

Pesticide Analytical Response Center

**July 1, 2009 – June 30, 2011
Biennial Legislative Report**

PARC

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Acronym Definitions

CROET Center for Research on Occupational and Environmental Toxicology, Oregon Health & Science University

DEQ Oregon Department of Environmental Quality

FIFRA Federal Insecticide, Fungicide and Rodenticide Act

FY Fiscal year; from 7/1/2009 – 6/30/2010, as an example

NIOSH National Institute of Occupational Safety and Health

OAR Oregon Administrative Rules

ODA Oregon Department of Agriculture

ODF Oregon Department of Forestry

ODFW Oregon Department of Fish and Wildlife

ODOT Oregon Department of Transportation

OHA Oregon Health Authority

OERS Oregon Emergency Response System

OHSU Oregon Health and Sciences University

OPC Oregon Poison Center, Oregon Health & Science University

OR OSHA Oregon Occupational Safety and Health Division, Oregon Department of Consumer and Business Services

ORS Oregon Revised Statutes

OSFM Office of State Fire Marshal

OSU Oregon State University

PARC Pesticide Analytical Response Center

PEST Pesticide Exposure, Safety and Tracking, Oregon Health Authority

US EPA United States Environmental Protection Agency

USFWS United States Fish and Wildlife Service

WPS Worker Protection Standard

Executive Summary

The Pesticide Analytical Response Center (PARC) is mandated to coordinate the response of eight state agencies to pesticide related incidents. It also has a responsibility to collect incident information, report investigation results, and evaluate mitigation measures or trends that may affect public health. This legislative report is a description of PARC activities from July 1, 2009, through June 30, 2011.

The eight state agencies are:

- Oregon Department of Agriculture (ODA)
- Oregon Department of Environmental Quality (DEQ)
- Oregon Department of Fish and Wildlife (ODFW)
- Oregon Department of Forestry (ODF)
- Oregon Health Authority, Public Health Division (OHA)
- Oregon Occupational Safety and Health Administration (OR OSHA)
- Oregon Office of State Fire Marshal (OSFM)
- Oregon Poison Center (OPC)

Several other organizations provide expertise to the PARC Board as contracted consultants:

- The Center for Research on Occupational and Environmental Toxicology (CROET; now known as Oregon Institute of Occupational Health Sciences), at Oregon Health & Science University
- The Department of Environmental and Molecular Toxicology at Oregon State University (OSU)
- Oregon Department of Transportation (ODOT)

The last PARC legislative report was produced for fiscal year 2009 (FY '09; period from 7/1/08 through 6/30/09). It is available from the following website:

<http://www.oregon.gov/ODA/PEST/Pages/parc.aspx>

Prior to December 2009, all health, environmental, or animal events referred to PARC that were pesticide-related were identified as “incidents” and reviewed based on PARC criteria. See Appendix 1 – PARC Case Referral Criteria. An incident became a “case” and was assigned a case number when investigative findings showed that the incident met the case criteria. PARC elevated incidents to cases if it had sufficient information and certain standards were met.

Beginning January 2010, the PARC Board changed how incidents are classified. All incidents now receive a unique incident number, regardless of how many people or animals may have been affected. The PARC Board also decided to stop utilizing both the ‘certainty’ and ‘severity’ indices and began to concentrate on factors that contributed to the incident. This new approach allows trends to be more easily identified. PARC incidents that occurred between July 1, 2009, and December 31, 2009, were re-classified according to the new classification scheme. Additionally, the PARC Board decided to change from producing a legislative report annually to bi-annually.

During the bi-annual reporting period from July 1, 2009, through June 31, 2011, there were 91 PARC incidents: 11 incidents occurred from 7/1/09 through 12/31/09, 40 occurred in 2010 and 40 incidents occurred from 1/1/11 through 6/30/11. Of the 91 incidents, 10 involved animals and one was an environmental incident; of the remaining 80 pesticide-related incidents involving humans, a total of 124 people were involved. (Figure 1; Table 1)

By assigning contributing factors to each PARC incident, the Board was able to identify some trends. The patterns were:

- The Oregon Health Authority (through the PEST program) and the Oregon Department of Agriculture (through the Pesticide program) provided the data sources for the vast majority of PARC incidents. (Table 2)
- The Oregon Department of Agriculture, in support of their investigations, took environmental samples in almost half of the incidents they investigated, whether or not analyses supported an enforcement action. (Table 2)
- Incidents occurred in population centers; Marion, Lane and Multnomah counties accounted for almost half (43/91) of the total number of PARC incidents. (Table 3)
- Approximately one-quarter (23/91) of PARC incidents occurred in single-family homes. (Figure 3)
- Approximately 40% (37/91) of PARC incidents occurred on land classified as 'agricultural.' (Figure 3)
- 47% (58/124) of people reporting exposures sought medical attention. (Table 4)
- In more than 60% (58/91) of incidents, people exposed reported symptoms (Table 4) but only 30% of those individuals exposed sought medical treatment. (Table 5)
- 38% of PARC incidents occurred at a residential-agricultural interface. (Table 5)
- In over half of PARC incidents, no violations were found by any member agency involved in the investigation. (Table 6)
- Approximately 15% (15/91) of PARC incidents were occupational in nature; more than 50% of the individuals exposed on the job were exposed in an agricultural setting. (Table 7)
- Of the 107 specific pesticide products identified by the EPA registration number, 73% carry a signal word of CAUTION, 9% carry a signal word of WARNING, and 17% carry a signal word of DANGER. (Figure 4)
- Of the 107 specific pesticide products identified, herbicides accounted for 39% and insecticides accounted for 36% of the total. (Figure 5)
- Restricted Use Pesticides (RUPs) accounted for fewer than 10% of the total number of products identified. (Table 8)

PARC's History

Increasing use of pesticides in Oregon in 1978 led to rising concerns regarding possible detrimental effects of these chemicals on the environment and health concerns of the toxicity of pesticides to individuals within the State of Oregon. There was also a need to improve interagency coordination in investigating incidents involving possible adverse effects of pesticides on human health and the environment. Appendix 4 defines a pesticide and the different types of pesticides.

In an effort to respond to these concerns, Executive Order No. 78-23 was issued in July 1978, directing that a task force be formed to report recommendations to the Governor for budgetary provisions and legislative changes needed to increase capabilities of the State to investigate environmental and human health concerns relating to pesticides.

In 1979, PARC was incorporated into statute (ORS 634.02) with responsibilities to centralize the receiving of information relating to actual or alleged health and environmental incidents involving pesticides and to mobilize the expertise necessary for timely and accurate investigations of pesticide incidents and analysis of associated samples. Finally, to report in a standardized format the results of investigations of pesticide reports.

Funding for PARC during the 2001-2003 and 2003-2005 biennium was withdrawn due to the financial situation of Oregon government. Funding to PARC was restored in 2005. Reorganization of PARC began in July 2005 and has included the development of a standardized procedure for the collection, evaluation, and reporting of pesticide incident information.

Since July 1, 2005, the primary responsibility for the administrative functions of the Pesticide Analytical Response Center (PARC) has resided with the Oregon Department of Agriculture (ODA). The PARC Coordinator collects and disseminates information to and from different agencies relating to pesticide related incidents. Major funding is provided to Oregon Health Authority (OHA) to collect health related information from medical records and to conduct interviews with the affected person or persons.

In 2011, the PARC Board began working to minimize the classification process for evaluating PARC cases and began to emphasize factors that may have contributed to the human, animal, or environmental pesticide exposure. For a complete list of Contributing Factors (CFs), see Appendix 3. The new report is more in line with PARC's statutory requirement of identifying trends and patterns of problems relating to pesticide use. Previously, PARC did not explore identifying trends or patterns of contributing factors but was primarily concerned with identifying the severity and certainty of specific incidents of exposure. This old classification process did not examine what may have led to the exposure or whether this incident could be prevented in the future with training, education, outreach, or policy changes.

This report addresses how PARC gathers information and is intended to make PARC transparent to the citizens of Oregon. The following report meets the legislative requirement as stated in OAR 634.550.

PARC Mandates

PARC is mandated by statute to perform the following activities when pesticide-related incidents result in suspected health or environmental effects:

- Collect incident information
- Mobilize expertise for investigations
- Identify trends and patterns of problems
- Develop policy or other recommendations for action
- Report results of investigations
- Prepare activity reports for legislative sessions

Membership

Membership of the governing board consists of the representatives from eight state agencies and one citizen of the state at large appointed jointly by the Director of Agriculture and the Director of Human Services. Appendix 2 lists member agencies and their jurisdiction.

The eight state agencies are:

- Oregon Department of Agriculture (ODA)
- Oregon Department of Environmental Quality (DEQ)
- Oregon Department of Fish and Wildlife (ODFW)
- Oregon Department of Forestry (ODF)
- Oregon Health Authority, Public Health Division (OHA)
- Oregon Occupational Safety and Health Administration (OR OSHA)
- Oregon Office of State Fire Marshal (OSFM)
- Oregon Poison Center (OPC)

Several other organizations provide expertise to the PARC Board as contracted consultants:

- The Center for Research on Occupational and Environmental Toxicology (CROET), Oregon Health & Science University
- The Department of Environmental and Molecular Toxicology at Oregon State University (OSU)
- Oregon Department of Transportation (ODOT)

Representatives from ODA and OHA alternate as PARC Board Chair each calendar year, with ODA conducting chairperson activities during odd numbered years and OHA during even numbered years. The Board meets every other month beginning each year with a January meeting, to discuss incidents and pesticide related topics.

PARC Member Agencies' Notable Events From July 1, 2009, through June 30, 2011

DEQ

The Pesticide Stewardship Partnership (PSP) Program is a collaborative initiative that uses water-monitoring data to focus voluntary pesticide management actions in seven (7) watersheds in Oregon. The goal is to show measurable water quality improvements over time resulting from these actions and related technical assistance activities. The PSP monitoring data also informs the efforts of Oregon's inter-agency Pesticide Management Team to set statewide priorities for pesticide water quality improvements. This team, in turn, provides guidance to and support for the local PSP projects.

The Department of Environmental Quality's (DEQ's) Laboratory currently analyzes water samples for over 100 pesticides. The most recent PSP data across all seven watersheds has been used by the Pesticide Management Team to designate high, moderate and low priority pesticides for water quality protection in the state. The primary prioritization criterion is concentration of pesticides in water relative to state criteria or EPA non-regulatory benchmarks. Other factors that influence priorities include frequency of detection and occurrence pesticides in mixtures. The current high-priority pesticides are chlorpyrifos (e.g., Lorsban), malathion, and diuron (e.g., Karmex, Direx). The moderate level priority pesticides are atrazine (e.g., Aatrex), metolachlor (e.g., Parallel), simazine (e.g., Princep), propicanazole (e.g., Propimax), carbaryl (e.g., Sevin), imidacloprid (e.g., Admire), sulfometuron-methyl (e.g., Oust), metribuzin (e.g., Tricor). The remaining pesticides that are analyzed for as part of the PSP have either not been detected or are considered low priorities because of their relatively low occurrence and concentrations.

