





- Cases
- ▶ Department of Health
    - ▶ **Definite**
    - ▶ **Probable**
    - ▶ Possible
    - ▶ Not probable
  - ▶ Washington State Department of Agriculture

- Cases
- ▶ What happened
    - ▶ What was the complaint
      - ▶ What the investigation found
      - ▶ Lessons learned
      - ▶ Best management practices


Landscape - What Happened

- ▶ Application of pesticides indiscriminately on landscaping at apartment complex





*Image not from case, only representative*

- Landscape - Complaint
- ▶ No posting in the landscape areas
    - ▶ Potential for post application bystander exposure
  - ▶ No PPE
- 

- Landscape - Investigation Found
- ▶ No WSDA Pesticide license
  - ▶ Not wearing proper PPE
  - ▶ Failed to post landscape notification signs
  - ▶ Failed to keep application records
- 



### Landscape - Lessons Learned

### Landscape - Lessons Learned

**Law violation**

- ▶ Not licensed
- ▶ Inadequate PPE
- ▶ No notification signs

### Landscape - Best Management Practices

- ▶ Be a Licensed Pesticide Applicator
  - ▶ Basic competency
  - ▶ Situational awareness - training
- ▶ Around a Home, Business, Dwelling
  - ▶ Super sensitive site
  - ▶ Pesticide Sensitive List
  - ▶ Building vents
  - ▶ Spray pressure


Licensee Name: Carl Dale  
 County (State): WASHINGTON (WA)  
 License Number: 9102

[View re-certification credit report by clicking on license type below.](#)

License	Status	Expiration	Recertification Cycle
Private Applicator	Renewed	12/31/2015	2015 - 2017
Public Operator	Renewed	12/31/2015	2012 - 2016

Categories (3)

- ▶ Agricultural Insect and Disease
- ▶ Agricultural Weed
- ▶ Ornamental Insect and Disease
- ▶ Ornamental Weed
- ▶ Right-of-Way Weed
- ▶ Soil Control (Other)

### Aerial Overspray - What Happened

- ▶ Off target movement of an application





### Aerial Overspray - Complaint

- ▶ Overspray of a house, horse and a field




### Aerial Overspray - Investigation Found

- ▶ Temperature inversion
- ▶ Portion of pesticide application detected off target
- ▶ No medical attention





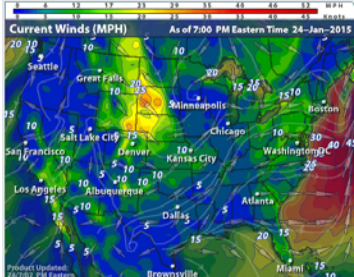

### Aerial Overspray - Lessons Learned



<http://pesticide-pics/>

### Aerial Overspray - Lessons Learned

- ▶ Know weather conditions



### Aerial Overspray Best Management Practices



- ▶ Know your area

Carol Black, WSU

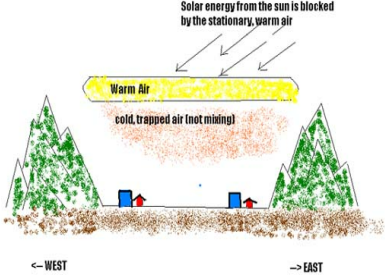
### Aerial Overspray Best Management Practices

- ▶ Test wind conditions if lower
- ▶ Watch weather for inversion conditions
  - ▶ Dust hanging on a dirt road
  - ▶ Smoke not dissipating
- ▶ Low wind conditions
- ▶ Evening and night times

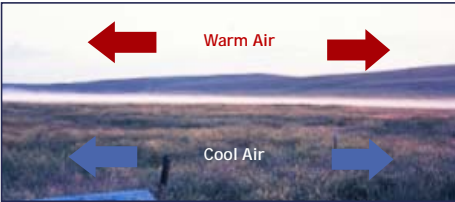


### Aerial Overspray Best Management Practices Inversions

Solar energy from the sun is blocked by the stationary, warm air



### Aerial Overspray Best Management Practices Inversions



Andrew Thostenson, North Dakota State University

What is a common cause of bystander exposure?

- A. Direct Spray
- B. Off target drift
- C. Pesticide spills



Which of the following is true regarding pesticide storage?

- A. Pesticides can be stored in food containers when they are properly marked.
- B. Pesticides should be stored near a water source for easy clean-up in a spill-event.
- C. Pesticides are stored in the original labeled containers.



All pesticide applications must be posted.

- A. True
- B. False



Temperature inversions occur when cool air

- A. is higher than warmer air.
- B. and warm air do not mix.
- C. mixes with warm air.



