# EPA's Worker Protection Standard

Revisions to EPA's WPS
Worker and Handler Training

College of Agriculture
Environmental Health and Safety Office

For:
College of Agriculture
Faculty, Staff and Student Workers

February 15, 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


Background

Regulatory Changes


Worker


Handler

Background

## 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."



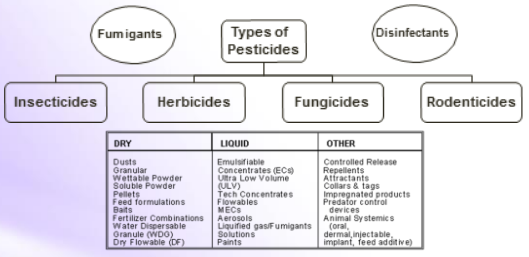

Source: Sarah Zukoff, K-State Southwest Research and Extension
Plant Protection Product Data: http://www.greenbook.net/



Background

## Types of Pesticides

'cide = to kill




| DRY | LIQUID | OTHER |
|---|---|---|
| Dusts<br>Granular<br>Wettable Powder<br>Soluble Powder<br>Pellets<br>Feed formulations<br>Baits<br>Fertilizer Combinations<br>Water Dispersable Granule (WDG)<br>Dry Flowable (DF) | Emulsifiable Concentrates (ECs)<br>Ultra Low Volume (ULV)<br>Tech Concentrates<br>Flowables<br>MECs<br>Aerosols<br>Liquified gas/Fumigants<br>Solutions<br>Paints | Controlled Release<br>Repellents<br>Attractants<br>Collars & tags<br>Impregnated products<br>Predator control devices<br>Animal Systemics (oral, dermal,injectable, implant, feed additive) |

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



Background

## WPS Purpose and Scope

- To reduce the risks of illness or injury resulting from workers' and handlers' occupational exposures to pesticides.

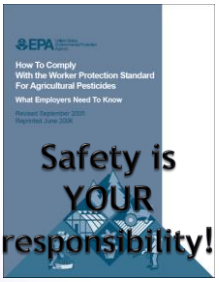

- Requires employers implement workplace practices designed to reduce or eliminate exposure to pesticides and establish procedures for responding to emergencies.

Background

## 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






Background

## WPS applies to…


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.



Background

## WPS applies when…

Any pesticide product is used on an **agricultural establishment** in the production of **agricultural plants**

- **Agricultural establishment =** forest, farm, field site, nursery, or greenhouse


Boom Sprayer


Aerial


Open Cab


Backpack Wand

- **Agricultural plants =** food, feed and fiber plants, trees, turf grass, flowers, shrubs, ornamentals and seedlings

Background

## WPS applies if…

- 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 mowing 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:**



## Program Elements


Background

Regulatory Changes


Worker


Handler

Regulatory Changes

## 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



Regulatory Changes

## Key Revisions to WPS

**Protect** workers, handlers and other people from exposure to pesticide

- 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



Regulatory Changes

## Key Revisions to WPS

**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 goes into effect this year? 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:**

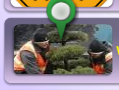
## Regulatory Changes Implementation Timeline

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

## Program Elements


Background

Regulatory Changes


Worker


Handler

Worker Training

## 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

## 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

## 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:**



## 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:**



Worker Training

## SENSOR Pesticide Surveillance Program[1]

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

[1]Calvert, G.M. et al. (2004). Acute occupational pesticide-related illness in the US, 1998-1999: Surveillance findings from the SENSOR-pesticides program. *American Journal of Industrial Medicine, 45*, 14-23.

Worker Training

## WSDH Annual Report[1]

### Washington State Greenhouse and Nursery Pesticide Exposure: 1995-1999

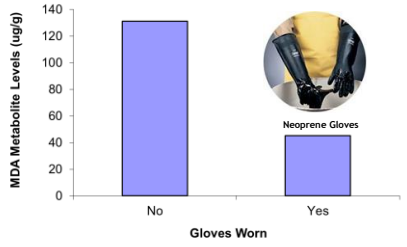
37% = Residues
24% = Applications
14% = Drift
10% = Mixing or loading
7% = Cleaning/fixing equipment
7% = Other

[1]Washington State Department of Health 2000-2001 Annual Report



Worker Training

## Protective Gloves and Malathion Metabolite Concentration in Urine of Farm Workers




Bradman, A., et al. (2008). Community-based intervention to reduce pesticide exposure to farmworkers and potential take-home exposure to their families. *Journal of Exposure Science and Environmental Epidemiology.*



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## Ability to Become Pregnant: Female Workers


Abell, A., Juul, S., & Bonde, J. P. (2000). Time to pregnancy among female green-house workers. *Scandinavian Journal of Work, Environment & Health*, *26*(2), 131-136.

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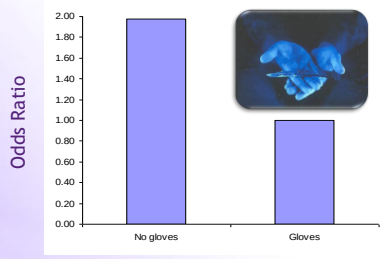
## Cancer in Children of Pesticide Applicators: Parent's Use of Chemically-Resistant Gloves

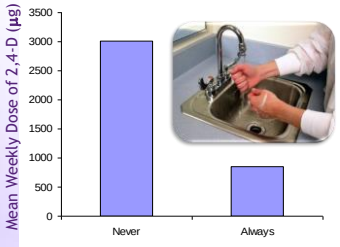



Flower, K.B., et al. (2004). Cancer risk and parental pesticide application in children of agricultural health study participants. *Environmental Health Perspectives, 112*, 631-635.



Worker Training

## Hand Washing Practices and Urine Concentration of 2,4-D in Turf Pesticide Applicators




Harris, S.A., et al. (2002). Development of models to predict dose of pesticides in professional turf applicators. *Journal of Exposure Analysis and Environmental Epidemiology, 12*, 130-144.



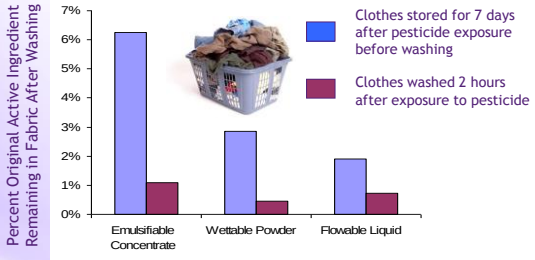
Worker Training

## Pesticide Residue in House Dust of Agricultural Families


McCauley, L.A., et al. (2003). Pesticide exposure and self reported home hygiene: Practices in agricultural families. *American Association of Occupational Health Nurses Journal, 51*, 113-119.

Worker Training

## Effect of Wash Delay on Carbaryl Residue in Polyester/Cotton Fabric




Fleeker, J. R., et al. (1988). Effect of formulation on removal of carbaryl and chlorothalonil from apparel fabrics by dry cleaning, aqueous extraction, and vaporization. In S. Z. Mansdorf, et al. (Eds.), *Performance of protective clothing: Second symposium, ASTM STP 989* (pp. 715-726). Philadelphia: ASTM.



## Knowledge Check

**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:**



Worker Training

## 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.

| Description | Acute | Chronic |
|---|---|---|
| Cause | Normal response to injury or medical condition | Often unknown or unrelated to medical findings |
| | Signal of tissue damage or underlying medical condition | Pain is often not a signal of harm |
| Duration | Short term | Lasts longer than three months |
| | Pain reduces as body heals | Pain often continues even after healing |
| Treatment | Often responds to traditional medical treatment | Minimal or no response to traditional medical treatment |
| Quality of life | Does not affect long-term quality of life | Often interferes with quality of life including sleep, work, recreational activities |
| | May or may not affect mood | Often accompanied by depression, anger and frustration. |

Worker Training

## Take-Home Contamination[1]

Two children in Florida, a brother and sister, died after playing on a swing made from a burlap sack that was heavily contaminated with parathion.

[1]DHHS (NIOSH) Pub. No. 95-123



## 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:**



Worker Training

## 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

Worker Training

## Biological Effects of Common Pesticides

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



Worker Training

## Allergic Sensitizations

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.



Worker Training

## Common Routes of Exposure

If the material is inhaled, the particles or mist settles in the respiratory tract. Some chemicals settle in the nose and throat, some go deeper into the lungs. The chemicals that go deeper in the lungs the potential for more damage. Fine dust usually goes deep into the lungs.

If the chemical contacts the skin, some chemicals are absorbed through the skin more easily than others. Also, some chemicals will have a direct effect on the skin without being absorbed through the skin. This is another good reason to wash your hands before eating or drinking.

If the chemical is ingested, some chemicals can be very readily absorbed.

If the chemical is splashed into the eyes or the hands contact the eyes, it can damage the eyes. The result, could be loss of sight.

