active Ingredients Sold in Canada in 2014

Active Ingredient
Available chlorine, present as sodium hypochlorite
Creosote
Tetrakis (hydroxymethyl) phosphonium sulfate (THPS)
Glutaraldehyde
Copper as elemental
Available chlorine, present as calcium hypochlorite
Pentachlorophenol
Available chlorine, present as trichloro-s-triazinetrione
Available bromine present as 1-bromo-3-chloro-5,5-dimethylhydantoin and related hydantoins
Chromic acid

Vertebrate Control

Vertebrate controls accounted for 0.3% (347 143 kg a.i.) of all pesticides sold in Canada in 2014. Since sales data have been collected in Canada, products for vertebrate control have always accounted for a very small and consistent amount of overall pesticide sales.

The top 10 vertebrate controls, as listed in Table 9 in decreasing order, accounted for 99.2% of all vertebrate control sales in 2014 and 0.3% of pesticide sales overall. Four of the top 10 active ingredients have remained consistent in the last five years: carbon dioxide gas, cellulose (from powdered corn cobbs), dried blood, and zinc phosphide.

Table 9: Top 10 Vertebrate Control Active Ingredients Sold in Canada in 2014

Active Ingredient
Cellulose (from powdered corn cobbs)
Carbon dioxide gas
Aluminum phosphide
Dried blood
Sulphur
Thiram
Zinc phosphide
Fish meal mixture
Oil of black pepper
Dried eggs

Others

Products fall into the “Others” type when they include uses that are not classified in any of the groups above and include adjuvants, nematicides, and molluscicides. These “other” products accounted for 4.0% (4 012 982 kg a.i) of pesticide sales in Canada in 2014. Sales in this category have fluctuated slightly over the years of reporting, but have remained fairly low, with a high in 2013 (4 122 259 kg a.i.) and a low in 2008 (2 033 691 kg a.i.). The majority of the label uses of these other active ingredients are in the Agricultural sector (99.6%).

The top 10 active ingredients sold in Canada in 2014 that fall into this type are listed in Table 10 in decreasing order and accounted for 99.5% of “other” type sales and 3.9% of pesticide sales overall. Six of the top 10 active ingredients have remained consistent in the last five years of reporting: surfactant blend, mineral oil, nonylphenoxypolyethoxyethanol, paraffin based petroleum oil, octylphenoxypolyethoxyethanol, and polyoxyalkylated alkyl phosphate ester.

Table 10: Top 10 Other Active Ingredients Sold in Canada in 2014

Active Ingredient
Surfactant blend
Polyoxyalkylated alkyl phosphate ester
Paraffin based petroleum oil
Triglyceride ethoxylate
Mineral oil
Nonylphenoxypolyethoxyethanol
Alcohols, C9-11, ethoxylated
Octadec-9-enoic acid, ethyl ester
Octadec-9-enoic acid, methyl ester
Octylphenoxypolyethoxyethanol

Biopesticides

Biopesticides include microbial pesticides (contain a bacterium, fungus, virus, protozoan, or alga as the active ingredient), pheromones and other semiochemical pesticides, and other non-conventional (formerly biochemical) pesticides.

In 2014, there were 163 active ingredients identified as biopesticides, which accounted for 894 registered products.

The 356 end-use biopesticide products reported as sold have been broken into two groups: 1) those products which could be converted into kg a.i. and 2) microbial products that could not be converted into kg a.i. It is important to note that biopesticide sales are represented in this subsection in addition to being included in each individual product type section (for example, herbicides, insecticides, etc.).

The 302 products that could be converted to kg a.i. accounted for 6 194 830 kg a.i. sold in 2014 which represents 6.1% of pesticide sales overall. There was a 7% increase in biopesticide sales from 2013 (5 786 693 kg a.i.) to 2014. The sales of biopesticides have fluctuated in the years that data have been collected; however, there is an overall increase from 2010 to 2014. Insecticides accounted for 53% of the biopesticide sales in 2014 (Figure 7). Herbicides accounted for the next largest portion of biopesticide sales in 2014 at 25.2%, followed by fungicides with 19.4% of sales, and vertebrate control with 5.1%. Antimicrobials accounted for 2.2% of the biopesticides sold in 2014 and the “others” product type accounted for 6.0%.

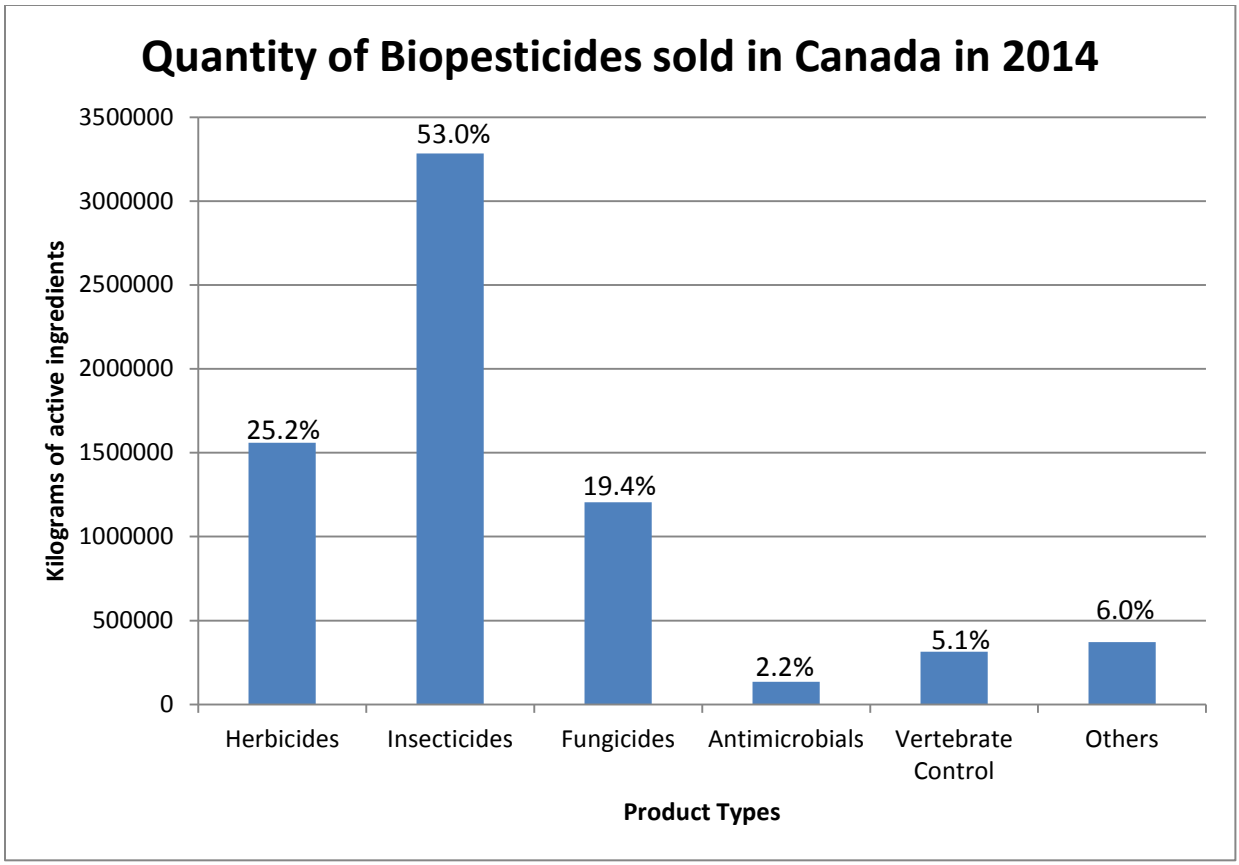

Figure 7: Kilograms of active ingredients of biopesticides sold in Canada in 2014.