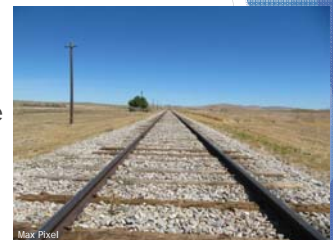
Large acreage applications are best done when

- A. wind speeds are greater than 12 mph.
- B. there is no temperature inversion.
- C. wind is moving towards a sensitive area.



Railroad Application - What Happened

- ▶ Applicator was treating a railroad
- ▶ Person riding his bike along a recreational trail



Max Pixel



### Railroad Application - Complaint

- ▶ Alleged sprayed with pesticide
- ▶ Looked up and saw 10-15 feet away a truck with 8 foot extension sprayer near a railroad



### Railroad Application - Complaint

- ▶ Approached applicator
  - ▶ Would not provide pesticide information



### Railroad Application - Complaint

- ▶ Gastrointestinal and eye symptoms
- ▶ Went to the emergency room

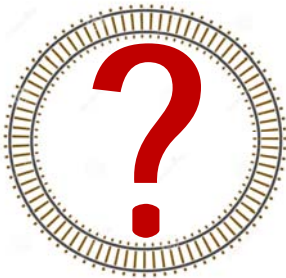


### Railroad Application Investigation Found

- ▶ Interview conducted too long after exposure for testing
- ▶ Applicator company paid for emergency room visit
- ▶ Hospital diagnosis reported chemical exposure
- ▶ Railroad right of way spraying drifted onto trail (prevention narrative)



### Railroad Application - Lessons Learned



### Railroad Application - Lessons Learned

Keep your eyes open



Becky Maguire, WSU





## Railroad Application - Lessons Learned

What is hidden behind the vegetation?



## Railroad Application Best Management Practices

- ▶ Knowing the treatment area
- ▶ Know what is adjacent
- ▶ Timing
- ▶ Deposition aid/course droplets
- ▶ **Applicator attitude!**



## Airblast Drift - What Happened

- ▶ Two airblast applicators
  - ▶ Spraying within the same orchard block



## Airblast Drift - Complaint



- ▶ One complained spray and dust got into his eyes
- ▶ Developed eye symptoms and sought medical attention two days later



## Airblast Drift - Investigation Found

- ▶ Dr. office visit diagnosed **irritant conjunctivitis**
- ▶ Pesticide used can cause **moderate eye irritation** and may cause **moderate corneal injury**
- ▶ **Concluded** symptoms might be the result of exposure to product used



## Airblast Drift - Lessons Learned



<http://pesticide.pics/>

### Airblast Drift - Lessons Learned

Poor planning and communication can result in exposure




### Airblast Drift - Best Management Practices

- ▶ Coordination of applications
- ▶ Educate the dangers of spraying close
- ▶ Be aware of hidden bystanders / other sprayers



Gery Amos



### Airblast Drift - Best Management Practices

- ▶ Be prepared for accident
- ▶ Immediate decontamination



<http://pesticide.pics/>




### Airblast Drift - Best Management Practices

#### Decontamination



Washington State University  
Pesticide Broadcasting Network




### Spray Rig Application - What Happened

- ▶ Property Management Service
  - ▶ Treating area
  - ▶ Spray rig





Virginia Tech Pesticide Programs, [PestHiddepics.org](http://PestHiddepics.org)



### Spray Rig Application - Complaint

- ▶ Heard compressor in spray rig outside of bedroom window
- ▶ Throat tightened up
- ▶ Went to **Emergency room**
- ▶ Pets in room also ill



### Spray Rig Application Investigation Found

- ▶ Fan in window drew in pesticides
- ▶ Caused complainant to become ill
- ▶ Hospital diagnosed with pesticide poisoning
- ▶ Lab found 2,4-D, MCP, MCPA and 2,4-DP inside the home



### Spray Rig Application - Lessons Learned



### Spray Rig Application - Lessons Learned

- ▶ Know the area treated and what is adjacent



### Spray Rig Application Best Management Practices

- ▶ Use coarse droplets
- ▶ Add a adjuvant to increase droplet size
- ▶ Buffer
- ▶ Know the area
  - ▶ Site assessment
  - ▶ Windows
  - ▶ Air vents



### Paraquat Dichloride:

**One Sip Can Kill !**



www.acuform.com

### Deaths from Accidental Ingestion of Paraquat

- ▶ Several accidental paraquat ingestion deaths have occurred in recent years.
- ▶ EPA looked into these deaths and found that such cases often occur as a result of the pesticide being transferred into a beverage container.