## 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:**



Worker Training

## Dermal Exposure

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



- The importance of PPE and handwashing

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



Worker Training

## 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

Worker Training

## Do you recognize this area?

Worker Training

## Decontamination Area

Worker Training

## Application Records

Worker Training

## 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.



Worker Training

## 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 change into clean clothes.



Worker Training

## Conclusion

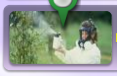
- This concludes the worker presentation.
- To receive your Certificate of Completion, you must complete the 10-question WPS Worker quiz. Your worker verification card will be send to you via campus mail.
- Please contact John H. Gamble at jhgamble@ksu.edu if you have questions or need additional information.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

## Program Elements


Background

Regulatory Changes


Worker


Handler

## 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

## 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

## 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

## 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

## Handler Training Elements (cont.)

10. Safe handling, transporting, storing and proper disposal of pesticides, including spill cleanup procedures
11. Environmental concerns – drift, runoff, habitat 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:**



Handler Training

## Pesticide Recordkeeping Requirements

Pesticide handlers are required to maintain records of their pesticide use applications in the field or in the greenhouses.

**Pesticide Application Record for** Kansas State University Horticulture Gre

(farm unit, business name, etc.)

| Year: 2004<br>Date: MO/DA<br>Time* | Crop or Commodity | Location* | Active Ingredient*<br>Brand or Product Name | EPA Registration Number* | # of Units or Acres | Total Amount of Product (ex., lb., pt., qt., gal. indicate) | Applicator Information | Restricted Re-entry Interval*<br>Duration (HOURS) | <br>Expiration (Mo/Da/Time) |
|---|---|---|---|---|---|---|---|---|---|
| 1-6-04<br>8:30-3:00 | | 102 C<br>102 D | Hydrogen dioxide<br>ZeroTol | 70 299-1 | | 1¼ oz/gal<br>8gal | Lea<br>Westervelt (wks) | 0 | 1-6-04<br>3:00 PM |
| 1-6-04<br>3:00-4:00 | | 104E<br>104F 101 N<br>104B | Imidacloprid<br>Marathon II | 3126-549<br>59807 | | 4¾ E/gal<br>1gal | Lea<br>Westervelt | 12 HR | 1-7-04<br>4:00AM |
| 1-6-04<br>3:15-3:45 | | 104 J | Hydrogen dioxide<br>ZeroTol | 70 299-1 | | 4oz/gal<br>4gal | Lea<br>Westervelt | 0 | 1-6-04<br>3:15-3:45 |
| 1-9-04<br>10:30-11:00 | | 104 J<br>102 G | Pendimethalin 0.1<br>Ultra Fine | 241-23-499 | | 1.5 #/gal<br>2gal | Lea<br>Westervelt | 4 HR | 1-9-04<br>8:00-3:00 |
| 1-12-04<br>4:00-4:50 | | 104L<br>104J 104D<br>104E | Spinosad A & D<br>Conserve SC | 62719-291 | | 11 oz/gal<br>3gal | Lea<br>Westervelt | 4 HR | 1-12-04<br>8:00-8:50 |
| 1-13-04<br>1:30-4:00 | | 104F 103 F<br>104C 102 E<br>104B 101 N | Imidacloprid<br>Marathon II | 3126-549-59807 | | 4¾ E/gal<br>1½gal | Lea<br>Westervelt | 12 HR | 1-14-04<br>1:30-4:00 |
| 1-16-04<br>1:30-2:30 | Geranium-tuff | 102 H<br>102 B | Spinosad A & D<br>Conserve SC | 62719-291 | | 4½ /gal<br>1gal | Lea<br>Westervelt | 4hr | 1-16-04<br>5:30 pm |
| 1-16-04<br>2:45-4:30 | Strawberry, Rhododen-dron, Geranium | 101 M<br>104 L<br>104 J<br>102 A, C | Triadimefon<br>Bayleton | EPA 264-RG-1 | | 4¼ /gal<br>2gal | Lea<br>Westervelt | 12 hr | 1-17-04<br>5 AM |
| 1-20-04<br>10:15-11:15 | Euonymus, Dogwood, Eucalyptus | 104 J<br>102 G | Paraffinic oil<br>Ultra Fine 07 | 862-23-499 | | 1.5 #/gal<br>2gal | Lea<br>Westervelt (Sam's) | 4hr | 1-20-04<br>4:00PM |
| 1-20-04<br>2:30-5 p.m. | | 104C 3120<br>104A 2105<br>104B 3105<br>104D 3120<br>104E 4:30<br>104F 4:20 | Bifenthrin<br>Talstar P | 279 - 3105 | | 2oz/10gal<br>12.5gal | Lea<br>Westervelt | 12 hr | 1221-04<br>5 a.m |

*Required for Worker Protection Standard, Central Area Information



To order call 1-800-382-8473 Order No. TR919

Handler Training

## Chemical Label Pictograms[1]

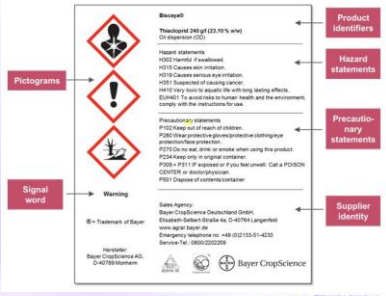
| Health Hazard | Flame | Exclamation Mark |
|---|---|---|
| • Carcinogen<br>• Mutagenicity<br>• Reproductive Toxicity<br>• Respiratory Sensitizer<br>• Target Organ Toxicity<br>• Aspiration Toxicity | • Flammables<br>• Pyrophorics<br>• Self-Heating<br>• Emits Flammable Gas<br>• Self-Reactives<br>• Organic Peroxides | • Irritant (skin and eye)<br>• Skin Sensitizer<br>• Acute Toxicity (harmful)<br>• Narcotic Effects<br>• Respiratory Tract Irritant<br>• Hazardous to Ozone Layer (Non Mandatory) |
| **Gas Cylinder** | **Corrosion** | **Exploding Bomb** |
| • Gases under Pressure | • Skin Corrosion/ burns<br>• Eye Damage<br>• Corrosive to Metals | • Explosives<br>• Self-Reactives<br>• Organic Peroxides |
| **Flame over Circle** | **Environment *(Non Mandatory)** | **Skull and Crossbones** |
| • Oxidizers | • Aquatic Toxicity | • Acute Toxicity (fatal or toxic) |

[1]OSHA: www.osha.gov/Publication/HazComm_Quickcard_Pictogram



Handler Training

## Chemical Labeling and Other Warnings






Handler Training

## Safety Data Sheet: Roundup

**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 |

Handler Training

## Safety Data Sheet: Roundup

| SDS Sections | Example Information |
|---|---|
| Accidental Release Measures | 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 |



Handler Training

## Safety Data Sheet: Roundup

| SDS Section | Example Information |
|---|---|
| Toxicological Information | NOAEL Toxicity: >20,000 mg/kg Diet |
| Ecological Information | $LC_{50}$ = 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 |



Handler Training

## PPE to Consider

Here's some other Personal Protective Equipment (PPE) you should consider wearing 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


Best Management Practices: Personal Protective Equipment

Handler Training

## 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?




Handler Training

## EPA Chemical Resistance Categories for Gloves

- 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.


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



Handler Training

## Latex Gloves

Do not use latex gloves for pesticide handling

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

Handler Training

## Natural Rubber and PVC Gloves

Slight or Moderate Chemical Resistance

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

Natural Rubber

PVC

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



Handler Training

## Neoprene and Nitrile Gloves

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

Neoprene

- Designed for chemical resistance to petrochemicals, oils, greases, pesticides and other agricultural chemicals.

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 pesticides? Choose all that apply.**

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

**ANSWER:**

## Handler Training 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.

## Handler Training 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)

| | Heavy Exposure | Limited Exposure |
|---|---|---|
| | Breakthrough Time in Minutes | Breakthrough Time in Minutes |
|  Best® Neoprene 6780 | 15 | NT |
|  Hustler™ 725R PVC | 30 | NT |
|  Nitri-Solve® 727 Nitrile | >480 | >240 |
|  N-DEX Plus® 8005 Nitrile Exam Glove | >480 | >240 |

## Knowledge Check

**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:**

CHEMREST Data Sheet For: ACETONE)

| | Heavy Exposure | Limited Exposure |
|---|---|---|
| | Breakthrough Time in Minutes | Breakthrough Time in Minutes |
|  Best® Neoprene 6780 | 35 | 43 |
|  Hustler™ 725R PVC | 7 | 14 |
|  Nitri-Solve® 727 Nitrile | 3 | 18 |
|  N-DEX Plus® 8005 Nitrile Exam Glove | NR | 6 |

## Knowledge Check

**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:**

## Handler Training Respirators

## Handler Training Other PPE

Donning: Personal Protective Equipment

Handler Training

## Mixing and Loading

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

- Back flow prevention
- Protect the environment
- Follow label directions
- Open containers
- Wear PPE

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79

Handler Training

## Transporting Pesticides

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 and
- Secure containers

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80

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## Leaking Pesticide 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

K-STATE Kansas State University

81

## Knowledge Check

**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:**



Handler Training

## Post Handling Tasks

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



Handler Training

## Pesticide Storage

When storing pesticides, keep them:

- In a locked cabinet or locked 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!

