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
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.
# Health effects to humans

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

ACTIVE INGREDIENTS:
* Glyphosate in the form of its ammonium salt ..... 73.3%
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
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.
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%)
Health effects
• Abdominal pain, diarrhea, nausea
• Headache
• Fatigue/malaise
Several visits to healthcare provider
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
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
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”
• 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

Slide shared courtesy of WSDA
“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
1-800-222-1222
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

  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

- 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/

