Oregon Department of Agriculture

Pesticide Use Reporting System

2008 Annual Report

June 2009

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INTRODUCTION

This is the third annual report published for Oregon's Pesticide Use Reporting System (PURS). The 1999 Oregon Legislature directed the Oregon Department of Agriculture (ODA) to develop and implement a system to collect, organize, and report information on all categories of pesticide use in Oregon. In order to meet this requirement, PURS includes both an online reporting component (for all non-household applicators) and a household pesticide use survey component.

The online component was partially implemented in 2002 but did not collect a complete year of reports due to funding issues. Calendar year 2008 was the second full year of reporting.

The Household Pesticide Use Survey began collecting information in 2006. The first presentations of household pesticide use survey information were in the PURS Amended 2006 Annual Report. The PURS 2008 Annual Report includes presentations of household survey information collected for 2008.

ABSTRACT

The 1999 Oregon Legislature authorized development of the Oregon Pesticide Use Reporting System (PURS). The second full year of collecting non-household pesticide use in PURS was 2008. Also, 2008 was the third year of collecting information through the Household Pesticide Use Survey.

In 2008, reporters filed 343,565 reports of pesticide use into PURS. These reports identified that 19,696,784 pounds of active ingredient pesticides were used in Oregon during 2008. This included approximately 572 active ingredients. The top five active ingredients, by pounds, for the entire state were:

- Metam-sodium (20%) [soil fumigant],
- Glyphosate (10%) [herbicide],
- 1,3-dichloropropene (6%) [soil fumigant],
- Sulfuric acid (6%) [desiccant], and
- Aliphatic petroleum hydrocarbons (4%) [insecticide].

The greatest percentage of pounds of active ingredients was from the site category of Agriculture. Because of licensing requirements for pesticide use on agricultural and forest crops, and outreach to agricultural and forestry pesticide applicators, the assumption could be made that PURS compliance was greatest among these reporters. Each of the site categories and percentage of pounds of active ingredients are as follows:

- Agriculture (77.3%),
- Other (11.1%),
- Forestry (4.2%),
- Right-of-way (3.5%),
- Urban/General Outdoor (2.5%),
- Aquatic (1.1%),
- Urban/General Indoor (0.7%),
- Public Health/Regulatory Pests (0.2%),
- Research (<0.1%).

A number of issues were again identified regarding pesticide reporters filing electronic reports into PURS. Among these issues were:

- Reporters had trouble identifying the product used.
- Reporters had varying skill levels and access regarding online reporting.
- Reporters experienced difficulty in communication between PURS and their computers.
- Reporters did not understand the reporting deadline was mandatory.

In the Household Pesticide Use Survey component of PURS for 2008, 1,717 households agreed to complete use diaries. Only 1,513 households completed at least one month of reporting. More than 51% of households reported no use of pesticides. The other participants provided 3,036 reports.

Only 60% of the household reports contained sufficient information to calculate pounds of active ingredients. Reasons for reports lacking sufficient information to conduct these calculations continue to include:

- Participants were unable to specify the amount of pesticide used.
- Participants were unable to determine what products were pesticides.
- Participants were unable to provide correct product identification.

Because of these difficulties, household information was insufficient to extrapolate to all households in Oregon. The greatest percentages of pesticide applications were reported to have taken place outdoors. All types of “bugs” (fleas, insects, mosquitoes, and spiders) represented the largest percentage of purpose for control. Herbicides accounted for the largest number of pounds of active ingredients, closely followed by moss control products.

ONLINE SYSTEM

Overview

Reporters had until January 31, 2009, to file all reports of pesticide applications made in 2008. Following the deadline, PURS only accepted reports for applications made in 2009.

Staff were available to help reporters during business hours through a dedicated phone line and by e-mail. Staff also held hands-on help classes throughout the state in the fall of 2008. These classes provided reporters the opportunity to bring their records to a computer classroom and receive one-on-one assistance registering and filing their reports. In addition to these classes, staff made a number of presentations at training seminars, sent direct mailings, and updated information presented on the Web site. An update of the PURS system was released in October 2008. Most of the changes were minor visual changes. Some major changes involved how reporters submitted their reports, including:

1) combining the two reporting pages into one,
2) making it clearer on how to use the "Make Similar Report" button,
3) improving instructions available on each page, and
4) enhancing the search process for previous reports.

By law, a "'pesticide user' means any person who uses or applies a pesticide in the course of business or any other for-profit enterprise, or for a governmental entity, or in a location that is intended for public use or access." Some, but not all pesticide applicators are required to be licensed. Because of this, it is difficult to determine the number of entities that should be reporting into PURS. It is assumed that not all applicators that are required by PURS to report actually did so. A number of reporters called following January 31, 2009, to say they had missed the deadline.

Between 2007 and 2008, there were approximately 6,290 reporters registered in PURS. PURS allows the business or organization to register as the reporter. PURS also allows individual persons actually making the pesticide application to register as the reporter. Therefore, the number of reporters does not represent the number of persons making pesticide applications. Some reporters decided to use proxies in filing their pesticide use reports. A proxy is an outside entity filing reports on behalf of the reporter. Of the 6,290 registered reporters, 264 were proxies.

A total of 343,565 reports were submitted for 2008. The number of reports does not equal the number of applications. PURS allows reporters to aggregate their reports if they meet specific criteria. In order to aggregate, applications must be made within the same calendar month to the same site category and/or specific site in the same location (waterbasin or ZIP code).

Continued Issues

The second year of reporting continued to reveal a number of issues (discussed in detail below), including problems with:

- Product identification,
- Computer literacy, and
- PURS requirements.

Reporters had trouble correctly identifying the product used. This issue is due, in part, to how pesticides are regulated. Products are assigned a unique identification (ID) number, by the United States Environmental Protection Agency (EPA), when they are registered for use. This ID number, called the EPA registration number, is unique to product formulation. For marketing purposes, manufacturers may sell a product under a variety of trade names but the formulation and EPA registration number remain the same. In addition, product names are sometimes used to generically refer to an active ingredient. PURS includes all products that have been registered by the EPA or by ODA. Reporters can use either the EPA registration number or trade name of the product to search for the specific product used.

Reporters who used the product name to search may not have selected the actual product used. Some reporters may have selected the first product returned in a search result list without crosschecking the EPA registration number. Therefore, they may have reported an old canceled product. Or, they may have reported a product containing different active ingredients and/or percentages of active ingredients than the product used.

Reporters also expressed frustration when searching by EPA registration number that there were multiple returns for what they considered to be the same product. Under Oregon law, different product names are different products even if the products have the same formulation and the same EPA registration number. Different names can be due to a variety of reasons, one of which is marketing and labeling targeted at homeowners vs. professional applicators.

EPA registration numbers are two or three part numbers separated by dashes and do not typically include letters (4-59; 9622-56-8705). The inclusion and placement of the dashes are important. The system allows reporters to manually enter the product used and that product's EPA registration number. When the manually entered product did not match any product, the report went under review. Such situations were additional irritations for reporters.

Reporters had varying skill levels and access regarding online reporting. While many people are familiar with computers, requiring online reporting was difficult for some reporters. Many reporters have never used, owned, or had access to a computer. Internet is still not available statewide. The available Internet in some areas consists of very slow dial-up access that can make reporting a difficult and time-consuming process. ODA attempted to build PURS with these reporters in mind. Graphics and other program items that slow the process down were kept to a minimum.

It was also clear that reporters had difficulty navigating drop-down menus. An example would be reporters accidentally choosing Upper Sacramento for water basin when they intended to choose Willamette. Because the water basins are in alphabetical order, it is an easy mistake to select the incorrect water basin when using a mouse to select from a dropdown list.