DEQ and the Oregon Departments of Agriculture and Forestry work with multiple partners at the watershed level, including Oregon State University (OSU) Extension and the Integrated Plant Protection Center, soil and water conservation districts, tribal governments, watershed councils, grower groups, NRCS, and local pesticide distributors. The two most noteworthy examples of water quality improvement in PSP watersheds are the reductions in chlorpyrifos concentrations in key tributaries of the Hood and Walla Walla Watersheds. Average and maximum concentrations have been reduced in these watersheds by over 90% since the PSP projects began.

ODF

During the reporting period, the Oregon Department of Forestry was involved with the following pesticide-related activities:

- In April 2011, Dr. Dana Barr presented to the Oregon Board of Forestry data indicating that analysis of urine samples from some of the residents of the Highway 36/Triangle Lake area were positive for certain pesticides. As the Board's staff support agency, ODF forwarded the data to PARC for review and potential action. ODF worked as part of the PARC team to support the resulting exposure investigation, which continued into the latter half of 2011 and beyond.

These are relevant to PARC's mandate for the following reason(s):

- They relate to the PARC-associated, OHA-led Exposure Investigation (EI) for residents in the Highway 36/Triangle Lake area.

OR OSHA

During the reporting period, Oregon OSHA was involved with the following pesticide-related activities: produced annual reports on Oregon OSHA's Pesticide Emphasis Program for 2009, 2010 and 2011 tabulating agency-wide pesticide activities on enforcement violation characteristics, numbers and types; consultative visits, resource distribution and outreach activities. These reports include summaries of the PARC cases investigated by Oregon OSHA. These were posted on line. These can be found at:

<http://www.orosha.org/subjects/pesticides.html> (under publications.)

- Developed forestry specific Worker Protection Standard pesticide safety poster: <http://www.orosha.org/pdf/pubs/4856.pdf>
- Amended Oregon OSHA's general industry requirements to include the Worker Protection Standard, which had been omitted.
- Developed a popular brochure, shared nationwide, on the selection, care and use of Personal Protective Equipment related to pesticides. <http://www.orosha.org/pdf/pubs/1018.pdf>
- A poster was presented on Oregon OSHA's Pesticide Emphasis Program entitled: "Preventing Pesticide Exposure: The Oregon OSHA Experience" at the joint Agriculture Safety & Health Council of America/National Institute for Occupation Safety and Health (NIOSH) Conference in Dallas, Texas.
- Developed an effective Multi-Agency format for the annual Pesticide Inspector's Forum. Attendees have included staff from multiple PARC Board agencies.
- Partnered with the RAND Corporation and NIOSH's National Personal Protective Testing Laboratory (NPPTL) on "Barriers to Personal Protective Equipment for Pesticide Handlers" was presented that the NIOSH/NPPTL Stakeholder's meeting in Pennsylvania.

These are relevant to PARC's mandate for the following reason (s):

- Oregon OSHA's regulatory and voluntary services related to pesticide safety are reported annually.
- Worked with other PARC Board members on joint inspections and training to collaborate on pesticide safety issues.
- Used the outcomes of the occupational exposure cases in the development and presentation of pesticide safety training courses to highlight prevention strategies.

OSFM

The Office of State Fire Marshal is a division of the Oregon State Police. The Community Right to Know Unit (CR2K) resides within the Office of State Fire Marshal. Under Oregon Revised Statute and Oregon Administrative Rule CR2K is charged with implementing and managing the Oregon Hazardous Substance Information Survey program. Since 1986, this

program also satisfies Federal Emergency Planning and Community Right to Know (EPCRA) for reporting the storage of hazardous substances. The CR2K program captures Oregon businesses required to report any hazardous substance(s) stored onsite that meets or exceeds minimum reportable quantities established under Administrative Rule (OAR) and or specific EPA threshold minimums.

Another aspect of managing the CR2K program involves coordinating activities with other programs, such as the Pesticide Analytical Response Center (PARC). In light of conducting each agency's respective duties, CR2K has shared records and information gathered from ongoing investigations, onsite audits, or databases. The benefits of such interagency cooperation are twofold; first, through an increased accountability by Oregon businesses utilizing hazardous chemicals in their daily operation, and secondly, because the threshold of safety benefiting the citizens of Oregon has been increased.

In the end, both the Pesticide Analytical Response Center and the Office of State Fire Marshal Community Right to Know Unit remain on task to achieve greater compliance and safety for Oregon businesses and citizens alike.

Additionally, the Office of State Fire Marshal:

- Reviews and evaluates information gathered through PARC, with particular emphasis on identifying trends and patterns of problems related to pesticide use, and formulating recommendations to address these problems.
- Provides relevant information and reports to PARC relating to actual or alleged health and environmental incidents involving pesticides. This may include complaints received and associated investigations.
- Receives information from PARC relating to incidents involving pesticides and conduct investigations under Fire Marshal authority as appropriate.
- Receives, reviews and evaluates recommendations from PARC for action. Reports to PARC the review and evaluation of the recommendations and intended actions.
- Provides information to Fire Marshal employees and members of the industries regulated by OSFM regarding the activities conducted by PARC.

OSU

Oregon State University investigators, in collaboration with the Oregon Poison Control Center, published the results of research exploring the geographic and temporal variation in symptomatic pesticide exposure incidents. The Oregon Poison Control Center provided data on unintentional, symptomatic pesticide exposures that occurred in Oregon from 2001 - 2005. Geographic Information Systems (GIS) and spatial scan statistics were utilized to assess whether serious medical outcomes were clustered in time or space within the state. The results of the analysis found that there were two adjacent counties in Oregon (Linn, Lane) where a doubling of risk of serious outcomes was observed. The results of this research were published in the journal *Clinical Toxicology*, and were presented at a PARC board meeting on May 19, 2010. The link to the article is here:

<http://informahealthcare.com/doi/abs/10.1080/15563650802646694?prevSearch=Contr+ib%253A%2528Sudakin%2529&searchHistoryKey=>

ODOT

- In 2007, ODOT began a Limited Spray Pilot project on Hwy 101 from Newport south to the Lane County border. No herbicides have been applied in this section since the pilot project became implemented.
- In 2010, ODOT began another Limited Spray Pilot on Highway 36. Herbicide applications are limited to noxious weed control, to areas that cannot be mowed and around structures.
- ODOT is reducing the amount of herbicides used statewide by 25% over five years, using 2010 quantities as the baseline. This 25% reduction in herbicide use does not include herbicides used to control or prevent the spread of noxious weeds as required by law.

ODFW

During the reporting period, the Oregon Department of Fish and Wildlife was involved in the following pesticide-related activities:

ORS 452.140 and ORS 452.245 require ODFW to annually review and approve planned applications of insecticides by a Vector Control District for the purposes of vector control. During 2009-2011, ODFW annually collaborated with 18 Vector Control Districts to protect biologically-sensitive areas while allowing effective vector control and mosquito abatement. ODFW identified biologically-sensitive areas across the state and recommended treatment protocols in Pesticide Use Plans submitted by the Vector Control Districts.

ODFW also responded to or provided technical expertise for any fish- or wildlife-related pesticide event. Two notable events occurred during the reporting period:

The first event, reported on February 16, 2011, involved the death of seven deer in Polk County. Glyphosate had recently been applied to the area. ODFW's District Wildlife Biologist investigated the incident and determined that the deer were decomposed and not viable for a necropsy. The Oregon Department of Agriculture analyzed the stomach contents of one deer and soil samples from underneath three deer, all of which were negative for glyphosate. Dr. Fred Berman, consultant for the PARC Board, determined that there was no connection between the deaths and herbicide application.

The second event involved the death of 49 Cackling Geese on approximately April 7, 2011, in Linn County. ODFW visited the site April 8 and submitted two specimens to the Oregon State University Veterinary Diagnostic Laboratory for necropsy and diagnostic analysis. The diagnosis was phosphide toxicosis resulting from the ingestion of one of the phosphide reagents (zinc or aluminum phosphide). ODFW confirmed zinc phosphide poisoning through pathological diagnosis in the two geese that were submitted.

These are relevant to PARC's mandate for the following reason(s):

ODFW's interest was in minimizing environmental effects from insecticide applications for the specific purpose of vector control through a collaborative planning process. In addition, ODFW was involved in investigations of other pesticide events that may have harmed fish, wildlife, or their habitats. In the event that a pesticide application allegedly impacted fish, wildlife, or their habitats, ODFW field staff responded to the site or provided technical expertise for the investigation.

OPC

The OPC is a well recognized and widely used resource for the public and health care providers throughout Oregon. Each year, the OPC receives over 42,000 calls from throughout Oregon regarding poisonings and toxic exposures to a wide variety of substances, including pesticides, pharmaceuticals, envenomations, industrial chemicals, plants and household products. The OPC staff collects detailed substance exposure data on each case, but utilize careful assessment and evaluation to determine the significance of that particular exposure to the actual medical condition of the patient. As a result, OPC data reflect large numbers of potential exposures to substances with varying levels of causality.

The OPC received 2,748 calls regarding potential human exposures to pesticides from July 2009 through June 2011. The vast majority of these cases involved minor exposures with no anticipated health effects. Seven hundred and forty-nine cases had minor symptoms that were safely managed at home, with the OPC nurses and physicians providing careful assessment and follow-up through telephone consultation. Two hundred and thirty-six cases received care in a health care facility. Although a potential pesticide exposure was identified in the medical history of these patients, it was not necessarily the primary reason for their medical condition.

To assist in meeting the requirements of ORS 413.042, 433.004 and 433.006 (that pesticide poisonings diagnosed or suspected by a healthcare provider be reported to local or state public health authorities), the OPC reports significant symptomatic pesticide exposures to the PEST staff of the OHA. PEST staff evaluate each case to determine whether it meets the PEST case definition. PEST reports appropriate cases, if staff gain permission from the person reporting symptoms (or their parent/guardian, if a minor) to PARC for subsequent review.

ODA

During the 2009-2011 biennium, the Oregon Department of Agriculture addressed the following notable pesticide-related issues:

The Oregon Legislature provided the Oregon Department of Agriculture Pesticide Program with two limited duration pesticide investigator positions to improve timely responses to pesticide-related incidents throughout Oregon.

The Oregon Legislature discontinued funding the Pesticide Use Reporting System. Pesticide users were not required to submit pesticide-use information to ODA during this time.

ODA's Pesticide Program developed a Program Option Package for reinstatement of general funds to support the Pesticide Analytical Response Center program. Previous legislative sessions reduced or eliminated the availability of funding for PARC.

The U.S. Environmental Protection Agency implemented new pesticide regulatory restrictions in 2010 that require buffers associated with the use of soil fumigants. Pesticide program staff conducted education and outreach activities, as well as trainings, to assist industry and users with new regulations.

