

Reducing Pesticide Risks



... an interactive program for
training pesticide handlers

Instructor's Manual

REDUCING PESTICIDE RISKS

An Interactive Program for Training
Pesticide Handlers

Patrick J. O'Connor-Marer
Jennifer L. Weber

University of California
Statewide Integrated Pest Management Project
Pesticide Education Program
Davis, California

2001

ACKNOWLEDGMENTS

This project was funded in part by the United States Department of Agriculture Cooperative State Research, Education, and Extension Service, through Cooperative Agreement Number 97-EXCA-3-0639.

Production

Instructor Handbook Design: *Dylan Leek*

Instructor Handbook Drawings: *Javier Juarez* and *David Kidd*

Editing: *Diane Clarke*

Video Script: *Jennifer Weber* and *Melanie Zavala*

Video Direction and Production Coordination: *Ray Lucas* and *Jennifer Weber*

Video Script Translation and Translation Coordination: *Myriam Grajales-Hall* and *Alberto Hauffen*

Videographers: *Ray Lucas* and *Jim O'Brien*

Lead Video Actors: *Myriam Grajales-Hall*, *Alberto Hauffen*, and *Mike Poe*.

Supporting Video Actors: *Christian Anaya*, *José M. Anaya*, *Juan C. Anaya*, *Juan C. Anaya, Jr.*, *Lucia Anaya*, *Jesús Barela*, *Mick Canevari*, *George Castañan*, *Rafael Chavez*, *Jorge Cisneros*, *Patricia Cisneros*, *Marisa Gaona*, *Alfredo García*, *José Guerrero*, *José Gutierrez*, *Neng Her*, *Shawn King*, *Michael Kohl*, *Dylan Leek*, *Eduardo Valadez Leon*, *Paul Lo*, *Peng Lo*, *Tou Lo*, *Rosalinda Martinez*, *David Mata*, *Adrian Medina*, *Yolanda Moreno*, *Andre Moua*, *Robert Mullen*, *Patrick O'Connor-Marer*, *Garry Pearson*, *Gale Pérez*, *Manuel Pickett*, *Marisol Pickett*, *Andrea Porras*, *Maria Ramirez*, *Martin J. Rodriguez*, *Ernie Roncoroni*, *Hector Venegas*, *Jay Xiong*, and *Medardo Zavala*.

Pesticide Education Program
Statewide IPM Project
University of California
One Shields Avenue
Davis, California 95616
(530)752-5273

The University of California prohibits discrimination against or harassment of any person employed by or seeking employment with the University on the basis of race, color, national origin, religion, sex, physical or mental disability, medical condition (cancer-related or genetic characteristics), ancestry, marital status, age, sexual orientation, citizenship, or status as a covered veteran (special disabled veteran, Vietnam era veteran, or any other veteran who served on active duty during a war or in a campaign or expedition for which a campaign badge has been authorized). University Policy is intended to be consistent with the provisions of applicable State and Federal laws. Inquiries regarding the University's nondiscrimination policies may be directed to the Affirmative Action/Staff Personnel Services Director, University of California, Agriculture and Natural Resources, 1111 Franklin, 6th Floor, Oakland, CA 94607-5200; (510) 987-0096.

CONTENTS

Episode 1: Pesticide Illnesses and Injuries	1
Discussion Activities	2
First Aid and Emergency Decontamination	3
Interpreting Label First Aid Instructions	6
Routes of Entry for Pesticides	6
Video Script	23
Episode 2: Protecting Yourself When Handling Pesticides	27
Discussion Activities	28
Selecting Personal Protective Equipment	29
Evaluating a Handler's Responsibility for Wearing the Proper PPE	29
Video Script	35
Episode 3: Safely Handling Pesticides and Their Containers	39
Discussion Activities	40
Planning for Mixing and Loading Pesticides	41
Mixing and Measuring Pesticides	42
Triple Rinsing Pesticide Containers	44
Storage and Disposal of Pesticide Containers	45
Video Script	73
Episode 4: Applying Pesticides Safely	77
Discussion Activities	78
Protecting People While Applying Pesticides	79
How Weather Influences a Pesticide Application	81
Keeping Pesticides Out of Sensitive Areas	83
Special Hazards at the Application Site	85
The Application Pattern	87
Using Buffer Strips to Protect Sensitive Areas	89
Pesticide Application Equipment Problems	91
Video Script	93
Episode 5: Cleaning Up after Handling Pesticides	95
Discussion Activities	96
Video Script	107

