EPA’s Worker Protection Standard

Revisions to EPA’s WPS
Worker and Handler Training
Presenter:
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For:
College of Agriculture
Faculty, Staff and Student Workers
Presentation: Spring Semester 2016

Worker Learning Objectives
This training is intended to assist you to:
• Identify key revisions to WPS
• Know where WPS applies
• Identify worker responsibilities
• Identify controls for minimizing exposure to pesticides
• Understand central posting and early entry

Program Elements

Types of Pesticides

What is a Pesticide?
FIFRA (40 CFR 162.3)
• Any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest and
• Any substance or mixture of substances intended for use as a plant regulator, defoliant, or desiccant.”

WPS Purpose and Scope
• To reduce the risks of illness or injury resulting from workers’ and handlers’ occupational exposures to pesticides.
• Requires employers implement workplace practices designed to reduce or eliminate exposure to pesticides and establish procedures for responding to emergencies.
Requirements and Responsibilities

Employee
- Read and follow labels and Safety Data Sheets (SDS)
- Follow employer instructions and warnings
- Identify hazards before starting a job
- Take training

Agricultural Worker:
- Hand labor, such as weeding, planting, cultivating and harvesting.
- Related tasks, such as moving or operating irrigation equipment.

Pesticide Handler:
- Mix, load or apply pesticides.
- Any tasks involving direct contact with pesticides.

WPS applies to...

Agricultural Worker:
- Any pesticide product is used on an agricultural establishment in the production of agricultural plants
  - Agricultural establishment = forest, farm, field site, nursery, or greenhouse
  - Agricultural plants = food, feed and fiber plants, trees, turf, grass, flowers, shrubs, ornamentals and seedlings

Pesticide Handler:
- You apply or employ others to apply pesticides for production of agricultural plants on a forest, farm nursery, or greenhouse.
  - That you own or manage
  - Where you hire a contractor for services, including labor contractors
  - You operate a business in which you or people you employ perform tasks as a crop advisor on any forest, farm, nursery, or greenhouse.

Knowledge Check
Match up the primary duties of the Worker and Handler to the definition of that category.

A. Agricultural Worker
B. Pesticide Handler
C. Tasks, such as moving or operating irrigation equipment
D. Mix, load or apply pesticides
E. Hand labor, such as weeding, planting, cultivating and harvesting
F. Any tasks involving direct contact with pesticides

Answer: A/C; A/E; B/D; B/F

Program Elements
Key Revisions to WPS

Inform workers and handlers about potential exposure to pesticides
• Annual training - no grace period for workers
• Display and provide application information and safety data sheets (SDS)
  – Can be requested by worker/handler, treating medical personnel or designated representative
• Post signs if Restricted Entry Interval (REI) > 48 hours (outdoor applications) or 4 hours for greenhouses

Protect workers, handlers and other people from exposure to pesticides
• If labeling requires respirator for handler, provide medical evaluation, fit testing, and respirator training
• Application exclusion zone during applications
• Handlers and early-entry workers must be 18 years old

Mitigate any pesticide exposures that workers or handlers receive
• Provide routine decontamination supplies for workers, handlers, and early-entry workers
• Provide eyewash system for mixers/loaders if labeling requires protective eyewear

Knowledge Check
What are the three key revisions to the Worker Protection Standard that go into effect in 2017? Choose all that apply.
A. Orient, Decontaminate, and Abate
B. Inform, Protect, and Mitigate
C. Educate, Label, and Isolate
D. Train, Post, and Mitigate

ANSWER: B

Implementation Timeline

<table>
<thead>
<tr>
<th>Date</th>
<th>Milestone</th>
</tr>
</thead>
<tbody>
<tr>
<td>September 28, 2015</td>
<td>Revised WPS final rule signed and announced.</td>
</tr>
<tr>
<td>November 2, 2015</td>
<td>Revised WPS final rule published in the Federal Register.</td>
</tr>
<tr>
<td>January 1, 2016</td>
<td>Revised WPS final rule becomes effective. During 2016, compliance is required with the existing WPS requirements.</td>
</tr>
<tr>
<td>January 2, 2017</td>
<td>Compliance is required with most of the revised WPS requirements.</td>
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</tbody>
</table>
| January 1, 2018   | Compliance is required with all of the revised WPS requirements. Last three requirements:
  • Cover new content in worker and handler training.
  • Include new content on pesticide safety information display.
  • Handlers suspend applications if anyone is in the application exclusion zone. |
Worker Training Elements

1. Descriptions of where and in what form pesticides may be encountered during work activities.
2. Hazards of pesticides from toxicity & exposure:
   - Acute effects
   - Chronic effects
   - Delayed effects
   - Sensitization

Worker Training Elements (cont.)