The top 10 biopesticide active ingredients sold in Canada are listed in Table 11 in decreasing order. The top 10 active ingredients accounted for 90.4% of sales of biopesticides that could be converted to kg a.i. and 5.5% of pesticide sales overall. Six of the top 10 active ingredients have remained in the top 10 over the last five years: corn gluten meal, mineral oil, sulphur, N-decanol, hydrogen peroxide, and mono- and dipotassium phosphite.

Table 11: Top 10 Biopesticide Active Ingredient Sold in Canada in 2014

Active Ingredient	Product Type
Mineral oil	Fungicide, Insecticide, Other
Corn gluten meal	Herbicide
Hydrogen peroxide	Herbicide, Insecticide, Fungicide, Antimicrobial
Soap	Herbicide, Insecticide, Fungicide
Sulphur	Fungicide, Insecticide, Vertebrate Control
N-decanol	Herbicide
Lime sulphur	Insecticide, Fungicide
Cellulose (from corn cobbs)	Vertebrate control
Mono- and dipotassium phosphite	Fungicide
Mono- and dibasic sodium, potassium, and ammonium phosphites	Fungicide
Carbon dioxide gas	Insecticide, Vertebrate Control

The remaining 54 products are microbial agents that could not be converted into kg a.i. due to unconventional units of measure. The amount of products sold in 2014 of these is listed in Table 12.

Table 12: Quantity of Microbials Sold in Canada in 2014

Units of Product Sold	Total
Litres (microbials)	1 024 441
Kilograms (microbials)	398 002

Sales Information by Chemical Group

Active ingredients have been grouped into chemical groups to present an alternate way of viewing Canadian pesticide sales information (Table 13). The chemical groups were aligned with the Quebec Ministry of Sustainable Development, Environment and Parks' listings (Dion 2007, 35) and are outlined in Appendix II.

In 2014, the chemical group with the largest proportion of sales was the "Phosphonic and phosphinic acids" group at 42%, followed by the "Inorganic, others" group at 13%. The third and fourth groups were the "Phenoxy acids" and "Fatty acids and surfactants" at just over 4%. The remaining chemical groups were all under 4% and 34 out of 52 chemical groups were under 1% of total sales. Nine chemical families remained in the top 10 from 2013 to 2014.

Table 13: Summary of Pesticide Sales by Chemical Group (All Sectors) in 2014

Chemical Grouping	Kilograms of Active Ingredients	Rank
Phosphonic acids, phosphinic acids	42 286 074	1
Inorganic, others	13 499 315	2
Phenoxy acids	4 541 896	3
Fatty acids & surfactants	4 077 266	4
Hydrocarbons	3 585 040	5
Alcohols	2 924 367	6
Benzonitriles	2 446 324	7
Biscarbamates	2 293 470	8
Oils, minerals and vegetable	2 144 563	9
Triazines, tetrazines	2 079 534	10
Carbamates	1 863 033	11
Anilides/anilines	1 854 068	12
Others	1 754 259	13
Triazoles	1 681 973	14
Urea derivatives	1 206 195	15
Inorganic coppers	1 134 174	16
Dithiocarbamates	1 049 002	17
Ammoniums, quaternary	1 043 082	18
Dinitrobenzenes	979 257	19
Acylureas	854 977	20

Chemical Grouping	Kilograms of Active Ingredients	Rank
Aldehydes	836 049	21
Organochlorines	XXX	22
Phenols/chlorophenols	732 110	23
Methoxyacrylates	677 678	24
Halogenated organic acids	666 456	25
Azoles, oxazoles, thiazoles	407 858	26
Guanidines	388 727	27
Amides	379 766	28
Cyclohexanedione oximes	370 251	29
Thiophosphates	369 142	30
Aryloxyphenoxyl acids	340 756	31
Benzamides	295 544	32
Phtalic acids	243 406	33
Dithiophosphates	XXX	34
Benzoic acid and derivatives	210 306	35
Imidazolinones	154 932	36
Morpholines & oxathiines	XXX	37
Pyrethroids, pyrethrins	121 521	38
Nitrobenzenes	115 993	39
Organic acids	101 740	40
Sulfonylureas	75 892	41
Pyridines	32 463	42
Diazines	28 690	43
Organohalogens	16 624	44
Phosphoramidothioates	XXX	45
Phosphates	XXX	46
Inorganic zincs	5 106	47
Pheromones	1 553	48
Organometallics	XXX	49
Chromenones	37	50
Indanediones	XXX	51
Microbials	0	52

XXX Indicates confidential business information. The chemical group did not contain a minimum of 4 registrants in the calculation of the total.

Future Years

The PMRA is collecting the sales data for the 2015 calendar year. The PMRA will publish the 2015 data once the data analysis is complete.

References

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Appendix I Ranking of all active ingredients sold in Canada in 2014

Active name	Kilograms of active ingredients
Glyphosate	> 25 000 000
Available chlorine, present as sodium hypochlorite	> 5 000 000
Creosote	> 1 000 000
Glufosinate-ammonium	
Tetrakis (hydroxymethyl) phosphonium sulfate (THPS)	
MCPA	
Mineral oil	
2,4-D	
Surfactant blend	
Mancozeb	
Triallate	
Bromoxynil	
S-metolachlor and R-enantiomer	
Chlorothalonil	
Corn gluten meal	> 500 000
Copper as elemental	
Glutaraldehyde	
Metam-sodium	
Available chlorine, present as calcium hypochlorite	
Pentachlorophenol	
Available chlorine, present as trichloro-s-triazinetrione	
Hydrogen peroxide	
Chloropicrin	
Atrazine (plus related active triazines)	
Available bromine present as 1-bromo-3-chloro-5,5-dimethylhydantoin and related hydantoins	
Ethalfluralin	
Prothioconazole	
Bentazon (present as sodium salt)	
Fluroxypyr (present as 1-methylheptyl ester)	
Polyoxyalkylated alkyl phosphate ester	> 100 000
Paraffin base petroleum oil	
Diquat	
Sulphur	
Triglyceride ethoxylate	
Chromic acid	
Tebuconazole	
Pyraclostrobin	
Sodium bromide	
N-decanol	
Ammonium bromide	
Propiconazole	
Borates	
Arsenic pentoxide	
Lime sulphur	

