

Pesticide Safety for Fieldworkers & Handlers



Instructor Notes:

- It is the responsibility of agricultural employers to provide workers and handlers with information and protections designed to reduce work-related pesticide exposures and illnesses. This includes ensuring workers and handlers have been trained in pesticide safety.
- The employer must provide:
 - pesticide safety and application and hazard information,
 - decontamination supplies and emergency medical assistance,
 - notification to workers of restrictions during applications, and
 - notification to workers of restrictions to treated areas.
- A worker may designate a representative to request, on their behalf, pesticide application and hazard information.
- Agricultural employers are prohibited by the rule from allowing or directing a worker to mix/load/or apply pesticides or assist in their application unless trained as a handler.
- Agricultural employers must provide specific information to early- entry workers before directing them to perform early-entry activities. Early-entry workers must be 18 years of age or older.
- Employer is to provide information, to the employee, on reporting suspected use violations to the State or Tribal agency responsible for pesticide enforcement.
- Agricultural employers are prohibited from intimidating, threatening, coercing or discriminating against any worker or handler for complying with or attempting to comply with the requirements of this rule, or because the worker or handler provided, caused to be provided, or is about to provide information to the employer or the EPA or its agents regarding conduct that the employee reasonably believes violates this part, and/or made a complaint, testified, assisted, or participated in any manner in an investigation, proceeding, or hearing concerning compliance with this rule.

Where and how may workers come in contact with pesticides or pesticide residues during work?



Important Terms:

- **Restricted-Entry Interval (REI):** the time following the completion of a pesticide application when a worker is not permitted to enter into the field, with the exception of early-entry workers.
- **Early-Entry Workers:** entry into a field by workers while the REI is still in effect; only tasks labeled for early entry are permitted.
- **Pre-Harvest Interval (PHI):** the number of days from the completion of a pesticide application until the crop can be harvested.

Instructor Notes:

Where and how may workers come in contact with pesticides or pesticide residues during work?

Offsite Movement & DRIFT: Drift is when a pesticide application doesn't stay in the intended field or area being treated. Possible causes are windy conditions during the application, carelessness, mis-applications, and making application with faulty equipment or unknowledgeable or incompetent applicators. Remember to keep children and non-working family members away from pesticide treated areas and areas that are being treated. However, offsite movement also includes off-gassing from soil/commodity fumigations, inversions, water run pesticide applications, such as flood basin applications from fumes or volatile compounds, or windy conditions during sprinkler application.

CHEMIGATION: Irrigation systems might be used to apply pesticides and pesticides can move off-site during applications contaminating irrigation water, especially in open systems, canals, ditches, sloughs, and similar systems that are open as opposed to closed systems using pipes and hoses and such equipment. However, signs or no signs, workers should not consider irrigation water safe to use for drinking, washing, cooling off, or any other use as it could contain pesticides or pesticide residues from other types of pesticide applications, such as from tractors or aircraft.

Application Equipment: Equipment such as sprayers and tractors can also have residues just like plant material. It isn't always the equipment out in the field, but residue can be found on equipment parked in a storage location.

PESTICIDE RESIDUES ON TREATED CROPS: Workers may contact pesticide residues on the leaves, stems and fruit of treated plants while they work in the crop, whether that crop is in a field, greenhouse, forest, or nursery. Contact with the soil, and from not washing hands when eating, drinking, smoking, chewing gum, or going to the bathroom can also result in contact with pesticide residues.

Discussion/Activity: Have class identify areas in their work environment or on the farm where they or others may come into contact with pesticides or residues. (e.g., pesticide storage shed, irrigation equipment, plant surfaces, field equipment, etc.)

Terms you should know:

Restricted-Entry Interval – The period of time AFTER a field is treated with a pesticide during which restrictions on entry are in effect to protect persons from potential exposure to hazardous levels of pesticide residues.

- Example: If a pesticide with a 4-hour REI begins being applied at 8:00 am and the application is completed at 12:00 pm, then the REI is in effect from 12:00 pm until 4:00 pm.

Pre-Harvest Interval -The time between the last pesticide application and harvest of the treated crops. (Information for agricultural practices only, does not affect workers or handlers)

- Can be used to remind workers of the importance of not picking and eating fruits, vegetables, or nuts without permission from the property operator.

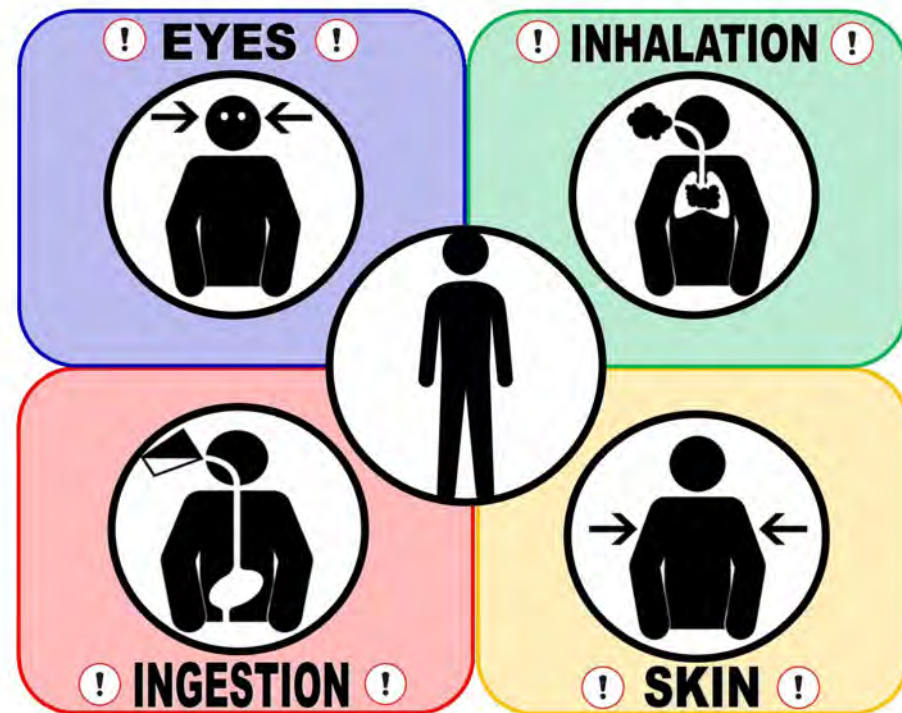
Employees must stay out of areas under REI unless their employer provides them early-entry information and protections. Employers must provide transport to a medical facility in case of an emergency. If early entry is required, the workers must be 18 years of age or older. They also should immediately leave any area where they are being contaminated with pesticides either through direct application or because of drift. Their employer must not retaliate against a worker for insisting on the protections that are provided by law or regulation.

Employer cannot allow or direct workers to mix/load or apply pesticides, or assist in their application, unless they have been trained as a handler. Handlers have different risks of exposure and additional responsibilities required to protect themselves and others.

Routes of Entry Into the Body

- Key Point: Contact with the SKIN is the main route of entry into the body.

- Washing up after any exposure and after work is very important



How Workers Can Protect Themselves from Exposure



Instructor Notes:

Routes of Entry into the Body

SKIN:

From applications/misapplications direct or indirect contact. Working too close to a pesticide application and weather carries contaminated water, gas vapor, or mist. Coming into contact with residue on treated plants and other objects that were in or near the treated site, such as irrigation pipes, hoses, tractors, forklifts, and application equipment. Unlaundered work clothing can also accumulate pesticide residue.

EYES:

Rubbing eyes with hands that may have pesticide on them from contact with treated plants. Also, eye irritation can be a sign of exposure from a treatment that is too close.

INHALATION:

Breathing contaminated air from drift and other off-site movement, such as off-gassing from nearby fumigated fields, or commodity fumigation in facilities that vent chambers near workers downwind, or fumes from a field fumigation/chemigation.

SWALLOWING:

Direct exposure by drinking water used for chemigation or eating produce from a treated field. Indirect contamination by touching mouth with contaminated fingers, hands, or clothing while smoking, eating, or coughing.

Discussion: Have the class identify possible routes of exposure to pesticides, and the hazards associated with each.

How Workers Can Protect Themselves from Exposure

When working in pesticide treated areas, wear work clothing that protects the body from pesticide residues and wash hands before eating, drinking, using the toilet, chewing gum or using tobacco. As soon as possible after working in pesticide-treated areas, wash or shower with soap and water, shampoo hair, and change into clean clothes. There are hazards to children and pregnant women from pesticide exposure. Keep children and nonworking family away from pesticide-treated areas.