In addition to problems with Internet access and familiarity with computers in general, reporters had varying degrees of understanding of the terms used by PURS. In situations where a reporter applied the same product month after month, PURS allowed the reporter to basically make a copy of a report they had already submitted. Reporters submitted the first report and then clicked a button titled "Make Similar Report." After clicking "Make Similar Report," a new report was returned on the screen, pre-filled with all the data from the previous report except for the date. Reporters could then enter the new date, change quantity as needed, add additional products, and submit the new report. Staff saw a number of situations where reporters entered information

for one product, submitted the report, and clicked “Make Similar Report.” Reporters then re-entered the same date and added a second product to the report. This process could be repeated multiple times. By doing this, reporters submitted the first product 20 times, the second product 19 times, etc. In situations where staff were aware of the problem and able to discuss it with the reporters, the reporters indicated they thought they were adding the products to the same report and did not understand that each one was a new report. A number of “Make Similar Report” issues were corrected but it is clear that a number of these were neither identified nor corrected. Only reports with special units (e.g. bait stations to be converted to ounces or grams) or manually entered products automatically came under staff review. ODA did not have the resources to review each report.

In order to prevent the above situation, an updated version of PURS was released in October 2008. While in the past, PURS pre-filled in the amount when users clicked “Make Similar Report” the updated version left the amount blank. A user could not save the new report unless they either filled in the amount or removed the product from the list. It is expected that this change, in addition to better instructions, greatly reduced the number of unintentional duplicate reports.

Reporters experienced difficulty in communication between PURS and their computers. It appeared that some Internet browsers were kicking reporters out of PURS or creating other issues when reporters were trying to navigate the system. This varied from annoying to extremely frustrating for reporters not familiar with computers.

Reporters did not understand the reporting deadline was mandatory. Reports for applications made in calendar year 2008 were due no later than midnight January 31, 2009. After midnight January 31, PURS only allowed reports to be submitted with use dates of 2009. It was obvious from the call load that many reporters waited until January to file their reports. ODA was clear from the beginning of PURS that January 31 is the reporting deadline. Some reporters indicated they had assumed that because the reporting deadline fell on a weekend day, that they would have until the following Monday to file their reports. It was announced on the PURS website that January 31, 2009, was the reporting deadline and that Staff would be available between 8:00 am and 5:00 pm on the deadline. Staff still received numerous phone calls following January 31 from reporters who were trying to file reports with dates in 2008 unable to submit their reports.

Issues Specific to 2008

2008 had a couple situations that were new.

2008 saw an increase in the total number of reports along with a nearly 50% reduction in the total pounds of active ingredient reported. It is likely the increased reports were from pest control companies who submit their reports via electronic data submission (EDS). Many pest control companies maintain their records in electronic software. While the software companies provided many of these pest control companies upgrades that allowed them to file their PURS reports using EDS, many of the software companies did not provide these upgrades until 2008. Because they were waiting for the upgrades, a lot of the pest control companies told staff they did not file reports for 2007. The products that pest control companies use typically contain very low percentages of active ingredients. Because of this, the increase in reports would not contribute much to the total pounds active ingredients.

It is likely that the upgrade in October 2008 greatly reduced the number of duplicate reports. While there is no way to quantify the number of duplicate reports submitted in 2007, staff agree that the number was likely a large percentage. With education and changes to the system to 2008, it is possible that the reduction to duplicate reports likely contributed to the reduction in total pounds active ingredients.

In 2007, copper naphthenate was number three in the top five active ingredients (in pounds). After the 2007 report was released, one of the companies that use large amounts of copper naphthenate contacted the Department of Agriculture and explained that they had mistakenly reported the diluted amount of product used rather than amount of undiluted. This meant that the active ingredient was artificially elevated in the list. After the reporting deadline for 2008, the same company contacted the Department of Agriculture and explained that rather than over report the product, they had failed to report at all for 2008. This too contributed to the drop in total pounds active ingredients.

Conclusions

Five hundred and seventy-two (572) different active ingredients were reported used in 2008. Below are the top five pesticides by pounds of active ingredient. The top 100 pesticides used, in pounds of active ingredient, can be found in Appendix A. This report does not include an analysis of pesticide use trends since only two years worth of data have been collected.

Additional tables follow providing information by water basin. Information for Urban/General Indoor and Urban/General Outdoor were reported by ZIP code. In order to compare all information by water basin, Geographic Information Systems (GIS) was used to determine the predominant water basin for each ZIP code. On the next page, a map of Oregon water basins, as well as a list of site categories and specific sites, is presented.

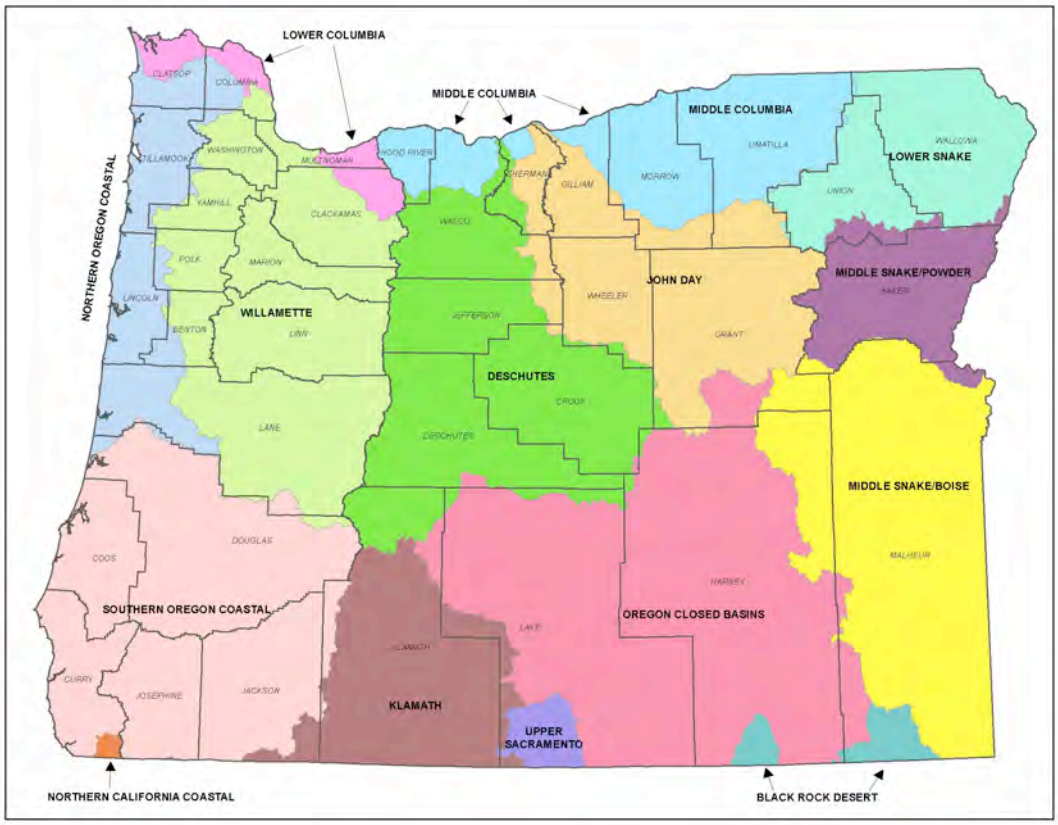

Figure 1 – Oregon Water Basin Map

Site Categories and/or Specific Sites

- Agriculture
  - Field crops
  - Fruits/nuts
  - Livestock/poultry
  - Nursery/Christmas tress
  - Oil Crops
  - Pasture/forage/hay
  - Seed crops
  - Vegetables
  - Other
- Aquatic
- Forestry
- Public health/regulatory pests
- Research
- Right-of-way
- Urban/general indoor
  - Dwelling/residence
  - Site with public access
  - Site with non-public access
  - Other
- Urban/general outdoor
  - Site associated with dwelling/residence
  - Site with public access
  - Site with non-public access
  - Other
- Other

Table 1 – Top Five Active Ingredients (in pounds) for the Entire State

ACTIVE INGREDIENT	PESTICIDE TYPE	LBS. REPORTED	PERCENTAGE
Total		**19,696,784**	
Metam-sodium	Soil fumigant	3,980,871	20%
Glyphosate	Herbicide	1,914,144	10%
1,3-dichloropropene	Soil fumigant	1,214,251	6%
Aliphatic petroleum hydrocarbons	Desiccant	1,097,237	6%
Sulfuric acid	Insecticide	852,789	4%
All others	Various	10,637,492	54%

