Spray Drift and Human Health Incidents

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Abstract

Exposure to pesticide drift is a significant problem in Washington State. Pesticide illness surveillance data, generated by the Washington Department of Health (WDOH), were reviewed for cases of illness involving exposure to pesticide drift. For the most recent two-year period (2002-2003), WDOH documented 58 pesticide drift incidents involving 95 symptomatic people. Drift cases were most likely to come from agricultural applications, from aerial and air blast sprayer applications, and from applications to tree fruit. Cases of illness were most likely to be people exposed in their nearby residences.

Introduction

Exposure to pesticide drift is a significant problem in Washington. Drift was responsible for nearly one third (258/848) of all reported pesticide illness cases[1] during the most recent five year period 2000-2004.

WA is one of eight states in the U.S. that conduct surveillance for pesticide-related illness and injury. WA state law requires primary health care providers to report cases of known or suspected pesticide illness. The Washington State Department of Health (WDOH), Pesticide Program investigates to determine the nature of the incident, the pesticides involved, and the medical outcome. Potential cases are also referred to WDOH by the Washington Poison Center, the State Department of Labor and Industry, local health agencies, and state enforcement agencies. WDOH investigates approximately 300 cases per year. Cases that fit the known toxicology of the pesticide involved and for which the exposure and health effects can be documented are classified as "definitely", "probably" or "possibly"- related. Other cases are classified suspicious, unlikely, unrelated, or insufficient information.

The data are used for improving public health. The data have been used to recommend improvements to pesticide laws, develop educational programs, and identify key prevention messages for training licensed pesticide applicators.

Methods

Information collected during case investigations is stored in a database at the WDOH. For this presentation, data from the two most recently completed years 2002 and 2003 were searched for pesticide drift exposures. Only cases that were classified as definitely, probably or possibly (DPP) were included in the analysis. Data were compiled on drift events (applications that drifted) and on cases (the number of people reporting symptoms).

The WDOH data has several limitations. The surveillance program investigates acute illnesses and injuries only. It does not investigate chronic or latent effects of pesticides. DOH is not always able to collect enough information during follow-up on reported cases to document the case. These cases are entered into the central database but are not included in most analyses of DOH data. Finally, not all acute cases of pesticide illness are reported to our illness surveillance program. The case may not be reported if the sick person does not seek health care, if the person seeks health care but the health care

[1] Cases reported to the Washington Department of Health and considered to be definitely, probably, or possibly related to pesticide exposure

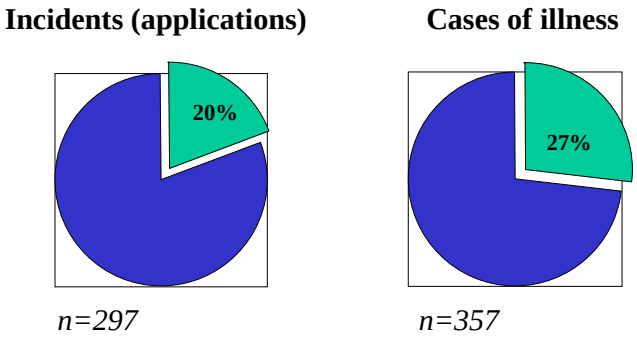
provider fails to recognize it as pesticide-related illness, or if the health care provider does not report the case as required.

WA State recently undertook a 3-year study[1] in an agricultural region to identify barriers to reporting and possible remedies. The study included a review of medical records for area clinics and hospitals. Among agricultural workers that did seek health care in the study area and were assigned a pesticide-related diagnosis, the WDOH, Pesticide Program received their case reports 60% of the time. Many pesticide-related illnesses list less specific diagnoses such as "rash" or "eye injury." We have not determined what proportion of these cases our surveillance system captures. We have also not determined the proportion of under-reporting for non-occupational or non-agricultural pesticide exposures.

Results

In the years 2002 and 2003 pesticide drift was involved in 58 incidents involving 95 people with at least one symptom. This is similar to the number of reports from previous years.