Proper Work Attire

Long-sleeved shirt

Long pants

Socks

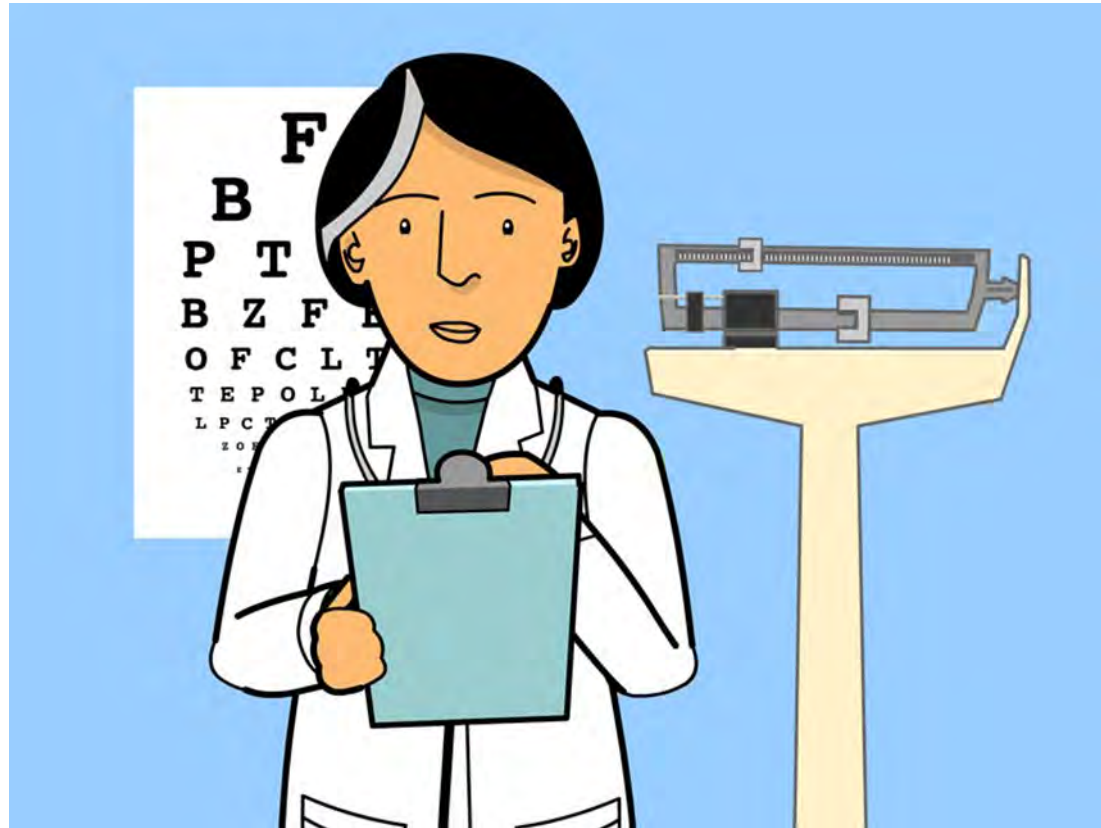
Closed work shoes

Wide brim hat

Handkerchief (if needed for sweat or dust)

Discussion: With the class discuss what they enjoy doing after work, and point out any possible risks of exposing their family, friends, or personal items to residues on their clothing or body. (e.g., hugging a loved one with dirty clothes on, getting into the family vehicle with dirty clothes, sitting on furniture at home)

Types of Effects of Pesticide Exposure



- Acute
- Delayed
- Long-Term or Chronic
- Sensitization

Signs and Symptoms of Poisoning



- SIGNS AND SYMPTOMS
- Dizziness
- Nausea
- Diarrhea
- Eye Irritation

Instructor Notes:

Types of Effects of Pesticide Exposure

ACUTE: Acute health effects are illnesses or injuries that occur soon after an exposure and have a relatively rapidly developing symptom, such as a rash. A bad headache and nausea which occurs soon after an exposure would be considered an acute health effect.

DELAYED: Delayed health effects are symptoms that are not felt right away. Depending on the pesticide and the type of exposure, the effects can be delayed for up to several days. For example, a person could be exposed to a pesticide while working and not feel the effects of skin and eye irritation until that evening or the next day.

LONG-TERM or CHRONIC: Chronic illness usually shows up long after exposure to the harmful substance has occurred. Long-term effects may be the result of repeated exposure at a level too low to produce noticeable immediate illness or injury. They may also be caused by a single exposure and appear long after recovery from the acute effects of the exposure. Some long-term health effects commonly associated with pesticide exposure include cancer, inability to become pregnant, spontaneous abortions, birth defects in the children of exposed parents, nervous system damage, damage to specific organs such as the lungs or liver, and damage to the immune system.

SENSITIZATION: Sensitivities to pesticides is an additional chronic health issue. Sensitization can be explained by comparing certain pesticides to plants such as poison oak. Many people have no skin reaction the first few times they are exposed to poison oak. However, with repeated exposure some eventually become sensitized. In other words they develop a reaction that becomes progressively worse with each additional exposure. In the same way, certain pesticides only affect some people after several exposures, but once they become sensitized, they will suffer a reaction every time they are exposed to the material. As with poison oak, some people never develop sensitivities or allergies to these pesticides.

Signs and Symptoms of Pesticide Poisoning

Some of the common symptoms of poisoning associated with certain types of pesticides including dizziness, headache, muscle aches or cramps, tiredness, nausea, and diarrhea. More serious poisoning can result in chest pain, breathing difficulties, excessive salivation or drooling, lack of muscle control, convulsions, and unconsciousness. A person who has been poisoned with a pesticide will not necessarily experience all of these symptoms and not all pesticides cause these types of symptoms. Some cause skin and eye irritation, nose and throat pain, severe skin rashes, or other kinds of injury. Certain fumigants can cause people to behave irrationally, and may cause the body temperature to change. Make sure that workers understand that there are many kinds of pesticides that could affect them in a variety of ways.

Many of the common pesticide poisoning symptoms are similar to symptoms of a cold, the flu, morning sickness, or a hangover. If illness occurs, and if there is a reason they believe that a pesticide exposure occurred or if the person shows signs consistent with pesticide illness, they should seek medical attention. Their employer must provide transportation to a medical facility and information about the possible exposure if these conditions are met.

Discussion: How are pesticide poisoning symptoms similar to other illnesses? Emphasize the importance of looking out for themselves and coworkers, and communicating to the employer when pesticide symptoms or illnesses occur.



Heat-Related Illnesses

How to Protect Handlers

- Perform the heaviest work in the coolest part of the day, if possible.
- Slowly build up tolerance to the heat and the work activity.
- Drink plenty of cool water.
- Wear lightweight, breathable clothing, if PPE are not required.
- Take frequent short breaks in cool shaded areas.
- Avoid eating large meals before working in hot environments.
- Avoid caffeine and alcoholic beverages before working in the heat.
- Learn the signs and symptoms of heat related illness and how to treat them.

Handlers are at Increased Risk When:

- They wear personal protective equipment, like respirators or suits.
- All PPE must be worn according to the label.

Consider applying pesticide during the cooler parts of the day, early in the morning or once the sun goes down that way the PPE will not be as hot.

- They take certain medications.
- They have had a heat-induced illness in the past.



Heat Exhaustion Symptoms Include:

- Heat exhaustion is the body's response to an excessive loss of water and salt, usually through excessive sweating.

Headaches, nausea, dizziness, weakness, irritability, upset stomach, vomiting, thirst, heavy sweating, elevated body temperature, and decreased urine output.

What Should Be Done?

- Move the person to a cool shaded area to rest.
- Loosen and remove any unnecessary clothing, including shoes and socks.
- Have the person drink frequent sips of cool water.
- Cool the skin with cold compresses or have the person wash their head, face and neck with cold water.
- Take the person to a clinic or emergency room for medical evaluation and treatment, or call for emergency help. If heat exhaustion is not treated, the illness may advance to heat stroke.

Heat stroke is the most serious heat-related illness. It occurs when the body becomes unable to control its temperature. The body's temperature rises rapidly, the sweating mechanism fails, and the body is unable to cool down. When heat stroke occurs, the body temperature can rise to 106°F or higher within 10 to 15 minutes. Heat stroke can cause death or permanent disability if emergency treatment is not given.

Heat Stroke Symptoms include:

- Confusion, altered mental status, or slurred speech; loss of consciousness; hot, dry skin or profuse sweating; seizures; and very high temperature

What should be done?