Table 2 – Pounds Reported by Water Basin

WATER BASIN	LBS. REPORTED	PERCENTAGE
Middle Columbia	7,482,839	38%
Willamette	4,515,486	23%
Southern Oregon Coastal	3,098,503	16%
Middle Snake-Boise	1,537,464	8%
Klamath	898,157	5%
Lower Columbia	735,262	4%
Middle Snake-Powder	445,819	2%
Deschutes	333,055	2%
John Day	240,586	1%
Lower Snake	214,744	1%
Northern Oregon Coastal	123,611	<1%
Oregon Closed Basins	63,531	<1%
Upper Sacramento	5,203	<1%
Black Rock Desert	2,105	<1%
Northern California Coastal	419	<1%

Table 3 – Top Five Active Ingredients (in pounds) by Water Basin

WATER BASIN	ACTIVE INGREDIENT	PESTICIDE TYPE	LBS. REPORTED	PERCENTAGE[1]
Black Rock Desert			**2,105**	
	Diuron	Herbicide	1,160	55%
	Glyphosate	Herbicide	468	22%
	Potassium permanganate	Disinfectant	107	5%
	Chlorpyrifos	Insecticide	73	3%
	Pyraclostrobin	Fungicide		
	All others	Various	247	12%
Deschutes			**333,055**	
	Xylene range aromatic solvent	Aquatic herbicide	48,551	15%
	2,4-D	Herbicide	41,457	12%
	Glyphosate	Herbicide	35,931	11%
	Boric acid	Insecticide	35,097	11%
	Diuron	Herbicide	20,092	6%
	All others	Various	151,927	46%

John Day			**240,586**	
	Glyphosate	Herbicide	105,040	44%
	2,4-D	Herbicide	67,572	28%
	Boric acid	Insecticide	40,910	17%
	Diuron	Herbicide	7,747	3%
	Aliphatic petroleum hydrocarbons	Insecticide	2,672	1%
	All others	Various	16,645	7%
Klamath			**898,157**	
	Methyl bromide	Fumigant/soil fumigant	265,977	30%
	1,3-dichloropropene	Soil fumigant	175,671	20%
	Metam-sodium	Soil fumigant	173,533	19%
	Chloropicrin	Fumigant/soil fumigant	172,505	19%
	Tebuconazole	Fungicide	15,136	2%
	All others	Various	95,336	11%
Lower Columbia			**735,262**	
	Aliphatic petroleum hydrocarbons	Insecticide	232,383	32%
	Glyphosate	Herbicide	93,950	13%
	Boric acid	Insecticide	75,280	10%
	Copper hydroxide	Fungicide	50,994	7%
	Metam-sodium	Soil fumigant	46,091	6%
	All others	Various	236,564	32%
Lower Snake			**214,744**	
	Glyphosate	Herbicide	68,315	32%
	2,4-D	Herbicide	20,537	10%
	Diuron	Herbicide	14,567	7%
	MCPA	Herbicide	14,287	7%
	Paraquat dichloride	Herbicide	10,188	5%
	All others	Various	86,848	40%
Middle Columbia			**7,482,839**	
	Metam-sodium	Soil fumigant	3,129,778	42%
	Glyphosate	Herbicide	760,251	10%
	1,3-dichloropropene	Soil fumigant	633,870	8%
	Sulfuric acid	Desiccant	609,106	8%
	Aliphatic petroleum hydrocarbons	Insecticide	466,556	6%
	All others	Various	1,883,278	25%
Middle Snake-Powder			**445,819**	
	Sulfuric acid	Desiccant	243,655	55%
	Metam-sodium	Soil fumigant	43,826	10%
	1,3-dichloropropene	Soil fumigant	42,019	9%
	Xylene range aromatic solvent	Aquatic herbicide	23,339	5%
	Chloropicrin	Fumigant/soil fumigant	11,957	3%
	All others	Various	81,023	18%

Middle Snake-Boise			**1,537,464**	
	Metam-sodium	Soil fumigant	459,860	30%
	Potassium N-methyldithiocarbamate	Soil fumigant	364,991	24%
	1,3-dichloropropene	Soil fumigant	318,917	21%
	Xylene range aromatic solvent	Aquatic herbicide	77,093	5%
	Glyphosate	Herbicide	46,793	3%
	All others	Various	269,811	18%
Northern California Coastal			**419**	
	2,4-D	Herbicide	189	45%
	Triclopyr	Herbicide	170	41%
	Glyphosate	Herbicide	30	7%
	Difenoconazole	Fungicide	13	3%
	Thiamethoxam	Insecticide	10	2%
	All others	Various	7	2%
Northern Oregon Coastal			**123,611**	
	Glyphosate	Herbicide	31,032	25%
	Atrazine	Herbicide	16,426	13%
	2,4-D	Herbicide	12,191	10%
	Sulfur	Fungicide	11,985	10%
	Hexazinone	Herbicide	11,118	9%
	All others	Various	40,859	33%
Oregon Closed Basins			**63,531**	
	Glyphosate	Herbicide	16,987	27%
	2,4-D	Herbicide	15,453	24%
	Diuron	Herbicide	6,846	11%
	Atrazine	Herbicide	5,877	9%
	Hexazinone	Herbicide	5,009	8%
	All others	Various	13,360	21%
Southern Oregon Coastal			**3,098,503**	
	Boric acid	Insecticide	672,503	22%
	Copper ethanolamine complex	Algaecide	600,546	19%
	Copper ammonium carbonate	Wood preservative	427,195	14%
	Aliphatic petroleum hydrocarbons	Insecticide	308,906	10%
	Kaolin	Various	232,540	8%
	All others	Various	856,812	28%

Upper Sacramento			**5,203**	
	Diuron	Herbicide	1,684	32%
	2,4-D	Herbicide	1,326	25%
	Glyphosate	Herbicide	681	13%
	Hexazinone	Herbicide	215	4%
	Dicamba	Herbicide	200	4%
	All others	Various	1,098	21%
Willamette			**4,515,486**	
	Glyphosate	Herbicide	635,750	14%
	2,4-D	Herbicide	257,805	6%
	Diuron	Herbicide	251,660	5%
	Pendimethalin	Herbicide	163,495	4%
	Methyl bromide	Fumigant/soil fumigant	154,339	3%
	All others	Various	3,052,438	68%

[1]Percentages may not add to 100% due to rounding.

Breaking out the pounds of active ingredients reported by site category, agriculture accounted for the largest percentage. Because of licensing requirements for pesticide use on agricultural and forest crops, and outreach to agricultural and forestry pesticide applicators, the assumption could be made that PURS compliance was greatest among these reporters. There is no mechanism within PURS to determine compliance with PURS requirements. Figure 2, below, shows all site categories by percentage pounds of active ingredients reported.

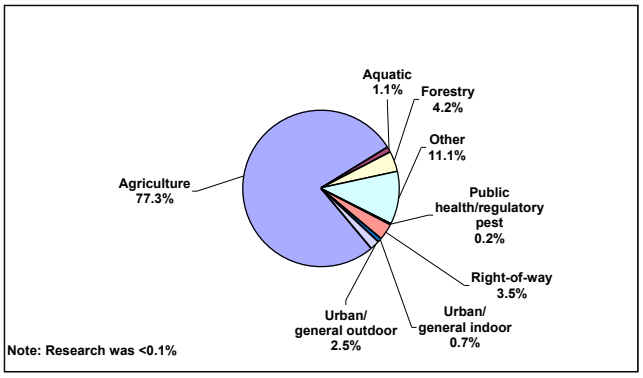

Figure 2 – Percentage of Pounds of Active Ingredients by Site Category

Below are additional tables that show the top five active ingredients by pounds reported for each of the site categories and/or specific sites (Agriculture, Urban/General Indoor, and Urban/General Outdoor all have specific sites).