Active name	Kilograms of active ingredients
Chlorpyrifos	
Hexahydro-1,3,5-tris(2-hydroxyethyl)-s-triazine	
N-alkyl (40% C12, 50% C14, 10% C16) dimethyl benzyl ammonium chloride	
Poly[oxyethylene(dimethyliminio)ethylene(dimethyliminio)ethylene dichloride]	
2,2-dibromo-3-nitrilopropionamide	
Available chlorine present as 1-bromo-3-chloro-5,5-dimethylhydantoin and related hydantoins	
Boscalid	
Cellulose (from powdered corn cobs)	
Clethodim	
Metiram	
Metribuzin	
Trifluralin	
DEET	
Acrolein	
Captan	
Iprodione	
Cupric oxide	
Picoxystrobin	
Dicamba (present as acid, amine salt, ester, or sodium salt)	
Mono- and dipotassium phosphite	
Piperonyl butoxide	
Alkyl-1,3-propylene diamine acetates	
Metconazole	
Mono- and dibasic sodium, potassium, and ammonium phosphites	
Dimethenamid-P	
Bronopol	
Silicon dioxide	
Linuron	
Clothianidin	
Nonylphenoxypolyethoxyethanol	
Pendimethalin	
Clodinafop-propargyl	
Paradichlorobenzene	
Sodium chlorite	
Carbathiin	
Ammonia (present as ammonium sulfate)	
Fenoxaprop-P-ethyl	
Clopyralid	
Pinoxaden	
Mecoprop	
Fluxapyroxad	
Thiram	
Alcohols, C9-11, ethoxylated	

Active name	Kilograms of active ingredients
Thiamethoxam	> 50 000
Azoxystrobin	
Sodium dimethyldithiocarbamate	
Nabam	
Malathion	
Available chlorine, present as sodium dichloro-s-triazinetrione	
Quizalofop-P-ethyl	
Saflufenacil	
Pyrasulfotole	
Phorate	
Hexazinone	
Tralkoxydim	
Cyprodinil	
Didecyldimethylammonium present as carbonate and bicarbonate salts	
Acetic acid	
Chlorpropham	
Soap	
Propamocarb hydrochloride	
Sulfentrazone	
2,4-DB	
1-(3-chloroallyl)-3,5,7-triaza-1-azoniaadamantane chloride	
Mesotrione	
Dazomet	
Metam-potassium	
Sodium chloride	
Difenoconazole	
Carbaryl	
Imidacloprid	
Imazethapyr	
Fludioxonil	
Permethrin	
Penthiopyrad	
Iron (present as FeHEDTA)	
Diuron	
Potassium dimethyldithiocarbamate	
Fosetyl-Al	
Didecyl dimethyl ammonium chloride	
Sulfuryl fluoride	
Imazamox	< 50 000
Triclopyr-butotyl	
Diazinon	
Fomesafen	
1,2-benzisothiazolin-3-one, bit	
Metalaxyl	
Amitrole	
Fluazinam	
Phosmet	

Active name	Kilograms of active ingredients
Available chlorine present as 1,3-dichloro-5,5-dimethylhydantoin and 1,3-dichloro-5-ethyl-5-methylhydantoin	
Octadec-9-enoic acid, ethyl ester	
Octadec-9-enoic acid, methyl ester	
Carbon dioxide gas	
Mineral spirits	
Simazine plus related active triazines	
N-alkyl (5% C12, 60% C14, 30% C16, 5% C18) dimethyl benzyl ammonium chloride	
Ferrous sulfate	
Available chlorine present as 1-bromo-3-chloro-5,5-dimethylhydantoin, 1,3-dichloro-5,5-dimethylhydantoin, 1,3-dichloro-5-ethyl-5-methylhydantoin and related hydantoins	
EPTC	
Aluminum phosphide	
Dimethoate	
Iodocarb	
Imazamethabenz-methyl	
5-chloro-2-methyl-4-isothiazolin-3-one	
Chlorantraniliprole	
Thiophanate-methyl	
Maleic hydrazide	
Florasulam	
Paraquat	
Flucarbazone (present as flucarbazone-sodium)	
N-alkyl (68% C12, 32% C14) dimethyl ethylbenzyl ammonium chloride	
Dichlorprop	
Sodium omadine	
Isoxaflutole	
Octhilinone	
Picloram	
Oxirane derivatives (50% minimum)	
Pyrimethanil	
Ethephon	
Cinerin I, cinerin II, jasmolin I, jasmolin II, pyrethrin I and pyrethrin II	
Tepraloxydim	
Tribenuron-methyl	
Imazapyr	
4-chloro-3-methylphenol (sodium salt)	
Aluminum silicate	
Lambda-cyhalothrin	
Octylphenoxypolyethoxyethanol	
Carfentrazone-ethyl	
Dichlobenil	
Oxydiethylene bis(alkyl dimethyl ammonium chloride)	
Sethoxydim	
Acephate	

Active name	Kilograms of active ingredients
Sedaxane	
Fluazifop-P-butyl	
Triticonazole	
Garlic juice	
Formic acid	
Thiabendazole	
Cyantraniliprole	
Siloxylated polyether	
Terbacil	
Flumioxazin	
Thifensulfuron-methyl	
N-alkyl (67% C12, 25% C14, 7% C16, 1% C18) dimethyl benzyl ammonium chloride	
Trifloxystrobin	
N-coco-alkyltrimethylene diamines present as monobenzoate salt	
Ethyl alcohol	
Sodium fluoride	
Mandipropamid	
Aminopyralid	
2-phenylphenol	
Pyroxasulfone	
2-methyl-4-isothiazolin-3-one	
Fluopyram	
MCPB	
Prometryne plus related active triazines	
1,2-dibromo-2,4-dicyanobutane	
Cypermethrin	
Napropamide	
Pyroxsulam	
Barium metaborate monohydrate	
Potassium bicarbonate	
Thiencarbazone-methyl	
Formaldehyde	
Methylene bis(thiocyanate)	
Naled	
2-(thiocyanomethylthio)benzothiazole	
Carbendazim	
Folpet	
Propyzamide	
Quinclorac	
Peracetic acid	
Diflufenzopyr	
1,3-bis(hydroxymethyl)-5,5-dimethylhydantoin	
Deltamethrin	
Dried blood	
Ferbam	

Active name	Kilograms of active ingredients
Flumetsulam	
Dichlorvos	
Fenamidone	
Diodofon	
Rimsulfuron	
Halosulfuron (present as methyl ester)	
Bromacil (present in free form, as dimethylamine salt, or as lithium salt)	
Chlorimuron-ethyl	
D-phenothrin	
Tetramethrin	
Oxamyl	
Silica gel (amorphous)	
Chlorthal-dimethyl	
Nicosulfuron	
4,5-dichloro-2-n-octyl-3(2H)isothiazolone	
Daminozide	
Potassium peroxymonosulfate (present as potassium peroxymonosulfate sulfate)	
Fenhexamid	
Clomazone	
Tembotrione	
Acetamiprid	
Spirotetramat	
Acifluorfen-sodium	
Myclobutanil	
Zoxamide	
Flonicamid	
Zinc	
3-decen-2-one	
2,2'-(1-methyltrimethylenedioxy)bis-(4-methyl-1,3,2-dioxaborinane)	
Octylbicyclo heptene dicarboximide	
Dodine	
Flutriafol	
Cyfluthrin	
Ferric sodium EDTA	
Tetrachlorvinphos	
Dimethomorph	
Trinexapac-ethyl	
Icaridin	
Zinc phosphide	
Metsulfuron-methyl	
Chlormequat chloride	
Formetanate hydrochloride	
Methyl bromide	
Thiacloprid	
Cymoxanil	
Penflufen	