The U.S. EPA also implemented in 2010 new pesticide regulations under the Clean Water Act that require issuing National Pollution Discharge Elimination System (NPDES) permits. In Oregon, the Department of Environmental Quality administers this program. ODA assisted DEQ in the dissemination of information to the agriculture industry and pesticide user community.

ODA appointed Ray Jaindl as Natural Resources Policy Area Director, overseeing the Natural Resources, and Pesticide and Fertilizer programs. This includes administration of the Water Quality Program, Confined Animal Feeding Operations, Smoke Management, Land Use, and Fertilizer and Pesticide regulation. Jaindl also was assigned to carry out the duties as PARC Administrator.

OHA

The PARC Board is co-chaired by a representative of the Oregon Health Authority (OHA). Staff members at OHA's [Pesticide Exposure Safety & Tracking \(PEST\) Program](http://healthoregon.org/pesticide) (healthoregon.org/pesticide) are responsible for gathering symptomology and exposure pathway information on cases of human acute pesticide-related illness and injury (APII) in Oregon. Such cases are reported to OHA by several sources, including PARC itself, the Oregon Poison Center, and by healthcare providers. [In Oregon, healthcare providers are required to report diagnosed or suspected cases of human pesticide poisoning to their local health department or OHA under Oregon's disease reporting statutes ([ORS 413.042](http://ors.legislature.gov/ORS/433.004), [433.004](http://ors.legislature.gov/ORS/433.004) & [433.006](http://ors.legislature.gov/ORS/433.006)).]

OHA is the only state entity that seeks to determine the burden of APII on Oregonians. This identification of trends in reported exposures is in keeping with PARC's statutory mandate ([see ORS 634.550](http://ors.legislature.gov/ORS/634.550)). For data-based pesticide policy-making, both in Oregon and by federal regulators, it is critical that APII trends in Oregon be comparable to those of other states. To that end, PEST staff members assess available evidence of reported exposures in Oregon using the [case classification criteria and standardized variables](http://www.cdc.gov/niosh/topics/pesticides/case.html) (www.cdc.gov/niosh/topics/pesticides/case.html) for APII from the [SENSOR-Pesticides](http://www.cdc.gov/niosh/topics/pesticides/overview.html) (www.cdc.gov/niosh/topics/pesticides/overview.html) program at the Centers for Disease Control & Prevention. This system is used by eleven other states. [Analyses of that data](http://www.cdc.gov/niosh/topics/pesticides/journal.html) (www.cdc.gov/niosh/topics/pesticides/journal.html), some of which include de-identified cases from Oregon, may be used by the US Environmental Protection Agency's [Pesticides Program](http://www.epa.gov/pesticides/) (www.epa.gov/pesticides/) in its regulation of pesticide products and practices.

For the 2009-2011 reporting period, a PEST team, which included a physician or toxicologist, assessed 256 cases of pesticide exposure reported to PARC and/or PEST. Of these, 70% (178 of 256) met the criteria for the top three categories – “definite,” “probable” and “possible” – of SENSOR-Pesticides program’s [classification criteria](http://www.cdc.gov/niosh/topics/pesticides/pdfs/casedef.pdf) (www.cdc.gov/niosh/topics/pesticides/pdfs/casedef.pdf). Because these have the most evidence that the illness being reported was actually pesticide-related, further analysis was done only on those 178.

Assessing available evidence for those 178 cases resulted in findings that may be useful to policy-makers and advocates. Of those findings, two stand out: First, at least 62% of on-the-job cases (18 of 29) occurred to those who were not applying pesticides themselves. Similarly, for non-work-related cases, almost two-thirds of cases (94 of 149 cases) occurred to individuals who were engaged in routine outdoor or indoor activities, usually at or in their own homes, and were not applying pesticides themselves. Second, 23 cases were due to drift of a pesticide application from a nearby farm; one resulted from drift from an application at an adjacent nursery, one resulted from drift from an application done at a post-harvest crop processing facility, and one resulted from drift from an application by helicopter to a nearby forest.

An expanded report on the findings for these 178 confirmed cases may be found on PEST’s webpage at: healthoregon.org/pesticide.

Investigation Coordination

The primary statutory function of PARC is to coordinate pesticide-related investigations. PARC collects and analyzes information about reported incidents of health or environmental effects from possible pesticide exposures. Because PARC does not have regulatory or investigative authority, it relies on these agencies to collect pertinent information. PARC member agencies conduct the investigations and take necessary enforcement actions.

Investigation coordination includes:

- Collecting information from callers and distributing the information to member agencies and other organizations as necessary.
- Assigning a tracking number for possible pesticide incidents when adverse health or environmental effects are alleged or suspected.
- Requesting investigation or collaboration by member or partner agencies.
- Coordinating information sharing, as appropriate, between member agencies.
- Collecting investigative reports and enforcement actions from other agencies.

Participants in incident investigations may include other government agencies that are not specifically mentioned in the PARC mandate. Some examples of those agencies are:

- Oregon Department of Transportation
- Oregon State University Extension Service
- United States Environmental Protection Agency
- United States Fish and Wildlife Service

PARC Incidents

PARC defines an incident as an event involving a pesticide whereby adverse effects to people, animals, or the environment have been alleged or suspected.

Incidents are reported to PARC in a variety of ways. This includes receiving reports through PARC member agencies, as well as other federal, state, or local agencies. By state law (1987) in Oregon, all health care providers including Oregon Poison Control (OPC) must report suspected pesticide poisonings to the Pesticide Exposure Safety and Tracking (PEST) program within 24 hours. Additionally, other sources for reporting incidents includes the Oregon Emergency Response System (OERS), the news media, and ODA investigatory staff. PARC maintains a telephone line and email address for the public to report impacts to health and/or the environment. PARC follows up on any allegations to confirm which agency should take the lead in the investigation and which agencies should be involved or notified.

When an incident is reported to PARC, an incident number is assigned. This incident number is used to track the incident from start to finish. Each incident is entered into a spreadsheet and summarized for presentation to the PARC Board at each bimonthly meeting. Incident reports represent urban (indoor and outdoor) and rural situations,

agricultural and forestry pesticide applications, pesticide spills, accidents, homeowner applications, and neighbor complaints.

Member agencies submit final incident investigation reports to the PARC Coordinator. These reports include any violations and/or enforcement actions and are routinely shared among agencies and with the PARC Board, when incidents are assigned contributing factors (CFs).

The data developed from incident investigations are analyzed and presented to the Oregon Legislature. Information collected by PARC is used to:

- Identify the appropriate agencies that can assist during crisis.
- Conduct training of other agencies' personnel to ensure information collection.
- Develop educational materials aimed at reducing exposures.
- Make recommendations to state and federal agencies regarding products and application practices with the aim of reducing acute pesticide poisonings.

Information collected by the PARC program is available and provided to the public, other agencies, and business interests. Information is also provided to the U. S. Environmental Protection Agency (US EPA) and the U. S. Fish and Wildlife Service (US F&W) when appropriate. These federal agencies combine PARC data with information from other states to identify possible national trends regarding pesticide products or uses. Upon request, pesticide product manufacturers, industry organizations, and public interest groups are also provided the information developed by PARC agencies and any conclusions that PARC has drawn from that information.

Information is disseminated to targeted groups through presentations at training seminars, meetings, and through pesticide safety literature. PARC anticipates expanding public and professional educational efforts as the program moves forward.

Education is identified as a key component to collecting and substantiating exposure scenarios. Delays in reporting pesticide exposures inhibits the ability of PARC and individual member agencies to gather adequate information, identify rule violations, and evaluate the relationships between reported exposures and adverse impacts to people, animals, or the environment.

Funding

For the biennial fiscal period 2007 – 2009 (July 1, 2007 – June 30, 2009), the Oregon Legislature authorized General Funds. For the biennial fiscal period 2009 – 2011 (July 1, 2009 – June 30, 2011), General Funds were again provided to ODA for the operation of PARC. Because General Funds instead of than Other Funds were authorized, PARC expenditures were not subject to ODA indirect costs. The PARC budget for 2009 – 2011 was as follows:

ODA -	\$99,447
OHA -	\$118,174
OSU -	\$50,000
<u>OHSU -</u>	<u>\$25,000</u>
Total Approved Budget	\$ 292,621

ODA expenses included salary and support costs for one-half technical position as the PARC Coordinator. Activities of this position included receiving information from the public and other agencies regarding incidents, communicating information to staff of other agencies, coordinating investigations, tracking the actions of responding agencies, compiling gathered information, interacting with OSU toxicologists and reporting to the PARC Board.

OHA expenses included salary and support costs for a portion of one part-time technical position. Activities of this position included communicating with individuals regarding pesticide related health concerns, gathering incident information from individuals, obtaining medical information from individuals and health care providers, and interacting with OSU toxicologists.

OSU expenses included providing human and environmental toxicology consultations. Activities of participating staff included receiving, evaluating and reporting information provided on specific incidents referred by the PARC Coordinator.

The expenses of other agencies participating in PARC were not charged to PARC, but absorbed by individual agencies. This includes the time provided by OHA and ODA management staff acting as the PARC Co-Chairs, and ODA management staff acting as the PARC Administrator.

Annual Report

This annual report covers the period from July 1, 2009, to June 30, 2011. A PARC Legislative Report has not been published since July 2011. This delay was caused by a number of factors.

- The PARC Coordinator position within ODA has been a half-time position. Historically, the PARC Coordinator also worked half time as a Pesticide Investigator.
- There have been several changes with the PARC Coordinator position; there have been four PARC Coordinators since June 2009. These changes delayed the forwarding of cases to the appropriate agency for investigation and forwarding case information to PARC's toxicologists for case classification (prior to January 2010, when the case classification system stopped being utilized).
- There are resource issues at OHA as PARC funding is enough to support a portion (0.44 FTE) of a part-time staff member over the biennium. This affects OHA's ability to investigate PARC cases in a timely fashion and obtain medical human health information from individuals who seek medical care.
- The schedule of PARC meetings limits the Board's availability to discuss incidents. Normally, the PARC board meets every other month for three hours to address PARC related issues and to classify PARC cases. This meeting schedule affects PARC's ability to work through the backlog of PARC cases. However, the Board held several all-day meetings in 2011 to address this backlog.
- PARC continues to operate without a database in which data may be entered and associations between contributing factors may be closely examined. Further delays in database development inhibit PARC's ability to fully carry out its mandated mission in the areas of trend analysis and policy recommendations.

PARC 2009-2011 Data

Environmental

There was one PARC incident that was classified as environmental. This incident involved a retail coffee establishment that received a shipment of coffee beans. The beans had a strong odor of a commonly used insect repellent containing the active ingredient DEET. ODA tested the coffee beans for the presence of DEET; DEET was not detected above the minimum level of detection.

Animal

During the reporting period, there were 10 animal incidents that involved four horses, seven deer, 12 dogs, four rabbits, and 49 geese.