Table 4 - Top Five Active Ingredients (in pounds) by Site Category

SITE	ACTIVE INGREDIENT	PESTICIDE TYPE	LBS. REPORTED	PERCENTAGE[1]
Agriculture			**15,221,190**	
	Metam-sodium	Soil fumigant	3,957,670	26%
	Glyphosate	Herbicide	1,563,656	10%
	1,3-dichloropropene	Soil fumigant	1,214,251	8%
	Aliphatic petroleum hydrocarbons	Insecticide	1,081,302	7%
	Sulfuric acid	Desiccant	852,787	6%
	All others	Various	6,555,524	43%
Aquatic			**206,961**	
	Xylene range aromatic solvent	Aquatic herbicide	142,646	69%
	Acrolein	Herbicide	46,475	22%
	Sodium percarbonate	Algaecide	10,200	5%
	Copper sulfate pentahydrate	Algaecide/ herbicide	5,624	3%
	Glyphosate	Herbicide	508	<1%
	All others	Various	1,509	1%
Forestry			**820,541**	
	Glyphosate	Herbicide	226,225	28%
	Atrazine	Herbicide	181,539	22%
	2,4-D	Herbicide	150,895	18%
	Hexazinone	Herbicide	77,754	9%
	Triclopyr	Herbicide	65,868	8%
	All others	Various	118,260	14%
Public Health/ Regulatory Pest			**32,383**	
	Aliphatic petroleum hydrocarbons	Insecticide	5,677	18%
	Malathion	Insecticide	5,294	16%
	2,4-D	Herbicide	4,702	15%
	BT israelensis	Insecticide	4,134	13%
	Naled	Insecticide	3,135	10%
	All others	Various	9,441	29%
Research			**923**	
	Glyphosate	Herbicide	238	26%
	Calcium polysulfide	Fungicide	108	12%
	2,4-D	Herbicide	77	8%
	Oryzalin	Herbicide	73	8%
	Dimethoate	Insecticide	48	5%
	All others	Various	379	41%
Right-of-way			**683,408**	
	Boric acid	Insecticide	155,181	23%
	Diuron	Herbicide	110,170	16%
	Sodium bifluoride	Wood preservative	100,395	15%
	Glyphosate	Herbicide	71,969	11%
	2,4-D	Herbicide	58,805	9%
	All others	Various	186,888	27%

Urban/General Indoor			**144,851**	
	Copper ammonium carbonate	Wood preservative	65,008	45%
	Tebuconazole	Fungicide	33,344	23%
	Methyl bromide	Fumigant/soil fumigant	15,422	11%
	Chlorpyrifos	Insecticide	7,484	5%
	Boric acid	Insecticide	6,262	4%
	All others	Various	17,330	12%
Urban/General Outdoor			**391,700**	
	Cyfluthrin	Insecticide	101,677	26%
	Bifenthrin	Insecticide	37,174	9%
	Oryzalin	Herbicide	30,994	8%
	Glyphosate	Herbicide	30,757	8%
	2,4-D	Herbicide	20,453	5%
	All others	Various	170,655	44%
Other			**2,190,827**	
	Boric acid	Insecticide	663,552	30%
	Copper ethanolamine complex	Algaecide	600,546	27%
	Copper ammonium carbonate	Wood preservative	427,195	19%
	Chromic acid	Wood preservative	122,935	6%
	Copper oxides	Marine organism control/wood prervative	120,705	6%
	All others	Various	255,894	12%

[1]Percentages may not add to 100% due to rounding.

Table 5 – Top Five Active Ingredients (in pounds) by Specific Sites in Agriculture

SPECIFIC SITE	ACTIVE INGREDIENT	PESTICIDE TYPE	LBS. REPORTED	PERCENTAGE[1]
Field Crops			**6,056,435**	
	Metam-sodium	Soil fumigant	2,837,319	47%
	Glyphosate	Herbicide	877,631	14%
	1,3-dichloropropene	Soil fumigant	699,486	12%
	2,4-D	Herbicide	348,805	6%
	Potassium N-methyldithiocarbamate	Soil fumigant	332,280	5%
	All others	Various	960,913	16%
Fruits/Nuts			**2,846,295**	
	Aliphatic petroleum hydrocarbons	Insecticide	1,044,558	37%
	Mineral oil	Insecticide	316,474	11%
	Kaolin	Various	238,344	8%
	Sulfur	Fungicide	215,002	8%
	Glyphosate	Herbicide	126,184	4%
	All others	Various	905,733	32%
Livestock/Poultry			**6,170**	
	Tetrachlorvinphos	Insecticide	2,154	35%
	Phosmet	Insecticide	1,077	17%
	Glyphosate	Herbicide	794	13%
	Piperonyl butoxide	Insecticide	758	12%
	MCPA	Herbicide	367	6%
	All others	Various	1,020	17%
Nursery/Christmas Trees			**1,210,355**	
	Methyl bromide	Fumigant/soil fumigant	396,880	33%
	Chloropicrin	Fumigant/soil fumigant	252,300	21%
	Glyphosate	Herbicide	64,713	5%
	Chlorothalonil	Fungicide	49,303	4%
	Oxyflurofen	Herbicide	33,188	3%
	All others	Various	413,972	34%
Oil Crops			**27,671**	
	Terbacil	Herbicide	3,544	13%
	Propargite	Insecticide	3,199	12%
	Ethoprop	Insecticide	3,155	11%
	Glyphosate	Herbicide	3,015	11%
	Acephate	Insecticide	2,867	10%
	All others	Various	11,892	43%
Pasture/Forage/Hay			**181,855**	
	Glyphosate	Herbicide	50,538	28%
	2,4-D	Herbicide	30,162	17%
	Paraquat dichloride	Herbicide	20,275	11%
	Diuron	Herbicide	15,317	8%
	Metribuzin	Herbicide	10,790	6%
	All others	Various	54,774	30%

Seed Crops			**1,589,048**	
	Glyphosate	Herbicide	261,091	16%
	Diuron	Herbicide	148,744	9%
	Pendimethalin	Herbicide	126,571	8%
	Metam-sodium	Soil fumigant	102,956	6%
	2,4-D	Herbicide	99,276	6%
	All others	Various	850,411	54%
Vegetables			**3,071,305**	
	Metam-sodium	Soil fumigant	1,014,538	33%
	Sulfuric acid	Desiccant	852,642	28%
	1,3-dichloropropene	Soil fumigant	451,603	15%
	Potassium N-methyldithiocarbamate	Soil fumigant	151,718	5%
	EPTC	Herbicide	71,945	2%
	All others	Various	528,858	17%
Other			**236,055**	
	Glyphosate	Herbicide	133,785	57%
	2,4-D	Herbicide	28,325	12%
	Chloropicrin	Fumigant/soil fumigant	22,293	9%
	1,3-dichloropropene	Soil fumigant	10,721	5%
	Imidacloprid	Insecticide	5,663	2%
	All others	Various	35,268	15%

[1]Percentages may not add to 100% due to rounding.

Table 6 – Top Five Active Ingredients (in pounds) by Specific Sites in Urban/General Indoor

SPECIFIC SITE	ACTIVE INGREDIENT	PESTICIDE TYPE	LBS. REPORTED	PERCENTAGE
Dwelling/Residence			**11,824**	
	Boric acid	Insecticide	5,817	49%
	Bifenthrin	Insecticide	2,662	23%
	Diuron	Herbicide	717	6%
	Sulfuryl fluoride	Fumigant	520	4%
	Cyhalothrin	Insecticide	257	2%
	All others	Various	1,850	16%
Site with Public Access			**3,775**	
	Sulfuryl fluoride	Fumigant	592	16%
	Aluminum phosphide	Fumigant	414	11%
	Boric acid	Insecticide	397	11%
	Glyphosate	Herbicide	277	7%
	Bifenthrin	Insecticide	275	7%
	All others	Various	1,819	48%

Site with Non-public Access			**86,960**	
	Copper ammonium carbonate	Wood preservative	65,008	75%
	Methyl bromide	Fumigant/soil fumigant	15,422	18%
	Thiram	Fungicide	1,194	1%
	Chloropropham	Plant growth regulator	1,016	1%
	Sodium o-phenylphenate	Fungicide	710	1%
	All others	Various	3,610	4%
Other			**42,292**	
	Tebuconazole	Fungicide	33,344	79%
	Chlorpyrifos	Insecticide	7,484	18%
	Imidacloprid	Insecticide	667	2%
	3-iodo-2-propynyl butylcarbamate (IPBC)	Fungicide	354	1%
	Propiconazole	Fungicide	342	1%
	All others	Various	101	<1%

Table 7 – Top Five Active Ingredients (in pounds) by Specific Sites in Urban/General Outdoor

SPECIFIC SITE	ACTIVE INGREDIENT	PESTICIDE TYPE	LBS. REPORTED	PERCENTAGE[1]
Site Associated w/ Dwelling/Residence			**217,812**	
	Cyfluthrin	Insecticide	101,302	47%
	Bifenthrin	Insecticide	35,949	17%
	Mineral oil	Insecticide	14,389	7%
	Oryzalin	Herbicide	11,728	5%
	Boric acid	Insecticide	6,602	3%
	All others	Various	47,842	22%
Site with Public Access			**142,792**	
	Glyphosate	Herbicide	23,436	16%
	Oryzalin	Herbicide	18,914	13%
	Pentachloronitrobenzene (PCNB)	Fungicide	16,245	11%
	Chlorothalonil	Fungicide	12,015	8%
	2,4-D	Herbicide	11,789	8%
	All others	Various	60,392	42%
Site with Non-Public Access			**26,088**	
	Aluminum phosphide	Fumigant	4,006	15%
	Diuron	Herbicide	3,711	14%
	Aliphatic petroleum hydrocarbons	Insecticide	3,267	13%
	Glyphosate	Herbicide	2,631	10%
	2,4-D	Herbicide	1,419	5%
	All others	Various	11,055	42%

Other			**5,009**	
	2,4-D	Herbicide	2,582	52%
	Dicamba	Herbicide	861	17%
	Diuron	Herbicide	696	14%
	Glyphosate	Herbicide	331	7%
	Bifenthrin	Insecticide	229	5%
	All others	Various	308	6%

[1]Percentages may not add to 100% due to rounding.

HOUSEHOLD USE

Overview

The Gilmore Research Group (Gilmore) continued the Household Pesticide Use Survey in 2008. Gilmore telephone screeners were used to recruit households to participate in the diary portion of the survey. Using a purchased sample of phone numbers selected randomly from throughout Oregon, Gilmore contacted a total of 13,737 households in 2008. During the telephone contact, respondents were asked if they would be willing to use a diary form to keep track of the use of pest control products over a three-month period. Approximately 12% of all households contacted agreed to participate in the diary portion of the survey. For those who agreed to participate in the diary portion, Gilmore mailed reporting forms within one week of recruitment. The mailing included a letter from the ODA director thanking the respondent for agreeing to participate and provided phone numbers and a web site.

To address the fact that many households did not fill out diary forms on a regular basis or with complete information, Gilmore made monthly telephone calls to participants. The calls were used to remind participants to keep track of their use of pest control products. Through these calls, Gilmore obtained interim monthly pesticide use information, which was later compared with the contents of submitted diary forms.

The state was divided into nine regions according to counties (Figure 3). Each quarter, attempts were made to obtain minimum numbers of participants for each region totaling at least 250 participants per quarter from the entire state. The percentage of participants for each region was to be 10% with the exception of region 6 at 17%. This method was used to obtain information from throughout Oregon rather than just from the areas of highest population, such as in and around the Portland Metro area.

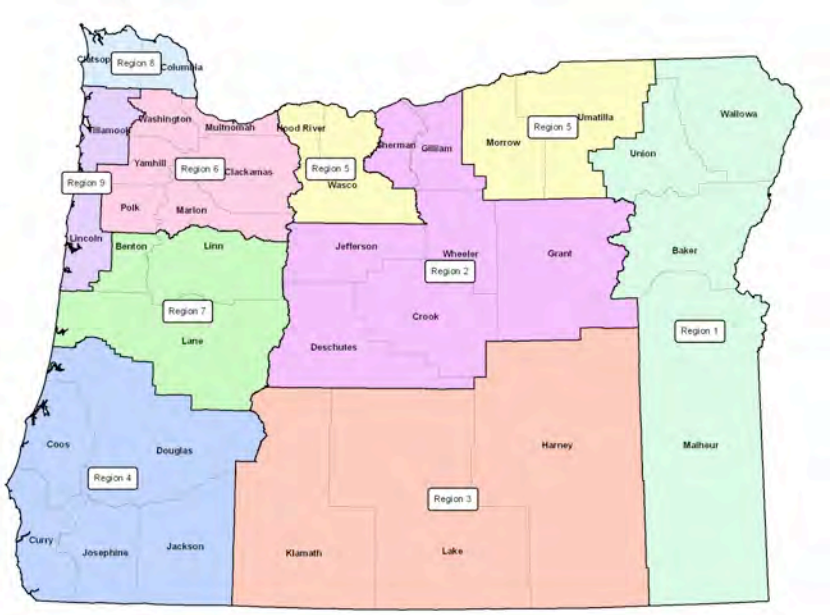

Figure 3 – State Map with Regions Used in the Household Pesticide Use Survey

Figure 4, below, illustrates the number of participants by region.

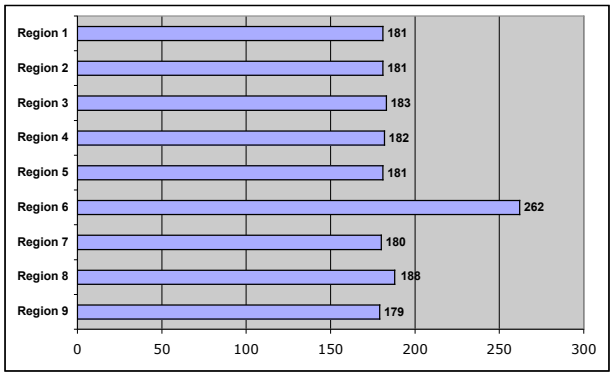

Figure 4 – Number of Participants By Region

A total of 1,717 households agreed to complete use diaries. However, only 1,513 participants actually completed at least one month of reporting. Of those, 776 reported that they did not use any pesticides during the quarter in which they participated. The other 737 participants provided 3,036 reports (Figure 5). Approximately 60% of the reports contained sufficient information to calculate pounds of active ingredients.

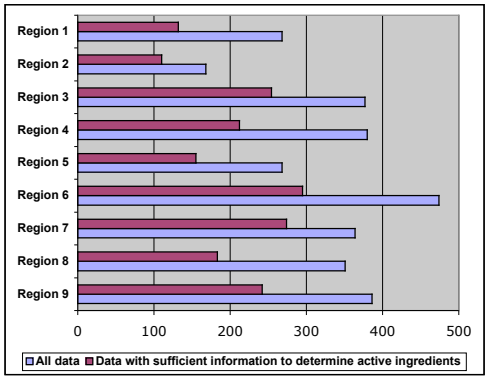

Figure 5 – Number of Reports of Pesticide Use Received By Region

Issues

The most significant issue continues to be not being able to calculate pounds of active ingredient used from the information reported. Several reasons why reports contained insufficient information to calculate pounds of active ingredients included:

- **Participants were unable to specify amount of pesticide used.** For some products, such as those in spray cans, it is difficult to provide actual amounts used.
- **Participants were unable to determine what products were pesticides.** Under federal and Oregon law, "pesticide" is a very broad term that includes insecticides, herbicides, rodenticides, fungicides, etc. Basically, anything that kills, repels, or mitigates a pest is a pesticide. Many persons do not understand this meaning of "pesticide." Thus, some products that are pesticides may not have been reported. And, some products that are not pesticides were reported. It is because of this confusion that ODA chose to use the term "pest control products" rather than "pesticide" when conducting the Household Pesticide Use Survey.

- **Participants did not provide correct product identification.**
  1. Each pesticide product is assigned a unique registration number by the United States Environmental Protection Agency (EPA). This EPA registration number is on the label of each product and identifies that product. The survey used this EPA registration number to identify specific products used. A number of reports did not include the EPA registration number. Some reports included another number, such as the barcode, instead of the EPA registration number.