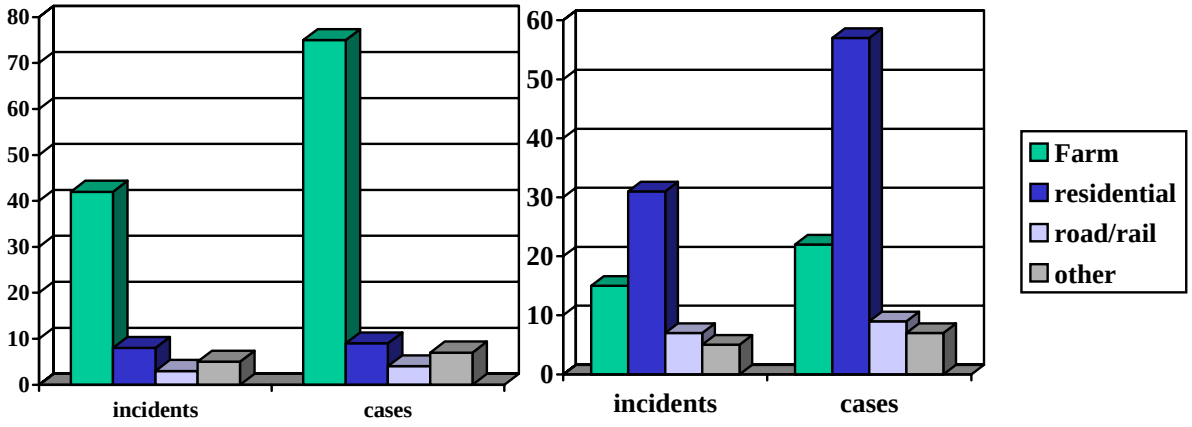
Drift as a proportion of all DPP* cases and Incidents; 2002-2003 data



*DPP = Definitely, Probably or Possible related to pesticide exposure

Agricultural applications to farms comprised nearly 80% of the drift cases (42 incidents and 75 cases). It might surprise people that farmers and farm workers were not the main recipients of pesticide drift in reported incidents. On farm exposures to drift comprised only 23% of the reported cases. Rather, 60% of reported illnesses involving pesticide drift were exposed at their residence. As farmland in WA is converted to housing developments we may see this problem increase.

Washington Department of Health, Pesticide Illness Surveillance
2002-2003, DPP drift cases

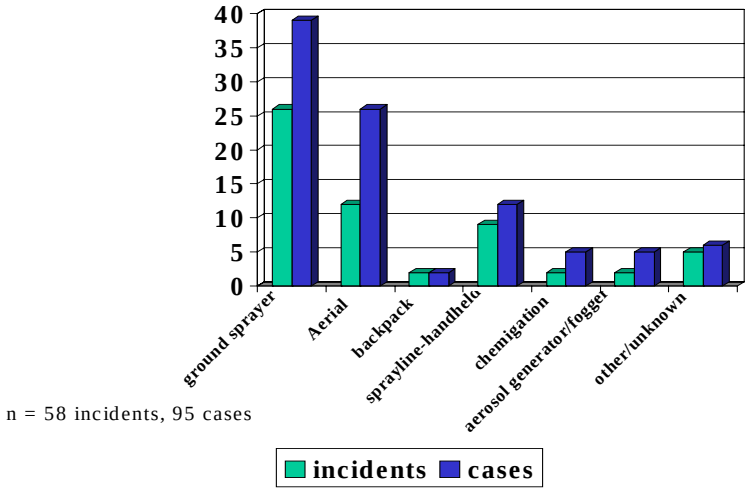


Site of the Application **Site of the Exposure**

n= 58 incidents. 95 cases

The type of application equipment in 2002-2003 drift incidents was most frequently an air blast sprayer or aerial equipment. Use of this equipment near residences or workers without prior notification appeared to be a risk factor for drift-related illness.

