

Pesticides for Urban Landscapes & Worker Safety



Green Gardening Program
South Seattle Community College
November 2, 2011

Presentation Objectives

1. Pesticide-related illness data
2. Laws applicable to landscapes
3. General toxicology of common herbicides
4. Actual pesticide illness cases; causes of pesticide exposure and prevention



Pesticide Illness Monitoring and Prevention Program

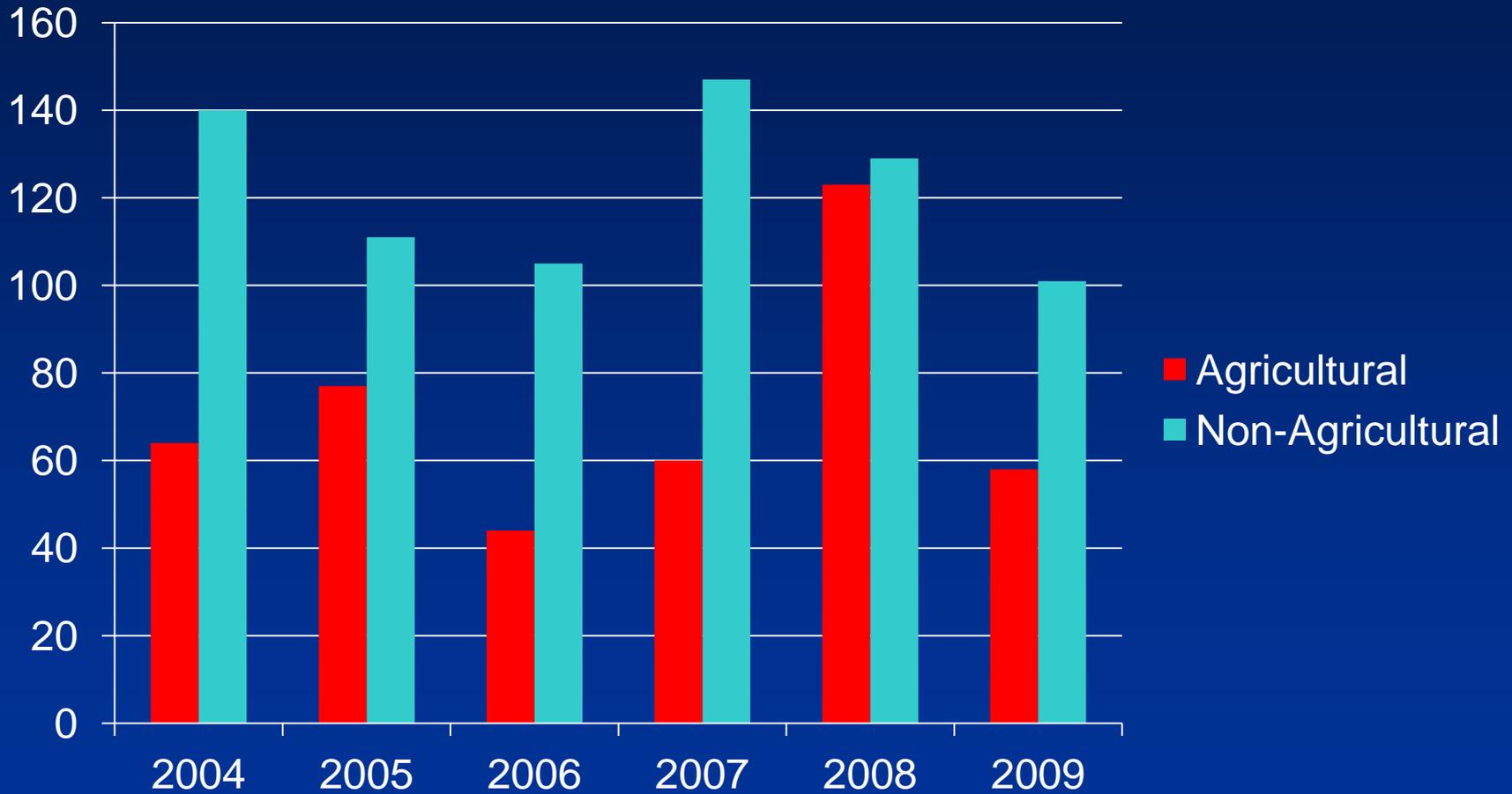
- In 1989 pesticide exposure became a reportable condition in WA (RCW 70.104) and the Pesticide Incident Reporting and Tracking (PIRT) Panel was created.
- Investigate approximately 250 reports/year
- Data collected is used to identify trends, problems and understand effects to human health for appropriate intervention