ODA investigated 80% of the incidents involving animals; agriculture was the incident site

60% of the time. Concomitantly, 60% of the time, the target pest was agriculturally related. In 60% of the animal incidents, the exposure was inadvertent. No violations were documented in 70% of the incidents involving animals; however, ODA issued two letters of advisement. Letters of advisement are issued to the responsible party when the investigation concludes that there is not enough evidence to issue a notice of violation or civil penalty but there are sufficient grounds to issue a warning.

ODA received a referral from ODFW about seven deer carcasses that had been recently found near a Christmas tree farm; there had been a recent application of glyphosate to the Christmas tree field. ODFW determined that necropsies were not viable, so ODA sampled the stomach contents of one deer and the soil near several other deer carcasses. Based upon the extremely low levels of glyphosate found, PARC's veterinary toxicologist consultant concluded that the deer deaths were unrelated to the recent pesticide application.

ODA cooperated with the USFWS regarding the death of 49 Cackling Canada geese. Two of the geese were necropsied, and phosphine was found in one of the geese. The goose probably consumed either zinc phosphide or aluminum phosphide, both of which produce phosphine gas following ingestion. No unique source of either phosphide product could be located. Oregon has had Special Local Need (SLN) registrations in place since 1998 (instituted by the Oregon Department of Agriculture), limiting the above ground application of zinc phosphide to protect migrating Canada geese.

Human

From July 1, 2009, through June 31, 2011, there were 80 PARC incidents involving a total of 124 people. Of these incidents, 25% of these 80 incidents occurred in single-family homes and almost half of the people involved lived in Marion, Lane or Multnomah counties. Seventy-five percent of the people reporting exposure also reported symptoms; however only 30% of these individuals sought medical treatment. People reported that pesticide drift had occurred from the application site in 20% of the incidents.

Over one-third (29/80) of PARC incidents were occupational in nature and almost half of these incidents occurred because of inadequate personal protection equipment (PPE).

One hundred and seven specific pesticide products were identified in these 80 pesticide-related incidents involving people. Herbicides (39%) and insecticides (36%) were the classes of pesticides most often identified in these incidents. Of these 107 products, 73% of these pesticide products carry a signal word of CAUTION, 9% carry a signal word of WARNING and the remaining 17% carry a signal word of DANGER. Less than 10% of the products involved were restricted use pesticides (RUPs) and there were a variety of active ingredients associated with the incidents.

See the remaining tables and figures located in the appendix for additional information.

PARC Accomplishments

The following was accomplished by PARC during the reporting period:

- The PARC Board decided to alter the way that incidents/cases are to be handled. Prior to December 2009, PARC received reports and labeled them 'incidents', which received unique identifying incident numbers. Incidents were elevated to 'cases' if certain criteria were met. Additionally, each case was discussed by the PARC Board and along with the toxicology consultants and assigned certainty and severity indices. Unfortunately, this method limited PARC's ability to examine the factors that led up to the incident in the first place. In early 2011, the PARC Board decided to concentrate on identifying factors that are thought to have contributed to a pesticide incident occurring. PARC-funded staff developed a list of such factors (See Appendix 2 for a list of contributing factors that may be assigned to PARC incidents). Using that list, the Board has a process by which it assigns, by consensus, factors that either contributes to the incident occurring or that label it for later analysis. Analyzing these Contributing Factors with a database (which has not yet been funded or created) has the potential to greatly increase PARC's ability to examine pesticide incident trends. Being able to assess trends in pesticide incidents across the state (and over time) would increase PARC's ability to make recommendations, whether to individual state agencies or to the Oregon State Legislature.
- Oregon cases of human pesticide poisoning from pesticide drift were included in a national study. Staff from the PEST program of OHA, which is financially supported by PARC, contributed de-identified Oregon incidents of pesticide poisoning, which had been ascertained and confirmed by OHA staff, to a multi-state study. "[Acute Pesticide Illnesses Associated with Off-Target Pesticide Drift from Agricultural Applications: 11 States, 1998-2006](#)" was published in the peer-reviewed journal, *Environmental Health Perspectives*.
- Oregon cases of fipronil poisoning were included in another national study. [Fipronil is the active ingredient in many flea and tick treatments for pets.] PEST staff contributed de-identified Oregon incidents of human fipronil poisoning, which had been ascertained and confirmed by OHA staff. "[Acute illnesses associated with exposure to fipronil--surveillance data from 11 states in the United States, 2001-2007](#)" was published in the peer-reviewed journal, *Clinical Toxicology*.

Appendix 1 PARC Member Agencies' Case Referral Criteria

Background: The Pesticide Analytical and Response Center (PARC) was created by executive order in 1978. With the passage in 1991 of Senate Bill 740, the program was reauthorized under the Oregon Department of Agriculture (ODA) as ORS 634.550. By legislation, membership of the governing board consists of representatives of eight state agencies, and one member of the public appointed jointly by the Director of Agriculture and the Director of Human Services.

The Center collects and shares information about pesticide-related incidents involving alleged impacts to human health, animal health, and/or the environment. By statute, PARC is mandated to perform the following activities with regard to pesticide-related incidents in Oregon that have suspected health or environmental effects:

- Collect incident information
- Coordinate and mobilize expertise for investigations
- Identify trends and patterns of problems
- Make policy or other recommendations for action
- Report results of investigations
- Prepare activity reports for each legislative session

In order to facilitate the timely transfer of incident information between PARC member agencies, this document was developed to document the statutory authority, pesticide-related jurisdiction(s), and/or areas of expertise for each member agency. The intended purpose of this document is to serve as a reference for representatives of PARC member agencies, and the PARC Coordinator, in the early stages of any PARC case; the user should refer to these criteria and provide referrals as indicated.

<p style="text-align: center;">Pesticide Analytical Response Center</p> <p>Administrator – Ray Jaindl Co-Chair – Jae Douglas Co-Chair – Dale Mitchell</p> <p><u>Contacts</u> Coordinator - Theodore Bunch, Jr. (503) 986-6470</p> <p>635 Capitol St NE Salem, OR 97301 Oregon Department of Agriculture</p>	<p><u>Referral Criteria:</u> PARC should be notified at (503) 986-6470 as soon as possible after any pesticide-related incident that is alleged to have had an impact on human and/or animal health, or the environment (air, soil, water).</p> <p><u>Resources/Programs:</u> By referral and coordination, PARC has the capacity to tap into resources from each of its member agencies.</p>
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<p>Oregon Department of Agriculture Pesticides Division</p> <p><u>Contacts</u> Dale Mitchell – (503) 986-4646 Program Manager</p> <p>Oregon Department of Agriculture 635 Capitol St NE Salem, OR 97301</p>	<p>ODA Pesticide Division would like to be notified as soon as possible whenever a violation of Oregon’s Pesticide Control Law (ORS 634 & OAR 603) is suspected. This would include any suspected misuse, drift, or otherwise faulty, careless or negligent acts related to pesticide use, storage, distribution or disposal.</p> <p><u>Resources/Programs:</u> ODA has field staff positioned around the state with experience in pesticide application technology and regulation. As part of an investigation, ODA has access to laboratory services. ODA maintains a label for each pesticide registered in Oregon and a database of information about those products. ODA also maintains a database of information about pesticide-related licenses and licensees.</p>
<p>Oregon Health Authority Public Health Division Center for Prevention and Health Promotion</p> <p><u>Contacts</u> Jae Douglas – (971) 673-1139 Curtis Cude – (971) 673-0975 Justin Waltz – (971) 673-1217 PEST</p> <p>Oregon Health Authority 800 NE Oregon St #640 Portland, OR 97232</p>	<p><u>Referral Criteria:</u> The PEST Program in the Environmental Public Health Section, which is part of Center for Prevention and Health Promotion at OHA-Public Health, would like to be notified by email, fax or phone of reports of human health symptoms thought to be pesticide-related within 24 hours.</p> <p><u>Resources/Programs:</u> The PEST Program is made up of a portion of a program analyst who can draw upon the expertise of toxicologists and an industrial hygienist in Environmental Public Health Section. Drinking water engineers, research analysts and epidemiologists at OHA-Public Health may be available, as needed.</p>

<p>Oregon Department of Fish & Wildlife</p> <p><u>Contacts:</u> General Issues – Danette Faucera Water Policy Coordinator (503) 947-6092</p> <p>or</p> <p>Spills - Art Martin – (503) 947-6082</p> <p>Oregon Department of Fish & Wildlife 4034 Fairview Industrial Drive SE Salem, OR 97302</p>	<p><u>Referral Criteria:</u> ODFW wants to be notified as soon as practicable or within 24 hours of any suspected pesticide related poisoning of fish or wildlife. Pesticide spills should be reported to the Oregon Emergency Response System (OERS) who has a call down list and will contact the appropriate ODFW staff when necessary. OERS phone number is (800)452-0311.</p> <p><u>Resources/Programs:</u> ODFW district biologists handle issues with pesticide poisoning or spills that affect fish and wildlife. ODFW biologists assist to identify potential fish and wildlife receptors and resources that are at risk; assess extent of damage to the resource(s); collect samples for analysis and to identify laboratories for analysis.</p>
<p>Oregon Department of Forestry</p> <p><u>Contact:</u> Brad Knotts – (503) 945-7484 Silvicultural Policy Analyst Oregon Department of Forestry 2600 State St Salem, OR 97310</p>	<p><u>Referral Criteria:</u> ODF wants to be notified any time there is a report or allegation of damage to natural resources, human health, or human property as a result of a forest pesticide application, spill, or other related activity. If the application is ongoing, immediate notification is requested. If it is over, ODF requests notification as soon as is practical.</p> <p><u>Resources/Programs:</u> ODF has field offices across the state. ODF field foresters administer forest practice pesticide rules, which deal with natural resource protection. ODF investigates incidents that may involve violations of the forest practices rules. ODF maintains a database of information on planned forest pesticide applications.</p>

<p>Oregon Department of Environmental Quality</p> <p><u>Contact:</u> Greg Pettit – (503) 693-5705 Department of Environmental Quality 3150 NW 229th Ave Suite 150 Hillsboro, OR 97124</p> <p>Eastern office: (541) 388-6146, Ext. 236 Northwest Office: (503) 229-5474 Western Office: (503) 378-8240, Ext. 227</p>	<p><u>Referral Criteria:</u> If there is a pesticide spill, release, or other emergency response situation, DEQ wants to be notified through OERS. Chuck Donaldson is the manager of the Emergency Response Section. For pesticide complaints, forward to the regional contacts on the left.</p> <p><u>Resources/Programs:</u> DEQ has field staff available in district offices and a dedicated laboratory facility. Water quality, air quality and environmental quality are all regulated by DEQ.</p>
<p>Oregon Occupational Safety & Health Administration</p> <p><u>Contact:</u> Garnet Cooke – (503) 378-3274 Stan Thomas – (503) 378-3274</p> <p>Salem Field Office PO Box 14513 1340 Tandem Ave NE, Suite 160 Salem, OR 97309</p>	<p><u>Referral Criteria:</u> OR OSHA is notified any time a pesticide-related incident or unreasonable exposure risk is occupational in nature. OR OSHA must be notified of work-related fatalities and/or catastrophes within eight hours of occurrence or employer knowledge, of work-related overnight hospitalization within 24 hours of occurrence or employer knowledge. Complaints are classified and responses initiated as follows: <i>Imminent danger:</i> Investigation initiated within 24 hours; <i>Serious:</i> Investigation initiated within 5 days; <i>Other-than-serious:</i> Investigation initiated within 30 days.</p> <p>OR OSHA requests notification by phone contact with email follow-up.</p> <p><u>Resources/Programs:</u> OR OSHA has field staff available to investigate occupational incidents, and a library of educational materials relevant to pesticide handling, storage, and application in agriculture.</p>