## Knowledge Check

**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:**



Handler Training

## Control and Contain Spills

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



Handler Training

## Clean-up the Spill

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 adsorbent 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

Handler Training

## Pesticide Fires

Chemical Characteristics:

- Pesticides may give off highly toxic vapors or smoke that may harm firefighters, nearby residents, animals, or plants
- Residues may be present in debris and soil
- Runoff from the fire site may be highly toxic

Actions:

- Call 911
- Contain with fog, foam, or dry powder if possible
- Contain the water and spilled chemicals
- Using water may lead to widespread contamination
- Build dikes to contain water if necessary

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



Handler Training

## People, Animals and Water Supplies

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



## Knowledge Check

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

A. Read the label
B. Contain by stopping the spill, 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:**

Handler Training

## Heat-Related Illnesses

- Heat Cramps
- Heat Exhaustion
- Heat Stroke



Handler Training

## 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



Handler Training

## Heat Exhaustion

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

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## 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



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## 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

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C. Poor physical condition
D. Work intensity
E. Humidity
F. Lack of acclimatization

**ANSWER:**

Handler Training

## 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 send to you via campus mail.
- Please contact John H. Gamble at jhgamble@ksu.edu if you have questions or need additional information.
- Other sources of information include: http://www.epa.gov/pesticide-worker-safety; http://www.ksre.k-state.edu/agsafe

# QUICK REFERENCE GUIDE TO THE WORKER PROTECTION STANDARD (WPS) AS REVISED IN 2015

The WPS is a federal regulation designed to protect agricultural workers (people employed in the production of agricultural plants) and pesticide handlers (people mixing, loading, or applying pesticides or doing certain tasks involving direct contact with pesticides). Each section links to the Code of Federal Regulations (40 CFR Part 170) for more information on the revised WPS. (www.ecfr.gov)

The guide summarizes the maximum requirements under the revised WPS. It does not include exemptions and exceptions that may allow you to do less. See the referenced sections below.

Exemptions (general) 170.303 (b) and 170.601

Exceptions for **workers** 170.401 (b) and 170.409 (a)(2)

Exceptions for early-entry **workers** during a restricted-entry interval 170.603

Exceptions for **handlers** 170.501 (b)

Exceptions to PPE required on pesticide labels 170.607

## Employer Responsibilities for Supervisors and Labor Contractors

Employers must provide sufficient information to supervisors and/or labor contractors to ensure compliance with the revised WPS. Specify:

- The tasks supervisors/labor contractors must do, and
- The information they must provide to workers/handlers.

Employers are liable for a penalty under FIFRA if a supervisor or labor contractor acting for them fails to comply with the revised WPS requirements. 170.309 (d), 170.313 (d), 170.317 (c)

# Duties for ALL Employers

These requirements apply to agricultural employers and commercial pesticide handler employers except the pesticide safety, application and hazard information requirements apply only to agricultural employers.

## Anti-Retaliation

Employers must not retaliate against a worker or handler who attempts to comply with the WPS, files a complaint, or provides information in an investigation of alleged WPS noncompliance. 170.315

## Minimum Age Requirements

1. Ensure that early-entry workers and all handlers are at least 18 years old. 170.309 (c) and 170.313 (c)

## Pesticide Safety, Application and Hazard Information

An agricultural employer must display or make certain information available on the establishment. Commercial pesticide handler employers do not have to comply with information display requirements.

1. Display or make available all of the information listed in #2 together in an easily accessible ("central") location on the agricultural establishment. 170.311 (a)(5) and 170.311 (b)(2)
2. The information includes:
   - EPA WPS safety poster or equivalent information, which must include some additional information by January 2, 2018, and must be kept current. 170.311 (a)
   - Application information that includes:
     - Product name, EPA registration number, and active ingredient
     - Crop or site treated, location and description of the treated area
     - Date, start and end times of the application, and duration of restricted-entry interval (REI). 170.311 (b)(1)
   - A copy of the safety data sheet (SDS) for the formulated product for each WPS-labeled pesticide applied. 170.309 and 170.311
3. In addition, display the EPA WPS safety poster (or equivalent) where decontamination supplies are located at permanent sites and where decontamination supplies are provided for 11 or more workers. 170.311 (a)(5)
4. Allow workers and handlers unrestricted access to all of the information and keep all of the displayed information current and legible. 170.311 (a)(6)-(7) and 170.311 (b)(3)-(4)
5. Display the EPA WPS safety poster or equivalent information before an application takes place and for 30 days after the REI expires. 170.309 (h)
6. Display the SDS and application information within 24 hours of the application and before workers enter treated areas. This information must be displayed for 30 days after the REI expires and kept in records on the agricultural establishment until 2 years after the REI expires. 170.309 (h)&(l) and 170.311 (b)(5)-(6)
7. Provide the SDS and application information upon request of a worker, handler, designated representative or medical personnel, within 15 days. 170.311 (b)(7)-(9)

## Pesticide Safety Training

Ensure that **workers** are trained before performing tasks in a pesticide treated area (REI in effect within the last 30 days). 170.401 (a) Ensure that **handlers** are trained before performing any handler activity. 170.501 (a) There is no grace period for worker or handler training.

1. Train workers and handlers annually. 170.401 (a) and 170.501 (a)
2. Present training using EPA-approved materials either orally from written materials or audio-visually. After January 2, 2018, the training must cover additional topics. 170.401 (c) and 170.501 (c)
3. Trainers must be certified applicators or have completed an EPA-approved train-the-trainer program or be designated by the State or Tribal pesticide enforcement agency. 170.401 (c)(4) and 170.501 (c)(4)
4. Training must be delivered in a manner the employees can understand, and the trainer must be present and respond to questions. 170.401 (c)(1) and 170.501 (c)(1)
5. Maintain training records on the establishment for two years from the training date for each worker and handler required to be trained on the agricultural establishment. 170.401 (d) and 170.501 (d)

Continued on next column

Separate from the pesticide safety training, employers must tell workers and handlers where to find the following on the worksite: EPA WPS safety poster (or equivalent), application information, SDSs and decontamination supplies. 170.403 and 170.503 (b)

## Decontamination Supplies

1. Establish accessible decontamination supplies located together within 1/4 mile of all **workers** (when required 170.411 (c)) and **handlers**. 170.411 and 170.509
   - 1 gallon of water per worker and 3 gallons of water per handler at the beginning of each work period for routine and emergency decontamination,
   - Plenty of soap and single-use towels, Note: hand sanitizers and wet towelettes are insufficient. 170.411 (b)(2) and 170.509 (b)(2)
   - A clean coverall (or other clean change of clothes) for handlers
2. Provide water that is safe and cool enough for washing, eye-flushing, and drinking. Do not use water that is also used for mixing pesticides unless steps are taken to ensure safety. 170.411 (b)(1)
3. Provide **handlers** with decontamination supplies where personal protective equipment (PPE) is removed at the end of a task. 170.509 (a)
4. Provide **handlers** with decontamination supplies at each mixing and loading site. 170.509 (c)(1)
5. When a product requires protective eyewear for **handlers**, and/or when using a closed system under pressure, provide the following in mixing and loading areas: a system that can deliver gently running water at 0.4 gallons per minute for at least 15 minutes or 6 gallons of water in containers suitable for providing a gentle eye-flush for about 15 minutes. 170.509 (d)(1)
6. When applying a product that requires protective eyewear, provide 1 pint of water per **handler** in portable containers that are immediately available to each handler. 170.509 (d)(2)
7. Do not put **worker** decontamination supplies in areas being treated or under an REI. 170.411 (d)
8. For **handlers**, decontamination supplies must be kept outside the treated area, or any area under an REI, unless they are protected from contamination in closed containers. 170.509 (c)(1)&(3)

## Employer Information Exchange

1. Before any application, commercial pesticide handler employers must make sure the owner/operator of an agricultural establishment where a pesticide will be applied, is aware of:
   - Location and description of area to be treated,
   - Date of application, estimated start time and estimated end time of the application,
   - Product name, EPA registration number, active ingredient(s), and REI,
   - Whether the product label requires both oral warnings and treated area posting,
   - All other safety requirements on labeling for workers or other people. 170.313 (i)
2. Owners/operators of agricultural establishments must make sure any commercial pesticide handler employer they hire is aware of:
   - Specific location and description of any treated areas where an REI is in effect that the commercial handler may be in or walk within 1/4 mile of, and,
   - Restrictions on entering those areas. 170.309 (k)

The commercial pesticide employer must pass this information along to the handler doing the work. 170.313 (h)

## Emergency Assistance

If there is reason to believe a worker or handler has been exposed to pesticides, during or within 72 hours of employment, and needs emergency medical treatment, employers must do the following:

1. Promptly make transportation available to an appropriate emergency medical facility.
2. Promptly provide to the treating medical personnel, information related to each pesticide product to which the person may have been exposed:
   - Safety Data Sheet
   - Product name, EPA registration number, and active ingredient(s).
   - Description of how the pesticide was used on the agricultural establishment.
   - Circumstances that could have resulted in exposure to the pesticide. 170.309 (f)

This is a summary of the requirements. It does not contain all the information to comply with the revised WPS. Refer to the regulations where indicated for complete details.

# Additional Duties for Worker Employers

These requirements apply to agricultural employers who employ workers.

## Restrictions During Applications 170.405 (a)-(b)

During pesticide applications, keep workers and everyone other than appropriately trained and equipped handlers out of the treated area (for all types of applications) and out of:

- The application exclusion zone (AEZ) for outdoor production, or
- A specified area that varies by the type of application until the ventilation criteria are met for enclosed space production.

## Restricted-Entry Intervals (REIs) 170.309 (l) and 170.407

Do not direct or allow any worker to enter or remain in the treated area until the REI has expired and all posted warning signs are removed or covered. Read the exceptions in 170.603.

## Notice About Applications 170.409 (a)

1. Orally warn workers **and** post treated areas if required by the pesticide labeling.
2. If not, post warning signs if the REI is **greater than**:
   - 48 hours for outdoor production or
   - 4 hours for enclosed space production.
3. For all other applications, **either** orally warn workers or post warning signs.

## Posted Warning Signs 170.409 (b)

1. Post legible 14" x 16" WPS-design warning signs no more than 24 hours prior to an application; keep posted during REI; remove or cover before workers enter and within 3 days after the end of the REI. 170.409 (b)(1)-(3)
2. Post signs so they can be seen at all reasonably expected entrances to treated areas. 170.409 (b)(3)(ii)
3. Warning signs can be smaller than 14" x 16" under certain conditions. All warning signs must meet specific requirements. 170.409 (b)

## Oral Warnings 170.409 (c)

1. Before each application, tell workers who are on the establishment (in a manner they can understand):
   - Location and description of treated area,
   - Date and times entry is restricted
   - AEZ, REI, and not to enter during REI.
2. Workers who enter the establishment after application starts must receive the same warning at the start of their work period.

# Additional Agricultural Employer Duties

Before allowing persons not directly employed by the establishment to clean, repair, or adjust pesticide application equipment, provide the following information:

- The equipment may be contaminated with pesticides.
- The potentially harmful effects of pesticide exposure.
- How to handle equipment to limit exposure to pesticides.
- How to wash themselves and/or their clothes to remove and prevent exposure to pesticide residues. 170.309 (g) and 170.313 (i)

# Additional Duties for Handler Employers

These requirements apply to commercial pesticide handler employers and agricultural employers who employ handlers.

## Application Restrictions and Monitoring 170.505

1. Do not allow handlers to apply a pesticide so that it contacts, directly or through drift, anyone other than appropriately trained and equipped handlers.
2. Handlers must suspend applications when anyone other than appropriately trained and equipped handlers enter the application exclusion zone (AEZ). This goes into effect on January 2, 2018. 170.505 (b)
3. When anyone is handling a highly toxic pesticide with a skull and crossbones, maintain sight or voice contact every two hours.
4. Make sure a trained handler equipped with labeling-specific PPE maintains constant voice or visual contact with any handler in an enclosed-space production site (e.g., greenhouses, high tunnels, indoor grow houses) while applying a fumigant.

## Specific Instructions for Handlers

1. Before handlers do any handling task, inform them, in a manner they can understand, of all pesticide labeling instructions for safe use. 170.503 (a)(1)
2. Ensure that the handler has access to product labeling during the entire handling task. 170.503 (a)(2)

## Equipment Safety

1. Inspect pesticide handling equipment before each day of use, and repair or replace as needed. 170.309 (j) and 170.313 (g)
2. Allow only appropriately trained and equipped handlers to repair, clean, or adjust pesticide equipment that contains pesticides or residues, unless they are not employed on the establishment. 170.309 (g) and 170.507 (a) See Additional Agricultural Employer Duties for information regarding non-employed persons.

## Personal Protective Equipment (PPE) Handlers Must Use

1. Provide handlers with the PPE required by the pesticide labeling, and be sure it is: 170.507 (b)
   - Clean and in operating condition, 170.507 (b)
   - Worn and used according to the manufacturer's instructions, 170.507 (c)
   - Inspected before each day of use, 170.507 (c)(2)
   - Repaired or replaced as needed. 170.507 (c)(2)
2. When a respirator is required by product labeling, provide handlers with:
   - A medical evaluation to ensure the handler is physically able to safely wear the respirator,
   - Training in respirator use, and
   - A fit test to ensure the respirator fits correctly.
   - Keep records on the establishment of these items for two years. 170.507 (b)(10)
3. Take steps to avoid heat-related illness when labeling requires the use of PPE for a handler activity. 170.507 (e)
4. Provide handlers a pesticide-free area for:
   - Storing personal clothing not in use,
   - Putting on PPE at start of task,
   - Taking off PPE at end of task. 170.507 (d)(9)
5. Do not allow used PPE to be taken home. 170.507 (d)(10)

## Care of PPE

1. Store and wash used PPE separately from other clothing and laundry. 170.507 (d)(3)
2. If PPE will be reused, clean it before each day of reuse, according to the instructions from the PPE manufacturer unless the pesticide labeling specifies other requirements. If there are no other instructions, wash in detergent and hot water. 170.507 (d)(1)
3. Dry the clean PPE before storing. 170.507 (d)(4)
4. Store clean PPE away from personal clothing and apart from pesticide-contaminated areas. 170.507 (d)(5)

## Replacing Respirator Purifying Elements

1. Replace particulate filters or filtering facepiece respirators when any following condition is met:
   - When breathing becomes difficult,
   - When the filter is damaged or torn,
   - When the respirator label or pesticide label requires it,
   - After 8 total hours of use, in the absence of any other instructions or indications of service life. 170.507 (d)(6)
2. Replace vapor-removing cartridges/canisters when any following condition is met:
   - When odor/taste/irritation is noticed,
   - When the respirator label or pesticide label requires it (whichever is shorter),
   - When breathing resistance becomes excessive,
   - After 8 total hours of use, in the absence of any other instructions or indications of service life. 170.507 (d)(7)

## Disposal of PPE

1. Discard, do not clean, coveralls and other absorbent materials that are heavily contaminated with pesticide having a signal word "DANGER" or "WARNING." When discarding PPE, ensure that it is unusable as apparel or made unavailable for further use.
2. Follow federal, state, and local laws when disposing of PPE that cannot be cleaned correctly. 170.507 (d)(2)

## Instructions for People Who Clean PPE 170.507 (d)(8)

The handler employer must inform people who clean or launder PPE:

- That PPE may be contaminated with pesticides,
- Of the potential for harmful effects of exposure to pesticides,
- How to protect themselves when handling PPE,
- How to clean PPE correctly, and
- Decontamination procedures to follow after handling contaminated PPE.

EPA United States Environmental Protection Agency
epa.gov

PERC Pesticide Educational Resources Collaborative
pesticideresources.org

This was developed under cooperative agreement #X8-83616301.
EPA-305-B-16-001

Pesticides: Health and Safety

**EPA Chemical Resistance Category Chart**

| **Selection Category Listed on Pesticide Label** | **Types of Personal Protective Material** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Barrier Laminate | Butyl Rubber ≥ 14 mils | Nitrile Rubber ≥ 14 mils | Neoprene Rubber ≥ 14 mils | Natural Rubber ≥ 14 mils | Polyethelene | Polyvinyl Chloride (PVC) ≥ 14 mils | Viton ≥ 14 mils |
| A( a dry and water- based formulation) | high | high | high | high | high | high | high | high |
| B | high | high | slight | slight | none | slight | slight | slight |
| C | high | high | high | high | moderate | moderate | high | high |
| D | high | high | moderate | moderate | none | none | none | slight |
| E | high | slight | high | high | slight | none | moderate | high |
| F | high | high | high | moderate | slight | none | slight | high |
| G | high | slight | slight | slight | none | none | none | high |
| H | high | slight | slight | slight | none | none | none | high |

**HIGH**: Highly chemical-resistant. Clean or replace PPE at end of each day's 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 ten minutes of contact.
**NONE**: No chemical-resistance. Do not wear this type of material as PPE when contact is possible.

**Entry-Restricted Areas in Nurseries During Pesticide Applications**
http://www.epa.gov/oppfead1/safety/workers/equip.htm

# MONSANTO COMPANY

Safety Data Sheet
Commercial Product

## 1. PRODUCT AND COMPANY IDENTIFICATION

**Product name**
**Roundup PowerMAX[TM] Herbicide**

**EPA Reg. No.**
524-549
**Chemical name**
Not applicable.
**Synonyms**
None.
**Company**
MONSANTO COMPANY, 800 N. Lindbergh Blvd., St. Louis, MO, 63167
**Telephone:** 800-332-3111, **Fax:** 314-694-5557
**E-mail:** TS-SAFETYDATASHEET@DOMINO.MONSANTO.COM
**Emergency numbers**
FOR CHEMICAL EMERGENCY, SPILL LEAK, FIRE, EXPOSURE, OR ACCIDENT Call CHEMTREC - Day or Night: 1-800-424-9300 toll free in the continental U.S., Puerto Rico, Canada, or Virgin Islands. For calls originating elsewhere: 703-527-3887 (collect calls accepted).
FOR MEDICAL EMERGENCY - Day or Night: +1 (314) 694-4000 (collect calls accepted).

## 2. HAZARDS IDENTIFICATION

**Emergency overview**
**Appearance and odour (colour/form/odour):** Amber - Brown / Liquid / Odourless

CAUTION!
CAUSES MODERATE EYE IRRITATION

**Potential health effects**
**Likely routes of exposure**
Skin contact, eye contact, inhalation
**Eye contact, short term**
May cause temporary eye irritation.
**Skin contact, short term**
Not expected to produce significant adverse effects when recommended use instructions are followed.
**Inhalation, short term**
Not expected to produce significant adverse effects when recommended use instructions are followed.

Refer to section 11 for toxicological and section 12 for environmental information.

**OSHA Status**
This product is hazardous according to the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

**Active ingredient**
Potassium salt of N-(phosphonomethyl)glycine; {Potassium salt of glyphosate}

**Composition**

| COMPONENT | CAS No. | % by weight (approximate) |
|---|---|---|
| Potassium salt of glyphosate | 70901-12-1 | 48.7 |
| Other ingredients | | 51.3 |

The specific chemical identity is being withheld because it is trade secret information of Monsanto Company.

## 4. FIRST AID MEASURES

Use personal protection recommended in section 8.

**Eye contact**
If in eyes, hold eye open and rinse slowly and gently for 15-20 minutes. Remove contact lenses, if present, after first 5 minutes, then continue rinsing.

**Skin contact**
Take off contaminated clothing, wristwatch, jewellery.
Wash affected skin with plenty of water.
Continue for at least 15 minutes.

**Inhalation**
If inhaled, move person to fresh air. If person is not breathing, call emergency number or ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible.

**Ingestion**
Immediately offer water to drink.
Do NOT induce vomiting unless directed by medical personnel.
If symptoms occur, get medical attention.

**Advice to doctors**
This product is not an inhibitor of cholinesterase.

**Antidote**
Treatment with atropine and oximes is not indicated.

## 5. FIRE-FIGHTING MEASURES

**Flash point**
Does not flash.

**Extinguishing media**
Recommended: Water, foam, dry chemical, carbon dioxide (CO2)

**Unusual fire and explosion hazards**
Minimise use of water to prevent environmental contamination.
Environmental precautions: see section 6.

**Hazardous products of combustion**
Carbon monoxide (CO), phosphorus oxides (PxOy), nitrogen oxides (NOx)

**Fire fighting equipment**
Self-contained breathing apparatus.
Equipment should be thoroughly decontaminated after use.

## 6. ACCIDENTAL RELEASE MEASURES

**Personal precautions**

Use personal protection recommended in section 8.

**Environmental precautions**
Minimise spread.
Contain spillage with sand bags or other means.
Keep out of drains, sewers, ditches and water ways.

**Methods for cleaning up**
SMALL QUANTITIES:
Flush spill area with water.
LARGE QUANTITIES:
Absorb in earth, sand or absorbent material.
Dig up heavily contaminated soil.
Collect in containers for disposal.
Refer to section 7 for types of containers.
Flush residues with small quantities of water.
Minimise use of water to prevent environmental contamination.

Refer to section 13 for disposal of spilled material.
Use handling recommendations in Section 7 and personal protection recommendations in Section 8.

## 7. HANDLING AND STORAGE

Good industrial practice in housekeeping and personal hygiene should be followed.

**Handling**
Avoid contact with eyes, skin and clothing.
When using do not eat, drink or smoke.
Wash hands thoroughly after handling or contact.
Do not contaminate drains, sewers and water ways when disposing of equipment rinse water.
Thoroughly clean equipment after use.
Refer to section 13 of the safety data sheet for disposal of rinse water.
Wash contaminated clothing before re-use.
Emptied containers retain vapour and product residue.
FOLLOW LABELLED WARNINGS EVEN AFTER CONTAINER IS EMPTIED.

**Storage**
Compatible materials for storage: stainless steel, fibreglass, plastic; glass lining
Incompatible materials for storage: galvanised steel, unlined mild steel, see section 10.
Keep out of reach of children.
Keep away from food, drink and animal feed.
Keep only in the original container.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**Airborne exposure limits**

| Components | Exposure Guidelines |
|---|---|
| Potassium salt of glyphosate | No specific occupational exposure limit has been established. |
| Other ingredients | No specific occupational exposure limit has been established. |

**Engineering controls**
No special requirement when used as recommended.

**Eye protection**

If there is significant potential for contact:
Wear chemical goggles.

**Skin protection**
Wear chemical resistant gloves.
If there is significant potential for contact:
Wear face shield.
Wear chemical resistant clothing/footwear.
Applicators and other handlers must wear:
Wear long sleeved shirt, long pants and shoes with socks.
Follow manufacturer's instructions for cleaning/maintaining Personal Protective Equipment.
If no such instructions for washables, use detergent and hot water.

**Respiratory protection**
No special requirement when used as recommended.

When recommended, consult manufacturer of personal protective equipment for the appropriate type of equipment for a given application.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

These physical data are typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specifications for the product.

| | |
|---|---|
| Colour/colour range: | Amber - Brown |
| Odour: | Odourless |
| Form: | Liquid |
| Physical form changes (melting, boiling, etc.): | |
| Melting point: | Not available. |
| Boiling point: | Not available. |
| Flash point: | Does not flash. |
| Explosive properties: | No data. |
| Auto ignition temperature: | No data. |
| Specific gravity: | 1.356 |
| Vapour pressure: | Not applicable. |
| Vapour density: | Not applicable. |
| Evaporation rate: | No data. |
| Dynamic viscosity: | Not available. |
| Kinematic viscosity: | Not available. |
| Density: | Not available. |
| Solubility: | Water: Completely miscible. |
| pH: | 4.7 |
| Partition coefficient: | log Pow: -3.2 @ 25 °C (glyphosate) |

## 10. STABILITY AND REACTIVITY

**Stability**
Stable under normal conditions of handling and storage.

**Oxidizing properties**
No data.

**Materials to avoid/Reactivity**
Reacts with galvanised steel or unlined mild steel to produce hydrogen, a highly flammable gas that could explode.

**Hazardous decomposition**
Thermal decomposition: Hazardous products of combustion: see section 5.

**Self-accelerating decomposition temperature (SADT)**
No data.

## 11. TOXICOLOGICAL INFORMATION

This section is intended for use by toxicologists and other health professionals.

Data obtained on product, similar products and on components are summarized below.

**Skin irritation**
**Rabbit, 3 animals, OECD 404 test**:
Days to heal: 7
Primary Irritation Index (PII): 1.9/8.0
Slight irritation.
FIFRA category IV.

**Eye irritation**
**Rabbit, 3 animals, OECD 405 test**:
Days to heal: 10
Moderate irritation.
FIFRA category III.

**Similar formulation**

**Acute oral toxicity**
**Rat, LD50**: > 5,000 mg/kg body weight
Practically non-toxic.
FIFRA category IV.

**Acute dermal toxicity**
**Rat, LD50**: > 5,000 mg/kg body weight
Practically non-toxic.
FIFRA category IV.

**Acute inhalation toxicity**
**Rat, LC50, 4 hours, aerosol**:
Practically non-toxic.
FIFRA category IV.
No 4-hr LC50 at the maximum tested concentration. For purposes of the inhalation test, product was artificially aerosolized. Since this material will not become aerosolized to a hazardous concentration during transport, it is classified as non-hazardous under the transportation regulations in accordance with 2.6.2.2.4.7(b) and (c) of the UN Recommendations on the Transport of Dangerous Goods.

**Skin sensitization**
**Guinea pig, 3-induction Buehler test**:
Positive incidence: 0 %

**N-(phosphonomethyl)glycine; {glyphosate}**

**Mutagenicity**
**In vitro and in vivo mutagenicity test(s)**:
Not mutagenic.

**Repeated dose toxicity**
**Rabbit, dermal, 21 days**:
NOAEL toxicity: > 5,000 mg/kg body weight/day
Target organs/systems: none
Other effects: none

**Rat, oral, 3 months**:
NOAEL toxicity: > 20,000 mg/kg diet
Target organs/systems: none
Other effects: none

**Chronic effects/carcinogenicity**

**Mouse, oral, 24 months**:
NOAEL toxicity: ~ 5,000 mg/kg diet
Target organs/systems: liver
Other effects: decrease of body weight gain, histopathologic effects
NOEL tumour: > 30,000 mg/kg diet
Tumours: none

**Rat, oral, 24 months**:
NOAEL toxicity: ~ 8,000 mg/kg diet
Target organs/systems: eyes
Other effects: decrease of body weight gain, histopathologic effects
NOEL tumour: > 20,000 mg/kg diet
Tumours: none

**Toxicity to reproduction/fertility**

**Rat, oral, 2 generations**:
NOAEL toxicity: 10,000 mg/kg diet
NOAEL reproduction: > 30,000 mg/kg diet
Target organs/systems in parents: none
Other effects in parents: decrease of body weight gain
Target organs/systems in pups: none
Other effects in pups: decrease of body weight gain
Effects on offspring only observed with maternal toxicity.

**Developmental toxicity/teratogenicity**

**Rat, oral, 6 - 19 days of gestation**:
NOAEL toxicity: 1,000 mg/kg body weight
NOAEL development: 1,000 mg/kg body weight
Other effects in mother animal: decrease of body weight gain, decrease of survival
Developmental effects: weight loss, post-implantation loss, delayed ossification
Effects on offspring only observed with maternal toxicity.

**Rabbit, oral, 6 - 27 days of gestation**:
NOAEL toxicity: 175 mg/kg body weight
NOAEL development: 175 mg/kg body weight
Target organs/systems in mother animal: none
Other effects in mother animal: decrease of survival
Developmental effects: none

## 12. ECOLOGICAL INFORMATION

This section is intended for use by ecotoxicologists and other environmental specialists.

Data obtained on similar products and on components are summarized below.

**Similar formulation**

**Aquatic toxicity, fish**

**Bluegill sunfish (Lepomis macrochirus):**
Acute toxicity, 96 hours, static, LC50: 5.2 mg/L
Moderately toxic.

**Common carp (Cyprinus carpio):**
Acute toxicity, 96 hours, static, LC50: 4.0 mg/L
Moderately toxic.

**Aquatic toxicity, invertebrates**

**Water flea (Daphnia magna):**
Acute toxicity, 48 hours, static, EC50: 8.0 mg/L
Moderately toxic.

**Similar formulation**

**Aquatic toxicity, algae/aquatic plants**
**Green algae (Selenastrum capricornutum):**
Acute toxicity, 72 hours, static, EC50: 0.46 mg/L
Highly toxic.
**Arthropod toxicity**
**Honey bee (Apis mellifera):**
Oral, 48 hours, LD50: > 281 µg/bee
Practically non-toxic.
**Honey bee (Apis mellifera):**
Contact, 48 hours, LD50: > 273 µg/bee
Practically non-toxic.
**Soil organism toxicity, invertebrates**
**Earthworm (Eisenia foetida):**
Acute toxicity, 14 days, LC50: > 10,000 mg/kg dry soil
Practically non-toxic.
**Soil organism toxicity, microorganisms**
**Nitrogen and carbon transformation test:**
29.5 kg/ha, 28 days: Less than 25% effect on nitrogen or carbon transformation processes in soil.

**N-(phosphonomethyl)glycine; {glyphosate}**

**Avian toxicity**
**Bobwhite quail (Colinus virginianus):**
Dietary toxicity, 5 days, LC50: > 4,640 mg/kg diet
No more than slightly toxic.
**Mallard duck (Anas platyrhynchos):**
Dietary toxicity, 5 days, LC50: > 4,640 mg/kg diet
No more than slightly toxic.
**Bobwhite quail (Colinus virginianus):**
Acute oral toxicity, single dose, LD50: > 3,851 mg/kg body weight
Practically non-toxic.
**Bioaccumulation**
**Bluegill sunfish (Lepomis macrochirus):**
Whole fish: BCF: < 1
No significant bioaccumulation is expected.
**Dissipation**
**Soil, field:**
Half life: 2 - 174 days
Koc: 884 - 60,000 L/kg
Adsorbs strongly to soil.
**Water, aerobic:**
Half life: < 7 days

## 13. DISPOSAL CONSIDERATIONS

**Product**
Keep out of drains, sewers, ditches and water ways.
Recycle if appropriate facilities/equipment available.
Burn in proper incinerator.
Follow all local/regional/national/international regulations.

**Container**
See the individual container label for disposal information.
Emptied containers retain vapour and product residue.
Observe all labelled safeguards until container is cleaned, reconditioned or destroyed.
Empty packaging completely.
Triple or pressure rinse empty containers.
Do NOT contaminate water when disposing of rinse waters.
Ensure packaging cannot be reused.
Do NOT re-use containers.
Store for collection by approved waste disposal service.
Recycle if appropriate facilities/equipment available.
Follow all local/regional/national/international regulations.

Use handling recommendations in Section 7 and personal protection recommendations in Section 8.

## 14. TRANSPORT INFORMATION

The data provided in this section is for information only. Please apply the appropriate regulations to properly classify your shipment for transportation.

This product is not hazardous under the applicable DOT, ICAO/IATA, or IMDG regulations.

## 15. REGULATORY INFORMATION

**TSCA Inventory**
Exempt

**OSHA Hazardous Components**
Surfactant(s)

**SARA Title III Rules**
Section 311/312 Hazard Categories
Immediate
Section 302 Extremely Hazardous Substances
Not applicable.
Section 313 Toxic Chemical(s)
Not applicable.

**CERCLA Reportable quantity**
Not applicable.

## 16. OTHER INFORMATION

The information given here is not necessarily exhaustive but is representative of relevant, reliable data.
Follow all local/regional/national/international regulations.
Please consult supplier if further information is needed.
In this document the British spelling was applied.
|| Significant changes versus previous edition.

| | Health | Flammability | Instability | Additional Markings |
|---|---|---|---|---|
| NFPA | 1 | 1 | 1 | |

0 = Minimal hazard, 1 = Slight hazard, 2 = Moderate hazard, 3 = Severe hazard, 4 = Extreme hazard

Full denomination of most frequently used acronyms. BCF (Bioconcentration Factor), BOD (Biochemical Oxygen Demand), COD (Chemical Oxygen Demand), EC50 (50% effect concentration), ED50 (50% effect dose), I.M. (intramuscular), I.P. (intraperitoneal), I.V. (intravenous), Koc (Soil adsorption coefficient), LC50 (50% lethality concentration), LD50 (50% lethality dose), LDLo (Lower limit of lethal dosage), LEL (Lower

Explosion Limit), LOAEC (Lowest Observed Adverse Effect Concentration), LOAEL (Lowest Observed Adverse Effect Level), LOEC (Lowest Observed Effect Concentration), LOEL (Lowest Observed Effect Level), MEL (Maximum Exposure limit), MTD (Maximum Tolerated Dose), NOAEC (No Observed Adverse Effect Concentration), NOAEL (No Observed Adverse Effect Level), NOEC (No Observed Effect Concentration), NOEL (No Observed Effect Level), OEL (Occupational Exposure Limit), PEL (Permissible Exposure Limit), PII (Primary Irritation Index), Pow (Partition coefficient n-octanol/water), S.C. (subcutaneous), STEL (Short-Term Exposure Limit), TLV-C (Threshold Limit Value-Ceiling), TLV-TWA (Threshold Limit Value - Time Weighted Average), UEL (Upper Explosion Limit)

This Material Safety Data Sheet (MSDS) serves different purposes than and DOES NOT REPLACE OR MODIFY THE EPA-APPROVED PRODUCT LABELING (attached to and accompanying the product container). This MSDS provides important health, safety, and environmental information for employers, employees, emergency responders and others handling large quantities of the product in activities generally other than product use, while the labeling provides that information specifically for product use in the ordinary course. Use, storage and disposal of pesticide products are regulated by the EPA under the authority of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) through the product labeling, and all necessary and appropriate precautionary, use, storage, and disposal information is set forth on that labeling. It is a violation of federal law to use a pesticide product in any manner not prescribed on the EPA-approved label.

Although the information and recommendations set forth herein (hereinafter "Information") are presented in good faith and believed to be correct as of the date hereof, MONSANTO Company or any of its subsidiaries makes no representations as to the completeness or accuracy thereof. Information is supplied upon the condition that the persons receiving same will make their own determination as to its suitability for the purposes prior to use. In no event will MONSANTO Company or any of its subsidiaries be responsible for damages of any nature whatsoever resulting from the use of or reliance upon information. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR TO THE PRODUCT TO WHICH INFORMATION REFERS.

OSHA® QUICK CARD™

# Protecting Workers from Heat Stress

## Heat Illness

Exposure to heat can cause illness and death. The most serious heat illness is heat stroke. Other heat illnesses, such as heat exhaustion, heat cramps and heat rash, should also be avoided.

There are precautions your employer should take any time temperatures are high and the job involves physical work.