Case Definition

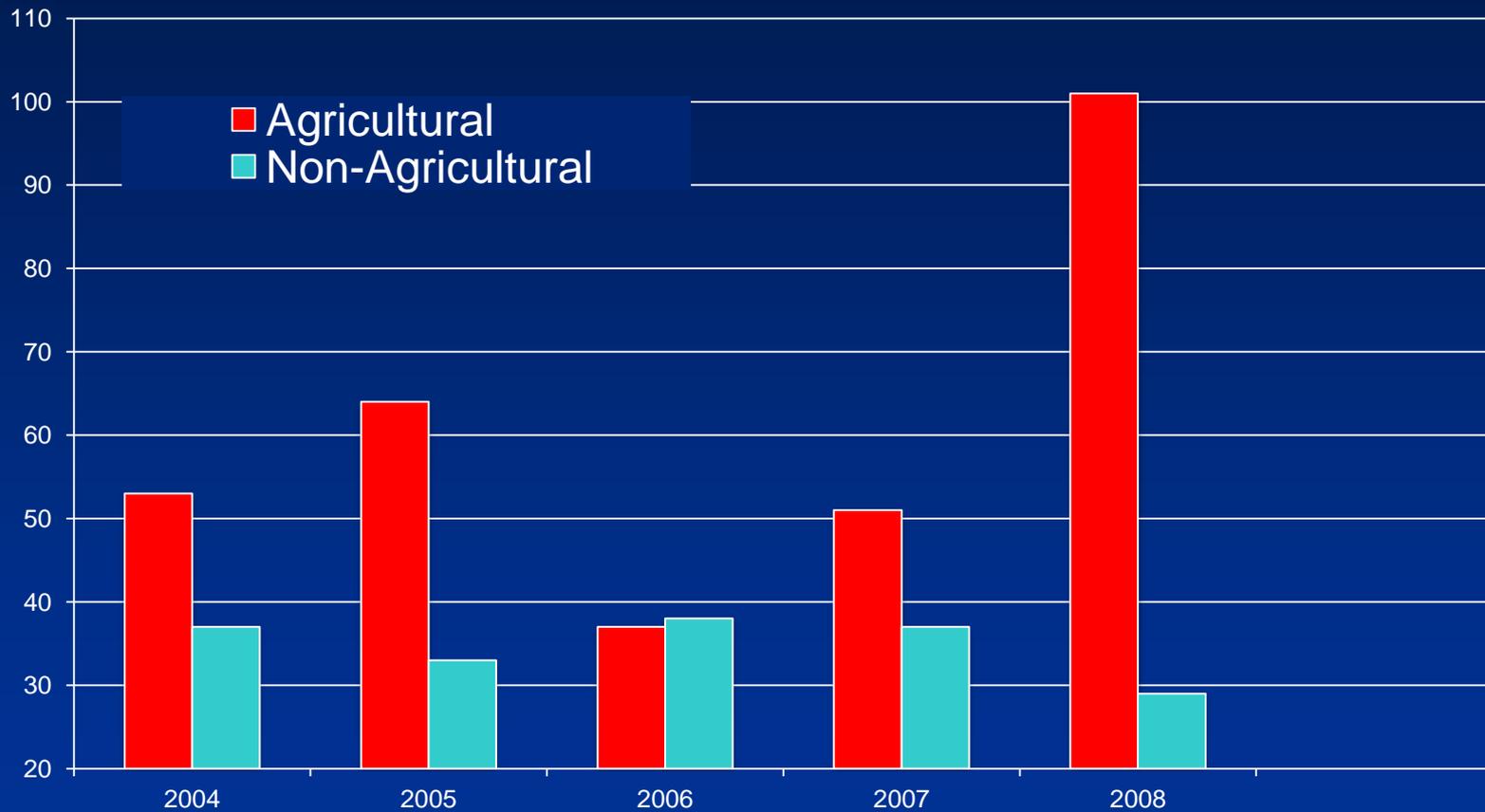
Case classification

- a. Documentation of exposure and health effects
- b. Symptoms are characteristic of known toxicological effects of the pesticide
- c. Time between exposure and symptom onset

Agricultural vs. Non-Agricultural Cases 2004-2009



Work-Related Cases, 2004-2008



The Law: landscape pesticide applications

Landscape or right-of-way applications

- Certified applicators are required to display contact info; carry MSDSs
- Landscape applications to **school grounds, licensed day care, regardless of certification** require markers at each primary point of entry to school grounds
 - Markers must remain minimum 24 hrs



The Law: landscape pesticide applications

- Ground maintenance licensing exemption
 - Only if ground maintenance duties are occasional (ex: works at apt. complex, multiple responsibilities- applying pesticides on occasion)

Pesticide sensitive registry

- WSDA sends certified applicators list twice a year.
- Certified applicators required to notify persons on list prior to landscape or right-of-way applications to adjoining property

The label is the law...