- Call for emergency help.
 - Move the person to a cool shaded area.
 - Remove outer clothing.
 - Cool the worker quickly with a cold water or ice bath if possible. Otherwise, wet the skin, place cold wet cloths on skin, or soak clothing with cool water.
- Try to speed up the cooling process by fanning the person.
- Be alert until EMS arrive.

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First Aid Procedures



Eyes



- Keep eyes open and flush with clean water for 15 minutes.
- Seek medical attention immediately.

INHALATION



- Move to fresh air and loosen clothing.
- Provide CPR if person is not breathing.
- Seek medical attention immediately.

Skin



- Remove contaminated clothing and wash skin with soap and water.
- Seek medical attention immediately.

INGESTION



- Read label and follow directions for care.
- Seek medical attention immediately.

Obtaining Medical Care



- Employees should be taken to the clinic if they are sick from pesticide exposure.
- Take the Safety Data Sheet (SDS) and application information and, if available, a copy of the label.
- Explain the circumstance of application or use of the pesticide.
- Explain the circumstances that could have resulted in exposure to the pesticide.

EMERGENCY NUMBERS	
	POLICE POLICIA _____
	AMBULANCE AMBULANCIA _____
	FIRE INCENDIO _____
	DOCTOR MEDICO _____
	POISON CTRL INTOXICAR _____
	MISCELLANEOUS MISCELANEO _____



Instructor Notes:

First Aid Procedures

If a pesticide gets in the eyes:

Rinse the eyes for at least 15 minutes in gently flowing water. If only one eye is affected, keep it lower than the unaffected eye, so rinse water doesn't get into it.

Rinse the eyes for at least 15 minutes in flowing water.

Seek medical attention immediately.

If a pesticide is inhaled:

If a person is in an enclosed space where a pesticide was used, they may have inhaled enough to make them ill. If the person can walk, they should abandon the area where the pesticide was used immediately. Before entering an enclosed area to rescue an unconscious victim, protect yourself using the appropriate PPE.

Move the victim to fresh air and loosen their garments.

If the victim is not breathing give CPR. (If you are properly trained in CPR.) Get the affected person to a medical facility promptly.

If a pesticide was swallowed:

Look for the label or the SDS to know what it is and follow the instructions under first aid.

Give water (or in some cases milk) to dilute if the instructions recommend it.

Induce vomiting if the label indicates to do so and the person is conscious.

Seek medical attention immediately.

If a pesticide spills or leaks onto skin or clothing:

Remove any contaminated clothing.

Wash the affected area with soap and water and rinse carefully.

Don't press too strong or scrub, that may abrade the skin and allow more pesticide to get into the body.

Seek medical attention immediately.

As soon as possible, follow up with washing or shower with soap and water, shampoo hair, and change into clean clothes.

Activity: Review first aid procedures on a label or SDS sheet. Stress the importance of reviewing first aid procedures found on label or SDS if possible.

Obtaining Medical Care

The employer must provide transportation to a medical facility and information about the possible exposure.

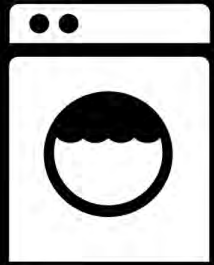
When taking a pesticide poisoning victim to a clinic or emergency room there are several things to remember. A person who has been made ill from pesticides should never be allowed to drive. It is required that medical personnel be provided information about the pesticide product involved, SDS, and circumstances of how the exposure occurred. There are hundreds of kinds of pesticides, and treatment for exposure varies according to the pesticide as well as the type of exposure.

Reminder: Under the Worker Protection Standard, the employer must provide the Product Information (product name, active ingredient, and EPA Reg No.), Safety Data Sheet (SDS) for the pesticide, and details regarding the circumstances relating to the exposure to attending medical personnel.

LAUNDERING WORK CLOTHES



- REMOVE CLOTHING AFTER WORK
- KEEP SEPARATE FROM FAMILY'S CLOTHES OR OTHER CLOTHING



- WASH SEPARATELY FROM FAMILY'S CLOTHES AND OTHER CLOTHING
- WASH CLOTHING USING HOT WATER
- WASH CLOTHING USING DETERGENT
- AFTER WASHING CLOTHING RINSE A SECOND TIME TO WASH AWAY ANY RESIDUES



- DRY CLOTHING
- HANG DRY IF POSSIBLE, AS SUNLIGHT CAN HELP BREAK DOWN ANY RESIDUES

Warnings about taking pesticides home or putting pesticides in food containers



Instructor Notes:

After-work care of contaminated work clothes

Remember, as soon as you get home, wash or shower with soap and water, shampoo hair, and change into clean clothes. Remove boots or shoes before entering your home. Be sure to remove work clothes and wash or shower before physical contact with your children and other family members.

Work clothes may become contaminated with pesticide residues when working in treated areas. Wash work clothes before wearing them again. Inform the person who is laundering the clothes that they may contain pesticides and to be careful when handling them, and to wash up afterwards. If the same clothing is used for several days without being laundered, residues can build up and transfer to the skin of the person wearing them. Used work clothing should be stored separately from the family laundry until it can be washed. Dirty work clothes should be washed separately from the family wash in hot water, using a heavy-duty detergent. It is better to dry work clothes in the sun rather than in a clothes dryer. The sun helps break down pesticide residues. Sun drying will also keep the dryer from becoming contaminated.

Tips for work clothes handling

- Wear clean clothing daily.
- Keep work clothes separate from family clothing.
- Wash clothes separately in hot water and with strong soap.
- Dry clothes outdoors, if possible.
- Shower daily – at work or immediately after arriving home if at all possible.

Discussion/Activity: Discuss procedures for decontaminating and laundering work clothes with the class. Have each employee write down the procedures they will use for handling their clothing after each work day, and encourage them to post the procedures in a prominent place they can look at daily (e.g. locker, laundry room, garage door, etc.).

Warnings about taking home

pesticides or pesticide containers

Pesticides should never be left unattended at the workplace. Empty containers should be carefully rinsed and put in a locked area for disposal. Workers should not take empty containers home. A pesticide container is never completely free of contamination and cannot safely be used for any other purpose.

The pesticides used on crops at the workplace are not the same kinds of pesticides that would be used around the house. They are likely to be more toxic and more concentrated than pesticides for home use.

To keep your family safe from pesticide hazards, keep them away from areas where pesticides have been used.

Pouring pesticides from their original containers into soft drink containers or other empty food, drink, or household containers is very dangerous and illegal. If one of these apparent food or drink containers is found, some unsuspecting person could mistake it for something edible. This is a common cause of accidental poisoning, especially among children. There are hazards of pesticide exposure especially to children and pregnant women.

Activity: Find a news article relating to an illness or death related to pesticides being stored in a food container.

Postings



Federal

Instructor Notes:

Notification of Entry Restrictions

After a pesticide has been applied, it is necessary to wait a period of time before entering the treated area. This waiting period is called the Restricted-Entry Interval (REI). REI's can vary from as little as 4 hours up to several days or even weeks, depending on the pesticide and the crop.

Outdoor Production Areas with REIs equal to or less than 48 hours: Employers must either post warning signs around the treated area or provide verbal warnings to workers who might enter. These verbal warnings and postings need to be obeyed for workers' protection.

Double Notification: The label may require double notification (*i.e.*, by posting & verbally). Warning signs are to be placed around a treated field, at usual points of entry and spaced regularly around the field. Greenhouses and other enclosed spaces must be posted at the entrances.

Required Posting of Warning Signs:

- The pesticide was applied in an enclosed space and has an REI greater than 4 hours;
- Field posting is required by the label (Found in the "Agricultural Use Requirements" section of the label);
- The pesticide was applied to an outdoor production area and the REI is greater than 48 hours.

