Dicamba
Issues
Volatility: Vapor drift may occur at high temperatures that cause some herbicides to change into gaseous form and move off target.
Physical Drift: Pressure too high on 4-wheeler boom apparatus resulting in fine spray particles that moved 30+ feet up into trees, downwind of application.
Air Temperature Inversions

Causes, Characteristics and Potential Effects on Pesticide Spray Drift

Pesticide spray drift always has been a costly and frustrating problem for applicators. Many factors contribute to the occurrence of spray drift, including wind, turbulence, and atmospheric stability. Understanding the causes and characteristics of spray drift is essential to minimizing its impact on crops and the environment.

John W. Saus
Professor Emeritus
Department of Soil Science

Vernon Hoffman
Professor Emeritus
Department of Agricultural and Biological Engineering

Andrew Thostenson
Extension Pesticide Program Specialist

Understanding air temperature inversions is essential to understanding the behavior of spray drift. Inversions are caused by the cooling of the air near the ground, which can create a layer of stable air that prevents the upward movement of spray droplets. This can lead to drift in the form of ground contamination and damage to sensitive areas.

NDSU Extension Service
November 2017
Washington State Drift Complaints

*****

Where Were We?
“Ah, the good ol’ days …”
Let’s start with the 1950’s

- 2,4-D and Grapes
2,4-D problems first recognized in concord grape vineyards in central eastern Washington in 1950

“I hope the regulations we finally decided upon will suffice in cutting down most of the injury to grapes. These regulations will no doubt, have to be changed somewhat, but I feel that they are a step in the right direction.”

TPSA February 11, 2016
The neighborly drift concern did not go away

- 1952 (in California): Civil Aeronautics Administration (FAA) bans use of 2,4-D dust due to widespread damage to cotton and grapes from use on nearby cereal grains
- 1952-53: At least nine crop-dusting cases reach appellate courts (suggesting many more cases at lower courts)
- Grape injury surveys were initiated from 1953 through 1955 due to chronic-severe symptoms.
  - Injunction requested but denied to stop Horse Heaven Hills 2,4-D aerial applications to wheat
  - Observation that problem was related to volatile esters
- 1959 to 1963 symptom severity triggered a systematic survey of 14 vineyards from Walla-Walla to Grandview
- 1964 HV 2,4-D esters banned in Benton and Yakima Counties
- 1964-1969 few symptoms were observed
- 1969-1973 General and severe damage was again observed but throughout all of central Washington…1973 was worst year on record
Early 1970’s WSU-CE Field Sampling Network Investigations

Around the clock air monitoring for 2,4-D HV, LV, and NV formulations during the active grape-growing season

Grape and grain growing areas of central Washington in the WSU-CE 1974 Sampling network

High volatility 2,4-D control areas in Benton and Yakima counties 1974

Reisinger LM and Robinson E. Long distance transport of 2,4-D. J. App. Meteorol 15: 836-845
Phenoxy Herbicide Rules

- 85 degree cutoff
- LV date cutoffs
- Nozzle restrictions
- Pressure Restrictions
- Evening cutoffs
- RUP’s in WA state
County Phenoxy Rules

- Many areas in E. WA counties were designed around grapes.
- Wine grape acreage tripled over a 15 year period.

<table>
<thead>
<tr>
<th>Year</th>
<th>Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998</td>
<td>15,000</td>
</tr>
<tr>
<td>1999</td>
<td>19,000</td>
</tr>
<tr>
<td>2000</td>
<td>24,000</td>
</tr>
<tr>
<td>2001</td>
<td>27,000</td>
</tr>
<tr>
<td>2002</td>
<td>27,000</td>
</tr>
<tr>
<td>2003</td>
<td>27,000</td>
</tr>
<tr>
<td>2004</td>
<td>27,000</td>
</tr>
<tr>
<td>2005</td>
<td>28,000</td>
</tr>
<tr>
<td>2006</td>
<td>29,500</td>
</tr>
<tr>
<td>2007</td>
<td>30,500</td>
</tr>
<tr>
<td>2008</td>
<td>32,000</td>
</tr>
<tr>
<td>2009</td>
<td>36,000</td>
</tr>
<tr>
<td>2010</td>
<td>39,000</td>
</tr>
<tr>
<td>2011</td>
<td>41,000</td>
</tr>
<tr>
<td>2012</td>
<td>43,000</td>
</tr>
<tr>
<td>2013</td>
<td>45,000</td>
</tr>
</tbody>
</table>
Badger Canyon

- Started noticing symptoms and getting complaints 1987-1988
- Dozens of complaints from 1989 – 1993
- Rules implemented in 1989 - 1992
Air Mass Deposition
The 1994 WSU Sentinel Plant Monitoring Network

Injury more associated with light precipitation events and not with 2,4-D application records

From Allan Felsot
Tordon - 1979

• Fairchild Air Force base west of Spokane (Airway Heights)

• Use of Tordon in the 1970’s

• Ground water contaminated

• Rules in 1979 place a “No Tordon restriction” in a given area
Desiccant drift onto nearby crops in Walla Walla County
- 1987 – 1988
- WSDA monitored the area daily
Soil that Moves……

- Sulfometuron-methyl (Oust)
- Franklin County – 1985
- Soil movement from ROW affecting adjacent crops
- Clopyralid (Curtail)
- Columbia Basin – 1989
- Label had a 12-month plant back
- A number of fields were showing symptoms
- Label modified to an 18-month plant back
Daminozide (Alar)

- Summer 1989 – “Don’t Eat Apples”!
- TV announcements to wash apples
- 1,000 samples in 10 days
- Only 1-2 very low level detections attributed to pre-1989 use
1992
Encapsulated methyl parathion (Penncap-M)
- Application records requested from > 290 orchards
Amitraz (Taktic)
- Mite control
- Mis-use killed 3,000 colonies. Was originally blaming PennCap-M
AMINOCYCLOPYRACHLOR

- One issue in Stevens County along several miles of road. Root uptake.
- Oregon has issued rules
Clearfield Wheat and Beyond Herbicide

A few incidents, but the concern did not happen.
Compost
1999 - 2000
Symptoms Observed

- Fiddle-necking of growing points.
- Some epinasty.
- Growth not stunted.
- Color not affected.
Washington State Drift Complaints

*****

Is There Less Drift Now?
## Case and Inspection Data

<table>
<thead>
<tr>
<th></th>
<th>1990’s</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Cases</td>
<td>400 – 500 cases per year</td>
<td>116</td>
<td>166</td>
<td>34 +</td>
</tr>
<tr>
<td>Total Inspections</td>
<td></td>
<td>248</td>
<td>208</td>
<td>74</td>
</tr>
<tr>
<td># of Violations</td>
<td></td>
<td>646</td>
<td>625</td>
<td></td>
</tr>
<tr>
<td>Drift</td>
<td></td>
<td>23</td>
<td>52</td>
<td>10 +</td>
</tr>
<tr>
<td>Herbicide</td>
<td></td>
<td>54</td>
<td>65</td>
<td></td>
</tr>
<tr>
<td>Human Exposure</td>
<td></td>
<td>13</td>
<td>30</td>
<td></td>
</tr>
</tbody>
</table>
Aim and Reckon = $5,000,000
2012 – 2103: Flumioxazin (Chateau, Valor) moving with dust

- One incident had a 300 foot buffer for pears. Label was not followed.
• Soil fumigant off gassing due to poor soil preparation and/or soil seal

• Desiccant drift during potato, garbanzo and other crop burn down as a pre-harvest aid
Washington State Drift Complaints

*****

What Are We Doing About It!
Spray Drift Task Force

A SUMMARY OF
Airblast Application Studies

A SUMMARY OF
Aerial Application Studies

A SUMMARY OF
Tank Mix and Nozzle Effects on Droplet Size

1997

A SUMMARY OF
Ground Application Studies

A SUMMARY OF
Chemigation Application Studies
Pesticide Label Language

• Do not drift onto sensitive crops or desirable plants
• Do not apply within 300 feet of pears
• Do not apply during an inversion
• Do not apply if there is an inversion at field level
• Do not apply if there are sensitive plants or crops 250 feet downwind
• Do not apply if winds are less than 2 MPH
• Do not apply if winds are greater than 10 MPH
• Do Not apply if someone is within the AEZ
Outside The Box

The ways to manage spray drift are not always obvious in the age of dicamba-resistant technologies.

See page 8

Also Inside:
Nozzles and Tips Review, p. 12
Summer Show Preview:
Spreaders, p. 38
A Pesticide Decision-Making Guide to Protect Pollinators in Tree Fruit Orchards

2018 Edition

By Maria van Dyke, Emma Mullen, Dan Wixted, and Scott McArt
Use Restricted Herbicide County Rules
Phenoxy Herbicide Rules Update

• Keeping LV ester cutoff dates across different counties.
• Keeping evening cutoff times - to reduce inversion condition applications.
• Keeping the aerial application of phenoxy / dicamba prohibition within 1 mile of a vineyard. (between ½ mile and 1 mile still allowed by permit request)
• Keeping aerial applications of Use Restricted – phenoxy / dicamba type products to coarse or larger sized droplets.
Phenoxy Herbicide Rules Update

- Standardizing the droplet size / pressure language to be more consistent with labels.

- Eliminating the open LV ester container prohibition at Mix/Load area.
- Eliminating the prohibition of ferrying with LV esters over an area under order.
- Eliminating restriction limit of 1 pint/acre on oil type carriers and adjuvants.
- Eliminating the prohibition on turning or flying low over cities, towns, residences and other sensitive sites.
- Eliminating duplication between Statewide rule and specific County rules for Temperature cutoff’s and wind restrictions.
2019 - Licensed Applicators in Washington State

- Total # = 20,200
- Dealers = 1,214
- Private Applicators = 10,447
- Public Operators = 4,491
- Commercial Applicators in Ag = 409
- Commercial Applicators in Landscape = 786
- Aerial Commercial Applicators = 61 (46 in EA WA)
- Commercial Operators employed in Ag = 1,176
- Applicators that do Soil Fumigation = 336
- Applicators that do aquatic applications = 1,291
**Recordkeeping**
Pesticide Compliance Offices and Coverage Areas

Area 1 – Western WA
*Olympia Office
AM – Neil Lanning
Val Davis
Rusty Sauls
Kevin Jensen
Daleena Blair**

** Bi-lingual field staff

Toll Free: 1-877-301-4555
Main Office (Olympia): 360-902-2040

Area Manager contacts:
#1: *Neil Lanning, 360-902-2038
#2: *Tom Hoffmann, 509-766-2574
#3: *Scott Nielsen, 509-990-6518
#4: *Tim Schultz - Operations Manager, 509-994-0936

Area 2 – South Central WA
Yakima Office
Chris Sutherland
Robert Sausedo**

Area 4 – North Central WA
E. Wenatchee Office
David Bryson
Bruce Olson
Alberto Hernandez**
AM - *Tim Schultz (Spokane)

Area 3 – Eastern WA
*Spokane Office
AM - Scott Nielsen
Aaron Brown
Tim Stein

Pasco Office – Coming 2019

Dec. 26, 2018
### Exposed to a Pesticide

**What to do, who to call**

Pesticide Management Division  
P.O. Box 42589  
Olympia, WA 98504-2589

### Have you been exposed to pesticides or witnessed inappropriate use of pesticides?

<table>
<thead>
<tr>
<th><strong>Para reportar el posible uso inapropiado de pesticidas que podría poner en riesgo a personas o al medio ambiente, comuníquese con el Departamento de Agricultura del Estado de Washington (WSDA por sus siglas en inglés) para obtener servicio en inglés y español al:</strong></th>
<th><strong>Have you recently been exposed to pesticides or witnessed inappropriate use of pesticides? To report a possible inappropriate use of pesticides, contact the Washington State Department of Agriculture for service in English or Spanish at:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1-844-388-2020</strong></td>
<td><strong>1-844-388-2020</strong></td>
</tr>
<tr>
<td><strong>Si es una emergencia médica, busque atención médica inmediatamente o llame al 911 para obtener ayuda.</strong></td>
<td><strong>If it is a medical emergency, seek medical attention immediately or call 911 for help.</strong></td>
</tr>
</tbody>
</table>

WSDA investiga quejas sobre el mal uso de pesticidas. Visite nuestra página web: [www.agr.wa.gov/pestfert](http://www.agr.wa.gov/pestfert)

---

**¿Ha sido usted expuesto a pesticidas recientemente o ha sido testigo del uso inapropiado de pesticidas?**

Para reportar el posible uso inapropiado de pesticidas que pudiera haber causado daño a personas o al medio ambiente, comuníquese con el Departamento de Agricultura del Estado de Washington para obtener servicio en inglés y español al: **1-844-388-2020**

Si es una emergencia médica, busque atención médica inmediatamente o llame al 911 para obtener ayuda.

WSDA investiga quejas sobre el mal uso de pesticidas. Visite nuestra página web: [www.agr.wa.gov/pestfert](http://www.agr.wa.gov/pestfert)

---

**Have you recently been exposed to pesticides or witnessed inappropriate use of pesticides?**

To report a possible inappropriate use of pesticides, contact the Washington State Department of Agriculture for service in English or Spanish at: **1-844-388-2020**

If it is a medical emergency, seek medical attention immediately or call 911 for help.

In Case of Drift
A Toolkit for Responding to Pesticide Drift

Pesticide Action Network North America
2017
Human Exposure to Pesticide Drift: Washington State Report
February 2017

Written by:
Dun Ford, Columbia Legal Services (CLS), dford@columbialegal.org
Negan Dibun, Northwest Center for Alternatives to Pesticides (NCAFP), ndibun@pecicide.org
Joe Morrison, Columbia Legal Services (CLS), joe.morrison@columbialegal.org
Catherine Willis, cwillis@uw.edu

Personal testimony and content provided by:
Socorro Diaz, Viviana Silva

With special thanks to our reviewers:
Elliot Dandy (OneAmerica), Eric Gonzalez (Washington State Labor Council),
Pete Goldman (Earthjustice), Anne Katten (California Rural Legal Assistance Foundation),
Virginia Ruiz (Farmworker Justice)
Washington State Drift Complaints

Where Are We Now?
Some think they have been impacted by drift
The Repeat Caller!
Aerial Applicator Fly-Ins
When an occupied structure beyond the agricultural employer’s property boundaries comes within the AEZ, the handler must:

- Suspend (pause) the application.
- Evaluate conditions and ensure they can continue the application safely.
- Resume the application only if they are confident they can continue the application without drifting onto the occupied structure.
PROCESS
Investigating Pesticide Complaints