  2. Relying only upon a product's name may not identify the specific product used. For example, there are about 75 different products that contain "Roundup™" in the trade name. Some contain the single active ingredient glyphosate but in varying concentrations. Some contain additional active ingredients. In addition, there are a number of "generic" products containing glyphosate that some persons may refer to as "Roundup™." Despite education outreach activities by ODA and Gilmore, many participants did not understand how to identify the product used.

  3. The Department did ask Gilmore to collect bar code information during 2008 in hopes of having an alternative way to identify the product. This did not work however. Participants did not always provide the barcode and many of the barcodes provided did not adequately identify the product used.

Conclusions

Households that reported continue to show that participants have difficulty identifying pesticide products. There are also continued concerns about the ability of pesticide users to read the label and correctly identify information.

Herbicides accounted for the greatest percentage of pounds active ingredient in 2008 at 53%. By reported purpose, herbicides accounted for 22% of the reports. Of the herbicides, phenoxies (a chemical family) accounted for 28%.

Moss control products accounted for 33% of the pounds of active ingredient, but only 1.3% of the reports identified moss control as the purpose. Moss control products contain higher percentages of active ingredients and typically have higher application rates, than do other types of products.

One specific chemical grouping, including pyrethrins and synthetic pyrethroids, accounted for 9% of total insecticide poundage. Organophosphates, another insecticide chemical group, accounted for 67% of total insecticide poundage, while carbamates accounted for 5%.

Overall, looking at pounds of active ingredient, the greatest number of pounds reported were for:

- glyphosate (30%) [weed control],
- ferrous sulfate monohydrate (21%) [moss control],
- 2,4-D (12%) [weed control],
- zinc sulfate monohydrate (11%) [moss control], and
- malathion (6%) [insect control].

The main five active ingredients by greatest number of records were:

- permethrin (8%) [insect control],
- glyphosate (7%) [weed control],
- tetramethrin (5%) [insect control],
- methoprene (5%) [insect control], and
- imidacloprid (4%) [insect control].

Table 8, identifies active ingredients by type and highlights those that were reported in the greatest amount. In total, 99 active ingredients were identified as being used.

Table 8 – Main Active Ingredients Reported, Presented by Pesticide Type

	Active Ingredient	Lbs. reported	Percentage[1]
Insecticides	**15.87 Total**		
	Malathion	10.29	65%
	Canola oil	0.92	6%
	Carbaryl	0.78	5%
	Bifenthrin	0.59	4%
	Diatomaceous earth	0.45	3%
	All others	2.85	18%
Herbicides	**85.64 Total**		
	Glyphosate	48.44	57%
	2,4-D	18.69	22%
	MCPA	3.37	4%
	Dicamba	2.67	3%
	Triclopyr	2.49	3%
	All others	9.98	12%
Moss control	**53.76 Total**		
	Ferrous sulfate monohydrate	33.79	63%
	Zinc sulfate monohydrate	18.22	34%
	Ferric sulfate	1.42	3%
	Ammonium salts of fatty acids	0.34	1%
Rodenticides[2]	**0.0093 Total**		
	Zinc phosphide	0.0042	45%
	Strychnine	0.0038	40%
	Bromadiolone	0.0080	9%
	Brodifacoum	0.0050	5%
	Diphacinone	0.0001	1%
	All others	<0.0001	<1%
Insect repellents	**1.89 Total**		
	DEET	1.26	67%
	Oil of citronella	0.61	32%
	Picaridin	0.02	1%
Fungicides	**0.49 Total**		
	Calcium polysulfide	0.16	34%
	Captan	0.14	28%
	Tebuconazole	0.07	15%
	Sulfur	0.05	10%
	Triforine	0.03	6%
	All others	0.04	8%
Slug/snail control	**3.22 Total**		
	Metaldehyde	2.87	89%
	Iron phosphate	0.35	11%
Animal Repellent		**0.42 Total**	
	Castor oil	0.42	100%

[1]Percentages may not add to 100% due to rounding.
[2]Rodenticides contain very low percentages of active ingredient. Therefore, the total poundage used was quite low and are presented to the fourth decimal place.

The number of reports with sufficient information to determine pounds of active ingredients varied some among the nine regions. Figure 6, below, illustrates this.

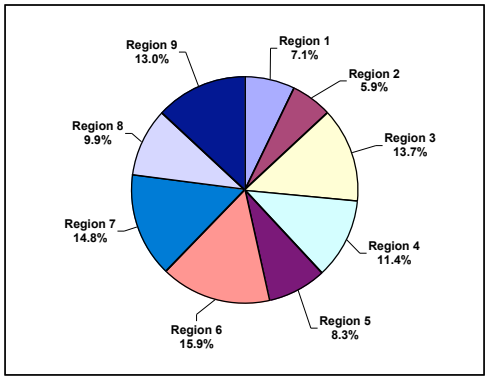

Figure 6 – Percentage by Region of Reports that Had Sufficient Information to Determine Active Ingredients

While approximately 40% of the reports contained insufficient information to determine pounds of active ingredient used, most did contain information about site of pesticide application and the intended purpose for the application. Following are summaries about site and purpose of reported pesticide use, both for all reports and those that contained sufficient information to calculate pounds of active ingredients. The purpose of product use, presented by quarter is also included for reports that contained sufficient data to calculate pounds of active ingredient. (Note: Percentages in the following charts may not add to 100% due to rounding.)

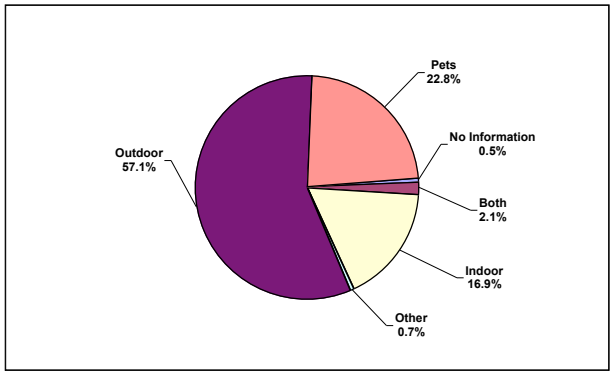

Figure 7 – Reported Sites for All Data (from all 3,036 total reports received)