Highest toxicity.
Warning (next highest)
Caution (lowest toxicity)



Calibration and Records

- Records are required for schools, parks, commercial properties such as apartments, and for all commercial applications.
- Calibration will help you complete your record.

State of Washington
Department of Agriculture
Olympia, Washington 98504

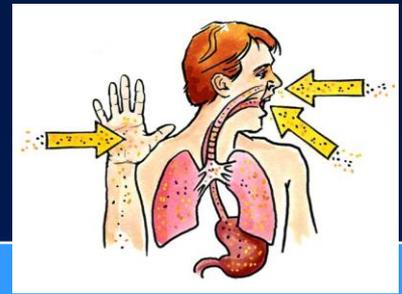
PESTICIDE APPLICATION RECORD (Version 1)

NOTE: This form must be completed same day as the application and it must be retained for 7 years (Ref. chapter 17.21 RCW)

- Date of Application - Year: Month: Day: Start Time:
Stop Time:
- Name of Person for whom the pesticide was applied:
Firm Name (if applicable):
Street Address:
City: State: Zip:
- Licensed Applicator's Name (if different from #2 above): License No.
Firm Name (if applicable):
Tel. No.: Street Address:
City: State: Zip:
- Name of person(s) who applied the pesticide (if different from #3 above):
License No(s), if applicable:
- Application Crop or Site:
- Total Area Treated (acre, sq. ft., etc.):
- Was this application made as a result of a WSDA Permit? No Yes (if yes, give Permit No.) #
- Pesticide Information (please list all information for each pesticide, including adjuvants (buffer, surfactant, etc.), in the tank mix):

a) Full Product Name	b) EPA Reg. No.	c) Total Amount of Pesticide Applied In Area Treated	d) Pesticide Applied/Acre (or other measure)	e) Concentration Applied
			/	
			/	
			/	
			/	
- Address or exact location of application. NOTE: If the application is made to one acre or more of agricultural land, the field location must be shown on the map on page two of this form.
- Wind direction and estimated velocity (mph) during the application:
- Temperature during the application:
- Apparatus license plate number (if applicable):
- Air Ground Chemigation
- Depth of application / Inches of water (chemigation):
- Miscellaneous information:

Health effects to humans



Active Ingredient	EX. PRODUCTS	Acute Health Effects
Glyphosate	Roundup, Buccaneer, Rodeo	Skin, eye, respiratory irritant; gastrointestinal if ingested.
2,4-D	Crossbow, many <i>weed & feed</i> products	Irritating to skin, mucous membranes; inhalation: dizziness, respiratory pain/irritation; vomiting, diarrhea
Dicamba	Banvel, Trimec	Corrosive to eyes; skin, respiratory irritant; gastrointestinal effects and weakness
Sulfur (fungicide)		Upper respiratory irritant (inhalation); eye & skin irritant; diarrhea if ingested
Dichlobenil	Casoron	Respiratory irritant (inhalation of dust); eye irritant; absorbed by skin
Paraquat & Diquat	Gramoxone, Reglone	Highly toxic, fatal if very small amt ingested. Dermal effects common, absorbed if skin abraded. GI, neurological health effects

ROUNDUP products

- Non-selective, not volatile
- 240 registered products with glyphosate in WA;
39 “Roundup” products
- Primarily eye & skin irritant
- Inhalation of products containing glyphosate:
Upper respiratory irritation
- Ingestion: Increased saliva, burns in mouth/throat,
nausea, vomiting, diarrhea
- Research: evidence suggests endocrine
disruption in mammals (2005, 2009)

MONSANTO

BAYER
ADVANCED

SPECTRACIDE



ACTIVE INGREDIENTS:

* Glyphosate in the form of its ammonium salt73.3%
Diquat dibromide 2.9%
OTHER INGREDIENTS:23.8%

Post-emergence Broadleaf Herbicides: 2,4-D...

- 2,4-D, dicamba, others
- Highly volatile
- Moderately irritating to skin, eyes, respiratory and gastrointestinal linings
- Acute poisoning health effects: fatigue, weakness, gastrointestinal
- Excreted from body through urine



Class D carcinogen

Not classifiable as a human carcinogen

Case Summary

DOH #070288

- 42 y/o licensed applicator wearing safety glasses got splash in eye
 - Notified supervisor and rinsed with water
 - Burning sensation persisted after 45 minutes, went to doctor
 - Corneal burn

DOH #070288

- Garlon 4 for woody plants, annual and perennial broadleaf weeds
 - AI Triclopyr-61.6%
 - Signal word- CAUTION
 - He wore required PPE: long-sleeved shirt, long pants, shoes + socks.
 - “causes moderate eye irritation”





Protective Eyewear

- Protective eyewear must be splash proof.
- Goggles, face shield, or safety glasses with temple and brow protection.



Slide shared
courtesy of WSDA

Case Summary

DOH #080133

- 45 y/o male landscaper at a community college developed gastrointestinal and general health effects after mixing & spraying 2 herbicides to spot weeds repeatedly



No training in chemical applications
No license

First time to apply

Mixing product with no instructions on
protection or PPE

Declined referral to L&I

- Pesticides: Crossbow (2,4-D & Triclopyr),
Roundup PRO (Glyphosate 41%)



DOH #080133 (cont.)

Health effects

- Abdominal pain, diarrhea, nausea
- Headache
- Fatigue/malaise

Several visits to healthcare provider



DOH #080133 (cont.)

How to prevent?

- **Train personnel** in how to spray, what PPE to wear
- **Wear** appropriate eye protection
- **Also wear** required chemical gloves, long pants, shirt
- **Permit referral** to state occupational health regulator (DOSH- L&I enforcement of safety and health regulations)

Case Summary

080118 Landscaper using backpack sprayer gets rash

- A 27 y/o male licensed applicator
- Spraying weeds with Roundup Pro and Reglone (diquat)
- His back felt cool; he thought it was sweat
- Realized the cap cracked

080118 (cont.)

- He felt burning, itching
- White spots, then white blisters on neck and back
- The cap on the sprayer was new. He thinks it cracked when the truck hit a pothole
- **Prevention:**
 - **Check** equipment before each use. Backpack sprayers slosh when you walk.
 - **Always check for leakage if excess moisture**

Case Summary

DOH #080234

- Two social workers at an adult residential facility developed headache, nausea and irritant health effects as herbicide drifted into the classroom indoor air on a warm day
 - “Roundup was sprayed”
 - They noticed maintenance staff spraying right across from them (door was open)
 - Called school office to find out what was sprayed. Went to the dr.



Adult residential facility



DOH #080234 (cont.)



- WSDA investigated and observed plant damage uncharacteristic of glyphosate & noted odor of 2,4-D
- There were no signs posted notifying application
- Misleading herbicide identification: licensed applicator told WSDA “maybe leftover Crossbow in bottom of 15 gallon tank”

DOH #080234 (cont.)

- Applicator said he didn't know pesticide could harm those in the bldg if drifted
- Chose to apply volatile herbicides on very hot day
- Incomplete recordkeeping

Prevention

- **Post** information, notification flags
- **Always identify** all the pesticides in the tank
- **Know** the materials you're working with

Case Summary

DOH #100028 Landscaper very sick after spraying product from client

- A 35 y/o unlicensed male landscaper
- Spraying trees at customer residence
- Client supplied the product and he sprayed
- Shortly after, started feeling confused, dizzy
- Sought medical help
- Had product with him- identified as *diazinon*

Diazinon was one of the most widely used insecticides for **household and agricultural pest control**. Both indoor and outdoor residential uses have been banned since 2004.

- Legal for agricultural use

HIGHLY TOXIC TO BIRDS, FISH, WILDLIFE in addition to HUMANS

DOH #100028

- Started vomiting
- Eyes: corneal abrasion, inflammation
- Missed 5 days of work
- Self-employed; didn't return calls from WSDA.

Prevention:

- Know** when you need a license
- Get** the appropriate **training**
- Don't accept** unknown products. **Read** the label
- Wear eye and skin protection**