Application Exclusion Zone—AEZ

AEZs in Indoor Areas

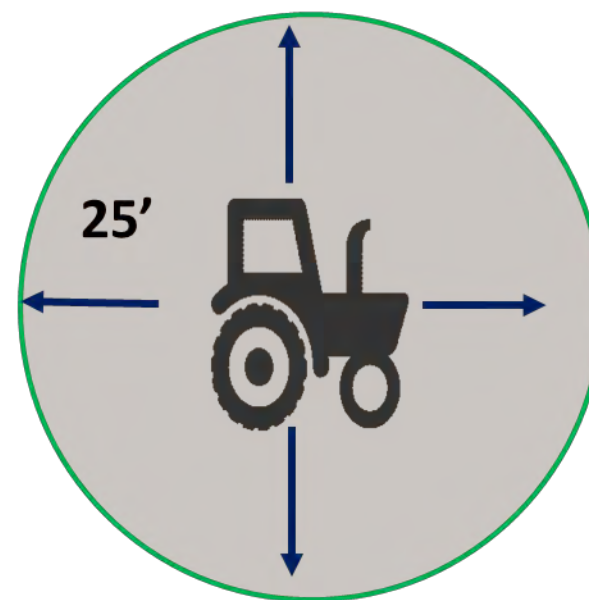
If the pesticide is applied for enclosed space production, the application exclusion zone is defined as follows:

- The entire enclosed space plus any adjacent area that is not sealed (sufficient to prevent pesticide transfer) from the treatment site when the pesticide is applied as a space treatment (fumigant, smoke, fog, aerosol, or mist) or is a pesticide for which the product labeling requires respiratory protection until ventilation criteria have been met.
- The entire enclosed space when the pesticide is applied using a fine spray until the ventilation criteria has been met.
- The treatment site plus 25 feet in all directions within the enclosed space when the pesticide is applied as a spray from a height greater than 12 inches from the soil or other planting medium, or as a spray of medium or larger.



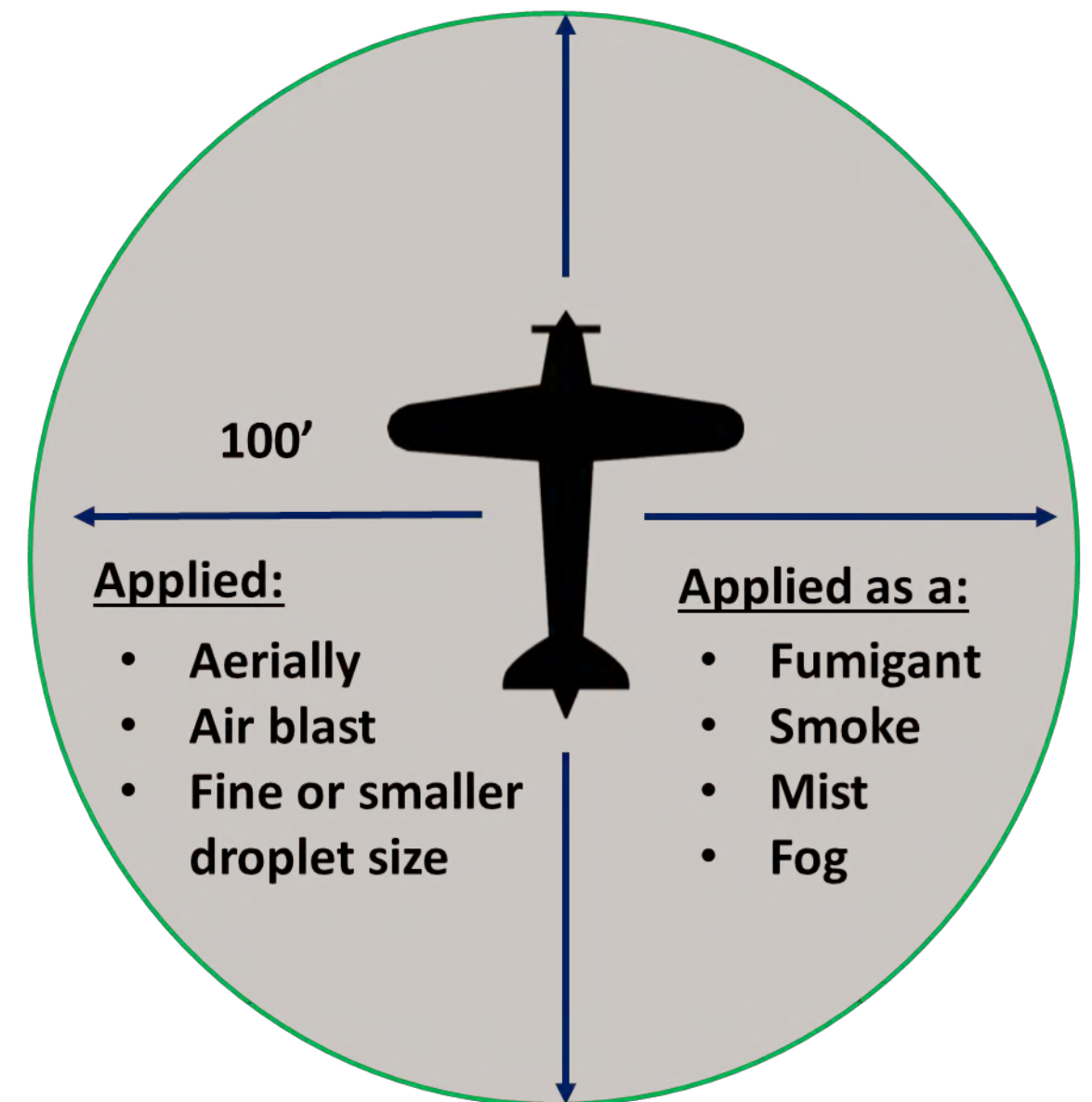
AEZs in Outdoor Areas

Employer responsibility to keep workers out of the application exclusions zone (AEZ).



Applied:

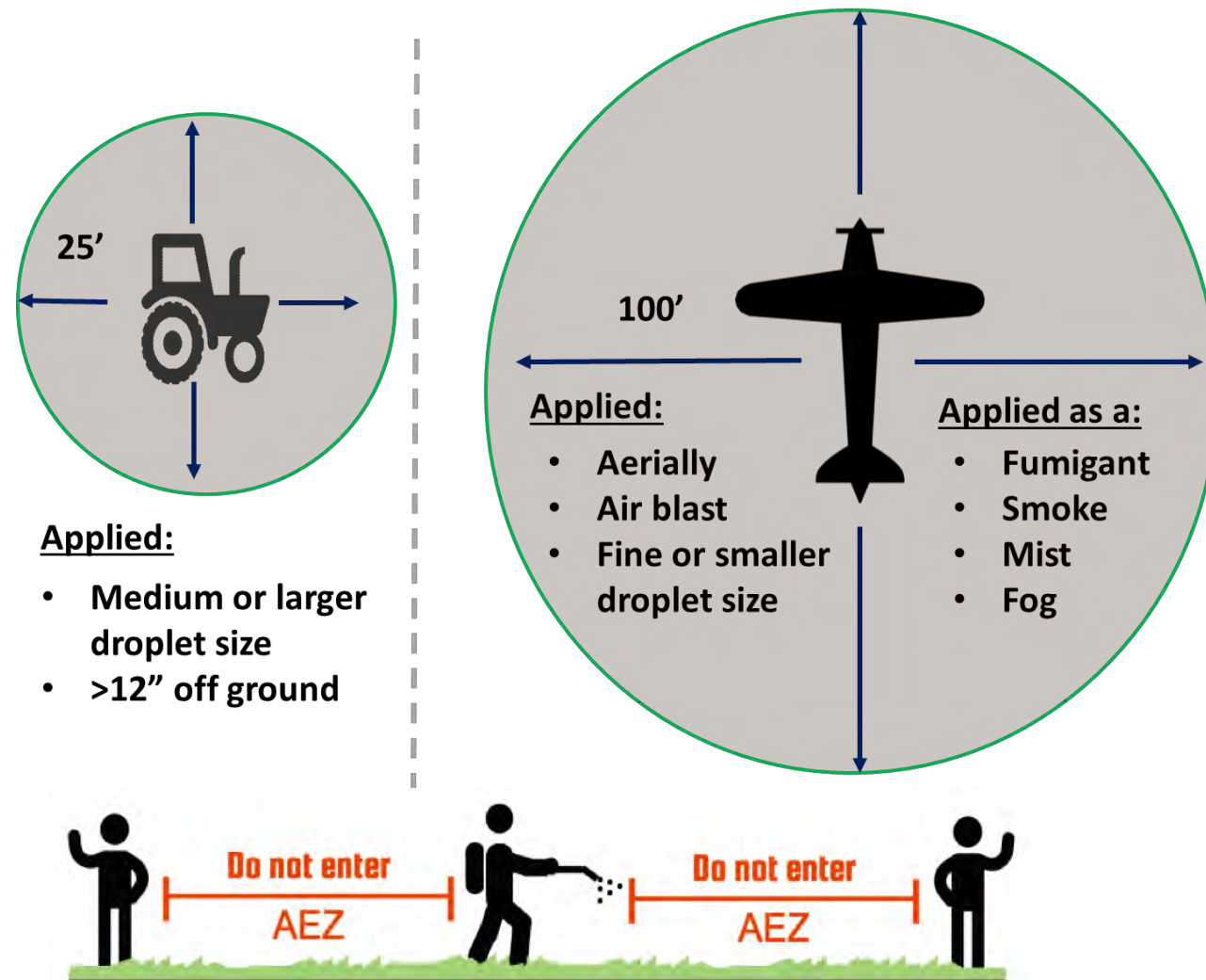
- Medium or larger droplet size
- >12" off ground



Instructor Notes:

AEZs in Outdoor Areas

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AEZs in Indoor Areas

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Double Notification: the label may require double notification (e.g. written & verbal). Also, warning signs are to be placed around a treated field, at usual points of entry and spaced regularly around the field. Greenhouses and other enclosed spaces must be posted at the entrances.