<p>Office of the State Fire Marshal</p> <p><u>Contact:</u> Aleta Carte – (503) 934-8262 HazMat Information Specialist</p> <p>Community Right-to-Know Unit Office of the State Fire Marshal 4760 Portland Road NE Salem, OR 97305</p>	<p><u>Referral Criteria:</u> The OSFM prefers to stay in communication regarding pesticide-related incidents by participating in PARC meetings. Because their requirements are based on storage, they do not require notification of pesticide incidents. OFSM may respond to incidents on a case-by-case basis.</p> <p><u>Resources/Programs:</u> The OSFM can offer information about hazardous materials, including pesticides that are stored at facilities around the state including storage location, quantities and hazard type. Expertise is also available regarding application of the Oregon fire code to pesticide storage.</p>
<p>Oregon Poison Center</p> <p><u>Contact:</u> Sandy Giffin – (503) 494-8600 Deputy Director Oregon Poison Control Center 3181 SW Sam Jackson Park Road Mail Code – CSB Portland, OR 97201</p>	<p><u>Referral Criteria:</u> The OPC wants to be notified immediately at (800)-222-1222 of any pesticide exposures for which assistance is needed in acute clinical management of the patient.</p> <p><u>Resources/Programs:</u> OPC staff is available for consultation and advice regarding clinical toxicology issues.</p>
<p>Oregon Department of Transportation</p> <p><u>Contact:</u> Will Lackey – (503) 986-3010 Vegetation Management Coordinator 355 Capitol St NE, MS 11 Salem, OR 97301-3871</p>	<p><u>Referral Criteria:</u> ODOT is notified of any pesticide-related incident that involves with Oregon’s state highway system.</p>

<p>Oregon Institute of Occupational Health Sciences (formerly known as CROET)</p> <p><u>Contact:</u> Fred Berman – (503) 494-7366 or (800) 457-8627 Director – Toxicology Information Center 3181 SW Sam Jackson Park Road, L606 Portland, OR 97239</p>	<p><u>Referral Criteria:</u> The Institute would like to be contacted by anyone who has a need for scientifically based information relevant to the environmental, human and animal toxicology of pesticides.</p> <p><u>Resources/Programs:</u> The Institute is not notified about pesticide-related incidents unless incident managers/consultants use the Toxicology Information Center, a special-use library with access to a variety of occupational safety and health and environmental information resources, including those related to the use of pesticides. The Institute also has a toxicologist and an industrial hygienist on staff who are prepared to answer questions related to the use of chemicals (including pesticides) in the home and workplace.</p>
<p>National Pesticide Information Center (NPIC) at Oregon State University A cooperative effort between OSU and the US EPA</p> <p><u>Contact:</u> (800) 858-7378 8:00 a.m. to 12:00 pm PST, M-F</p> <p>Oregon State University 333 Weniger Hall Corvallis, OR 97331 www.npic.orst.edu</p>	<p><u>Referral Criteria:</u> NPIC is not notified about pesticide-related incidents unless incident managers/consultants need access to specific information or resources.</p> <p><u>Resources/Programs:</u> NPIC’s “user-friendly” scientists can communicate technical pesticide-related information to the general public, health care providers, and local, state and federal agencies. They help callers find assistance with emergency treatment, pesticide cleanup, disposal, and laboratory analysis. If an incident or question requires more technical expertise than the specialist can provide, OSU faculty are available for consultation.</p>

Appendix 2 - Member Agencies and Consultant Jurisdictions

Pesticide Analytical & Response Center (PARC)

Resources/Programs: By referral and coordination, PARC requests investigations or resources from each of its member agencies.

Oregon Department of Agriculture (ODA) – Pesticide Program

Resources/Programs: ODA has field staff positioned around the state with experience in pesticide application technology and regulation. As part of an investigation, ODA has access to laboratory services. ODA maintains a label for each pesticide registered in Oregon and a database of information about those products. ODA also maintains a database of information about pesticide-related licenses and licensees.

Oregon Health Authority, Public Health Division, (OHA) Office of Environmental Public Health, Research & Education Services, Pesticide Exposure Safety & Tracking (PEST) Program

Resources/Program: The expertise within OEPH is diverse, and there are epidemiologists and occupational/environmental public health specialists, as well as environmental health specialists, toxicologist, physicians, environmental engineers, health physicists, and research analysts.

Oregon Department of Fish & Wildlife (ODFW)

Resources/Programs: ODFW district biologists handle issues with pesticide poisoning or spills that affect fish and wildlife. ODFW biologists assist to identify potential fish and wildlife receptors and resources that are at risk; assess extent of damage to the resource(s); collect samples for analysis and to identify laboratories for analysis.

Oregon Department of Forestry (ODF)

Resources/Programs: ODF has field offices across the state. ODF field foresters administer forest practice pesticide rules, which deal with natural resource protection. ODF investigates incidents that may involve violations of the forest practices rules. ODF maintains a database of information on planned forest pesticide applications.

Oregon Department of Environmental Quality (DEQ)

Resources/Programs: DEQ has field staff in district offices and a laboratory facility. DEQ regulates water quality, air quality, and environmental quality.

Oregon Occupational Safety & Health Administration (OR OSHA)

Resources/Programs: OR OSHA has field staff available to investigate occupational incidents, and a library of educational materials relevant to pesticide handling, storage, and application in agriculture.

Office of the State Fire Marshal (OSFM)

Resources/Programs: The OSFM offers information about hazardous materials that are stored at facilities around the state. This can include pesticide storage, location, quantities, and hazard type. Expertise is also available regarding application of the Oregon fire code to pesticide storage.

Oregon Poison Center (OPC)

Resources/Programs: OPC staff is available for emergency consultation and advice regarding clinical toxicology issues 24 hours a day.

Center for Research on Occupational & Environmental Toxicology (CROET)

Resources/Programs: The Toxicology Information Center houses a special-use library with access to a variety of occupational safety and health and environmental information resources, including those related to the use of pesticides. CROET also has on staff a toxicologist, epidemiologist, and industrial hygienist who are prepared to answer questions related to the use of chemicals (including pesticides) in the home and workplace. Additionally, CROET can address animal-poisoning issues.

Oregon State University - Environmental and Molecular Toxicology Department (OSU)

Resources/Programs: OSU medical and environmental toxicologists evaluate incident information using investigations and reports from member agencies including information about the pesticides identified during the investigation.

Appendix 3
PARC Contributing Factors (CFs) and Definitions
Incident and Exposure Sites

This category is mutually exclusive; only one site may be coded.

1. Single family home - Private, detached residence usually with front/back yards; driveway and attached carport or garage.
2. Multi-unit housing (apartment) - Housing structure containing more than one living unit for families or persons.
3. Mobile home/trailer - A large trailer, fitted with parts for connection to utilities that can be installed on a relatively permanent site and that is used as a residence.
4. Housing authority building - A housing development that is publicly funded and administered for low-income persons or families.
5. School - The buildings, other structures, playgrounds, athletic fields, and parking lots of a school and any other areas on the school property that are accessed by students on a regular basis.
6. Nursing home/care facility - A structure that serves as living quarters/care for the elderly or the chronically ill, and which is staffed and equipped to care for them.
7. Hospital - A structure where medical, surgical, or psychiatric care and treatment for the sick or the injured takes place; this includes outpatient facilities.
8. Homeless shelter - A structure that serves as a temporary residence for homeless people or emergency shelter for those in need.
9. Hotel/motel - A structure where the provision of paid lodging on a short-term basis takes place.
10. Forestry - A site where the harvesting of trees and/or growing and tending of trees (silviculture) occurs as a commercial activity.
11. Agricultural (e.g. farm, nursery) - A site where the growing of plants (excluding forestry) or raising of livestock for foodstuffs or other products takes place. This includes, but is not limited to: Christmas trees, fruit, grains, vegetables, dairy, poultry and egg, horses, cattle, game, fur production, worm, pet breeding, apiaries and aquaculture facilities. Included are nurseries and greenhouses.
12. Commercial (e.g. office park, retail) - A site where activity is focused on, but not limited to mercantile exchange, including: retail settings, office parks, and service stations.

13. Road, right-of-way, trail, Non-Ag - A strip of land that is public land, private land, or has been granted through an easement or other mechanism, use for transportation purposes, such as a trail, driveway, rail line or highway.
14. Industrial (e.g. manufacturing) - A site where the main activity is the production or repair of tangible economic goods. This includes but not limited to: factories, chemical processing facilities, and machine shops.
15. Golf course - An outdoor series of linked grass fields, each consisting of a teeing ground, fairway, rough and other hazards, and a green with a flagstick (pin) and cup, all designed for the game of golf.
16. Construction - Site where structures are in the process of being made, including, but not limited to: houses, office parks, school, etc.
17. Other – Used when a site doesn't fit into any of the above categories

Data Sources for Incidents

This category is NOT mutually exclusive; there may be more than one source.

1. OPC Fax - A report from a Poison Control Center, usually Oregon Poison Center, which details the conversation between clinical staff & callers seeking advice (as recorded by the PCC staffer) on the medical management of an incident reported as pesticide poisoning.
2. Reporter Interview with PEST - A standardized report on the exposure pathway of a reported pesticide exposure, as described, by the person (or guardian) reporting exposure, to OHA's PEST Program staff.
3. Official reports from PARC member agencies that pertain to the incident in question.
 - OR OSHA Report
 - ODF Report
 - ODFW Report
 - SFM Report
 - DEQ Report
4. Medical Record - An electronic or paper compendium of a single patient's medical history and care across time.
5. OERS Report - A standardized report issued by the Oregon Emergency Response System regarding a reported a pesticide release and/or exposure.

Intended Targets

This category is mutually exclusive; there may be only one target.