## Deaths from Accidental Ingestion of Paraquat

- ▶ EPA is concerned because paraquat is a **Restricted Use Pesticide** and, like all pesticides, should never be placed into a beverage container.



<http://npic.orst.edu/images/rupbmr.jpg>

- ▶ Paraquat is highly toxic to humans; one **small accidental sip is often fatal** and there is **no antidote**.



## Deaths from Accidental Ingestion of Paraquat

- ▶ The product labels clearly prohibit pouring paraquat into food or beverage containers with the prominently-placed statements:

**“NEVER PUT INTO FOOD, DRINK OR OTHER CONTAINERS.”**

**“DO NOT REMOVE CONTENTS EXCEPT FOR IMMEDIATE USE.”**



## True Stories

- ▶ In 2008, an 8-year old boy drank paraquat that had been put in a **Dr. Pepper bottle**, which he found on a window sill in the garage. **He died in the hospital 16 days later.** His older brother had used the product on weeds around the house and put it in the bottle in the garage. The older brother obtained the product from a family friend who is a certified Restricted Use Pesticide applicator.



## True Stories

In 2003, a 49-year old male **took a sip from his coffee cup** in which he had poured paraquat herbicide because the product's bottle was deteriorating. He realized his mistake and went to the Emergency Department. At that time, he was vomiting, cold and sweating profusely.

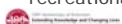
Doses of activated charcoal were administered and his stomach was pumped; morphine was provided for esophageal pain; and he was intubated to support breathing function on the fourth day. Aggressive supportive care continued until **he died on the 10th day.**



## Applicators: The Solution is You!

**To prevent the severe injury and/or death from paraquat ingestion, a paraquat product must:**

- ▶ Be used only by a certified applicator or under the direct supervision of a certified applicator.
- ▶ Never be transferred to a food or drink container.
- ▶ Always be kept secured to prevent access to children and/or other unauthorized persons.
- ▶ Never be stored in or around residential dwellings.
- ▶ Never be used around home gardens, schools, recreational parks, golf courses or playgrounds.



<http://paraquat.com/safety>

highly toxic by the **oral route**  
highly toxic by the **inhalation (lungs) route**  
toxic by the **dermal (skin) route**

an irritant to skin and eyes

not a skin sensitizer



Which of the following plays a key role in the potential for drift?

- A. Applicator's attitude
- B. Spray tank agitation
- C. Gravitational pull



A pesticide decontamination kit should contain

- A. Eyewash, soap and a bath towel
- B. Water, hand sanitizer, and aspirin
- C. Soap, water and single-use towels



Paraquat is a Restricted Use Pesticide and is a(n)

- A. Insecticide
- B. Fungicide
- C. Herbicide



Accidental deaths from paraquat exposure usually occur because

- A. people are eating contaminated food products.
- B. the pesticide is being stored in unlabeled food containers.
- C. the pesticide label has a signal word of Caution.



Spray adjuvants can be used to increase droplet size and reduce drift potential.

- A. True
- B. False



Pesticide Best Management Practices  
Back to the Basics  
How to do it Right the First Time

- ▶ Follow all local, state and federal regulations
- ▶ Always read and follow all product label directions and precautions
- ▶ Spray drift management





Virginia Tech Pesticide Program, [Pesticides.org](http://Pesticides.org)





### Pesticide Best Management Practices Back to Basics How to do it Right the First Time

- ▶ Carefully assess the application site
- ▶ Watch wind speed and wind direction
  - ▶ What is down wind or down slope
- ▶ Time of application
- ▶ Use buffer zones to sensitive sites



- ▶ Avoid spraying in conditions that may result in drift!!!
  - ▶ Spotty pest control
  - ▶ Wasted chemicals
  - ▶ More high value specialty crops
  - ▶ Off-target damage
  - ▶ Urban areas
  - ▶ Less tolerant neighbors
  - ▶ Litigious society
  - ▶ Result-higher costs-\$\$\$




Google Earth


### Best Management Practices - Drift

- ▶ Applicator attitude
- ▶ Equipment set-up
- ▶ Weather conditions


### ▶ Applicator Attitude

- ▶ Assess what sensitive sites are near the application area
  - ▶ No-spray buffer necessary?
- ▶ Set up equipment with appropriate boom height, nozzles, and pressure
- ▶ Assess weather conditions: air stability, wind direction and speed
- ▶ Make decision to spray **or not to spray**




