Pesticide Safety Basics

Mary Ann Rose
Ohio Pesticide Safety Education Program
First, a few public service announcements......

Testing for Pesticide Applicator Licenses currently on hold

To apply pesticides for hire,

You must be a -

• Licensed commercial applicator

OR

• A trained serviceperson working under a licensed applicator
Trained Serviceperson – how to

- Read manual, both English & Spanish available
- Sign verification form
- Trained in equip & pesticides
Trained Serviceperson Requirements

Direct supervision definition:

- Must receive TRAINING
- In pesticides & equipment
- Complete Trained Serviceperson manual
- Must have PPE and pesticide labels at hand
- Commercial Applicator must provide DIRECT SUPERVISION
- No more than 25 miles away or within 2 hours travel of trained serviceperson
PPE Shortages!

• Must Wear Required PPE!
  • Shortages of ALL kinds of PPE, not just what medical professionals typically wear
  • Only use a pesticide if you have the required PPE
  • Visit label sites to review PPE requirements, e.g., agrian.com
Health effects from pesticides can be categorized as **ACUTE** (short term) or **CHRONIC** (long term) toxicity.
Chronic Effects

- Cancer
- Tumor growth (not necessarily cancers)
- Genetic changes
- Birth defects & developmental changes
- Liver damage
- Reproductive disorders
- Nerve damage
- Allergic sensitization
Acute Effects

- Immediate “poisoning” or harm
- Symptoms appear in 24-48 hours or less
- EPA classifies all pesticides by acute toxicity
- Acute toxicity determines Signal Words on the pesticide labels
3.1 Hazards to Humans and Domestic Animals

CAUTION!
CAUSES MODERATE EYE IRRITATION.
Avoid contact with eyes or clothing. Avoid breathing vapor or spray mist.

FIRST AID: Call a poison control center or doctor for treatment advice.

IF IN EYES
- Hold eye open and rinse slowly and gently with water for 15 to 20 minutes.
- Remove contact lenses if present after the first 5 minutes then continue rinsing eye.
- Have the product container or label with you when calling a poison control center or doctor, or going for treatment.
- You may also contact (314) 694-4000, collect day or night, for emergency medical treatment information.
- This product is identified as Roundup PROMAX® Herbicide, EPA Registration No. 524-579.

DOMESTIC ANIMALS: This product is considered to be relatively nontoxic to dogs and other domestic animals; however, ingestion of this product or large amounts of freshly sprayed vegetation may result in temporary gastrointestinal irritation (vomiting, diarrhea, colic, etc.). If such symptoms are observed, provide the animal with plenty of fluids to prevent dehydration. Call a veterinarian if symptoms persist for more than 24 hours.

Personal Protective Equipment (PPE)
Applicators and other handlers must wear: long-sleeved shirt and long pants, shoes plus socks.
Pesticides are categorized by their acute toxicity

- Label Signal Words correspond to four acute toxicity categories

<table>
<thead>
<tr>
<th>DANGER</th>
<th>I. Highly Toxic</th>
</tr>
</thead>
<tbody>
<tr>
<td>LD $\leq$50 mg/kg</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>WARNING</th>
<th>II. Moderately Toxic</th>
</tr>
</thead>
<tbody>
<tr>
<td>50-500</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CAUTION</th>
<th>III. Slightly Toxic</th>
</tr>
</thead>
<tbody>
<tr>
<td>500-5000</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CAUTION</th>
<th>IV. Practically Non-toxic</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;5000</td>
<td></td>
</tr>
</tbody>
</table>

LD$_{50}$ = Lethal dose that kills 50% of a test population in mg/kg body wt.
Signal Words

• Danger = highly toxic – taste to teaspoon may be lethal

• With Poison/Skull and Crossbones – acute illness through any route of entry

• Without – Severe burning to eyes, skin
Signal Words

**Warning**
Warning is moderately toxic

**Caution**
Caution is slightly toxic
Risk to the Applicator

Risk = Hazard X Exposure

TO YOU

TOXICITY of material

DANGER

WARNING

CAUTION

- How much
- How long
- Where exposed

↑
Glyphosate – Risk Equation

Can it cause cancer?