1. Bed bugs - Used when the intended target of the pesticide application in question is the insect *Cimex lectularius*.
2. Other household insect/arachnid pests - Used when the intended target of the pesticide application in question are insects (besides bedbugs) or spiders.
3. Unwanted residential vegetation - Used when the intended target of the pesticide application in question, is a weed or other plant that the applicator has decided should be destroyed.
4. Residential vegetation/insect/fungus - Used when the intended target of the pesticide application in question is a weed or other undesired plant.
5. Human (e.g. DEET application) - Used when the intended target of the pesticide application in question is a person for the purpose of providing protection against insects.
6. Forestry - Used when the intended target of the pesticide application in question is a tree(s) for silviculture/forestry purposes.
7. Agriculture - Used when the intended target of the pesticide application in question is a site where the growing of plants (excluding forestry) or raising of livestock for foodstuffs or other products takes place. This includes but is not limited to: Christmas trees, fruit, grains, vegetables, dairy, poultry and egg, horses, cattle, game, fur production, worm, pet breeding, apiaries and aquaculture facilities. Included are nurseries and greenhouses.
8. Other pests - Used when the intended target, of the pesticide application in question is to kill or repel an undesirable animal such as rats.
9. Non-Ag, Non-Crop, Right of Way - Used when the intended target of the pesticide application in question is unwanted vegetation in and around a strip of land that is used for transportation purposes, such as a trail, driveway, rail line or highway.
10. Community Application (Japanese beetle, gypsy moth) - Used when the intended target of the pesticide application in question is government-mandated eradication of invasive species or for public health purposes.

Application Factors

This category is NOT mutually exclusive; there may be more than one application factor. Application factors are agency-verified.

1. Spill/splash of liquid or dust (not involving application equipment failure) - The unintentional leak or spill of pesticide material from its container from any cause. The leak or spill could have occurred at the time of exposure or prior to the exposure.

2. Application equipment failure - Improper preparation, assembly, maintenance, or failure of application equipment. This code's appropriate for nozzles plugging, valves not tightened properly, spray lines splitting, o-ring failure, leaking backpack sprayers, or malfunctions such as fogger spraying to the side or aerosol can nozzle malfunctioning.
3. Mixing of incompatible chemicals - Mixing incompatible products (e.g. bleach & ammonia)
4. Improper storage leading to release - Pesticide stored contrary to label, leading either to spontaneous release or to environmental conditions causing release (e.g. storage of aerosols in heated vehicle).
5. Excessive application of pesticide - Pesticide applied above the label rate and/or if an excessive number of products were used.
6. Drift - commercial-Agriculture-forestry-vector control - Movement of pesticides that were applied by an individual functioning in one of these occupational capacities, away from the treatment site. Pesticide spray, mist, or fumes are carried from the target site by air.
7. Drift - originating from application by resident - Movement of pesticides that were applied by a private resident, away from the treatment site. Pesticide spray, mist, or fumes are carried from the target site by air.
8. Repeated incident/violation by applicator - Factor attached to two or more incidents involving applications by the same individual.
9. Misapplication by homeowner, indoors.
10. Misapplication by homeowner, outdoors.
11. Misapplication by pest control operator, outdoors.
12. Misapplication pest control operator, indoors.
13. Misapplication by forestry operator.
14. Misapplication by agricultural operator.
15. Misapplication by vector control/Right of Way/non-Agriculture - An application of a pesticide by an individual functioning in one of the specified capacities in a manner that contradicts either the label language for that pesticide or current agency regulations.
16. Unlicensed applicator (when required) - Used when the applicator in question is neither licensed (as required) nor working under the supervision of a currently licensed applicator, as determined under current ODA regulations.

17. Industrial accident - Used when the main purpose of the site is the commercial production of goods.
18. Impaired applicator - Used when the incident in question reportedly took place because the applicator was under the chemical influence of the pesticide(s) in question.
19. Illegal pesticide used/illegal dumping of pesticide - Used for incidents where the pesticide(s) in question was either used when not registered with ODA (and therefore, illegal for use in Oregon) or disposed of in a manner contrary to its label or ODA/ODF/DEQ regulation.
20. Gaseous release (from fumigant use) - Individual reporting exposure to gas because: A) of entry into treated area (no placarding; temperatures slowed; incorrectly gauged fumigation time; individual thought enough time had passed); B) the gas had moved through application structure (raceways, piping) or through tunnels and caused exposure; or C) failure to use prescribed PPE.
21. Gaseous release (from fumigant deactivation) - Individuals reporting fumigant exposure from A) unused fumigant remaining at site (not activated by application), and/or B) improper disposal of materials/equipment, which resulted in explosion.
22. Improper storage within reach of child - Pesticide left in such a way that a reasonable adult concludes that a child was able to access it
23. Licensed applicator not properly trained/supervised - In accordance with current agency regulations.
24. Total release fogger used - Sometimes called "bug bombs," these are pesticide products designed to fill an area with insecticide and often are used in homes and workplaces to kill cockroaches, fleas, and flying insects.
25. Misapplication by vector control operator - An application of a pesticide by an individual functioning in one of the specified capacities in a manner that contradicts either the label language for that pesticide or current agency regulations.
26. Misapplication by using a cancelled product.
27. Application by a minor.

Exposure Factors

This category is NOT mutually exclusive; there may be more than one exposure factor. Exposure factors may or may not be agency verified.

1. Required Notification/posting lacking or ineffective - Applications for which verbal or written (and posted in conspicuous area) notification is required by label language for that pesticide or current agency regulations.

2. People were in the treated area during application - Attached to incidents where people were present in an area under application likely led to the incident
3. Inadequate ventilation of treated area before re-entry - Attached to incidents where inadequate ventilation of treated area is likely to have led to the symptoms reported by people who entered that area.
4. Early re-entry - Attached to incidents where people entered a treated area (without required PPE) before the passage of the Restricted Entry Interval (REI) stated on the label for the pesticide used.
5. Contact with treated article - For incidents reportedly involving physical contact with a treated item e.g. mosquito net treated with permethrin.
6. Mixing & loading antecedents - Attached to incidents where actions/activities done to prepare a pesticide for application or to load it into application equipment likely led to the incident
7. Occupational exposure - Used when the person reporting exposure in question was engaged in an on-the-job activity for which either she/he was earning a wage/salary or for a job that she/he was voluntarily performing.
8. PPE Eye - Used when the PPE specified is either not used (or not used correctly) as directed by the formulation's label or current PARC agency regulation.
9. PPE Gloves - required gloves not worn/inadequate.
10. PPE respirator - required respirator not worn/inadequate.
11. PPE Other - other PPE not worn/inadequate.
12. Decontamination not adequate or timely - Used when the exposure in question may have occurred because either the decontamination was as not as specified on the label or because too much time elapsed between exposure and when appropriate decontamination occurred.
13. Exposure/symptoms - When a person or the treating health care provider reports signs and/or symptoms that they attribute to the pesticide release in question.
14. Inadvertent animal exposure - Used when the animal exposure in question occurred to domestic pets (often dogs) or wildlife (often geese) that were NOT the intended target of the application.
15. Veterinary product exposure - Used when a person reports exposure to a pesticide formulation intended for use on animals.

16. Vegetation symptom consistent with the formulation - Used when ODA/ODF personnel report plant damage that is consistent with the effects of the pesticide in question.
17. Performing an authorized activity.
18. Decontamination not adequate or timely.
19. Label insufficient to protect public health or non-target health.
20. Off-site movement/odor reported.
21. Pediatric exposure of children < 6.

Other Factors

This category is NOT mutually exclusive; there may be more than one 'other' factor.

1. Neighbor-to-neighbor conflict - Incident between two or more residential addresses involving (but not limited to) report of off-site movement of pesticide.
2. Residential - Agricultural Interface - Incident reportedly occurring where one party is an agricultural interest and the other a residential interest.
3. Group exposure ≥ 3 or more people - Used when three or more people report symptoms that they (or a health care provider) attribute to the same pesticide release or application.
4. Residential - Forestry Interface - Incident reportedly occurring where one party is an agricultural interest and the other a residential interest.
5. Site with repeated reports of exposure/symptoms - Address or geographic location where two or more PARC incidents have been reported.
6. No public health department access to other ingredients, because of confidential business information - Attached to incidents where the manufacturer of the pesticide formulation in question, citing confidential business information, refuses to provide the chemical make-up of that formulation's 'other ingredients' to the Oregon Health Authority.
7. Medical treatment sought - Used when a person reporting exposure is treated by (or reports seeking treatment from) a health care provider who's licensed by the State of Oregon to perform medical care.
8. Pesticide poisoning diagnosed or suspected by HCP, but not reported, per OAR 333-018-0015 (mandatory reporting).

Remedial Actions

Remedial actions are those taken by individual state agencies at the conclusion of their investigation. There may be more than one remedial action; they are NOT mutually exclusive.

1. Referral to community-based mediation source
- *2. ODF Citation for ____
- *3. ODA Citation for ____
- *4. Agency Letter Ordering ____
- *5. OR OSHA Citation for ____
- *6. OR OSHA Hazard Letter Recommending ____
7. No violations documented - used for incidents where no PARC agency has found violations of the either pesticide label or the agency's regulations
8. ODA Letter of Advisement Ordering ____

* - Used when a PARC agency has issued this official regulatory action regarding the incident in question.

Appendix 4 - What is a pesticide?

A pesticide is any substance or mixture of substances intended for:

- preventing
- destroying
- repelling
- mitigating any pest.

Although often misunderstood to refer only to insecticides, the term pesticide also applies to herbicides, fungicides, and various other substances used to control pests. Under United States law, a pesticide is also any substance or mixture of substances intended for use as a plant regulator, defoliant, or desiccant.