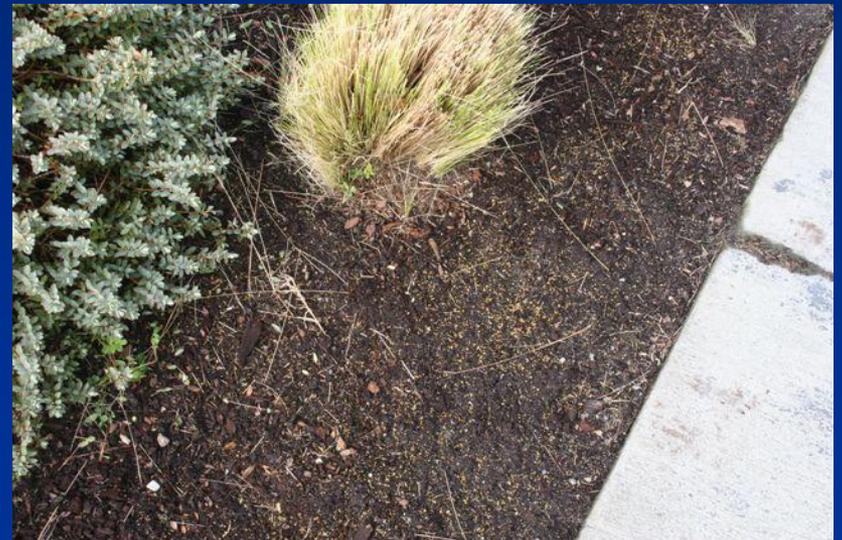
DOH # 080015-Herbicides Sprayed at College Campus

- 2 faculty and 2 students: respiratory, neurological and gastrointestinal health effects
- Maintenance staff applied around campus over week's period:
 - Casoron 4G (dichlobenil)
 - Crossbow (2,4-D)
 - Roundup Pro (glyphosate)
 - Snapshot 2.5 TG (trifluralin)

Noxious odor stronger than normal-warmer weather
Granules observed by WSDA

DOH # 080015

- Exposed walking through campus & in classroom
- All beds were treated
- Windows to classroom open; door too
- Only 1 notification flag found on campus



“Until Watered In and Soil has Dried”

- Use Directions for granular products such as Casoron 4G state: **“Do not enter or allow workers to enter the treated area until granules are thoroughly watered in and the soil has dried”**
- It is the applicator’s responsibility to either water in the granules or “clearly” instruct the customer in writing that the granules must be watered-in
- Rainfall or irrigation will suffice as long as the granules are considered watered-in

“Until Watered In and Soil has Dried” (cont.)

- It is also the applicator’s responsibility to ensure that people and pets stay off the treated area until the soil has dried (after the granules have been watered-in)
- If the soil remains wet due to rainfall or irrigation after the granules are considered watered-in, a 12-hour Restricted Entry (REI) period would be considered a reasonable waiting period for re-entry

More information

IPM in WA State: Urban Pesticide Education Strategy Team (UPEST) website

<http://www.ecy.wa.gov/programs/swfa/upest/schoolIPM.html>

Pesticide Illness Monitoring and Prevention Program

<http://www.doh.wa.gov/ehp/pest/default.htm>

WA State Department of Agriculture- Pesticides & Fertilizer

<http://agr.wa.gov/Portals/PF/>

EPA's Nat'l Pesticide Information Center (NPIC) website:

<http://npic.orst.edu/>

Poison Help & Information- WA Poison Center

1-800-999-1099

Other concerns

- **Chronic effects of occupational exposure (cancer, neurodegenerative disease)**
- **Effects on normal growth and development (learning problems, behavioral problems)**
- **Effects on fertility**
- **Environmental concerns (i.e. salmon)**

Summary

- Accidents happen – expect them.
 - Important to wear required PPE.
 - Be prepared. Emergency supplies and quick response will minimize absorption.
- Supervisors
 - Provide PPE and encourage proper use.
 - Create climate of safety/ communication.
- Trouble shoot potential problems before use.
 - Act to reduce potential for exposure to “neighbors” “park visitors” and others.
- Don't carry home pesticides to your family on shoes or shirt.
- Store products safely out of the reach of children.

Resources

- **WA State Dept of Health, Pesticide Program: 1-877-485-7316**
www.doh.wa.gov/ehp/ts/Pest
- **National Pesticide Information Center: 1-800-858-7378**
<http://npic.orst.edu>
- **US National Library of Medicine Hazardous Substance Data Bank**
<http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB>
- **WA State Department of Agriculture pesticides database**
<http://www.kellysolutions.com/WA/pesticideindex.htm>
- **Urban Pesticide Education Strategy Team (UPEST)**
<http://www.ecy.wa.gov/programs/swfa/upest/>
- **US EPA Reregistration Eligibility Document (RED)**
<http://www.epa.gov/oppsrrd1/REDs/factsheets/>
- **Gasnier C, Dumont C, et al. Glyphosate-based herbicides are toxic and endocrine disruptors in human cell lines. Toxicology. 209. Aug 21: 262(3): 184-91.**
- **Richard S, Moslemi S, et al. Differential effects of glyphosate and roundup on human placental cells and aromatase. Environmental Health Perspectives. 2005 Jun:113(6):716-20.**



PUBLIC HEALTH

**ALWAYS WORKING FOR A SAFER AND
HEALTHIER WASHINGTON**

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