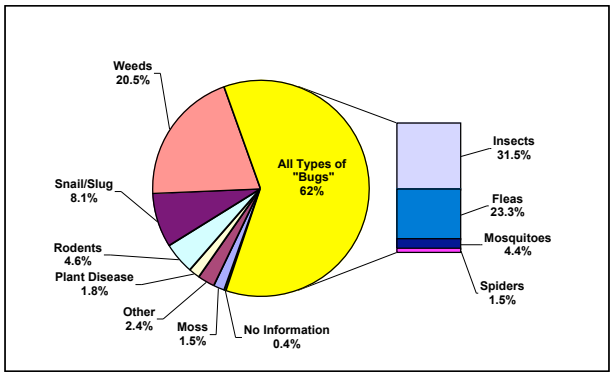

Figure 8 – Reported Purposes for All Data

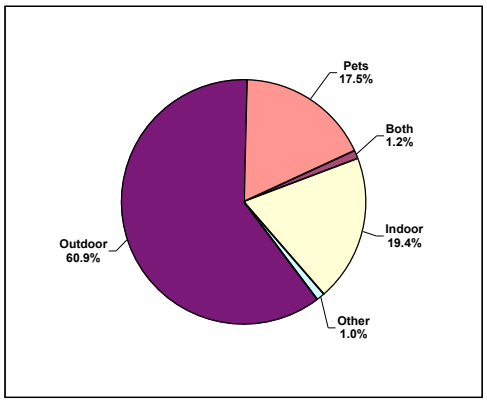

Figure 9 – Reported Sites for Data with Active Ingredient Information

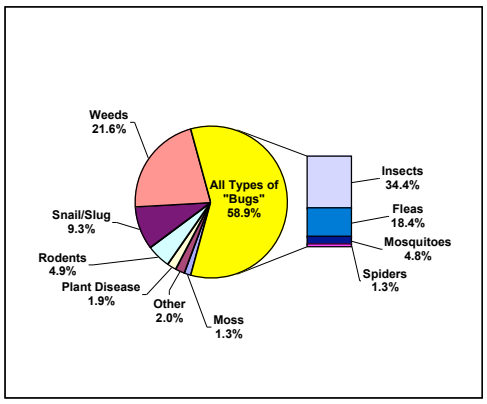

Figure 10 – Reported Purposes for Data with Active Ingredient Information

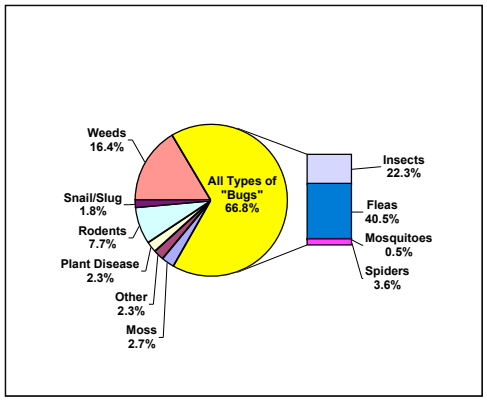

Figure 11 – Reported Purposes for Data with Active Ingredient Information – Quarter 1

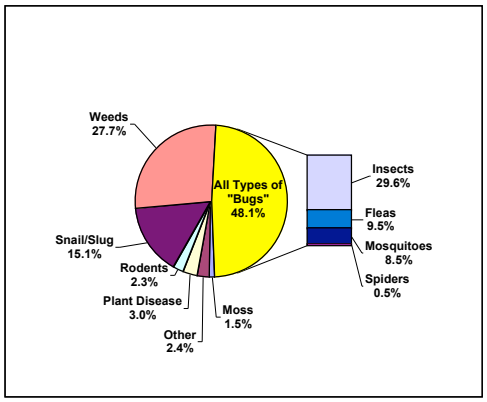

Figure 12 – Reported Purposes for Data with Active Ingredient Information – Quarter 2

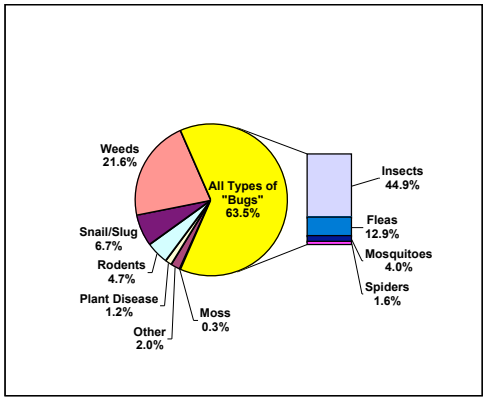

Figure 13– Reported Purposes for Data with Active Ingredient Information – Quarter 3

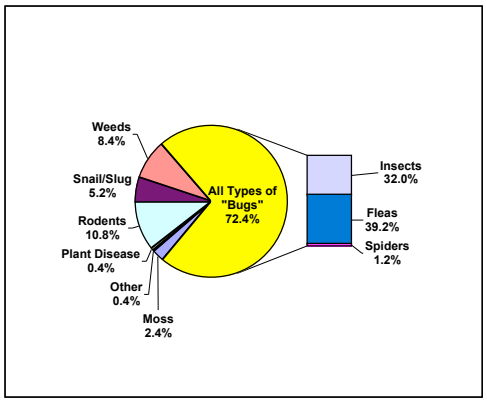

Figure 14 – Reported Purposes for Data with Active Ingredient Information – Quarter 4

The following (Figure 15) illustrates the pesticide types reported by percentage pounds of active ingredient. Additional charts are included below that separate this information out for the nine regions. Type of pesticide is related to purpose information previously presented. For example, herbicides are used for weed control, insecticides are used for "bug" control, etc.

