

Pesticide Drift in the Midwest: Database Development for Tracking Events and Contributing Factors

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Background

- 92% of Iowa is agricultural farmland
- 30.5 million acres of farmland in 2012 (USDA)
 - 77% were treated with herbicides
 - 29% were treated with insecticide
 - 7% were treated for various diseases

Workers and the public who are near fields during treatment are at risk of pesticide exposures from drifting chemicals

The Pesticide Bureau of the Iowa Department of Agricultural and Land Stewardship (IDALS) investigates complaints of pesticide drift and maintains records of events

Objectives

- Use IDALS historical records to build a pesticide drift database
- Perform initial qualitative analysis from cases to identify contributing factors to drift events
- Identify key factors to recommend data structure for ease of long-term data collection and analysis

Methods

- Identify potential critical fields, prior to case review
- Review case files and determine additional fields available:
 - 2010-2016 case files from IDALS available
- Convert narratives into data base parameters
- Identify what data were consistently and intermittently reported: Recommend improved case reporting
- Use current database to analyze confirmed pesticide cases for trends

Results

Initially identified date and location, ground/aerial, target crop, plant/animal damage, human exposure, pesticide applied, weather conditions, and proximity to spray as potential critical fields

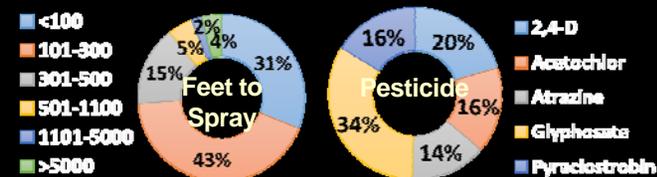
- Case Review:
- 245 reports 2010 to 2016
 - 163 confirmed drift events

- Consistently reported data:
- Narratives from drifters / driftees
 - Pesticides applied (labels)
 - Official correspondence
 - Laboratory results
 - Maps of the location
 - Photos of the property
 - Weather conditions
- Inconsistently reported data:
- Relative humidity data
 - Proximity of the drift event to the complainant's dwelling
 - County of origin
 - Animals present during the drift event

- 42 variables were identified – 10 broad categories
- Case ID
 - Confirmation of spray
 - Date/time/season
 - Location (4 indicators)
 - Application type/target (3)
 - Plant/animal damage (7)
 - Human exposure (3)
 - Chemicals detected (14)
 - Weather conditions (4)
 - Quality of the written narrative

A maximum of the 5 most common pesticides detected was maintained due to the large number of pesticides across all events.

Results, cont.



Conclusions

By building a database, pesticide drift events can be tracked and contributing factors can be identified

Key factors for long-term data collection and analysis include proximity of the drift event to the complainants dwelling, county of origin, weather conditions, and plant/animal/human exposures

- Preliminary findings include:
- 63% of cases occur in the Spring in agricultural settings
 - 76% of cases have occurred within 300ft of the complainants dwelling
 - The majority of drifts occur onto people who are not working
 - Drift events are 67% more common during ground application
 - The 5 most common pesticides investigated were involved in cases between 14 and 34% of the time

Future Research

- Analyze factors contributing to pesticide drift with multi-state comparisons
- Amend and enforce case collection criteria to determine any shifts in results due to increased awareness of contributing factors

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Descriptive analysis of case reports:

