Oregon’s Pesticide Stewardship Program
Protecting Water Quality through Collaboration

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Oregon Pesticide Symposium
April 29-30, 2014
Pesticide Stewardship
Protecting Water Quality

➢ Pesticides in Oregon & the inter-agency approach to pesticide related water quality

➢ Pesticide Stewardship Partnerships (PSPs)
  • History, status & accomplishments
  • Monitoring priorities
  • Key challenges

➢ Evolving Pesticide Stewardship Program
  • PSP Expansion into new watersheds
  • Technical Assistance Support
  • Pesticide Waste Collection
Pesticides in Oregon

**Multiple Products**

Over 900 registered active ingredients
insecticides, fungicides, herbicides, antimicrobials......

Over 12,000 registered pesticide products
agricultural pesticides, home products, pet products, mosquito repellents, cleaners, pool/spa chemicals, etc....

- **a.i.** Fipronil in >160 products - pets / home - termiticide
- a.i. = Bifenthrin >150 products - ag & non-ag - pre-mixes
Pesticides in Oregon: **Multiple Use Sites & Users**
Rural → Forestry → Right-of-way → Recreation → Landscaping → Urban → Homes
Pesticides in the Environment: Multiple layers of complexity

**Multiple Products**
>900 active ingredients → >12,000 products

**Multiple Users & Use Sites**
Agriculture / Forests / Rights-of-Way / Recreation / Landscaping / Urban Commercial / Homes….

**Multiple Routes of Entry**
Drift – runoff – leaching -…..

**Partitioning in the Environment**
Surface water / Groundwater / Bed Sediment

**Other Considerations…**
Application Method/ Formulation / Invasive Pests
Oregon’s Pesticide Water Quality Management Program

ODA Pesticides Program: Dual Mission….ORS 634 & FIFRA

- Registration, distribution and safe use of pesticides for beneficial uses...
- Protect people & the environment from possible adverse effects of pesticides

Balance the benefits of responsible pesticide use & the protection water resources

ODA agreement with EPA to address pesticide-related water quality

3 other state agencies have significant statutory responsibility for water quality in Oregon (under different authorities)

- Department of Environmental Quality (DEQ) – CWA & ORS 468B
- Department of Forestry (ODF) – FPA (ORS 527)
- Oregon Health Authority (OHA) – SDWA & ORS 448
Currently registered pesticides in...
- Surface and groundwater
- Agricultural and non-Agricultural

**Oregon Water Quality Pesticide Management and Assessment**

- Federal & State Pesticides of Interest
- Monitoring Program (PSPs)
- Oregon WQ Pesticide Management Plan
- Pesticide Management Team (2007)
Water Quality Pesticide Management Team (WQPMT)
Current Members (2014)

- **ODA:**
  - Steve Riley, Rose Kachadoorian, Sheila Marcoe, Judith Callens, Paul Measeles

- **DEQ:**
  - Kevin Masterson, Julia Crown

- **ODF:**
  - Kyle Abraham

- **OHA:**
  - David Farrer

- **OWEB:**
  - Ken Fetcho

- **OSU:**
  - Jeff Jenkins
Pesticide Stewardship Partnerships (PSPs)
Key Steps in Partnership Projects

- **Monitor for current use pesticides in surface waters from drift & runoff**

- **Identify streams with elevated pesticide concentrations or high # of detections**

- **Collaborate to implement voluntary management practices**

- **Follow-up monitoring to determine improvements over time**
EPA Aquatic Life Benchmarks

- EPA OPP – Federal Insecticide, Fungicide and Rodenticide Act (FIFRA)
- Based on toxicity data used for EPA registration risk assessments
- >230 active ingredients or degradates

Other “weight-of-evidence” factors: (among & within watersheds)

- Frequency of detections
- No. of Pesticides in a sample (mixtures)

**Water Quality Criteria / Standards** (most statistically rigorous)

- EPA Office of Water (OW) & Oregon DEQ - Clean Water Act (CWA)
- 5 current use pesticides have OR in-stream Aquatic-life standards
1999: **Organophosphate (OP) insecticides detected** above WQ Standards for fish

2000: **Coordinated Program Developed**
- State Agencies – DEQ monitoring
- Local Stakeholders: Growers and Shippers, SWCD, WSC, Irrigation Districts & Confederated Tribes of Warm Springs

2002-03: **Voluntary Best Management Practices (BMPs) Implemented**
- Application Practices, Buffers, etc.
- Outreach/Training
- Technical expertise, resources & pesticide management tools in place
Oregon Pesticide Stewardship Partnerships
Grown to 7 Watersheds Since 2000

Actions Implemented
- Spray drift reduction training
- Installation of weather stations
- Alternative control methods
- Less toxic pesticides
- IPM training & assistance
- Buffer strips & minimal spraying near streams
# Pesticide Stewardship Partnerships

**Key Partners**

<table>
<thead>
<tr>
<th>Partnership</th>
<th>Description</th>
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<tbody>
<tr>
<td>Watershed Councils, SWCDs &amp; NRCS</td>
<td>Collect samples, work with landowners</td>
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<tr>
<td>OSU Extension and Integrated Plant Protection Center</td>
<td>Watershed-based Integrated Pest Management &amp; pesticide risk reduction activities</td>
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<tr>
<td>Tribal Governments</td>
<td>Collect samples, provide resource support</td>
</tr>
<tr>
<td>Grower Groups &amp; Ag Chemical Distributors</td>
<td>Direct work with landowners, info on pesticide use</td>
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<tr>
<td>State Departments of Environmental Quality, Agriculture, Forestry and Oregon Health Authority</td>
<td>Laboratory and data analysis, project support and guidance</td>
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What Types of Actions Have Been Implemented to Produce Results?

- **Spray Drift Reduction Trainings & Practices**
- **Installation of Weather Stations**
- **Use of Biological Controls (e.g., mating disruption)**
- **Integrated Pest Management Training & Technical Assistance**
  - Use of Less Toxic Pesticides
  - Buffer Strips & Minimize Spraying near Streams
Pesticide Types Detected 2009-2011

Total Number of Detections

- **Herbicides**
- **Insecticides**
- **Fungicides**

- **2009**
  - 75%
  - 17% (Insecticides)
  - 8% (Fungicides)

- **2010**
  - 77%
  - 16% (Insecticides)
  - 7% (Fungicides)

- **2011**
  - 79%
  - 13% (Insecticides)
  - 8% (Fungicides)
Hood River PSP: What Can Be Achieved?

Goal: Reduction in concentrations & frequency of detections over time

Early Spring Chlorpyrifos - Lower Neal Creek

- Average
- Chronic WQS
- Acute WQS
- Frequency

Average (ug/l) vs. Frequency

Year:
- 2000
- 2001
- 2002
- 2003
- 2004
- 2005
- 2006
- 2007
- 2008
- 2009
- 2010
- 2011
- 2012
Malathion in Wasco Watersheds  
2011-2013  
Median Concentration of Detections

- **2011**
  - 15 detects (13 ≥ ALB.)
  - Max. Conc. = 28.1 ug/L

- **2012**
  - 24 detects (15 ≥ ALB.)
  - Max. Conc. = 6.4 ug/L

- **2013**
  - WQ Criteria = 0.1
Little Walla Walla River Distributaries (3 sites)  
Diuron (Karmex) - Average Concentrations  
Spring 2010-2013

Max = 18.9 ug/l
Max = 6.4
Max < 0.1 ug/l

EPA Aquatic Life Benchmark = 2.4 ug/l
PSP Monitoring Status in Western Oregon Watersheds

• 20+ pesticide ingredients often found during one monitoring season in single watershed

• Relatively small number of benchmarks exceeded, but high detection frequency

• Wide array of ag and non-ag operations that use many of the same pesticides
Mixtures: PSP Monitoring 2009-2012
Percent of Samples with ≥ 5 Pesticides

Clackamas Hood River Pudding Walla Walla Yamhill Wasco Amazon

2009 2010 2011 2012

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
Responding to PSP Monitoring Results: Remaining Program Challenges

• Reducing detections in complex watersheds with diverse land uses and sources (Ag, urban, forestry, ROW, etc.)
  • Linking cause of trends and effects of management actions

• Addressing mixtures of pesticides
  • Much still unknown about the biological impact of mixtures

• Ensuring monitoring capabilities reflect current uses of pesticides
  – Inclusion of widely used and new pesticides
  – Include more sediment and groundwater
Pesticide-related Water Quality Management: Addressing Agency Resource Needs

• Consistent long-term funding of monitoring program

• 2013 Oregon Legislature allocated resources:
  1. To add 2 new watersheds to program and support monitoring in existing PSP watersheds
  2. Refine existing PSP monitoring efforts
  1. To provide stewardship technical assistance in existing PSP areas for biennium
  2. To conduct pesticide waste collection events during biennium (7 events over two years) – tighter link between pesticide use, water quality and pesticide disposal
#1 Oregon Pesticide Stewardship Partnerships

*Potential New Sub-Basins/Watersheds for 2014-2015*

Based on a high level qualitative review/assessment by the WQPMT

Key criteria: pesticide use & 3 major land use categories (ag, urban & forestry) represented

PSP Candidates: 2014 pilot monitoring
#2 Refining Existing PSP Monitoring Program
Example: Yamhill PSP (West Fork Palmer Creek)
Partners: Yamhill SWCD, Greater Yamhill Watershed Council, local growers
#3 Technical Assistance in Existing PSP Watersheds
2014 Theme: Spray Optimization/Drift Reduction

Protecting Water Quality and Ensuring Crop Quality
Two primary goals & a multi-faceted approach

- Improved Pesticide Application Technology
- Integrated Pest Management (IPM)
- Best Management Practices for Pesticide Use (BMPs)
Recent support of two technical assistance projects: purchase of pesticide spray optimization equipment.

1. **OSU Extension**: Hood River Spray Optimization/Calibration Equipment program in fruit orchards (plans to expand to Wasco and Walla Walla PSPs)

1. **Yamhill SWCD**: Supported Tunnel Sprayer equipment for spray optimization & drift reduction on small fruit
OSU Extension: Orchard Spray Optimization & Calibration Project (Hood River, OR)
• Yamhill SWCD: “Tunnel Sprayer” for spray optimization & drift reduction on small fruit

**Tunnel Sprayer Demonstrations and Field Testing**

- Proven technology in Vineyards to reduce 99% of drift and reduce chemical usage by 35%
- Purchasing demonstration unit to run preliminary tests in caneberries and blueberries
• 12 OR events sponsored by multiple groups since 2006
  – Approximately **250,000 pounds** of waste pesticides collected and properly disposed
  – Mix of “legacy” and current use pesticides
  – *Amount have increased for 2nd events in same areas.*
  – Over 9,000 pounds of rinsed empty plastic containers collected for recycling (Agri-Plas, Brooks, OR)

• Compare to WA State: >2.5 million lbs. over past 20 years.
#4 Pesticide Disposal: Oregon PSP Program


- Tualatin/Clackamas (Cornelius)
- Mid-Columbia (Hood River / The Dalles)
- Umatilla (Hermiston)
- Grande Ronde (La Grande)
- Lower Malheur (Ontario)
- Coquille/Coos (Bandon/Coos Bay)
- Rogue (Medford) & Umpqua (Roseberg)
- Yamhill (McMinnville/Newberg)
- Lane County (Eugene Area)
- Walla Walla (Milton-Freewater)

Support for locally sponsored collection events

Proposed locations for fully supported collection events
Benefits of the PSP Approach

**Data-driven**
- Awareness & Feedback
- IDs pesticides & locations with greatest concerns, and…
- Shows where there are no problems
- Real-world data for decision-making and policy
- Clear environmental outcome measures

**Watershed-based & Non-Regulatory**
- Locally customized & implemented solutions
- Most effective set of actions for the area
- Local ownership of projects
- Multiple partnerships lessens the burden on any one entity
Pesticide Stewardship

- Increased Awareness
- Local, Voluntary and Collaborative
-Thank You-
Questions