Active name	Kilograms of active ingredients
Methomyl	
Fish meal mixture	
Ethofumesate	
Propoxur	
Bifenthrin	
P-menthane-3,8-diol	
Methylated seed oil of soybean	
Topramezone	
Oxyfluorfen	
Ametoctradin	
D-cis, trans allethrin	
Ipconazole	
Dodecylguanidine hydrochloride	
Novaluron	
Spinosad	
1- or 3-monomethylol-5,5-dimethylhydantoin	
Bifenazate	
Spinetoram	
Metaldehyde	
2,2-oxybis(4,4,6-trimethyl-1,3,2-dioxaborinane)	
Tefluthrin	
Streptomycin	
D-trans allethrin	
Magnesium phosphide	
Aminocyclopyrachlor	
Ethylene oxide	
Butoxypolypropylene glycol	
Cyazofamid	
Oriental mustard seed meal	
Methoxyfenozide	
Liquid corn gluten	
Kresoxim-methyl	
Prohexadione-calcium	
Quinoxyfen	
Metrafenone	
Naphthalene	
Spiromesifen	
Bis(trichloromethyl)sulfone	
Desmedipham	
Phenmedipham	
Pyridaben	
5,5-dimethylhydantoin	
Acequinocyl	
(S)-methoprene	
Amitraz	
Oil of black pepper	
Oxalic acid	

Active name	Kilograms of active ingredients
Cloransulam-methyl	
Garlic powder	
Dried eggs	
Ferric phosphate	
Endosulfan	
Fenbuconazole	
Spirodiclofen	
Azadirachtin	
Sodium 2-phenylphenate	
Halauxifen-methyl	
From nanogen: chlorocresol (or: parachlorocresol)	
Brassica hirta white mustard seed powder	
Lactic acid	
Tebufenozide	
Triforine	
Azamethiphos	
Famoxadone	
Etridiazole	
Oxadiazon	
Fenbutatin oxide	
Methyl nonyl ketone	
3-methyl-2-cyclohexen-1-one	
Capsaicin	
Ethametsulfuron-methyl	
Citric acid	
Sodium alpha-olefin sulfonate	
Phosphine	
Sulfoxaflor	
Meat meal mixture	
Codlelure	
1,4-dimethylnaphthalene	
Strychnine	
Artificial grape extract	
Dithiopyr	
Wintergreen oil	
Chlorfenapyr	
Polybutene	
(Z)-11-tetradecenyl acetate	
Foramsulfuron	
Chlorsulfuron	
Disodium cyanodithioimidocarbonate	
Octyl decyl dimethyl ammonium chloride	
6-benzylaminopurine (or: 6-benzyladenine)	
Natamycin	
Octenol	
Diphenylamine	
Verbenone	

Active name	Kilograms of active ingredients
Hydramethylnon	
(Z)-9-dodecenyl acetate + (Z)-11-tetradecenyl acetate	
Dioctyl dimethyl ammonium chloride	
Bispyribac-sodium (KIH-2023)	
Abamectin	
Fish oil mixture	
Garlic oil	
Castor oil	
Pyriproxyfen	
1,4-bis(bromoacetoxy)-2-butene	
Tetraconazole	
Di-n-propyl isocinchomeronate	
Saponins of *Chenopodium quinoa*	
Gibberellic acid	
S-kinoprene	
Naphthylacetic acid	
Kasugamycin hydrochloride	
1-dodecanol	
(E,Z)-11-tetradecenal	
3,13-octadecadienyl acetate	
Metofluthrin	
Piperine	
N-dialkyl (5% C12, 60% C14, 30% C16, 5% C18) methyl benzyl ammonium chloride	
(Z)-9-tetradecen-1-yl acetate	
Diisobutylphenoxyethoxyethyl dimethyl benzyl ammonium chloride	
Muscalure	
Bromadiolone	
Paclobutrazol	
Clofentezine	
Z-8-dodecenyl acetate	
3-(trimethoxysilyl)-propyldimethyloctadecyl ammonium chloride	
Warfarin	
Eucalyptus oil	
Oil of geranium	
Pine needle oil	
Lemon oil	
Chlorophacinone	
1-tetradecanol	
Garlic	
Tau-fluvalinate	
Related capsaicinoids	
(Z)-11-tetradecen-1-ol	
Triflusulfuron-methyl	
(Z)-11-tetradecenal	
Diphacinone (present in free form or as sodium salt)	
Camphor oil	

Active name	Kilograms of active ingredients
4-aminopyridine	
Brodifacoum	
1-MCP	
Difethialone	
(E,E)-8,10-dodecadien-1-ol + 1-dodecanol + 1-tetradecanol	
Pymetrozine	
Putrescent whole egg solids	
E-8-dodecenyl acetate	
Cyromazine	
Denatonium benzoate	
Bromethalin	
Uniconazole-P	
Prosulfuron	
Aviglycine hydrochloride	
(E,Z)-2,13-octadecadien-1-yl acetate	
Z-8-dodecenol	
Ancymidol	
4-CPA	
(Z,Z)-3,13-octadecadien-1-ol	
Acibenzolar-s-methyl	
(E,Z)-2,13-octadecadien-1-ol	
Sodium monofluoroacetate	
Sodium cyanide	
1-(alkyl-amino)-3-carboxymethylaminopropane (component of Ampho 443-31)	
Lactococcus lactis ssp. *cremoris* strain M11/CSL	
Thidiazuron	
Methyl salicylate	
Typhyla phacorrhiza (strain 94671)	
Aureobasidium pullulans	
Thymol	
Bacillus subtilis	
Anhydrous ammonia	
Fungus: *Gliocladium catenulatum*	
Pheromone pine shoot borer	
Pyrazon	
Pseudomonas fluorescens	
Coumaphos	
N-alkyl (25% C12, 60% C14, 15% C16) dimethyl benzyl ammonium chloride	
Petroleum hydrocarbon blend	
Sclerotinia minor IMI 3144141	
Tributyl tetradecyl phosphonium chloride	
Bacillus firmus I-1582	
Triethylene glycol	
Bensulide	
Tea tree oil	

Active name	Kilograms of active ingredients
(Z)-8-dodecenyl acetate + (E)-8-dodecenyl acetate + (Z)-8-dodecen-1-ol	
Cyphenothrin	
Diflubenzuron	
Propylene glycol	
Metarhizium anisopliae (strain F52)	
Nucleopolyhedrovirus for gypsy moth larvae	
N-alkyl (5% C5-18, 61% C12, 23% C14, 11% C16) dimethyl benzyl ammonium chloride	
Paraformaldehyde	
N-alkyl (40% C12, 50% C14, 10% C16) dimethyl benzyl ammonium saccharinate	
Endothal or Endothall	
Niclosamide	
Iodosulfuron-methyl-sodium	
Decyl isononyl dimethyl ammonium chloride	
Isofetamid	
Ophiostoma piliferum fungus	
Cyprosulfamide	
Trichoderma harzianum strain KRL-AG2	
Clavibacter michiganensis (spp *michiganensis*) bacteriophage	
(E)-11-tetradecenyl acetate	
N-alkyl (3% C12, 95% C14, 2% C16) dimethyl benzyl ammonium chloride (or: myristyl dimethyl benzyl ammonium chloride dihydrate)	
D-limonene	
Fluoxastrobin	
Flufenacet	
Quintozene	
Oxalic acid dihydrate	
Neodiprion abietis nucleopolyhedrovirus	
Chondrostereum purpureum (strain: North American; pathovar: PFC2139)	
Bacillus sphaericus	
Phoma macrostoma	
Bacillus thuringiensis	
Ethanol extract of *Reynoutria sachalinensis*	
R-(-)-1-octen-3-ol	
Nucleopolyhedrovirus for Douglas-fir tussock moth	
Rotenone	
Oxycarboxin	
(E)-4-tridecenyl acetate + (Z)-4-tridecenyl acetate	
Nuclear polyhedrosis virus of red-headed pine sawfly	
Coniothyrium minitans strain CON/M/91-08	
Beauveria bassiana	
Soybean oil	
Picolinafen	
Pantoea agglomerans	
Indaziflam	
Trichoderma asperellum, strain T34	

Active name	Kilograms of active ingredients
Sodium chlorate	
Trichoderma virens strain G-41	
Iron (present as ferric phosphate)	
German cockroach extract	
Dodemorph-acetate	
1-alkyl(C6-C18)-1,3-propanediamine	
4-nitro-3-(trifluoromethyl) phenol sodium salt	
N-octanol	
2-bromo-4'-hydroxyacetophenone	
1-(alkyl-amino)-3-aminopropane hydrochloride (component of Ampho 443-31)	
Dichloran	
Fosamine ammonium	
Thyme oil	
Prallethrin	
3-chloro-P-toluidine hydrochloride	
Sulfometuron methyl	
Dinocap (plus related active compounds)	
Triclopyr triethylamine salt	
Cornmint oil	
Lactococcus lactis ssp. *lactis*	
Imiprothrin	
Cydia pomonella granulovirus	
Lactobacillus casei strain LPT-111	
Flusilazole	
Phlebiopsis gigantea	
Cloquintocet-mexyl	
Lactobacillus rhamnosus (strain LPT-21)	
Naphthaleneacetamide	
2-(hydroxymethyl)-2-nitro-1,3-propanediol	
Sodium lauryl sulfate	
Cyflumetofen	
Diallyl disulfide and related sulfides	
Pseudomonas syringae - strain ESC-10	
Verticillium albo-atrum, isolate WCS850	
Etofenprox	
Dimethoxane	
Propetamphos	
Isoxaben	
Available chlorine, present as lithium hypochlorite	
Primisulfuron-methyl	
Isopropyl alcohol	
Nosema locustae canning, (spore of)	
Benzyl benzoate	
Fluopicolide	
Paecilomyces fumosoroseus strain FE 9901	
Ziram	

Active name	Kilograms of active ingredients
Pyraflufen-ethyl	
Fenpropimorph	
Streptomyces acidiscabies strain RL-110T cells and spent fermentation media	
Aromatics	
Streptomyces griseoviridis strain K61	
Streptomyces lydicus strain WYEC108	
Agrobacterium radiobacter	
Ethaboxam	
10,10'-oxybis(phenoxarsine)	
Mesosulfuron-methyl	

Appendix II Chemical Groups and Active Ingredients-2014

Chemical Group	Active Ingredient Name
Acylureas	Bromacil (present in free form as dimethylamine salt or as lithium salt) Bentazon (present as sodium salt) Cymoxanil Diflubenzuron Iprodione Novaluron Terbacil Hexazinone
Alcohols	Alcohols, C9-11, ethoxylated Aviglycine hydrochloride Bronopol Butoxypolypropylene glycol Ethyl alcohol Ethylene oxide N-decanol N-octanol Tetrakishydroxymethyl phosphonium sulphate (THPS) Isopropyl alcohol P-menthane-3,8-diol and related oil of lemon eucalyptus compounds P-menthane-3,8-diol Propylene glycol Siloxylated polyether Triethylene glycol 2-(hydroxymethyl)-2-nitro-1,3-propanediol
Aldehydes	Formaldehyde Glutaraldehyde Metaldehyde Paraformaldehyde
Amides	2,2-dibromo-3-nitrilopropionamide Capsaicin Piperine Daminozide Isofetamid Mandipropamid Naphthaleneacetamide Napropamide Related capsaiciniods Saflufenacil

Chemical Group	Active Ingredient Name
Ammoniums, Quaternary	Chlormequat chloride 1-(3-chloroallyl)-3,5,7-triaza-1-azoniaadamantane chloride Denatonium benzoate Diquat Paraquat N-alkyl (25% C12, 60% C14, 15% C16) dimethyl benzyl ammonium chloride N-alkyl (40% C12, 50% C14, 10% C16) dimethyl benzyl ammonium chloride N-alkyl (68% C12, 32% C14) dimethyl ethylbenzyl ammonium chloride Didecyl dimethyl ammonium chloride N-alkyl (5% C12, 60% C14, 30% C16, 5% C18) dimethyl benzyl ammonium chloride N-alkyl (67% C12, 25% C14, 7% C16, 1% C18) dimethyl benzyl ammonium chloride Diisobutylphenoxyethoxyethyl dimethyl benzyl ammonium chloride N-alkyl (5% C5-C18, 61% C12, 23% C14, 11% C16) dimethyl benzyl ammonium chloride N-alkyl (40% C12, 50% C14, 10% C16) dimethyl benzyl ammonium saccharinate Didecyldimethylammonium present as carbonate and bicarbonate salts Decyl isononyl dimethyl ammonium chloride Dioctyl dimethyl ammonium chloride Octyl decyl dimethyl ammonium chloride N-dialkyl (5% C12, 60% C14, 30% C16, 5% C18) methyl benzyl ammonium chloride Oxydiethylene bis(alkyl dimethyl ammonium chloride) N-alkyl (3% C12, 95% C14, 2% C16) dimethyl benzyl ammonium chloride (or: myristyl dimethyl benzyl ammonium chloride dihydrate) 3-(trimethoxysilyl)-propyldimethyloctadecyl ammonium chloride
Anilides/Anilines	S-Metolachlor and R-Enantiomer Amitraz Niclosamide Boscalid 3-chloro-P-toluidine hydrochloride Dimethenamid-P Diphenylamine Fenhexamid Flufenacet Flumioxazin Fluxapyroxad Artificial grape extract Metalaxyl-m and s-isomer Metalaxyl Picolinafen Penflufen Penthiopyrad Sedaxane