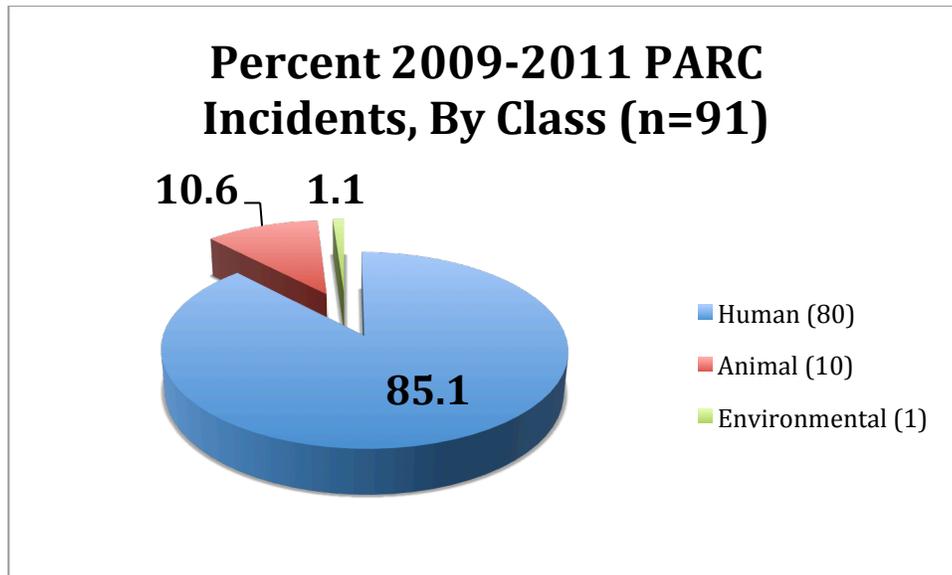
Types of Pesticides

Algaecide	Control algae in lakes, canals, swimming pools, water tanks, and other sites
Antifouling agent	Kill or repel organisms that attach to underwater surfaces, such as boat bottoms
Antimicrobial	Kill microorganisms (such as bacteria and viruses)
Attractant	Attract pests for example, to lure an insect or rodent to a trap; food is not considered a pesticide when used as an attractant
Biopesticide	Derived from natural materials such as animals, plants, bacteria, and certain minerals
Biocide	Kill microorganisms
Disinfectant/sanitizer	Kill or inactivate disease-producing microorganisms on inanimate objects
Fungicide	Kill fungi (including blights, mildews, molds, and rusts)
Fumigant	Produce gas or vapor intended to destroy pests in buildings or soil
Herbicide	Kill weeds and other plants that grow where they are not wanted
Insecticide	Kill insects and other arthropods
Miticide	Kill mites that feed on plants and animals
Molluscicide	Kill snails and slugs

Nematicides	Kill nematodes
Ovicide	Kill eggs of insects and mites
Pheromones	Biochemicals used to disrupt the mating behavior of insects
Repellents	Repel pests, including insects (such as mosquitoes) and birds
Rodenticides	Kills mice and other rodents
Defoliants	Cause leaves or other foliage to drop from a plant, usually to facilitate harvest
Desiccants	Promote drying of living tissues, such as unwanted plant tops
Insect growth regulators	Disrupt the molting and maturity from pupal stage to adult, or other life processes of insects
Plant growth regulators	Alter the expected growth, flowering, or reproduction rate of plants (excludes fertilizers or other plant nutrients)

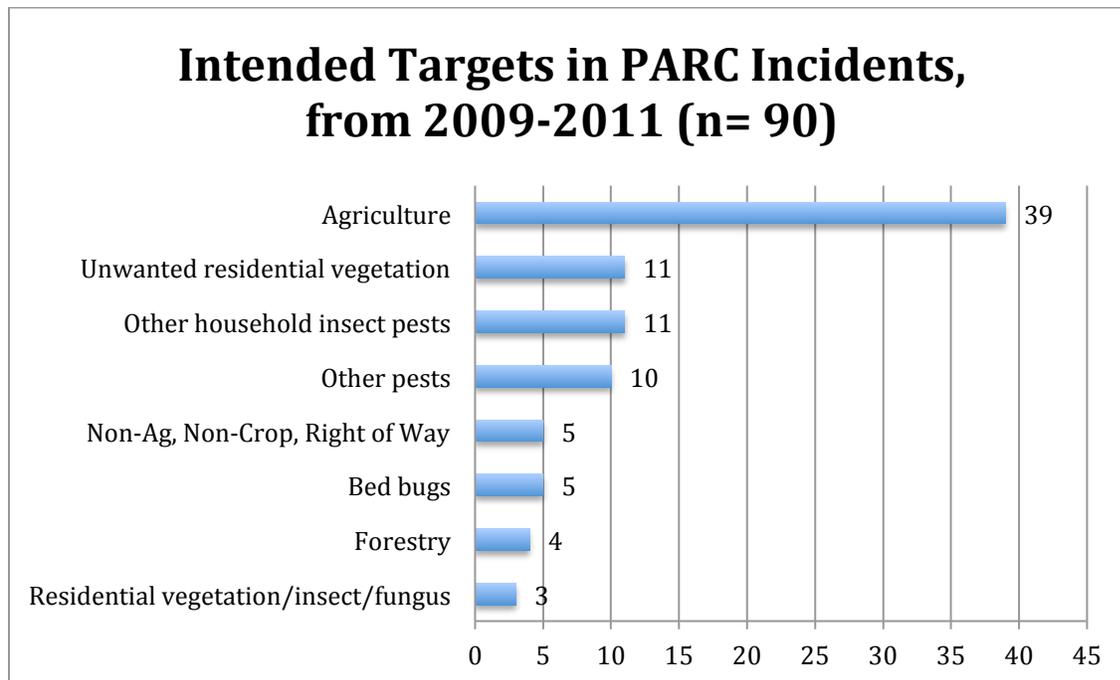
Figures

Figure 1



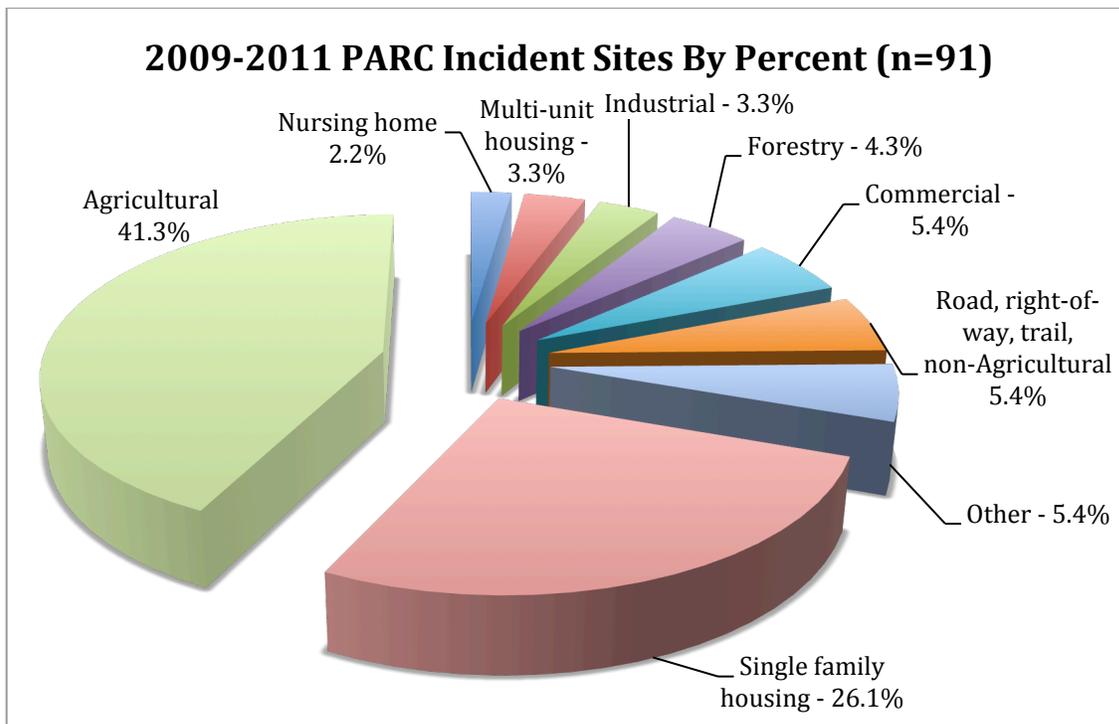
From July 1, 2009, through June 30, 2011, there were 91 PARC incidents involving a pesticide: 83 human, seven animal and one environmental.

Figure 2



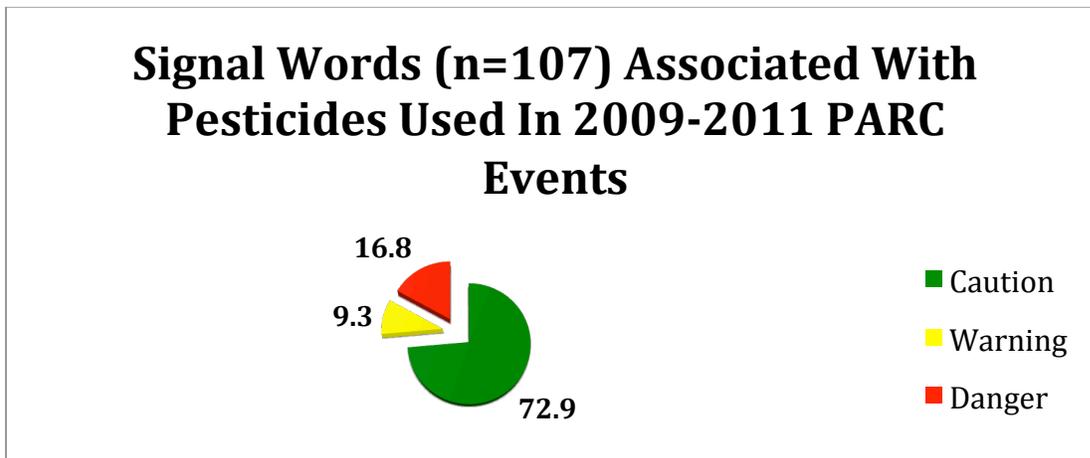
PARC identified the intended target in 90 of 91 incidents. 43% of the time, the intended target was related to agriculture. Not shown is one human target (insect repellent) and one 'turf and ornamental.'

Figure 3



During the reporting period, PARC also receive one (1.1%) report each from a golf course, a hospital, and from a public housing authority building. Almost 42 % of all PARC pesticide-related incidents occurring between July 1, 2009 and June 30, 2011 occurred at an agricultural site; single-family homes were the sites of 26% of PARC pesticide-related incidents.