## Risk Factors for Heat Illness

- High temperature and humidity, direct sun exposure, no breeze or wind
- Low liquid intake
- Heavy physical labor
- Waterproof clothing
- No recent exposure to hot workplaces

## Symptoms of Heat Exhaustion

- Headache, dizziness, or fainting
- Weakness and wet skin
- Irritability or confusion
- Thirst, nausea, or vomiting

## Symptoms of Heat Stroke

- May be confused, unable to think clearly, pass out, collapse, or have seizures (fits)
- May stop sweating

## To Prevent Heat Illness, Your Employer Should

- Establish a complete heat illness prevention program.
- Provide training about the hazards leading to heat stress and how to prevent them.
- Provide a lot of cool water to workers close to the work area. At least one pint of water per hour is needed.

U.S. Department of Labor

For more information:

OSHA® Occupational Safety and Health Administration

www.osha.gov (800) 321-OSHA (6742)

OSHA 3154-06R 2014

OSHA® QUICK CARD™

- Modify work schedules and arrange frequent rest periods with water breaks in shaded or air-conditioned areas.
- Gradually increase workloads and allow more frequent breaks for workers new to the heat or those that have been away from work to adapt to working in the heat (acclimatization).
- Routinely check workers who are at risk of heat stress due to protective clothing and high temperature.
- Consider protective clothing that provides cooling.

## How You Can Protect Yourself and Others

- Know signs/symptoms of heat illnesses; monitor yourself; use a buddy system.
- Block out direct sun and other heat sources.
- Drink plenty of fluids. Drink often and BEFORE you are thirsty. Drink water every 15 minutes.

- Avoid beverages containing alcohol or caffeine.
- Wear lightweight, light colored, loose-fitting clothes.

## What to Do When a Worker is Ill from the Heat

- Call a supervisor for help. If the supervisor is not available, call 911.
- Have someone stay with the worker until help arrives.
- Move the worker to a cooler/shaded area.
- Remove outer clothing.
- Fan and mist the worker with water; apply ice (ice bags or ice towels).
- Provide cool drinking water, if able to drink.

**IF THE WORKER IS NOT ALERT or seems confused, this may be a heat stroke. CALL 911 IMMEDIATELY and apply ice as soon as possible.**

**If you have any questions or concerns, call OSHA at 1-800-321-OSHA (6742).**

U.S. Department of Labor

For more information:

OSHA® Occupational Safety and Health Administration

www.osha.gov (800) 321-OSHA (6742)

# Pesticide Application Record for _____

(farm unit, business name, etc.)

| Year: _____ Date: MO/DA Time* | Crop and Target Pest | Location* | Wind Speed/ Direction/ Temp. | Active Ingredient* _____ Brand or Product Name | EPA Registration Number* | # of Units or Acres | Total Amount of Product (oz., lb., pt., (qt., gal. indicator) | Applicator Information | Restricted Re-entry Interval* | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Duration (HOURS) | Expiration (Mo/Da/Time) |
| | | | | | | | | | | |
| | | | | | | | | | | |
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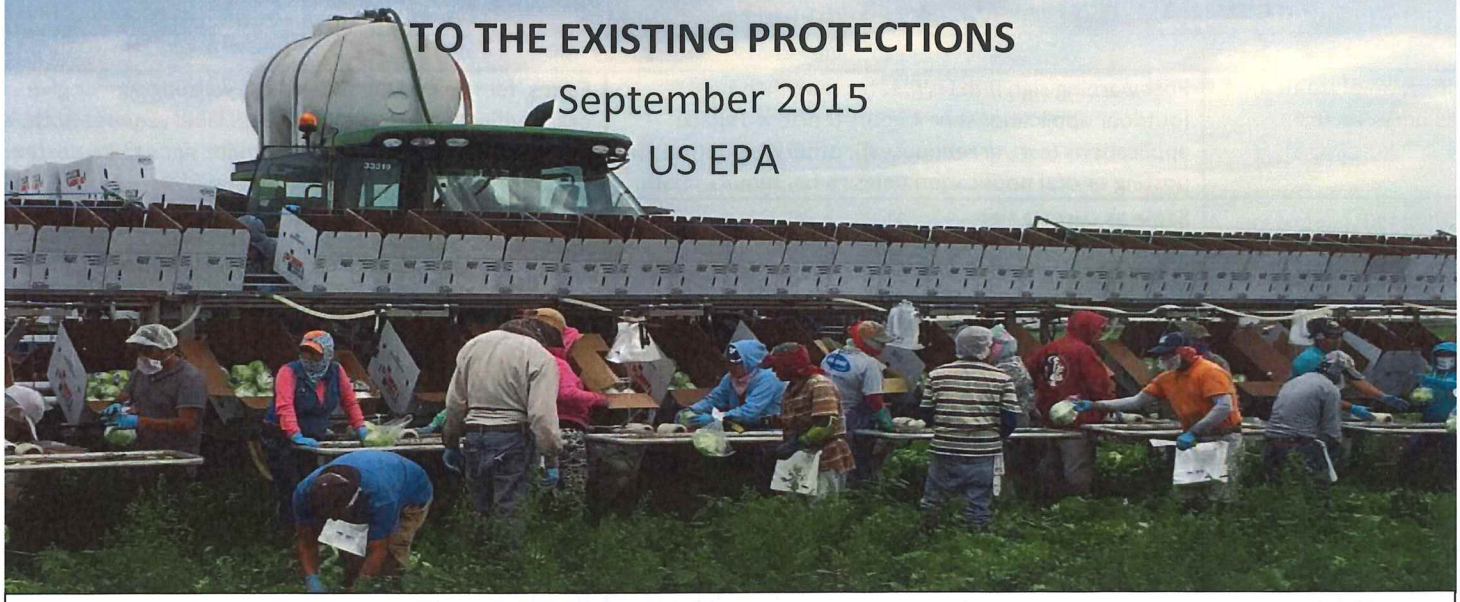
*Required for Worker Protection Standard, Central Area Information

# AGRICULTURAL WORKER PROTECTION STANDARD (WPS)

## COMPARISON OF THE NEW PROTECTIONS TO THE EXISTING PROTECTIONS

September 2015

US EPA



This table summarizes key provisions in the EPA's current WPS regulation and the 2015 revisions. It does not cover all of the details in the rule nor does it include all of the information needed to comply with the regulation.

| Requirement | New 2015 Provision | Current Provision |
|---|---|---|
| **Training** | | |
| Frequency of full training for workers and handlers | Annual training. | Every 5 years. |
| Training grace period for worker training | No grace period. Workers must be trained before they work in an area where a pesticide has been used or a restricted-entry interval has been in effect in the past 30 days. | 5-day grace period with abbreviated training. |
| Qualifications for trainers of workers | Certified applicators, State/Tribal/Federal approved trainers, and persons who have completed an EPA-approved train-the-trainer course. | Handlers, certified applicators, State/Tribal/Federal approved trainers, and persons completing an approved train-the-trainer course. |
| Expand training content for workers and handlers | Keep existing and expand content. Final worker training topics expanded to 23 items, and handler training expanded to 36 items. Training on new content not required until 2 years from effective date of final rule. | 11 basic training items for workers and 13 items for handlers. Minimal training on reducing take-home exposure, reporting use violations, and prohibition from employer retaliation. |
| Recordkeeping of training | Keep records for 2 years. Give copy of record of training to workers and handlers upon their request. | No recordkeeping of training. Voluntary verification card system. |
| **Hazard Communication** | | |
| Content and availability of hazard communications materials | Employer must display application information and safety data sheets (SDSs) at central location within 24 hours of end of application and before workers enter that treated area. Display both for 30 days after REI expires. Keep application information and SDS for 2 years from end of REI and make available to workers, handlers, designated representatives (identified in writing) or treating medical personnel upon request. | Employer must display application-specific information at a central location before application occurs, or, if no workers or handlers are on the establishment, before next period workers/handlers are on establishment. Keep posted for 30 days after REI expires. No recordkeeping. |