Chemical Group	Active Ingredient Name
Aryloxyphenoxyl Acids	Clodinafop-propargyl Fenoxaprop-P-ethyl Fluazifop-P-butyl Quizalofop-P-ethyl
Azoles, Oxazoles, Thiazoles	Chlorfenapyr 1,2-benzisothiazolin-3-one Carbendazim Clomazone Ethaboxam Fludioxonil 2-methyl-4-isothiazolin-3-one 5-chloro-2-methyl-4-isothiazolin-3-one 4,5-dichloro-2-n-octyl-3(2H)isothiazolone Isoxaflutole Topramezone 2-n-octyl-4-isothiazolin-3-one Pyraflufen-ethyl Pinoxaden Pyrasulfotole Pyroxasulfone Spirotetramat Strychnine 2-(thiocyanomethylthio)benzothiazole Etridiazole Thiabendazole
Benzamides	Cyantraniliprole Cyprosulfamide DEET Fluopicolide Fluopyram Isoxaben Chlorantraniliprole Propyzamide Methoxyfenozide Tebufenozide Zoxamide
Benzoic Acid And Derivatives	Acibenzolar-s-methyl Benzyl benzoate Bispyribac-sodium (KIH-2023) Dicamba (present as acid, amine salt, ester or sodium salt) Methyl salicylate Quinclorac
Benzonitriles	Bromoxynil Dichlobenil Chlorothalonil

Chemical Group	Active Ingredient Name
Biscarbamates	Desmedipham Ferbam Mancozeb Metiram Nabam Phenmedipham Thiram Thiophanate-methyl
Carbamates	Propoxur Bifenazate Carbaryl Chlorpropham EPTC Famoxadone Formetanate hydrochloride Iodocarb Methomyl Oxadiazon Oxamyl Propamocarb hydrochloride Icaridin Triallate
Chromenones	Brodifacoum Bromadiolone Difethialone Rotenone Warfarin
Cyclohexanedione Oximes	Clethodim Sethoxydim Tepraloxydim Tralkoxydim
Diazines	Aminocyclopyrachlor Ancymidol 6-benzylaminopurine (or: 6-benzyladenine) Maleic hydrazide Pyridaben Pyrazon Triforine
Dinitrobenzenes	Bromethalin Dinocap (plus related active compounds) Ethalfluralin Fluazinam Pendimethalin Trifluralin

Chemical Group	Active Ingredient Name
Dithiocarbamates	Dazomet Disodium cyanodithioimidocarbonate Potassium dimethyldithiocarbamate Metam-potassium Metam-sodium Sodium dimethyldithiocarbamate Ziram
Dithiophosphates	Bensulide Dimethoate Malathion Phorate Phosmet
Fatty Acids & Surfactants	N-coco-alkyltrimethylene diamines present as monobenzoate salt Alkyl-1,3-propylene diamine acetates 1-alkyl(C6-C18)-1,3-propanediamine Alkanolamine salts of fatty acids Ammonium salt of fatty acid Fatty acids Nonylphenoxypolyethoxyethanol Octadec-9-enoic acid, methyl ester Octadec-9-enoic acid, ethyl ester Octylphenoxypolyethoxyethanol Paraffin based petroleum oil Polyoxyalkylated alkyl phosphate ester Poly[oxyethylene(dimethyliminio)ethylene(dimethyliminio)ethylene dichloride] Sodium lauryl sulfate Soap (non-specific) Potassium salts of fatty acids Soap (herbicidal) Triethanolamine salts of fatty acids Tributyl tetradecyl phosphonium chloride Triglyceride ethoxylate 10 POE Surfactant blend Surfactant mixture
Guanidines	Hydramethylnon Clothianidin Cyprodinil Dodine Dodecylguanidine hydrochloride Imidacloprid Kasugamycin hydrochloride Pyrimethanil Streptomycin Thiamethoxam

Chemical Group	Active Ingredient Name
Halogenated Organic Acids	Aminopyralid 1,4-bis(bromoacetoxy)-2-butene Cyflumetofen Clopyralid Fluroxypyr (present as 1-methylheptyl ester) Halauxifen-methyl Picloram (present as potassium salts) Picloram (present as acid) Picloram (present as amine salts) Spirodiclofen Triclopyr triethylamine salt
Hydrocarbons	Creosote 1,4-dimethylnaphthalene Mineral spirits Naphthalene Petroleum hydrocarbon blend Polybutene
Imidazolinones	Imazapyr Imazamethabenz-methyl Fenamidone Imazethapyr Imazamox
Indanediones	Chlorophacinone Diphacinone (present in free form or as sodium salt)
Inorganic Coppers	Copper, present as basic copper sulphate Copper (present as cuprous thiocyanate) Copper (present as cupric oxide) Metallic copper Copper (present as copper naphthenate) Cupric oxide Copper (present as cuprous oxide) Copper, present as copper 8-quinolinolate Copper (present as mixed copper ethanolamine complexes or as bis(2-aminoethanolate)) Copper (present as copper sulfate pentahydrate) Copper, present as basic copper carbonate Copper (present as picro cupric ammonium formate and tannate complex) Copper (present as copper oxychloride) Copper (present as copper hydroxide)
Inorganic Zincs	Zinc as elemental (present as zinc naphthenate) Zinc (present as zinc oxide) Zinc phosphide

Chemical Group	Active Ingredient Name
Inorganic, Others	Anhydrous ammonia Aluminum phosphide Ammonium bromide Arsenic pentoxide Ammonia (present as ammonium sulfate) Barium metaborate monohydrate Borax pentahydrate Borax Boracic acid (boric acid) Disodium octaborate tetrahydrate Borax or sodium borate Available chlorine, present as calcium hypochlorite Calcium hypochlorite Chromic acid Fosetyl-Al Ferrous sulfate Ferric phosphate Hydrogen peroxide Iron (present as ferric phosphate) Iron (present as FeHEDTA) Kaolin Potassium peroxymonosulfate present as potassium peroxymonosulfate sulfate Available chlorine, present as lithium hypochlorite Mono- and dipotassium phosphite Magnesium phosphide Sodium chloride Phosphine Potassium bicarbonate Sodium bromide Sodium chlorite Sodium chlorate Sodium cyanide Sodium fluoride Sulfuryl fluoride Sodium hypochlorite Available chlorine, present as sodium hypochlorite Silicon dioxide (present as 100% diatomaceous earth) - fresh water fossils Silica gel (amorphous) Silicon dioxide (present as 100% diatomaceous earth) - salt water fossils Sulphur Lime sulphur or calcium polysulphide Zinc borate
Methoxyacrylates	Azoxystrobin Fluoxastrobin Kresoxim-methyl Pyraclostrobin Picoxystrobin Trifloxystrobin