7. Routine and emergency decontamination procedures (including eye flush techniques)
8. Hazards from chemigation (application of chemicals in irrigation waters) and drift
9. Hazards from residues on clothing
10. Warnings on taking pesticides or pesticide containers home.

Worker Training Elements (cont.)

11. Requirements of WPS designed to reduce the risks of illness or injury resulting from workers’ occupational exposure to pesticides, include:
   - Application and entry restrictions
   - Design of warning signs
   - Posting of warning signs
   - Oral warnings
   - Availability of specific information about applications
   - Protection against retaliation

Knowledge Check

Which of the following is not a worker training component as specified by the WPS?

A. Hazards of pesticides from toxicity and exposure
B. Calibration of application equipment
C. Signs and symptoms of pesticide exposure
D. Hazards from residues on clothing

ANSWER: B

Knowledge Check

Which of the following is not a worker training component as specified by the WPS?

A. Determining proper harvest moisture contents
B. Hazards from pesticide chemigation and drift
C. Routes through which pesticides enter the body
D. Warnings on taking pesticides home

ANSWER: A

SENSOR Pesticide Surveillance Program

1,009 Cases, Acute Occupational Pesticide Illness (6 States)

How Workers were Exposed:

25% = During application process (applying, mixing, loading, transport, disposal, or equipment maintenance)
67% = During routine work activities, such as weeding, planting, cultivating, and harvesting that did not involve handling pesticides
8% = Unknown


37% = Residues
24% = Applications
14% = Drift
10% = Mixing or loading
7% = Cleaning/fixing equipment
7% = Other


When people are accidently poisoned by pesticides, it is usually because they...

A. Got pesticides in their eyes, and mucous membranes
B. Got pesticides on their skin
C. Swallowed pesticides
D. Breathed in pesticides

Answer: B

Acute vs. Chronic Effects

Acute effects happen suddenly, normally from a single exposure. Acute health effects are often reversible.

Chronic effects occur when repeated exposures over long periods of time or when the body takes a long time to develop a response after a brief exposure. Chronic health effects are often irreversible.

Knowledge Check

What is an acutely toxic chemical?

A. An inert chemical
B. The chemical is toxic only if you drink it
C. The chemical will harm you only after years of exposure
D. The chemical can harm you in a single dose over a short period of time.

Answer: D

How do Pesticides Affect the Body?

It depends on several factors, such as:

- How the chemical enters the body - inhaled, absorbed or ingested
- The physical form of the chemical - solid, liquid, or gas
- The amount of chemical that actually enters the body - the dose
- How toxic or poisonous the chemical is
Organophosphates and Carbamates
• Widely used insecticides
• Cholinesterase inhibition:
  – Interferes with nervous system
  – Causes contraction of smooth muscles; secretion of glands; twitching/weakness/paralysis of skeletal muscles; sensory and behavioral disturbances; respiratory failure
• Victim may die of respiratory failure and excessive fluid in the lungs

Biological Effects of Common Pesticides

Skin Symptoms
• May include swelling, redness, itching, pain, and blistering

Respiratory Symptoms
• May include wheezing, difficulty in breathing, chest tightness, coughing and shortness of breath, and in some cases, respiratory sensitization can produce severe asthma attacks.

Common Routes of Exposure

Dermal Exposure
• Dermal is most common pesticide exposure
• The most common route is through the hands and forearms

• The importance of PPE and handwashing

Knowledge Check
What are the four common routes of entry of chemicals into the body? Choose all that apply.

A. Ears, eyes, contact lens, and mouth
B. Nose, mouth, skin, and lungs
C. Ingestion, swallowing, inhaling, and exhaling
D. Ingestion, inhalation, and skin or eye absorption

ANSWER: D

Dermal Exposure
• Formulations vary in their ability to be absorbed through the skin. Emulsifiable concentrates are more readily absorbed than other formulations.
• All formulations can be absorbed in clothing, thereby becoming a path to skin exposure.

Source: Sarah Zukoff, K-State Southwest Research and Extension
Do you recognize this area?

Decontamination Area

Application Records

Emergency Medical Care

EMERGENCY
Call 911
Via Christi Hospital Emergency Room
Corner of Kimball & College Ave.

NON-EMERGENCY
Occupational Health - Via Christi Therapy Center / Via Christi Hospital
315 Seth Child Road / Kimball & College Ave.