| Requirement | New 2015 Provision | Current Provision |
|---|---|---|
| **Notification of Treated Areas** | | |
| Notification of treated areas under an REI | Post warning sign if REI is greater than 48 hours (outdoor applications) or 4 hours (enclosed space applications (e.g., greenhouses)), otherwise option for posting or oral notification unless label requires both. | Farms, forests and nurseries: Post warning sign or give oral notification for any REI, unless label requires both. Greenhouses: all applications require signs to be posted. |
| Warning sign | Same as current sign. | Red circle containing stern-faced man with upraised hand. At the top: "DANGER" and "PELIGRO", "PESTICIDES", "PESTICIDAS". At the bottom: "KEEP OUT", "NO ENTRE." |
| Information exchange between handler employer and agricultural employer | Agricultural employer must provide application information on treated areas the handler may be in (or walk within ¼ mile of). Handler employer must notify before the application begins for certain changes and within 2 hours of end of application for most other changes, unless only change was less than 1 hour difference in application time. | Agricultural employer must provide application information on treated areas the handler may be in (or walk within ¼ mile of). Handler employer must notify of changes to application plans before application begins. |
| **Minimum Age** | | |
| Minimum age for handlers and early-entry workers | Handlers and early-entry workers must be at least 18 years old.<br>(Members of owner's immediate family are exempt from this and most other requirements of the WPS.) | No minimum age. |
| **Entry Restrictions During Application for Outdoor Production** | | |
| Ag employers must prohibit entry in areas during application for outdoor production. (Restrictions for greenhouses/enclosed space production are different.) | All outdoor production: No entry into treated area or the application exclusion zone, which is an area up to 100 feet area around the application equipment during pesticide application on farms, forests and nurseries. Size of the application exclusion zone depends on type of application. Revised descriptions of application methods. | Farms and forests: No entry into treated area.<br>Nurseries: No entry into treated area or an area up to 100 feet around the treated area, where the size of the additional area depends on type of application. |
| **Handler Suspend Application** | | |
| Handler (applicator) must suspend application in certain circumstances | Handler must apply pesticides so as not to contact workers or other persons. Handler must suspend application if a worker or other person is in the application exclusion zone, an area up to 100 feet around the application equipment. | Handler must apply pesticides so as not to contact workers or other persons. No specific requirement to suspend applications. |
| **Exemptions and Exceptions** | | |
| Exemption for certified crop advisors and their employees | Only certified crop advisors are exempt from labeling PPE and WPS requirements as specified in exemption. Certified crop advisor employees must use label-required PPE while working in a field during an REI, and employer must provide all required WPS protections, or rely on the PPE substitutions allowed under the crop advisors. | Certified crop advisor chooses PPE for themselves and their employees working under their direct supervision in a field during an REI. Also exempted from providing decontamination supplies and emergency assistance for themselves and employees. |
| Exceptions to REIs for early entry workers – notification requirements | Notify early-entry workers of application specifics, tasks to be performed, conditions of the early-entry exception, and hazard information from the pesticide label. | Inform early-entry workers of hazard information from the pesticide label. |

| Requirement | New 2015 Provision | Current Provision |
|---|---|---|
| **Basic Pesticide Safety Information** | | |
| Display of pesticide safety information | Display pesticide safety information at a central location and at sites where decontamination supplies are located, if the decontamination supplies are at a permanent site or at a location with 11 or more workers or handlers. | Display a safety poster at central location. |
| Content of pesticide safety information | Information can be displayed in any format (doesn't have to be a poster); keep the 7 concepts about preventing pesticides from entering your body; delete the point that there are federal rules to protect workers and handlers; add instructions for employees to seek medical attention as soon as possible if they have been poisoned, injured or made ill by pesticides; add name, address and telephone number of state or tribal pesticide regulatory authority; revise "emergency medical facility" to "*a nearby* operating medical care facility." New content for safety information display not required until 2 years from effective date of final rule. | The safety poster must include 7 concepts about preventing pesticides from entering your body; the point that there are federal rules to protect workers and handlers; and the name, address and phone number of the nearest emergency medical care facility. |
| **Personal Protective Equipment** | | |
| Respirators | Employer must provide respirator and fit testing, training, and medical evaluation that conforms to OSHA standards for any handler required to wear any respirator by the labeling. Require recordkeeping of completion of fit test, training, and medical evaluation. | Employer must provide respirator listed on label and ensure it fits. No recordkeeping required. |
| Definition of chemical-resistant | Same as current definition. | Made of a material that allows no measurable movement of the pesticide through the material during use. |
| PPE exception for closed systems | Exceptions to the labeling-specified PPE allowed for handlers when using closed systems. A closed system must meet a broad performance-based standard and basic operating standards (written operating instructions and training of handlers in use of the system) must be provided. | Exceptions to the labeling-specified PPE allowed for handlers when using closed systems. No specific criteria for closed systems. |
| PPE exception for crop advisors and their employees | Crop advisors and their employees entering treated areas while a REI is in effect to conduct crop-advisor tasks may wear a standard set of PPE (coveralls, shoes plus socks and chemical-resistant gloves made of any waterproof material, and eye protection if the labeling of the pesticide product applied requires protective eyewear for handlers, as outlined in rule), *OR* the PPE specified on the pesticide labeling for early-entry activities instead of the PPE specified on the pesticide labeling for handling activities, provided certain conditions are met. (See exemption for certified crop advisor.) | Crop advisors and their employees entering treated areas while a REI is in effect to conduct crop-advisor tasks may wear the PPE specified on the pesticide labeling for early-entry activities instead of the PPE specified on the pesticide labeling for handling activities, provided certain conditions are met. (See exemption for certified crop advisor.) |
| PPE exception from eyewear for pilots in open cockpits | If product label requires eye protection, pilots in open cockpits may wear a helmet with lowered face shield instead of label-required eye protection. | If product label requires eye protection, pilots in open cockpits may wear visor instead of label-required eye protection. |

| Requirement | New 2015 Provision | Current Provision |
|---|---|---|
| **Personal Protective Equipment** | | |
| PPE exception from gloves for pilots in enclosed cockpits | Same as current requirement. | Gloves are optional when entering and leaving aircraft unless required by product label. |
| PPE exception for enclosed cabs | Maintain exception for dermal PPE as in existing rule with same conditions, but handlers in enclosed cabs must wear the labeling-specified respiratory protection except when the only labeling-specified respiratory protection is a particulate filtering facepiece respirator (NIOSH approval number prefix TC-84A), previously called a dust/mist filtering respirator. | Exceptions to the labeling-specified PPE are allowed when handling tasks are performed from inside an enclosed cab that meets the specifications defined in the rule and certain conditions are met. Exceptions to the labeling-required respiratory protection are allowed only if the cab has been certified by the manufacturer to provide respiratory protection equivalent to the respiratory protection required by the pesticide labeling for handling. |
| **Decontamination Supplies** | | |
| Quantity of water | Provide 1 gallon for each worker and 3 gallons for each handler and each early entry worker as measured at beginning of workers' or handlers' work period. | Provide enough water for routine washing and emergency eye flushing for workers and handlers. For handlers, also provide enough to wash entire body in emergency. |
| Use of natural waters | Must provide water for decontamination. There is no reference to, or prohibition from, using natural waters in addition to decontamination water provided. Workers and handlers are trained to use any nearest clean water source in case of emergency. | Must provide water for decontamination. May use natural waters in addition to water provided for decontamination. |
| Eye wash for handlers | Provide a system capable of delivering 0.4 gallons/minute for 15 minutes, or 6 gallons of water able to flow gently for about 15 minutes at a mix/load site if handlers use products requiring eye protection or use a pressurized closed system. One pint of water in a portable container must be available to each handler applying pesticides if eye protection is required. | Provide enough water for emergency eye flushing. One pint of water in a portable container must be available to each handler if eye protection is required. |
| **Emergency Assistance** | | |
| Emergency Assistance | Provide prompt transportation to medical facility. Promptly provide the SDS, product information (name, EPA Reg No and active ingredient) and circumstances of exposure to treating medical personnel. | Provide prompt transportation to medical facility and provide any obtainable information about the product, antidote, first aid, and circumstances of exposure to the worker/handler or treating medical personnel. |
| **Exemptions and Exceptions** | | |
| Exemption for certified crop advisors and their employees | Only certified crop advisors are exempt from labeling PPE and WPS requirements as specified in exemption. Certified crop advisor employees must use label-required PPE while working in a field during an REI, and employer must provide all required WPS protections, or rely on the PPE substitutions allowed under the crop advisors. | Certified crop advisor chooses PPE for themselves and their employees working under their direct supervision in a field during an REI. Also exempted from providing decontamination supplies and emergency assistance for themselves and employees. |
| Exceptions to REIs for early entry workers – notification requirements | Notify early-entry workers of application specifics, tasks to be performed, conditions of the early-entry exception, and hazard information from the pesticide label. | Inform early-entry workers of hazard information from the pesticide label. |

| Requirement | New 2015 Provision | Current Provision |
|---|---|---|
| | **Definitions** | |
| Immediate Family | Expand to also include all in-laws, grandparents, grandchildren, aunts, uncles, nieces, nephews and first cousins. | Includes spouse, parents, stepparents, foster parents, children, stepchildren, foster children, brothers, and sisters. |
| Enclosed space production | New definition: enclosed space production that is indoors or in a structure or space that is covered in whole or in part by any nonporous covering and that is large enough to permit a person to enter. | Greenhouse means an operation inside any structure or space that is enclosed with nonporous covering and that is of sufficient size to permit worker entry. |
| Employ | Employ means to obtain, directly or through a labor contractor, the services of a person in exchange for a salary or wages, including piece-rate wages, without regard to who may pay or who may receive the salary or wages. It includes obtaining the services of a self-employed person, an independent contractor, or a person compensated by a third party. | No definition of "employ" in existing rule. Definitions of "agricultural employer" and "handler employer" covered aspects of what types of employment covered. |