Chemical Group	Active Ingredient Name
Microbials	*Aureobasidium pullulans* DSM 14940 *Aureobasidium pullulans* DSM 14941 *Aureobasidium pullulans* DSM 14940 and DSM 14941 *Agrobacterium radiobacter* *Beauveria bassiana* strain ANT 03 *Bacillus firmus* I-1582 *Beauveria bassiana* strain GHA *Beauveria bassiana* strain HF23 *Pseudomonas fluorescens* A506 *Pseudomonas syringae* - strain ESC-10 *Pseudomonas fluorescens* CL145A *Bacillus subtilis* QST 713 *Bacillus subtilis* (strain GB03) *Bacillus subtilis* MB1600 *Bacillus subtilis* var. *amyloliquefaciens* strain FZB24 *Bacillus thuringiensis Berliner* spp. *kurstaki* *Bacillus thuringiensis* serotype H-14 *Bacillus sphaericus* *Bacillus thuringiensis* sp. *tenebrionis* *Bacillus thuringiensis* ssp. *aizawai* *Coniothyrium minitans* strain CON/M/91-08 *Cydia pomonella* granulovirus (strain M) *Cydia pomonella* granulosis virus (strain CMGV4) *Chondrostereum purpureum* (strain: North American; pathovar: PFC2139) Fungus: *Gliocladium catenulatum* *Sclerotina minor* IMI 3144141 *Trichoderma harzianum* strain KRL-AG2 *Lactobacillus casei* strain LPT-111 *Lactobacillus rhamnosus* strain LPT-21 *Lactococcus lactis* ssp. *lactis* strain LL64/CSL *Lactococcus lactis* ssp. *cremoris* strain M11/CSL *Lactococcus lactis* ssp. *lactis* strain LL102/CSL *Metarhizium anisopliae* (strain F52) *Phoma macrostoma* *Neodiprion abietis* nucleopolyhedrovirus *Nosema locustae* canning (spore of) Nucleopolyhedrovirus for gypsy moth larvae Nuclear polyhedrosis virus of red-headed pine sawfly Nucleopolyhedrovirus for Douglas-fir tussock moth *Ophiostoma piliferum* fungus *Pantoea agglomerans* C9-1 *Pantoea agglomerans* strain E325 (NRRL B-21856) *Phlebiopsis gigantea* *Paecilomyces fumosoroseus* strain FE 9901 *Streptomyces acidiscabies* strain RL-110T cells and spent fermentation media *Streptomyces griseoviridis* strain K61 *Streptomyces lydicus* strain WYEC 108 *Trichoderma asperellum*, strain T34

Chemical Group	Active Ingredient Name
	Trichoderma virens strain G-41 *Clavibacter michiganensis* (spp *michiganensis*) bacteriophage *Typhyla phacorrhiza* (strain 94671) *Verticillium albo-atrum* isolate WCS850
Morpholines & Oxathiines	Dimethomorph Dodemorph-acetate Fenpropimorph Oxycarboxin Carbathiin
Nitrobenzenes	Acifluorfen-sodium Dichloran Fomesafen Tembotrione Mesotrione Oxyfluorfen Quintozene
Oils, Minerals And Vegetable	Oil of black pepper Castor oil Oil of geranium Garlic oil D-limonene Lemon oil Mineral oil- paraffin base (adjuvants) Mineral oil Methylated seed oil of soybean Verbenone Pine needle oil Thymol Soybean oil Thyme oil Tea tree oil Wintergreen oil
Organic Acids	Abamectin Acetic acid Acequinocyl Azadirachtin Citric acid Formic acid Gibberellic acid Gibberellins A4A7 Lactic acid Naphthylacetic acid Oxalic acid dihydrate Oxalic acid Peracetic acid Prohexadione calcium Natamycin Spinosad Spiromesifen

Chemical Group	Active Ingredient Name
	Spinetoram Sodium monofluoroacetate Trinexapac-ethyl Ferric sodium EDTA
Organochlorines	Chloropicrin Endosulfan Paradichlorobenzene
Organohalogens	1,2-dibromo-2,4-dicyanobutane Diodofon Methyl bromide Metrafenone
Organometallics	Fenbutatin oxide 10,10'-oxybis(phenoxarsine)
Others	Acrolein 1-(alkyl-amino)-3-aminopropane hydrochloride (component of Ampho 443-31) 1-(alkyl-amino)-3-carboxymethylaminopropane (component of Ampho 443-31) Aromatics 2,2-oxybis(4,4,6-trimethyl-1,3,2-dioxaborinane) Dried blood *Brassica hirta* white mustard seed powder Bis(trichloromethyl)sulfone Cellulose (from powdered corn cobbs) Corn gluten meal Carbon dioxide gas Camphor oil 3-decen-2-one Cornmint oil 3-methyl-2-cyclohexen-1-one Diallyl disulfide and related sulfides Dimethoxane Putrescent whole egg solids Dried eggs Endothall or endothal Ethofumesate Eucalyptus oil Fish meal mixture Fish oil mixture Garlic powder Garlic juice Garlic Oxirane derivatives (50% minimum) Liquid corn gluten Methylene bis(thiocyanate) 1-MCP 2,2'-(1-methyltrimethylenedioxy)bis-(4-methyl-1,3,2-dioxaborinane) Methyl nonyl ketone Oriental mustard seed meal

Chemical Group	Active Ingredient Name
	Meat meal mixture Piperonyl butoxide Extract of *Reynoutria sachalinensis* Sodium alpha-olefin sulfonate Saponins of *Chenopodium quinoa*
Phenols/Chlorophenols	2-bromo-4'-hydroxyacetophenone 2-phenylphenol 2-phenylphenol (present as sodium salt) Pentachlorophenol plus related active chlorophenols From nanogen: chlorocresol (or: parachlorocresol) 4-chloro-3-methylphenol (sodium salt) Sodium 2-phenylphenate 4-nitro-3-(trifluoromethyl)phenol sodium salt
Phenoxy Acids	4-CPA Cloquintocet-mexyl 2,4-DB Dichlorprop (present as butoxyethyl ester, as isooctyl ester, or as ethylhexyl ester) Dichlorprop-P (present as dimethylamine salt) Dichlorprop-P Dichlorprop P-isomer (present as 2-ethylhexyl ester) 2,4-D (present as acid) 2,4-D (present as amine salts : dimethylamine salt, diethanolamine salt, or other amine salts) 2,4-D (present as low volatile esters) 2,4-D present as choline salt MCPA (present as acid) MCPA (present as amine salts: diethanolamine, dimethylamine or mixed amines) MCPA (present as esters) MCPA (present as potassium salt or sodium salt) MCPB (present as sodium salt) MCPB (present as isomer specific) Mecoprop P-isomer (present as acid) Mecoprop-P (present as dimethylamine salt) Mecoprop-P (present as potassium salt) Mecoprop-P (present as amine salt) Triclopyr, present as butoxyethyl ester