Summary: Protect Yourself

Keep out of treated or restricted areas.
• Wash before eating, drinking, using chewing gum or tobacco, or using the toilet.
• Wear work clothing that protects your body from pesticide residues.
• Wash/shower with soap and water, shampoo hair, and put on clean clothes after work.
• Wash work clothes separately from other clothes before wearing them again.
• If pesticides are spilled or sprayed on your body:
  – Wash immediately using the nearest clean water.
  – As soon as possible, shower, shampoo, and put on clean clothes.

Conclusion

• This concludes the worker presentation.
• To receive your Certificate of Completion, you must complete the 10-question WPS Worker quiz. Your worker verification card will be sent to you via campus mail.
• Please contact John H. Gamble at jh gamble@ksu.edu if you have questions or need additional information.
• Other sources of information include:
  http://www.epa.gov/pesticide-worker-safety
Background

Regulatory Changes

Worker

Handler

Video Overview: Pesticide Handlers and the WPS

Program Elements

Handler Learning Objectives

This training is intended to assist you to:

- Identify handler responsibilities
- Follow safe procedures when handling pesticides
- Select PPE for handling pesticides
- Understand application record reporting
- Define and describe some signs and symptoms of heat stress

Handler Training Elements

1. Description of information on pesticide labeling including safety information
2. Hazards of pesticides from toxicity and exposure:
   - Acute effects
   - Chronic effects
   - Delayed effects
   - Sensitization

Handler Training Elements (cont.)

3. Routes through which pesticides can enter the body
4. Signs and symptoms of pesticide poisoning
5. Emergency first aid for pesticide injuries & poisonings
6. How to obtain emergency medical care

Handler Training Elements (cont.)

7. Routine and emergency decontamination procedures
8. Use of Personal Protective Equipment (PPE)
9. Prevention, recognition, and treatment of heat-related illness

Handler Training Elements (cont.)

10. Safe handling, transporting, storing and proper disposal of pesticides, including spill cleanup procedures
11. Environmental concerns – drift, runoff, and wildlife hazards
12. Warnings about taking pesticides and their containers home
Knowledge Check

Which of the following is not a handler training component as specified by the WPS?

A. Drift, runoff, and wildlife concerns
B. Signs and symptoms of pesticide poisoning
C. Warnings about taking pesticides home
D. Learning pesticide modes of action

Answer: D

Chemical Label Pictograms

Chemical Labeling and Other Warnings

Safety Data Sheet: Roundup

SDS Sections
- Accidental Release Measures: Example Information Use PPE as directed, Avoid Direct Contact, Prevent Soil Contamination
- Handling and Storage: Avoid Eye, Skin and Clothing Contact, Wash Hands, Keep only in Original Container
- Exposure Control and Personal Protection: None Established; Ventilation; PPE
- Physical and Chemical Properties: Liquid, Amber-Brown Color, Odorless
- Stability and Reactivity: Stable under Normal Conditions

SDSs – What information is in them?
- SDS Sections: Example Information
- Identification of the Substance, Preparation and the Company: Name: Roundup PowerMax, Supplier Contact Information
- Information on Ingredients: CAS No. 70901-12-1
- Hazard Identification: Irritating to Eyes
- First Aid Measures: Language Specific to Inhalation, Ingestion, Skin and Eyes Exposures
- Fire Fighting Measures: Language Specific to Extinguishment, Explosion Hazards, Protective Measures

Example Information
- Preferred Acronym: Protect Aromatic
- Hazard Statement: Irritating to Eyes
- Phrases: 'Irritating to Eyes'
- Pictograms: None
- Signal Word: None
- Hazard Category: None
- Preventive Measures: None
- Other Warnings: None

Safety Data Sheet:
- Roundup
- Physical and Chemical Properties
- Stability and Reactivity
- Example Information
- Physical and Chemical Properties
- Stability and Reactivity
**Safety Data Sheet: Roundup**

**SDS Section**
- Toxicological Information
  - NOAEL Toxicity: >20,000 mg/kg Diet

- Ecological Information
  - LC50 = 5.2 mg/l (Bluegill Sunfish)

- Disposal Consideration
  - Keep out of Drains, Sewers, Ditches and Water Ways; Triple Rinse Container

- Transportation Information
  - Non-Hazardous under DOT

- Regulatory Information
  - Labels: Surfactant(s)

- Other Information Included
  - NFPA: Health 1; Flammability 1; Instability 1

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**PPE to Consider**

Here’s some other Personal Protective Equipment (PPE) you should consider when applying pesticides:

- Boots or shoe covers
- Coveralls
- Hood or wide brimmed hat
- Apron
- Protective eyewear
- Respirator
  - Medical exam
  - Fit tested
- Protective clothing
  - Long sleeve shirt
  - Long pants
- Chemical Resistive Apron
- Chemical Resistive Coveralls
- Chemical Resistive Rubber Gloves

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**Gloves**

- No single glove will protect against every chemical exposure - check label
- Each manufacturer’s gloves will have difference breakthrough times, so again check the label
- What about leather gloves?
- Demonstration
  - Remove jewelry
  - Check for leaks
  - Proper removal
- Should I reuse a pair of gloves?