Figure 4

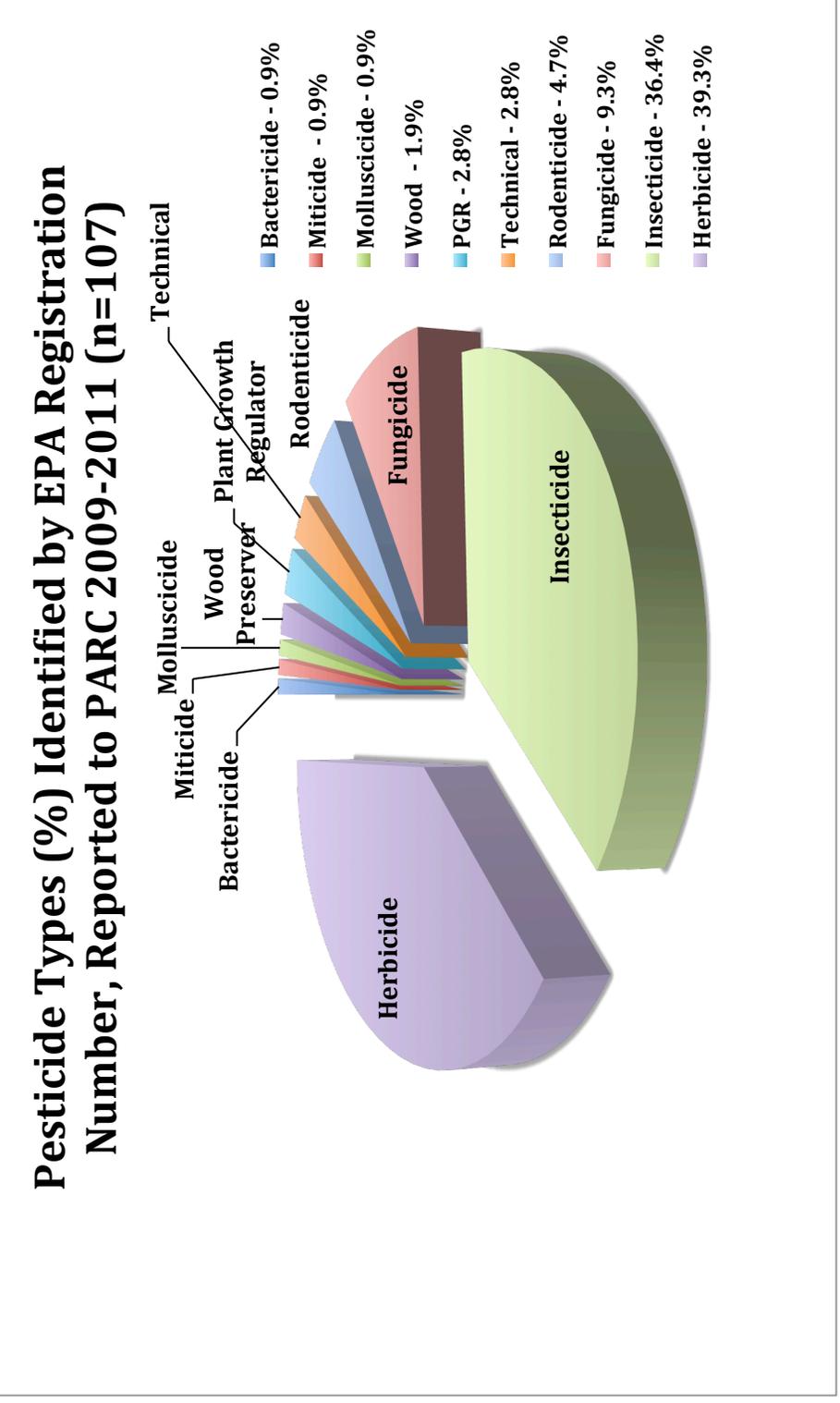


107 total products were identified by EPA registration number in FY 2009- FY2011 PARC incidents.

Signal words are required on most pesticide products and they inform as to how toxic the formulated product is, based upon how people can become exposed to the product. People may become exposed to a pesticide by breathing it in or inhaling, by getting a pesticide on the skin or in the eyes, or by ingesting or eating a pesticide product. Pesticide products may be more toxic by one route of exposure compared to another route of exposure.

Signal words are required to appear in all capital letters on pesticide labels. If a product has a signal word of **CAUTION**, this means that the product is slightly toxic by one (or more) of the routes of exposure. If a product carries a signal word of **WARNING**, this means that the product is moderately toxic by one (or more) of the routes of exposure and if a product carries a signal word of **DANGER**, this means that the product is highly toxic by one (or more) route of exposure. If a product does not have a signal word, this means that the product is low in toxicity by all routes of exposure.

Figure 5



Types of pesticides involved in PARC pesticide-related incidents, from FY 2009 through FY 2011

Almost 80% of PARC incidents from FY 2009 through FY 2011 involved either an herbicide or an insecticide. Additionally, fungicides accounted for almost 10% of pesticides used in PARC incidents.

Tables

Pesticide-related Incidents Reported to PARC, by Fiscal Year (FY)

Table 1

	2002-June 05	July 05- July 06	July 06- July 07	July 07 - July 08	July 08 - June 09	July 09- June 10	July 10 - July 11
Total incidents reported	PARC unfunded	230	240	170	135	35	56
Incidents reviewed		84	89	84	55	35	56
Cases		35	36	51	24	35	56
No. people involved		62	35	67	40	55	69
Children < 18			19	18	3	7	6
Animals		6	11	7	6	3	7
Environment		2	0	2	0	0	1

The drop in total incidents reported across years is due to a change in how PARC used to define incidents and cases; details concerning these changes in case classification is detailed in the Executive Summary.

Data Sources for PARC Incidents By Fiscal Year (FY)

Table 2

Data Sources	July '09- June '10	June '10 - July '11	Totals
DEQ Report	0	0	0
SFM Report	0	2	2
ODFW Report	0	0	0
OERS Report	0	2	2
ODF Report	14	15	29
OR OSHA Report	0	6	6
Medical Record	4	5	9
Insufficient Environmental Data	16	6	22
Sufficient Environmental Data	8	23	31
OPC Fax	8	25	33
ODA Report	34	66	100
Reporter Interview with PEST	40	68	108

Environmental data may be furnished by either ODA or DEQ; only ODA provided environmental data in this PARC biennial legislative report.

Table 3 PARC Incidents by County and Year

County	2008-2009 13 counties	Total (%)	*2009-2010 14 counties	Total (%)	*2010-2011 18 counties	Total (%)
Baker			2	6.1%		
Benton	1	4%			3	5.4%
Clackamas	1	4%	3	9.1%	4	7.1%
Clatsop						
Columbia						
Coos			2	6.1%		
Crook						
Curry			1	3.0%		
Deschutes					2	3.6%
Douglas						
Gilliam						
Grant						
Harney						
Hood River					1	1.8%
Jackson					1	1.8%
Jefferson						
Josephine	1	4%			2	3.6%
Klamath					2	3.6%
Lake			2	6.1%		
Lane	3	13%	3	9.1%	9	16.1%
Lincoln	1	4%	1	3.0%		
Linn	1	4%			1	1.8%
Malheur	2	8%				
Marion	3	13%	7	21.2%	5	8.9%
Morrow						
Multnomah	4	17%	4	12.1%	7	12.5%
Polk			2	6.1%	4	7.1%
Sherman						
Tillamook	1	4			2	3.6%
Umatilla	1	4	1	3.0%	2	3.6%
Union					1	1.8%
Wallowa						
Wasco			1	3.0%	1	1.8%
Washington	3	13	2	6.1%	5	8.9%
Wheeler			2	6.1%		
Yamhill	2	8			3	5.4%
Totals	24		33		55	

*2009-10 and 2010-11 includes all incidents (human, animal and environmental).

- 2008-09 top counties were Multnomah, Lane, Marion and Washington.
- 2009-10 top counties were Marion, Multnomah, Lane and Clackamas.
- 2010-2011 top counties were Lane, Multnomah, Marion and Washington.

A PARC database would enable extensive analysis of the contributing factors assigned to PARC incidents. This includes the assessment of geographic distribution of PARC cases that goes beyond the basic fact that the five counties with the highest number of PARC incidents are also Oregon's most populated.

Table 4 - Exposure factors reported to PARC during the 2009-2011 reporting period

Reported Exposure Factors	Number
Exposure/symptoms reported	58
Off-site movement/odor reported	20
Occupational exposure	18
People were in the treated area during application	13
Chemical Sensitivity is Reported	6
PPE Other (other PPE not worn/inadequate)	6
Required Notification/posting lacking or ineffective	6
PPE Gloves – (required gloves not worn/inadequate)	5
Contact with treated article	5
Early re-entry	5
Inadvertent animal exposure	4
Mixing & loading antecedents	4
Pediatric exposure (children <6)	2
Label insufficient to protect public or non-target health	2
PPE Eye (required eye protection not worn/inadequate)	2
Inadequate ventilation of treated area before re-entry	2
Decontamination not adequate or timely	1
PPE respirator (required respirator not worn/inadequate)	1

Exposure factors are not mutually exclusive; more than one factor may be assigned to a single PARC incident. Additionally, unlike application factors, exposure factors may not be verified by a PARC agency.

Table 5 – Other Factors Reported to PARC By Fiscal Year (FY)

Other Factors	July '09- June '10	June '10 – July '11	Totals
No PHD access to other ingredients	0	0	0
Residential – Forestry Interface	1	6	7
Pesticide poisoning dx/suspected but not reported by HCP	2	4	6
Site with repeated reports	1	20	21
Neighbor-to-neighbor	8	7	15
Group exposure (> 2)	9	11	20
Medical treatment sought	9	28	37
Residential-Agricultural Interface	11	24	35

Of the 91 incidents, ten (10) involved animals and one (1) was an environmental incident; of the remaining 80 pesticide-related incidents involving humans, a total of 124 people were involved. 30% (37/124) of people exposed sought medical attention.

Table 6 – Remedial Actions Taken By PARC Member Agencies

Remedial Actions Taken By Agencies	Number
Referral to mediation	1
Agency letter ordering ...	1
OR OSHA hazard letter	2
ODA letter	6
OR OSHA citation	14
ODA citation	23
No violations	54

When an investigation concludes, more than one agency may take a specific action against an individual(s) or company.

Table 7 – FY 2009 – FY 2011 PARC OR OSHA Incidents

	FY 07-08	FY 08-09	FY 09-10	FY 10-11
Number of PARC cases	14	8	5	10
Number of symptomatic people	8	15	13	18
PARC cases with ≥ 3 or more people involved	2	0	2	3
Settings				
Agriculture	4	4	8	9
Forestry	3		-	-
Retail	2	1	-	-
Landscaping	1	1	-	-
Structural	1		-	-
Right-of-way	1	-	-	-
Landscaping	1	-	-	-
Assisted living facility	-	-	5	1
Hospital	-	-	-	3
Office building	-	-	-	3
Wood treatment	2	-	-	-
Single-family housing	-	-	-	1
Manufacturing	-	-	-	1
Outcome				
*Total number hazard letters issued			2	2
**Total Number of violations	4	28	10	30

During the reporting period, there were 15 PARC/OR OSHA incidents that involved a total of 31 people who reported symptoms. Symptoms were dependent upon a number of factors, including length of exposure and to which specific active ingredient people reported being exposed. OR OSHA violations are detailed in OAR Division 1 (Rules for the Administration of the Oregon Safe Employment Act) 437-001-0135 through 437-001-0203.

Table 8 - Restricted Use Pesticides (RUPs) Involved In FY 2009- FY2011 PARC Incidents

Product Name	EPA registration number	Active Ingredients	Site
Thionex EC	66222-63	Endosulfan	Christmas tree farm
Weevil-cide	70506-14	Aluminum phosphide	Orchard
Thionex EC	66222-63	Endosulfan	Christmas tree farm
Thionex EC	66222-63	Endosulfan	Christmas tree farm
Wisdom	5481-519	Bifenthrin	Nursery
Warhawk	34704-857	Chlorpyrifos	Christmas tree farm
Metam CLR	45728-16	Sodium metam	Agricultural field (alfalfa)
Fumitoxin	72959-2	Aluminum phosphide	Ship fumigation
Chemonite	62190-27	Arsenic acid	Wood preservation plant
Coal tar creosote	61468-1	coal tar creosote	
Dura-Treet	61483-2	pentachlorophenol	
Atrazine 4L	66222-36	Atrazine	Forestry

Restricted use pesticides may only be applied by or under the direct supervision of specially trained and certified pesticide applicators. 90% of sites whereby RUPs were utilized were agricultural; one site was a manufacturing plant, producing pressure-treated wood products.