Chemical Group	Active Ingredient Name
Pheromones	E-8-dodecenyl acetate (E,Z)-2,13-octadecadien-1-yl acetate (E,Z)-2,13-octadecadien-1-ol German cockroach extract S-kinoprene (S)-methoprene Octenol (Z)-8-dodecenyl acetate + (E)-8-dodecenyl acetate + (Z)-8-dodecen-1-ol (E,E)-8,10-dodecadien-1-ol + 1-dodecanol + 1-tetradecanol (Z)-9-dodecenyl acetate + (Z)-11-tetradecenyl acetate Pheromone pine shoot borer (E,Z)-3,13-octadecadienyl acetate (Z,Z)-3,13-octadecanienyl acetate R-(-)-1-octen-3-ol (E)-11-tetradecenyl acetate Muscalure (Z)-11-tetradecenal (Z)-11-tetradecen-1-ol (Z)-9-tetradecen-1-yl acetate 1-tetradecanol 1-dodecanol Codlelure Z-8-dodecenol Z-8-dodecenyl acetate (Z)-11-tetradecenyl acetate (Z,Z)-3,13-octadecadien-1-ol (E,Z)-11-tetradecenal (E)-4-tridecenyl acetate + (Z)-4-tridecenyl acetate
Phosphates	Dichlorvos plus related compounds Tetrachlorvinphos Naled
Phosphonic Acids, Phosphinic Acids	Ethephon Glufosinate ammonium Glyphosate present as isopropylamine or ethanolamine salt Glyphosate present as mono-ammonium or diammonium salt Glyphosate present as isopropylamine and potassium salt Glyphosate present as potassium salt Glyphosate Glyphosate present as dimethylamine salt Fosamine ammonium Mono- and dibasic sodium, potassium, and ammonium phosphites
Phosphoramidothioates	Acephate Propetamphos
Phtalic Acids	Captan Chlorthal-dimethyl Folpet Octylbicyclo heptene dicarboximide

Chemical Group	Active Ingredient Name
Pyrethroids, Pyrethrins	D-cis, trans allethrin D-trans allethrin Bifenthrin Cyfluthrin Lambda-cyhalothrin Cypermethrin Cyphenothrin Deltamethrin Imiprothrin Etofenprox Tau-fluvalinate Tetramethrin Metofluthrin Prallethrin Permethrin D-phenothrin Pyrethrins Tefluthrin
Pyridines	4-aminopyridine Dithiopyr Di-n-propyl isocinchomeronate Acetamiprid Sodium omadine Pyriproxyfen Quinoxyfen Sulfoxaflor Thiacloprid Flonicamid
Sulfonylureas	Chlorimuron-ethyl Chlorsulfuron Rimsulfuron Ethametsulfuron-methyl Flucarbazone (present as flucarbazone sodium) Foramsulfuron Halosulfuron (present as methyl ester) Iodosulfuron-methyl-sodium Mesosulfuron-methyl Metsulfuron-methyl Tribenuron-methyl Thifensulfuron-methyl Nicosulfuron Primisulfuron-methyl Prosulfuron Sulfometuron methyl Triflusulfuron-methyl
Thiophosphates	Azamethiphos Coumaphos Diazinon Chlorpyrifos

Chemical Group	Active Ingredient Name
Triazines, Tetrazines	Atrazine (plus related active triazines) Metribuzin Clofentezine Cyromazine Hexahydro-1,3,5-tris(2-hydroxyethyl)-s-triazine Indaziflam Prometryne plus related active triazines Pymetrozine Thiencarbazone-methyl Available chlorine, present as sodium dichloro-s-triazinetrione Sodium dichloro-s-triazinetrione Simazine plus related active triazines Available chlorine, present as trichloro-s-triazinetrione
Triazoles	Amitrole Ametoctradin Flusilazole Carfentrazone-ethyl Cloransulam-methyl Difenoconazole Fenbuconazole Flutriafol Flumetsulam Florasulam Metconazole Ipconazole Pyroxsulam Myclobutanil Paclobutrazol Propiconazole Prothioconazole Sulfentrazone Tebuconazole Triticonazole Tetraconazole Uniconazole-P

Chemical Group	Active Ingredient Name
Urea Derivatives	Available chlorine present as 1-bromo-3-chloro-5,5-dimethylhydantoin and related hydantoins Available bromine present as 1-bromo-3-chloro-5,5-dimethylhydantoin and related hydantoins Cyazofamid Available chlorine present as 1-bromo-3-chloro-5,5-dimethylhydantoin, 1,3-dichloro-5,5-dimethylhydantoin, 1,3-dichloro-5-ethyl-5-methylhydantoin and related hydantoins Available chlorine present as 1,3-dichloro-5,5-dimethylhydantoin and 1,3-dichloro-5-ethyl-5-methylhydantoin Diflufenzopyr Diflufenzopyr (present as sodium salt) 5,5-dimethylhydantoin 1,3-bis(hydroxymethyl)-5,5-dimethylhydantoin Diuron Linuron 1-or 3-monomethylol-5,5-dimethylhydantoin Thidiazuron

Appendix III Glossary

Active ingredient	That ingredient of a pesticide that actually controls the targeted pest.
Adjuvant	Any substance that is added to a spray tank (separate from the pesticide formulation) that will improve the performance of the pesticide.
Agricultural sector	Commercial pesticides applied to farms involved in the production of raw agricultural commodities, such as food, fibre, and tobacco; excluding non-crop and post-harvest applications.
Antimicrobial	A pest control product that intends to control microorganisms and fouling organisms on/in inanimate objects, industrial processes and systems, surfaces, water and air.
Biopesticide	Microbial pesticides (contain a bacterium, fungus, virus, protozoan, or alga as the active ingredient), pheromones and other semiochemical pesticides, and other non-conventional (formerly biochemical) pesticides.
Colony forming unit	A measure of viable bacterial or fungal numbers.
Commercial product	A product that is used in commercial activities, such as farming and other industrial processes.
Device	An instrument or apparatus that generates or applies a pest control product.
Domestic product	A product that is used in or around the house by the public.
End-use product	A product containing active ingredient(s) and usually formulant(s) that is labelled with instructions for direct pest control use or application.
Fungicide	Pesticides used to kill or inhibit fungi or fungal spores.
Herbicide	Pesticides used to kill or inhibit weeds.
Insecticide	Pesticides used to kill or inhibit insects.
Insect repellent	Pesticides used to repel insects.
Manufacturing concentrate	A product containing a registered technical grade of active ingredient(s) and formulant(s) intended for further reformulating and/or repackaging into end-use products.
Non-agricultural sector	Commercial pesticides that are not applied to farms involved in the production of raw agricultural commodities.
Pest control product or Pesticide	Any product, device, organism, substance or thing that is manufactured, represented, sold or used as a means for directly or indirectly controlling, preventing, destroying, mitigating, attracting or repelling any pest.
Product type	Pesticide products can be grouped by their main target pest, into herbicide, insecticide, fungicide, antimicrobial, vertebrate control and “other”.
Registrant	A company that holds the registration of a pesticide with the PMRA.
Technical grade active ingredient	Contains the active ingredient and normally contains impurities that are by-products of the manufacturing process.
Vertebrate control	A product used to control vertebrates.
Water treatment	Products to control microorganisms in swimming pools and industrial process waters (for example, paper mill whitewater, wastewater systems, cooling water).
Wood preservative	Antimicrobials applied to wood to control wood-destroying organisms and increase the service life of the wood.