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**Latex Gloves**

Do not use latex gloves for pesticide handling

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**EPA Chemical Resistance Categories**

- High: Highly chemical-resistant. Clean or replace PPE at end of each days work period. Rinse off pesticides at rest breaks.
- Moderate: Moderately chemical-resistant. Clean or replace PPE within an hour or two of contact.
- Slight: Slightly chemical-resistant. Clean or replace PPE within 10 minutes of contact.
- None: Not chemical-resistant. Do not wear this type of material as PPE when contact is possible.

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**Natural Rubber and PVC Gloves**

Limited Chemical Resistance

Does not hold up well in organic solvents, oils, greases, kerosene or gasoline.

Natural Rubber

PVC

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Source: Sarah Zukoff, K-State Southwest Research and Extension
Neoprene and Nitrile Gloves

Excellent chemical resistance from exposure to organic and inorganic acids, organic solvents, oils, greases and petrochemicals.

- Neoprene
- Nitrile

Source: Sarah Zukoff, K-State Southwest Research and Extension

Handler Training

Glove Summary

To avoid secondary exposure before removing the gloves:
- Thoroughly wash the gloves with soap and water and rinse with a large amount of water.
- Then remove the gloves, and wash your hands and forearms thoroughly with soap and water

Knowledge Check

Which of the following gloves provide excellent chemical resistance when I am handling a pesticide? Choose all that apply.

A. Neoprene  
B. PVC  
C. Latex  
D. Nitrile  
E. Natural rubber

ANSWER: A and D

Coverall Summary

Disposable or limited use coveralls are sold under brand names such as Tyvek®, Pro/Shield®, Kleenguard®.

Non-woven fabrics have a random orientation of fibers, which eliminates direct paths that pesticides can follow through the fabric.

Boots Summary

- Wearing unlined, chemical-resistant footwear is required for some pesticides and is a sensible practice for all pesticide use.
- Select non-skid boots of PVC, natural rubber, or neoprene.

Chemrest Data Sheet

For: ROUNDUP (CONCENTRATED)

<table>
<thead>
<tr>
<th></th>
<th>Heavy Exposure</th>
<th>Limited Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Breakthrough</td>
<td>Time in Minutes</td>
</tr>
<tr>
<td>Best® Neoprene</td>
<td>15</td>
<td>NT</td>
</tr>
<tr>
<td>6780</td>
<td></td>
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<tr>
<td>Hustler™ PVC</td>
<td>30</td>
<td>NT</td>
</tr>
<tr>
<td>Nitri-Solve®</td>
<td>&gt;480</td>
<td>&gt;240</td>
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<tr>
<td>727 Nitrile</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N-DEX Plus® 8005</td>
<td>&gt;480</td>
<td>&gt;240</td>
</tr>
<tr>
<td>Exam Glove</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Which of the following gloves will protect me if I am handling Roundup? Choose all that apply.

A. Neoprene  
B. PVC  
C. Thick nitrile  
D. Thin nitrile exam gloves  
E. Any waterproof glove is okay

**Answer:** C & D

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Which of the following gloves will protect me if I am handling a pesticide containing acetone? Choose all that apply.

A. Neoprene  
B. PVC  
C. Thick nitrile  
D. Thin nitrile exam gloves  
E. Any waterproof glove is okay

**Answer:** A

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Knowledge Check: Breakthrough Time in Minutes

<table>
<thead>
<tr>
<th>Material</th>
<th>Heavy Exposure</th>
<th>Limited Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Best® Neoprene 6780</td>
<td>35</td>
<td>43</td>
</tr>
<tr>
<td>Hustler™ 725R PVC</td>
<td>7</td>
<td>14</td>
</tr>
<tr>
<td>Nitri-Solve® 727 Nitrile</td>
<td>3</td>
<td>15</td>
</tr>
<tr>
<td>N-DEX Plus® 8005 Nitrile Exam Glove</td>
<td>15</td>
<td>22</td>
</tr>
</tbody>
</table>

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**Mixing and Loading**

Pesticide handlers are often exposed when they mix and load pesticides. Can you think of any reasons why you need to take extra precautions when during mixing and loading operations?

- Back flow prevention  
- Protect the environment  
- Follow label directions  
- Open containers  
- Wear PPE
If you have to move pesticides from one place to another in a pickup or car, what are some precautions you need to take?