In addition to the warning signs employees must stay as much as 100 feet away from the application equipment during a pesticide application. The employer must ensure that workers are out of the application exclusion zone while the application is taking place.

Employers must also maintain a list of pesticides that have been recently used on each application site. This list must be posted at some central location at work where it can be seen by workers and handlers. It must include all the pesticides that have been applied in the past 30 days or with REI's that have expired within the past 30 days.


Safety Data Sheets SDS

Types of Information

- Hazards
- Emergency medical treatment/First Aid
- Acute and chronic symptoms
- Corrosiveness
- Fire
- Spill



Pesticide Poster

PROTECT YOURSELF FROM PESTICIDES	
	
<ul style="list-style-type: none">• Avoid getting on the skin or into the body any pesticides that may be on or in plants, soil, irrigation water, tractors, and other equipment, on used personal protective equipment, or drifting from nearby applications.• Wash before eating, drinking, using chewing gum or tobacco, or using the toilet.• Wear work clothing that protects the body from pesticide residues (long-sleeved shirts, long pants, shoes and socks, and a hat or scarf).• Wash or 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 the body use decontamination supplies to wash immediately, or rinse off in the nearest clean water, including springs, streams, lakes or other sources if more readily available than decontamination supplies, and as soon as possible, wash or shower with soap and water, shampoo hair, and change into clean clothes.• Follow directions about keeping out of treated areas and application exclusion zones.• Instructions to employees to seek medical attention as soon as possible if they believe they have been poisoned, injured or made ill by pesticides.	
<div>EMERGENCY MEDICAL TREATMENT</div> <div>Medical Facility Name: _____</div> <div>Address: _____</div> <div>Phone Number: _____</div>	
<div>REGULATORY AGENCY</div> <div>NAME</div> <div>ADDRESS</div> <div>PHONE NUMBER</div>	

Instructor Notes:

Safety Data Sheets (SDS) provide information about hazards, emergency medical treatment, and other information about pesticides that are used on the establishment.

The employer must display SDS for all pesticides used on the establishment that you may come in contact with, must tell workers and handlers where the SDS are located, and must allow workers and handlers access to the SDS during normal working hours.

Before employees are allowed to handle pesticides, the employer shall display a copy of a completed written Hazard Communication Information for Employees Handling Pesticides, as applicable, at a central location in the workplace. Upon request, the employer shall read to the requesting employee, in a language understandable to that employee, the pesticide poster. All employees should know the location of the SDS binder and must receive training on the type of information contained in the SDS.

Pesticide Poster

Under the Worker Protection Standard (WPS) as revised in 2015, specific information must be available to agricultural workers and pesticide handlers at all times during their working hours. Agricultural employers usually select a readily-accessible area, perhaps where workers check in/out for the day, where they change clothes, eat, etc.

Field Worker Decontamination Site

- At least 1 gallon of water – per worker
- Soap
- Single use towels
- Shall be not more than $\frac{1}{4}$ mile from the fieldworkers



Instructor Notes:

Fieldworker Decontamination Facilities.

The decontamination facilities shall be not more than 1/4 mile from the fieldworkers (or at the nearest point of vehicular access). Employees must be notified of the location of the decontamination site prior to working in a treated field.

The decontamination facilities shall not be in an area under a restricted-entry interval unless the fieldworkers for whom the site is provided are performing early-entry activities. The facilities shall not be in an area under treatment.

- At least 1 gallon of water – per worker
- Soap
- Single use towels
- Shall be not more than ¼ mile from the fieldworkers



Pesticide Safety for the Handlers/Applicators



- **A handler may be doing any of the following tasks:**

- Mixing, loading, transferring, or applying pesticides.
- Handling opened containers of pesticides.
- Acting as a flagger.
- Cleaning, handling, adjusting, or repairing the parts of mixing, loading, or application equipment that may contain pesticide residues.
- Assisting with the application of pesticides, including incorporating the pesticide into the soil after the application has occurred.
- Entering a greenhouse, where pesticides have been used and not yet ventilated
- Entering a treated area during any application or before the inhalation exposure level listed on pesticide product labeling has been reached or greenhouse ventilation criteria have been met,
- Or performing the duties of a crop advisor, including field checking or scouting, making observations of the well-being of the plants, or taking samples during an application or any restricted-entry interval listed on pesticide product labeling



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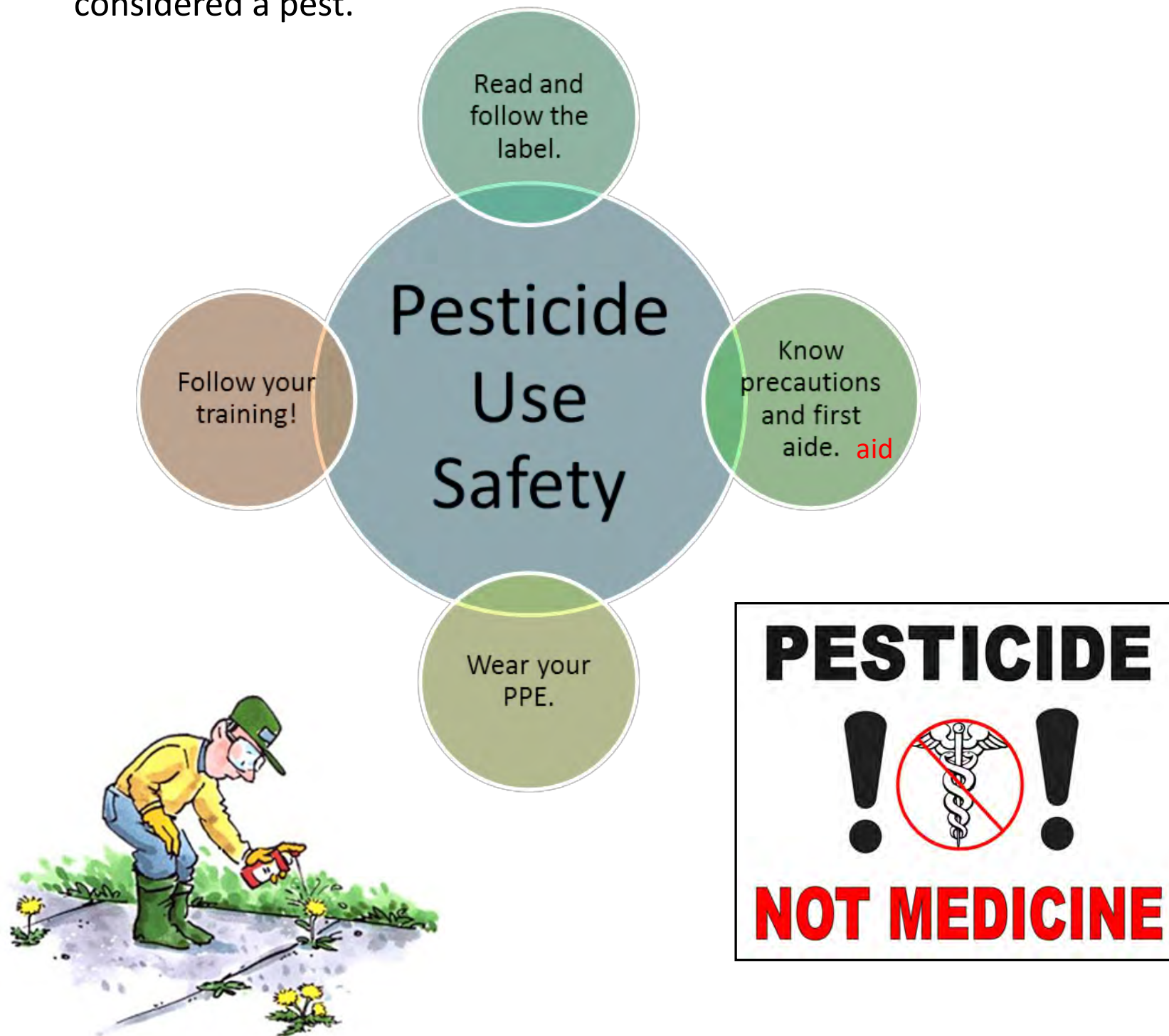
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- Handlers must suspend a pesticide application if workers or other persons are in the application exclusion zone.
- Handlers must be at least 18 years old.
- It is the responsibility of agricultural employers to post treated areas as required by this rule.