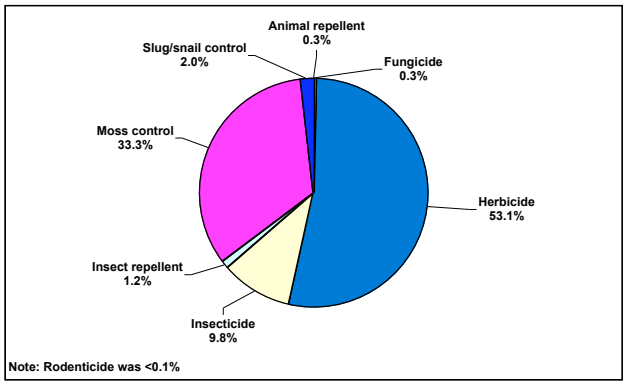

Figure 15 - Active Ingredients by Type – Entire State

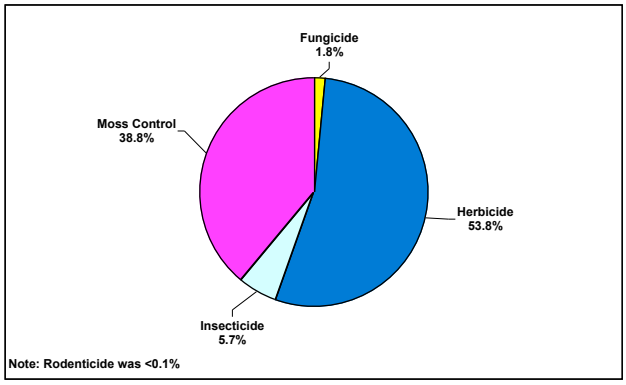

Figure 16 – Active Ingredients by Type – Region 1

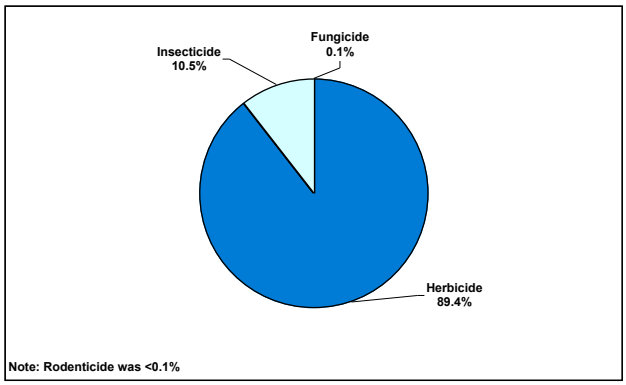

Figure 17 – Active Ingredients by Type – Region 2

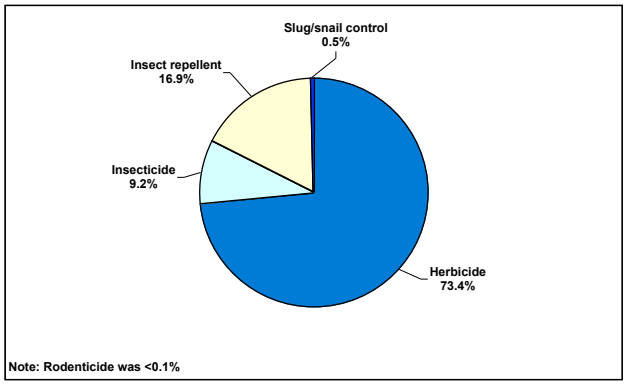

Figure 18 – Active Ingredients by Type – Region 3

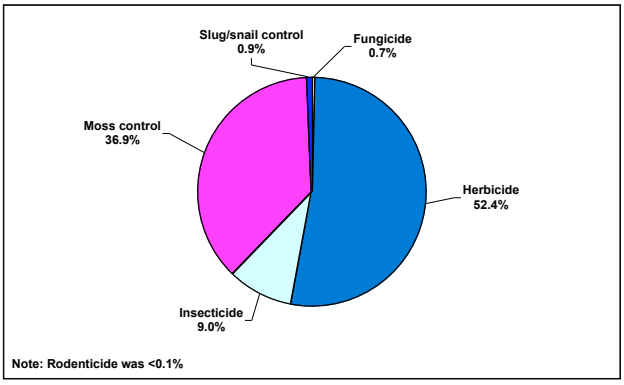

Figure 19 – Active Ingredients by Type – Region 4

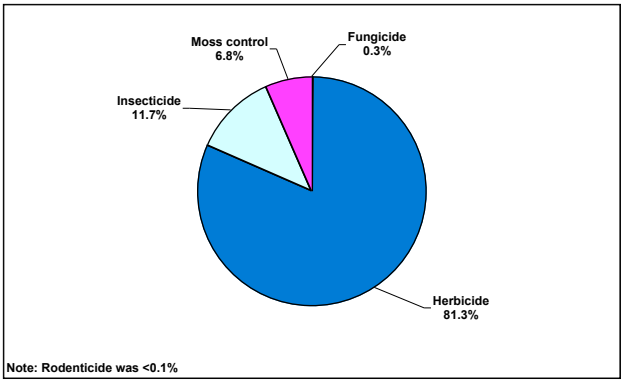

Figure 20 – Active Ingredients by Type – Region 5

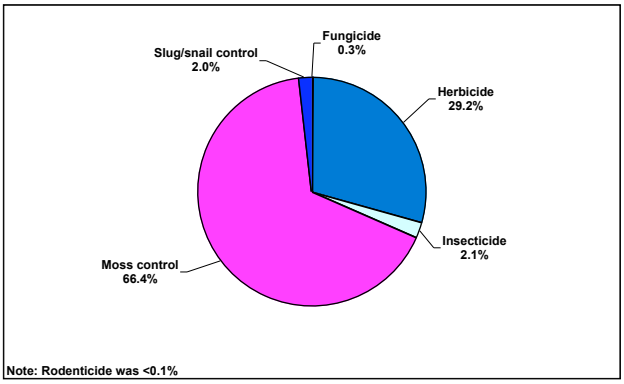

Figure 21 – Active Ingredients by Type – Region 6

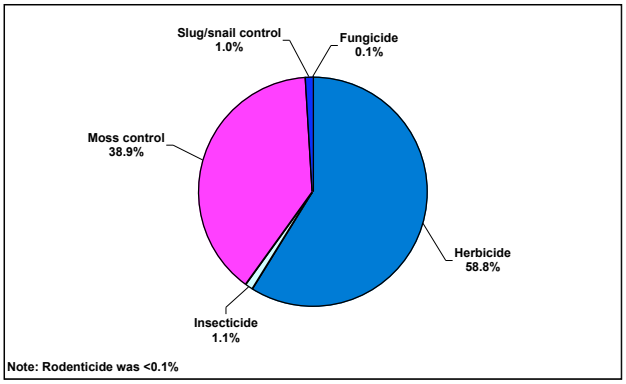

Figure 22 – Active Ingredients by Type – Region 7

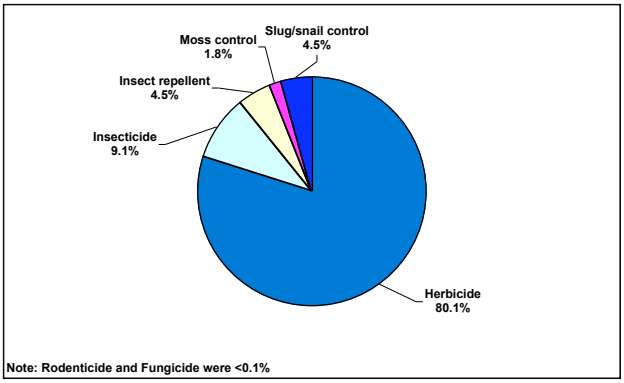

Figure 23 – Active Ingredients by Type – Region 8

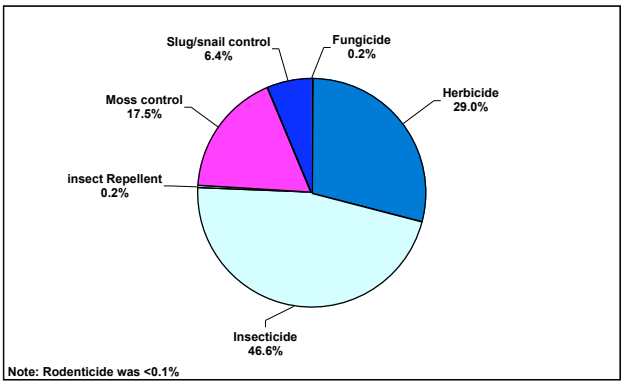

Figure 24 – Active Ingredients by Type – Region 9

APPENDIX

Appendix A – Top 100 Active Ingredients and Pounds Reported

#	Active Ingredient	Lbs. Reported
1	Metam-sodium	3,980,871
2	Glyphosate	1,914,144
3	1,3-Dichloropropene	1,214,251
4	Aliphatic petroleum hydrocarbons	1,097,237
5	Sulfuric acid	852,789
6	Boric acid	837,341
7	2,4-D	778,878
8	Copper ethanolamine complex	600,636
9	Copper ammonium carbonate	492,203
10	Potassium N-methyldithiocarbamate	483,999
11	Methyl bromide	435,656
12	Chloropicrin	400,936
13	Diuron	385,174
14	Mineral oil	339,466
15	Sulfur	255,627
16	Kaolin	240,653
17	MCPA	240,142
18	Atrazine	228,305
19	Pendimethalin	222,578
20	Chlorothalonil	211,140
21	Mancozeb	192,842
22	Chlorpyrifos	184,265
23	Copper hydroxide	166,010
24	Xylene range aromatic solvent	149,012
25	Triclopyr	125,542
26	Copper oxide	124,358
27	Chromic acid	122,935
28	Ethofumesate	121,520
29	EPTC	120,030
30	Calcium polysulfide	114,912
31	Hexazinone	105,284
32	Cyfluthrin	105,082
33	Sodium bifluoride	100,395
34	Dicamba	96,964
35	Trifluralin	95,759
36	Paraquat dichloride	94,046
37	Flufenacet	87,992
38	Arsenic acid anhydride	86,702
39	Metribuzin	83,186
40	Bromoxynil	79,103
41	Oryzalin	70,222

42	Malathion	62,245
43	Copper naphthenate	60,658
44	Oxyfluorfen	59,499
45	Oxamyl	58,606
46	Tebuconazole	57,174
47	Metaolachlor	55,969
48	Propiconazole	54,489
49	Bifenthrin	51,882
50	Clopyralid	48,592
51	Acrolein	46,732
52	Dimethenamid	42,538
53	Ethoprop	40,004
54	Trifloxystrobin	34,768
55	Diazinon	33,491
56	PCNB	33,295
57	Pentachlorophenol	30,770
58	Prohexadione calcium	30,327
59	Imazapyr	29,859
60	Imidan	29,352
61	Pine oil	28,963
62	Simazine	28,855
63	Ziram	27,030
64	Thiophanate-methyl	26,799
65	Aluminum phosphide	26,582
66	Methomyl	25,652
67	Sodium bentazon	25,244
68	Iprodione	25,144
69	Dazomet	24,891
70	Acephate	23,975
71	Dimethoate	21,352
72	Maleic hydrazide	21,251
73	Metaldehyde	20,763
74	Napropamide	20,702
75	Chlorpropham	20,385
76	Basic copper sulfate	20,018
77	Copper sulfate pentahydrate	19,529
78	Azoxystrobin	18,949
79	Propargite	18,937
80	Endosulfan	18,576
81	Carbaryl	17,189
82	Imidacloprid	16,922
83	Sulfometuron methyl	16,866
84	Diclofop-methyl	16,713
85	Sodium percarbonate	15,607
86	Ammonia	14,989
87	Bacillus thuringiensis subsp. kurstaki	14,880

88	Isoxaben	14,847
89	phosphorous acid	14,315
90	Trinexapac-ethyl	13,982
91	Captan	13,030
92	Pyraclostrobin	12,935
93	Didecyl dimethyl ammonium chloride	12,646
94	Aminopyralid	12,466
95	IPBC	12,433
96	Zinc phosphide	12,367
97	Carbonic acid, monopotassium salt	12,250
98	Azinphos-Methyl	11,734
99	Bromacil	11,189
100	Dichlobenil	10,746