- Keep up-to-date spill supplies on hand
- Don’t put pesticides in with people, animals, food, or clothing
- Put them in the back of a truck or in a trunk
- Secure containers

An agricultural worker became ill in the cab of a tractor while applying pesticides. He had placed the pesticide containers in the enclosed cab of the tractor, where they leaked from the container.

Oregon Public Health Services Pesticide Analytical and Response Center Case No. 98-028

Agricultural worker became ill in the cab of a tractor while applying pesticides. He had placed the pesticide containers in the enclosed cab of the tractor, where they leaked from the container.

If you have to move pesticides from one place to another in a pickup or car, what are some precautions you need to take? Choose all that apply.

A. Make sure you have spill clean-up materials with you.
B. While it maybe tempting to put pesticides inside your car or truck, put them in back of the pickup or in the trunk of the car.
C. Don’t put pesticides with people or animals, nor near feed.
D. Secure the containers, so they don’t fall over or roll around.

ANSWER: A, B, C & D

When you are finished with a pesticide handling job, what are the safe practices for taking off your equipment, cleaning up, and putting things away?

Doffing Poor Example: Why Decontaminate?

Summary: Selection and Use of PPE

When storing pesticides, keep them:

- In a locked cabinet or room
- In their original labeled containers
- With the lids on tight
- On shelves with lips or other means to keep the containers from tipping and spilling.

Inform supervisor of leaks or spill immediately!

When you are storing pesticides, you should not keep them:

A. In a locked cabinet or room
B. In their original, labelled containers
C. On a conveniently located shelf
D. With other compatible chemicals

ANSWER: C
Some basic procedures for managing spills:

- Read the label
- Use the right PPE and clean-up materials
- If you don’t know what to do, call for help
- If it is a large spill, send someone for help
- FIRST, control the spill by stopping it
  - Upright container so it no longer spills
  - Put smaller containers into larger ones
  - Create a perimeter
  - Avoid contact with the drift
  - Evaluate people from downwind areas
  - Stop the spill from spreading

Source: Sarah Zukoff, K-State Southwest Research and Extension

For liquid spills:

- Spread absorbent materials over entire spill; absorbent flakes, fine sand, vermiculite, clay, pet litter
- Avoid using sawdust on strong oxidizers
- Pillows, tubes, or pads

For dust and granular spills:

- Lightly mist with water and cover with a tarp
- Add absorbent material
- Add bleach or hydrated lime to neutralize area
- Dispose of pesticide containers (Triple Rinse)
- Dispose of waste: Call EH&S

Source: Sarah Zukoff, K-State Southwest Research and Extension

People, Animals and Water Supplies

What precautions can you take to make sure your pesticides don’t get on people, animals, or water supplies?

Source: Sarah Zukoff, K-State Southwest Research and Extension

What precautions can you take to make sure your pesticides don’t get on people, animals, or water supplies?

Source: Sarah Zukoff, K-State Southwest Research and Extension

Knowledge Check

If you are responsible for cleaning up a pesticide spill, what should you not do?

A. Read the label
B. Contain, then control the spill
C. If you don’t know what to do, call for help
D. Make sure you have the right PPE and clean-up materials
E. Dispose of pesticide container(s)
F. Dispose of waste

Answer: B

Heat-Related Illnesses

- Heat Cramps
- Heat Exhaustion
- Heat Stroke
Heat Cramps

- Caused by excessive loss of electrolytes
- Early warning signs of heat stress
  - Painful cramps usually in legs or abdomen
- Stop activity, hydrate, rest in cool place
- Get medical attention if condition continues

Heat Exhaustion

- The body’s response to excessive water and electrolyte loss
- Stop activity and seek treatment immediately

Heat Stroke

- The body’s cooling mechanism shuts down
- 50% that reach the heat stroke stage die even with medical attention
- Seek immediate medical attention

Worker Responsibility

- Follow instructions of the Industrial Hygienist and health care professionals
- Be watchful for symptoms (self and others)
- Properly hydrate (before, during and after)
- Get adequate rest
- Avoid alcohol, unnecessary medication, and caffeine

Knowledge Check

Match up risk factors for heat-related illnesses.

A. Job
B. Human
C. Environment
C. Poor physical condition
D. Work intensity
E. Humidity
F. Lack of acclimatization

Answer: A/D; B/C; B/F; C/E

Conclusion

- This concludes the handler presentation.
- To receive your Certificate of Completion, you must complete the 10-question WPS Handler quiz. Your handler verification card will be sent to you via campus mail.
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- Other sources of information include: http://www.epa.gov/pesticide-worker-safety