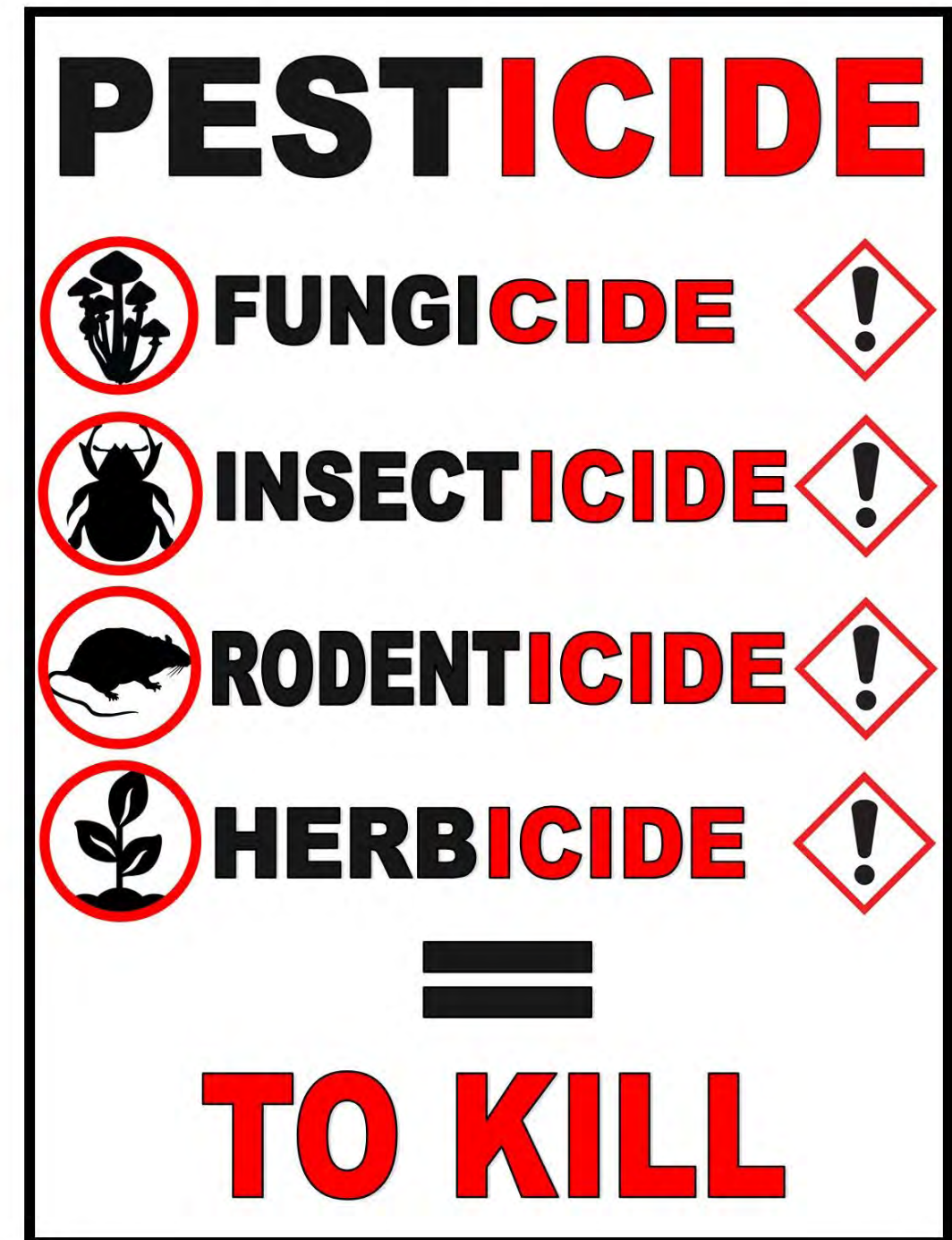
Discussion: What duties in your operation may trigger someone to be a pesticide handler, especially those that are not as obvious? (e.g., flaggers, irrigation personnel that initiate chemigation or algaecide applications when turning on water, mechanics that repair tractor/sprayer equipment)

What is a pesticide?

- A pesticide is any substance used to prevent, repel or mitigate insects, rodents, nematodes, fungi, weeds, or any other organism considered a pest.



Types of Pests and Pesticides



Instructor Notes:

WHAT IS A PESTICIDE?

A pesticide is any substance used to prevent, repel or mitigate insects, rodents, nematodes, fungi, weeds, or any other organism considered a pest. Although even disinfectants such as chlorine and Pinesol are pesticides, pesticides used in agricultural settings are used to control pests that damage crops. Herbicides, insecticides, fungicides, and rodenticides are pesticides, and those used in plant agriculture may be covered by WPS.

Note: Insect lures, mating disruption pheromones, adjuvant/surfactants, and growth regulators are also considered pesticides, and should be trained on as well.

How can we use them safely?

- Read and follow the label directions for application
- Be especially careful with pesticides before they are mixed with water, in their concentrated form
- Know the mixing order of pesticides
- Be familiar with the precautions & first aid
- Wear/Use the right protection (e.g. PPE & engineering controls)
- Get the proper training and follow it

TYPES OF PESTS AND PESTICIDES

Pesticides should only be used on the intended commodity/target site to control a specific pest. It is against the law to use a pesticide for a use other than stated on the label.

Examples:

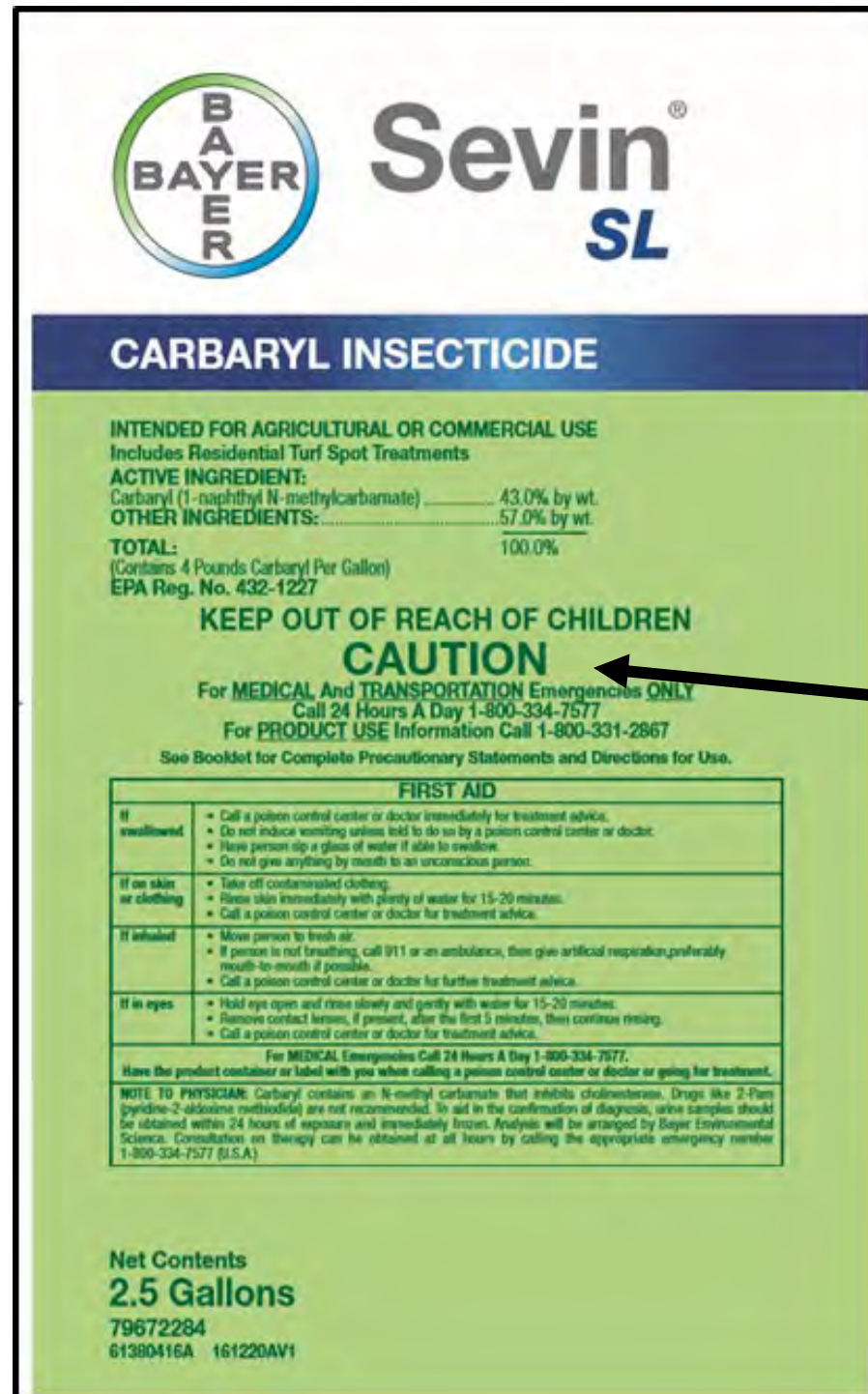
- Herbicides (Plants)
- Insecticides (Insects)
- Rodenticides (Rodents)
- Fungicides (Fungi)
- Fumigants (Soil/Storage Pests)