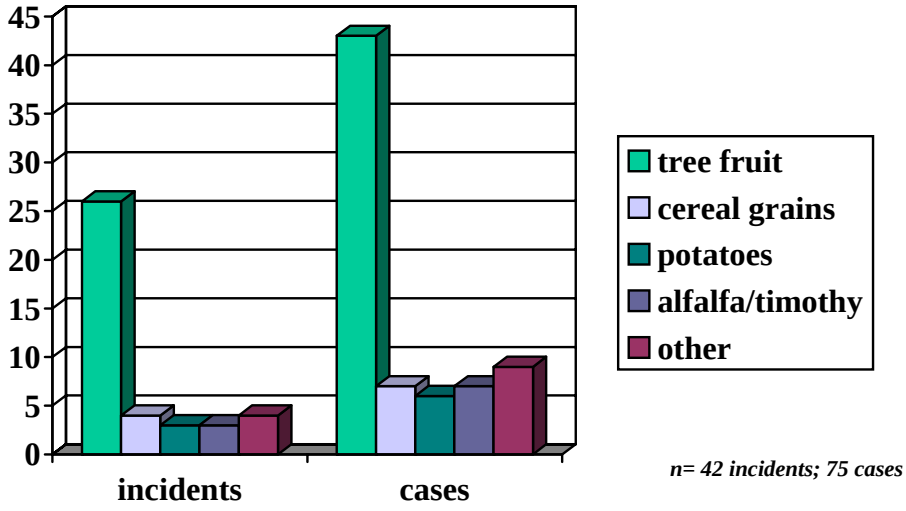
WDOH Pesticide Illness Surveillance
2002-2003 drift cases; DPP cases
Type of Application Equipment



n = 58 incidents, 95 cases

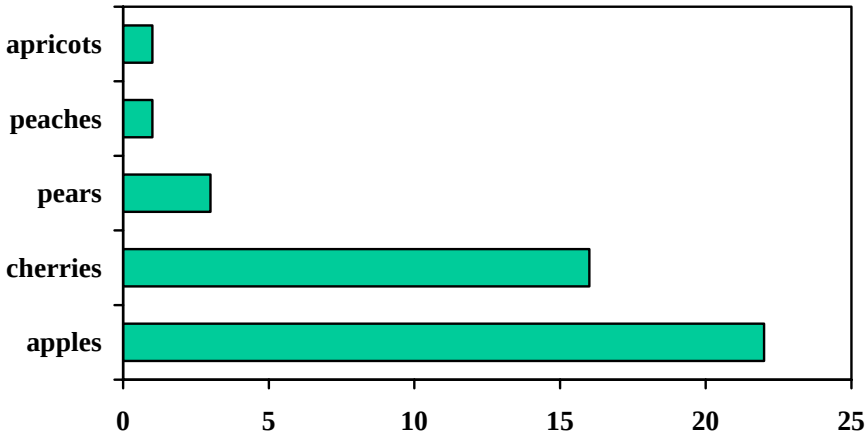
Of the 42 incidents of drift involving agricultural applications, 26 (62%) involved applications to tree fruit. Most of these cases occurred during treatment of apple and cherry orchards. This is consistent with past years. Drift cases involving applications to potatoes fell compared to the 2000-2001 period. We had only six cases involving applications to potatoes compared to 43 cases in 2000-2001.

2002-2003 Agricultural drift cases, DPP only



n= 42 incidents; 75 cases

2002-2003 drift cases involving Tree Fruit, DPP only



n= 43 cases

Conclusions

Pesticide drift is an important cause of pesticide-related illness in WA. Prevention should target aerial and ground applications to tree fruit. Strategies for preventing drift may include: increased use of non-pesticide pest management (e.g. mating disruption with pheromone), new technologies that deliver the pesticide to the target without production of fine sprays (e.g., drip chemigation), education of pesticide applicators and farm managers about best management practices for drift reduction, recognition and incentives for applicators and farms who operate with best management practices, disincentives to applicators and farm managers who cause drift.

More attention is needed to protecting residences near agricultural fields. Use of buffers and vegetated strips may help prevent drift from reaching neighboring residences. Pre-notification of nearby residences would allow them to close windows and further minimize the effect of an accidental drift.

References Cited

Washington Department of Health. 2004. Improving Data Quality in Pesticide Illness Surveillance. NIOSH Grant Number 5 U01 OH07296, Final Report.
http://www.doh.wa.gov/ehp/oehas/publications%20pdf/Improving_Data_Quality_in_Pesticide_Illness_Surveillance-2004.pdf