YES
IARC

Is real-world exposure enough to cause cancer?

NO
EPA risk assessment

YOUR RISK

NOT LIKELY TO BE A HUMAN CANCER AGENT
At real world exposure levels

CFAES
THE OHIO STATE UNIVERSITY
COLLEGE OF FOOD, AGRICULTURAL, AND ENVIRONMENTAL SCIENCES
REMEMBER, EPA assumes that you:
✓ Read and follow Label
✓ Wear the required PPE
Personal Protective Equipment (PPE) – the minimum
What’s Wrong With This Picture?
Routes of Entry

- Eyes
- Skin
- Lungs
- Oral
Dermal Exposure
SKIN
Gloves – the first line of defense

↑ Side without protection shows much more contamination

CFAES

The Ohio State University
College of Food, Agricultural, and Environmental Sciences
The protective value of gloves

- Farmers who used gloves had 70% less 2,4-D detectable in urine
- Farmers who used gloves had 80% less captan detectable on hands
Pesticide Absorption Rates

Scalp - 32%
Forehead - 36%
Ear Canal - 47%
Forearm - 9%
Palm - 12%
Abdomen - 18%
Scrotum - 100%
Ball of feet - 14%
Ocular Exposure
EYES

CFAES

The Ohio State University
College of Food, Agricultural, and Environmental Sciences
Eye Wash

Have you replaced solutions lately?
Does eyewash station work??!
Inhalation Exposure - Lungs

Half-face respirator

Full-face respirator

Wear only NIOSH-approved respirators!

CFAES
Some industries still use pesticides that require respirators

Agricultural Employers
- Greenhouse
- Nursery
- Christmastree

Commercial Pesticide Applicator Employers
- Golf Course
- Pest Control
If respirator required by label

Employer must provide:

• Initial Medical Evaluation
• Annual Fit Testing
• Training in care & use
• Respirator compliance records
Voluntary respirator use also has requirements

If not required by label, these still required

- Initial Medical Evaluation
- Ensure mask kept in sanitary condition
  (OSHA Appendix D)

- These are employer’s responsibility
Oral Exposure
MOUTH
What’s Wrong With This Picture?
What’s Wrong With This Picture?
Taking a Break?

Wash Hands BEFORE eating, drinking, smoking, bathroom breaks

CFAES

The Ohio State University
College of Food, Agricultural, and Environmental Sciences
PPE Requirements depend on the task

Applying

Mixing & loading
Some gear NOT recommended, or is off-label!
For an Effective PPE Barrier

• Choose the right equipment
• Use it correctly
• Clean and maintain it correctly
• Store PPE away from chemicals

NO!
Removing PPE – there is a CORRECT order

1. Wash gloves
2. Wash and remove PPE
3. Wash and remove gloves
Wash up thoroughly after removing PPE

Be prepared to decontaminate yourself the field!
Remove work clothes and shower before contact with your family.

I sure hope he’s not wearing his yucky pesticide clothes!

And leave the boots outside the door!
Wash Work Clothes Separately from Family Wash!

Follow manufacturer’s instructions for cleaning/maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry.
Summary

- Wearing PPE & following the label is the key to minimizing your risk from using pesticides!
Pesticides in the NEWS
Disinfectants are Registered Pesticides!

• Pesticides kill PESTS
  – microbes are pests!
• EPA registers all pesticides, approves labels
• Disinfectants kill pests on surfaces (not used on people)
• READ the disinfectant LABEL!
• Improper use makes people sick .. or worse!
How to use disinfectants

• For COVID-19 use EPA approved disinfectant
• Read label, follow precautions
  – Ventilation important
  – Wear protection for skin, eyes
• Clean surface first – 3 steps
• Apply disinfectant according to Label
  – Use correct dilution
  – Surface must remain wet for specified period
  – For food contact surfaces, rinse with potable water
  – NOT FOR USE ON PEOPLE
  – DO NOT SPRAY INTO AIR
Helpful Resources

National Pesticide Information Center
➢ Where to find out more about toxicity/safety of pesticides

http://npic.orst.edu/
1-800-858-7378

National Poison Control Center
• http://www.1-800-222-1222.info
• 1-800-222-1222