Activity: Obtain several pesticide labels (as diverse as possible) that you use in your operations, and have your handlers identify what commodities and pests those labels permit their use on.

The Pesticide Label

• Important Sections

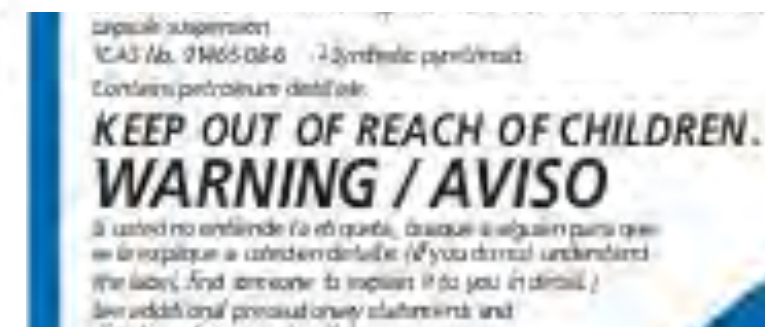
- Signal word
- Product name
- Chemical name
- Formulation
- First Aid
- Precautionary Statements
- Directions for use
- PPE for handlers
- REI
- User Safety
- Recommendations



Signal Words

These are the words that tell about acute effects:

- **“DANGER”**—this pesticide is extremely harmful.
- **“WARNING”**—this pesticide is moderately harmful.
- **“CAUTION”**—this pesticide is slightly harmful.



Instructor Notes:

The Pesticide Label

Activity: Using pesticide labels used in your operation, have your handlers locate and highlight these various areas on the labels. (Try to find labels with very different PPE requirements)

Signal Words

Toxicity Category I pesticides, which are the most hazardous materials, always have the word “DANGER” on the label.

Toxicity Category I - DANGER

Category II pesticides, those with the signal word “WARNING” are moderately toxic or hazardous. Toxicity

Toxicity Category II - WARNING


Category III & IV pesticides, those that are the least hazardous or toxic, are identified by the word “CAUTION”.

Toxicity Categories III & IV - CAUTION


(Category IV pesticides may not be required to have a signal word.)

Poison – skull and crossbones symbol

1. When required

The word “**POISON**” and the skull and crossbones symbol  are required for products classified as toxicity category I for acute oral, acute dermal, or acute inhalation toxicity studies. [40 CFR 156.64\(a\)\(1\)](#). Additionally, if a formulation contains $\geq 4\%$ methanol, the addition of “**POISON**” and the skull and crossbones symbol are recommended because of the well-known possible risk of causing blindness.

2. Location and prominence

If required, the word “**POISON**” and the  symbol must appear in immediate proximity to each other. The word “**POISON**” must appear in red on a background of a distinctly contrasting color. It should appear near the signal word “DANGER.” [40 CFR 156.64\(a\)\(1\)](#).

Types of Formulations

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



Mixing & Loading

- Follow the label instructions
- Equipment check
- Label-required personal protective equipment
- Opening containers
- Loading site set-up
- Measuring devices
- Proper mixing order
- Remember: All personal protective equipment must be provided by the employer.

Container Rinsing and Disposal



Instructor Notes:

Mixing & Loading

Mixing and loading pesticides can be the most hazardous pesticide handling activity. It is while mixing and loading pesticides that handlers are most likely to be exposed to large amounts of pesticide as concentrates.

Label Instructions: Always read the label directions first. The label provides information on required personal protective equipment, emergency procedures, and mixing rates. The law requires that the label be available at the mixing and loading site.

Equipment Check: Check the spray equipment to be sure all parts are safe and in good working order.

Review all hoses for cracks and leaks and proper connections. Make sure filters, screens and nozzles are clean. Make sure any drive belts are in good condition. Check all seals for leaks.

Opening Containers: Precautions should be taken when opening pesticide containers. Containers should be held downwind when being opened. For opening paper containers with powders or granules, use a knife or scissors. The contaminated knife or scissors should not be used for any other purpose. When opening plastic containers such as jugs, remove the top edge of the container mouth when pouring. All containers should be placed on a level and stable surface to avoid tipping or spilling.

Loading Site Set-Up: Set up the loading site for maximum safety. The surface the handler stands on should be even, clean and stable. The loading site must be well lit. The handler should be upwind and above the mouth of the spray tank and should pour down and away from his or her body to minimize exposure to splashes or fumes.

Measuring Devices: Accurate measuring devices are required by law for mixing pesticides. The measuring devices must be calibrated to the smallest unit in which the pesticide is being weighted and measured. This could be in pounds, ounces, cups, quarts, or other units of measure listed on the pesticide label. Ensure employees know conversion rates if having to convert work orders written in one unit to the units of the measuring device.

Proper Mixing Order: When mixing more than one pesticide, determine the proper order in which the chemicals should be added to the spray tank by following the pesticide label. The spray tank should first be partially filled with water and then filled to final volume after materials are added. Agitation may be necessary for some mixtures.

Types of Formulations

Powders, Liquids, Granulars, Emulsifiable Concentrates, Flowables, Wettable Powder, Water-soluble Concentrates

Mixing Order:

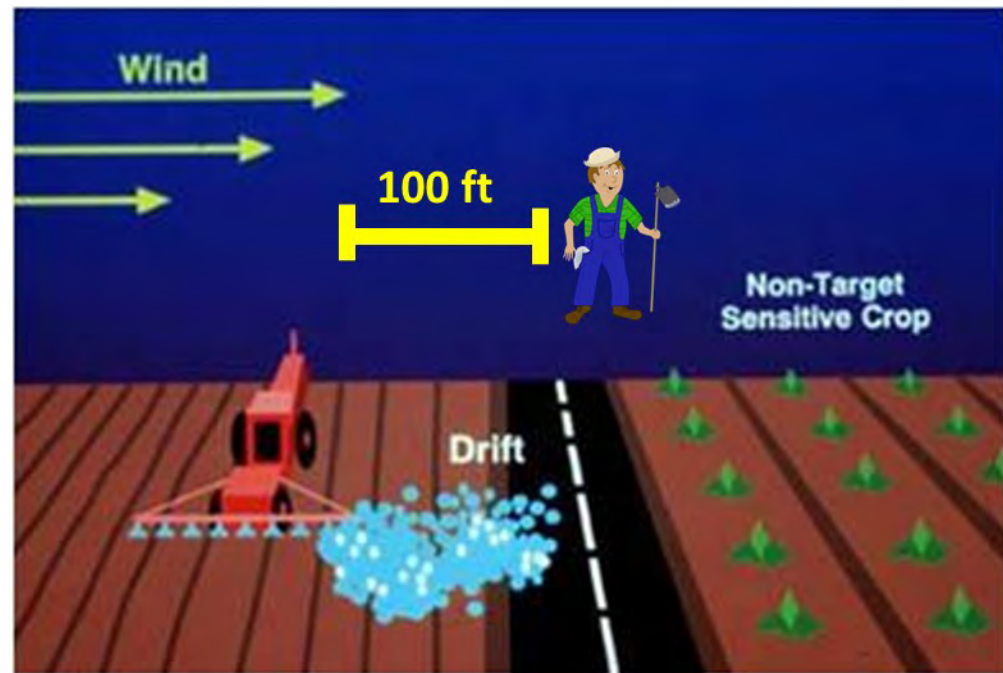
- 1)Wettable Powders
- 2)Flowables
- 3)Water-soluble concentrates
- 4)Emulsifiable concentrates

Container Rinsing and Disposal

Regulations require that pesticide containers be rinsed when emptied. Pesticide containers must be properly stored and disposed of as soon as possible. Pesticide labels must provide instruction about the timing and process for residues removal. These instructions, and instructions for container disposal, must be followed as written.