### Best Management Practices Equipment Set Up

- ▶ **Nozzle size** and **pressure** set to give an appropriate size droplet to reduce drift
  - ▶ Use lower pressure, except with certain nozzles
  - ▶ Apply at higher volumes, not low volume
- ▶ **Boom height** - drift potential increases as distances increase





### Best Management Practices - Drift

**Temperature** - droplet evaporates to smaller droplets as temperatures increase



**Humidity** - droplets evaporate as humidity decreases





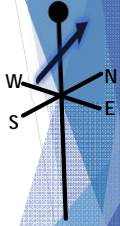

### Best Management Practices - Wind

- ▶ Urban
- ▶ Higher Acreage



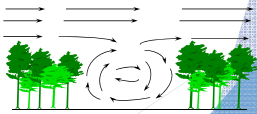


### Best Management Practices - Wind

- ▶ Wind **direction** is very important
  - ▶ Know the location of sensitive areas - consider safe buffer zones.
  - ▶ Do not spray at any wind speed if it is blowing towards sensitive areas - all nozzles can drift.
  - ▶ Spray when breeze is gentle, steady, and blowing **away** from sensitive areas.
  - ▶ "Dead calm" conditions are **never** recommended for large volume application.

### Best Management Practices - Wind

- ▶ Wind currents can drastically affect spray droplet deposition
- ▶ Structures affect wind currents
  - ▶ Wind breaks
  - ▶ Tree lines and orchards
  - ▶ Houses and barns
  - ▶ Hills and valleys

### Best Management Practices Off Target Movement

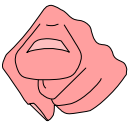
- ▶ Runoff - key mechanism for moving pesticides to surface waters






### Cost of not succeeding

- ▶ Case studies show the cost of not succeeding

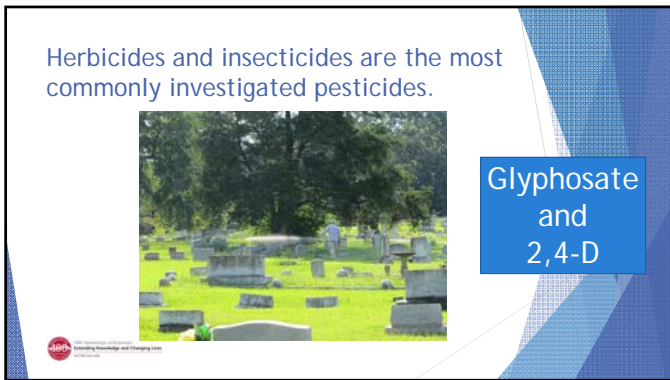
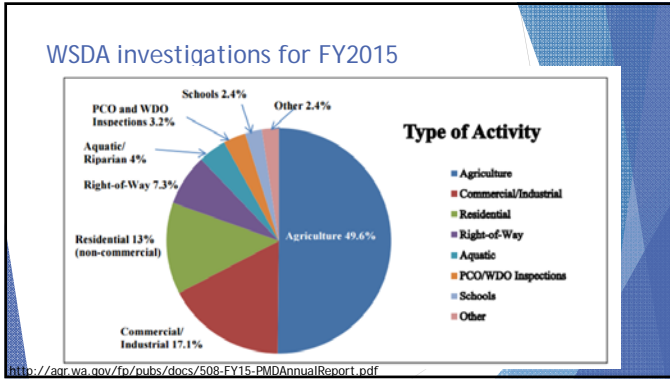


Bystander exposure



### WSDA investigates and enforces pesticide use in Washington.



### Which of the following increase drift potential?

- A. Large droplets and 12 foot boom height
- B. Low pressure and small droplet size
- C. High pressure and small droplet size



Complete the sentence.

As humidity \_\_\_\_\_ and temperature \_\_\_\_\_, drift potential increases.

- A) increases, decreases
  - B) decreases, increases
  - C) decreases, decreases
- A. increases, decreases  
B. decreases, increases  
C. decreases, decreases



The most common pesticide complaint investigation by WSDA is

- A. human pesticide exposure.
- B. drift.
- C. unlicensed pesticide applicators.



The most commonly investigated herbicide active ingredients are

- A. 2,4-D and paraquat
- B. Glyphosate and triclopyr
- C. 2,4-D and glyphosate

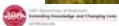


The majority of investigations conducted by WSDA involve which type of pesticide applications?

- A. Agriculture
- B. Commercial
- C. Residential (non-commercial)



Be a smart and safe pesticide applicator!



This is not the final slide.

Bystander Exposure Case Studies

Wendy Sue Wheeler  
Washington State University

This training was funded through the Pesticide Safety Education Program (PSEP) Improvement and Modernization Initiative.



This is the final slide.