Triple Rinse emptied containers immediately, add the rinse water to the tank during mixing. Mark and perforate containers clearly.

Environmental Concerns and Drift



Personal Protective Equipment (PPE)



Head
Protection



Goggles



Respirator



Gloves



Apron



Face Shield



Coverall



Boots

Instructor Notes:

Environmental Concerns and Drift

Handlers must not apply pesticides in a manner that results in contact with workers or other persons. Don't forget the application exclusion zone. Handlers must suspend a pesticide application if a worker or other person is in the application exclusion zone. And employers cannot direct their employees into the application exclusion zone if the application zone is on their property.

The label will provide information about sensitive crops and risks to water resources. These instructions must be followed.

Discussion: Have your handlers identify environmental risks around your operation that can impact your pesticide operations. (e.g., roadways, rivers, schools, bus stops, bee hives, etc.)

Personal Protective Equipment (PPE)

The purpose of personal protective equipment is to reduce the amount of pesticides contacting the body or clothing. Goggles also protect the eyes and respirators limit the inhalation of toxic chemicals. Personal protective equipment is effective only if it fits correctly, is used properly, and is kept clean and in good repair. Even the best-fitting equipment has limits to the amount of protection it affords; therefore, applicators must still use caution to prevent pesticides from being spilled, splashed or sprayed onto their bodies.

It is the responsibility of employers to provide handlers with information and protections designed to reduce work-related pesticide exposures and illness. This includes providing, cleaning, maintaining, storing, and ensuring proper use of the label required personal protective equipment. The employer must inform the handler of application- and handling-specific information about use and labeling information.


Remove PPE as soon as you complete the tasks where you were exposed to the pesticide. Wash reusable gloves with soap and water, and then remove other PPE while still wearing the gloves. Then wash the gloves again with soap and water before removing them. Clean reusable PPE according to the PPE instructions, without causing contamination to yourself.

Discussion/Activity: Explain and review manufacturers' instructions on how to care for or dispose of PPE. Have employees each select a different piece of PPE and instruct/demonstrate to the class how to properly clean/dispose of the PPE.

Respiratory Protection

RESPIRATOR
SELECTION AND CARE


READ THE LABEL




PESTICIDE LABEL

PERSONAL PROTECTIVE EQUIPMENT
(PPE)


SELECT YOUR RESPIRATOR/CARTRIDGE




ENSURE EMPLOYEES ARE MEDICALLY EVALUATED AND FIT-TESTED PRIOR TO



CLEAN AND DRY RESPIRATORS



DISPOSE OF DIRTY PARTICULAR FILTERS AND CAR-



Things to consider:

- Written Program
- Medical Questionnaire
- Fit Test
- Use
- Maintenance
- Facial hair

Employee's Name	Respirator Assigned	Type	Hazard(s)	Activity(ies)	Employer Required or Employee Requested	Date of Fit Test	Type of Fit Test	Results
					(1) Employer Required (2) Employee Requested		(1) Pass (2) Fail	
					(1) Employer Required (2) Employee Requested		(1) Pass (2) Fail	
					(1) Employer Required (2) Employee Requested		(1) Pass (2) Fail	
					(1) Employer Required (2) Employee Requested		(1) Pass (2) Fail	
					(1) Employer Required (2) Employee Requested		(1) Pass (2) Fail	

I have been trained on why respirators are necessary and how to properly fit, clean, or maintain them. I understand the limitations of the respirator and the consequences of not using it properly. I have been trained on the proper use of the respirator, including situations in which the respirator malfunctions, how to inspect, put on and remove, use, and check the seal of the respirator. I have been trained on the maintenance and storage of the respirator(s). I have been trained on the proper use of the respirator, including situations in which the respirator malfunctions, how to inspect, put on and remove, use, and check the seal of the respirator. I have been trained on the proper use of the respirator, including situations in which the respirator malfunctions, how to inspect, put on and remove, use, and check the seal of the respirator. I have been trained on the proper use of the respirator, including situations in which the respirator malfunctions, how to inspect, put on and remove, use, and check the seal of the respirator.

Employee's Signature: _____ Date: _____ Medical Evaluation on file: (1) Yes (2) No

Trainer's Name: _____ Trainer's Signature: _____

Respirator Fit Recor

Safe Pesticide Application

Application Exclusion Zone (AEZ)

The Application Exclusion Zone or the "AEZ" is the area around pesticide application equipment that must be kept free of all workers and bystanders. As of January 2, 2017, only pesticide handlers that are appropriately trained, wearing personal protective equipment (PPE) and participating in the application, are allowed in the AEZ.

The AEZ is measured from the application equipment. The AEZ also moves with the application equipment like a halo around the application.

100 feet AEZ for:

- Aerial applications
- Air blast sprayers
- Fumigant applications
- Smoke applications
- Mist applications
- Fog applications
- Other applications using fine or very fine droplets (<294 microns)



25 feet AEZ when:

Pesticide is sprayed using droplet sizes of medium or larger and from more than 12 inches above the plant medium



If your application does not fall into one of these categories the AEZ is not applicable.

As of January 2, 2018, pesticide handlers must immediately suspend an application if any worker or other person, other than an appropriately trained and equipped handler involved in the application, is in the AEZ, regardless of whether they are on or off the establishment. This includes individuals on neighboring farms.



Instructor Notes:

Respiratory Protection

Products that require the use of a respirator will identify the specific type or types that may be used. Prior to assigning any worker to wear a respirator, the employer must implement a written respiratory program. The written program must include information on respirator selection, fitting, medical evaluation, maintenance, sanitation, and training.

Respirator Fit Record

Under the WPS, the employer must provide the handler a fit test, medical evaluation for their ability to safely wear the respirator, and respirator training before the handler first wears the respirator. The employer must – as with all PPE – maintain and provide the respirator to the handler. The employer is required to keep a record of the completion of these requirements.

Safe Pesticide Application

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Transportation



Handler Decontamination Site

- Clean water for routine and emergency washing – 3 gallons per handler
- Soap
- Single-use towels
- A clean set of clothing, such as coveralls, for use in case of an emergency
- One pint of water for emergency eye flushing shall be immediately available (carried by the handler or on the vehicle the handler is using) to each handler if the pesticide's product labeling requires protective eyewear.
- Eyewash station at the mix/load site



Instructor Notes:

Transportation

- Make sure the pesticide product container is tightly closed.
- Place the container in the vehicle where people will not be exposed (for example, a truck bed).
- Pesticides should not be stored in/or transported near food or feed.
- Make sure pesticides are well-secured in an upright position.
- Ensure that the pesticide container is properly labeled. (Product Name/Active Ingredient, Signal Word, & Responsible Party's Contact Information)

“Never carry pesticides inside your car, car trunk, van or truck cab. Pesticides can cause injury or death if they spill on you or your passengers. Dangerous fumes may be released. Spills on seat covers are very hard to get out. The pesticide may make people sick days or weeks later if it is not cleaned up properly.”

Activity: Have employees demonstrate how to properly load/transport pesticides.

Handler Decontamination Site

The handler employer must provide the following decontamination supplies:

- Clean water for routine and emergency washing – 3 gallons per handler
- Soap
- Single-use towels
- A clean set of clothing, such as coveralls, for use in case of an emergency
- One pint of water for emergency eye flushing shall be immediately available (carried by the handler or on the vehicle the handler is using) to each handler if the pesticide's product labeling requires protective eyewear.
- Eyewash station at the mix/load site

Activity: Have employees build their own decontamination supply kit.

Instructor Notes:

Training Record for Pesticide Handlers and Fieldworker – required annually

An individual training record should be completed for each employee. Handlers must be at least 18 years old.

The training record shows that each employee has been trained in all aspects of pesticides and indicates the specific pesticides the employee was trained on.

Agricultural employers are prohibited by the WPS rule from allowing or directing a worker to mix, load, or apply pesticides, or assist in their application, unless trained as a handler.