1 EPISODE

PESTICIDE ILLNESSES AND INJURIES



The video that accompanies this workbook portrays a story, in five episodes, of interactions between a farm owner and a recently hired employee on a somewhat typical farm. In the English version, the owner of this farm is Murray. In the Spanish version, Susana is the owner. Richard is the employee in the English version of the video, and in the Spanish version he is Manuel. The first episode

begins with Murray asking Richard if he would be willing to take on new responsibilities that involve applying pesticides to control crop pests. Richard has had some previous experience handling pesticides while working for another employer, but has not made any pesticide applications for a while and has not had any recent training. Richard expresses a willingness to take on this new work, so Murray begins training him. The first information that Murray covers with Richard pertains to the potential health effects of pesticide exposure and how to deal with medical emergencies.

When the scene changes, Murray and Richard are seen sitting in the farm workshop. Murray is using the EPA handler booklet and some pesticide labels to review the potential health hazards caused by pesticide exposure and to train Richard on ways to deal with exposure emergencies.

IMPORTANT POINTS INCLUDED IN EPISODE 1

This first episode covers several of the pesticide handler training requirements that have been mandated by the federal Worker Protection Standard (WPS). These include

- understanding the format and meaning of first aid statements, precautionary statements, and other statements about human health hazards that are found on pesticide labels and in supplemental labeling
- recognizing and dealing with the health hazards associated with pesticide exposure
- routes through which pesticides can enter the body
- employer obligations to provide decontamination facilities
- signs and symptoms of common types of pesticide poisoning
- emergency first aid for pesticide exposure
- how to obtain emergency medical care

Showing Episode 1

Assemble the pesticide handlers you are training and tell them they will be viewing a short video segment that deals with the potential health effects of pesticide exposure. Ask them to pay close attention to the information in the video, and let them know there will be time for questions and a general discussion afterwards. Remain with the participants as they view Episode 1. Stop the video as soon as this episode is completed.

The script for Episode 1 is included at the end of this chapter, beginning on page 23. Refer to it if needed during the discussion activities.

Discussion Activities

The following three interactive activities provide opportunities for you to involve participants in discussions about the pesticide safety messages presented in Episode 1. These activities include the use of drawings, role-playing, and hands-on exercises. The purpose of these activities is to get feedback from participants so that you can be assured they comprehend the information provided by this video episode.



Activity: First Aid and Emergency Decontamination

Volunteers for Role-Playing Activities. Ask for four volunteers who will work in pairs in the two role-playing activities. One person in each pair will play the role of the victim, and the other will play the role of the rescuer who performs emergency first aid. Give each pair of volunteers one of the pictures provided with this activity. Instruct them to develop a scenario like the one they see in the picture, and then have them demonstrate the proper first aid and how to obtain emergency help for the exposure victim. Allow them a few minutes to plan their scenarios.

Observers. The rest of the participants in your training session will be observers for this activity. Ask the observers to think about the following as they watch the volunteers acting out the two scenarios:

- What is the correct first aid for the type of exposure being shown?
- Did the rescuer provide the proper first aid?
- How did the worker get exposed?
- How could this situation be avoided?

Required Materials

To prepare for these two scenarios, collect the following materials:

Scenario #1

- soap and a small container of water
- paper towels
- measuring cup
- new plastic container (to simulate a pesticide container)
- 2 pairs of safety goggles

drawing of two men measuring a pesticide (use Figure 1 on page 7)

Scenario #2

- two empty soft drink bottles

drawing of a man going to drink from a soft drink container (use Figure 2 on page 9)

While the volunteers are preparing for the scenarios, discuss the proper way to respond to pesticide injuries (through the skin and eyes, by swallowing, or by inhaling a pesticide) with the observers. After the volunteers present each scenario, have the observers answer the questions on the following pages.

Scenario 1—Pesticides on the Skin

Question: What caused the victim's exposure to this pesticide?

Possible answer: The person was not wearing the correct PPE for working with pesticides.

Question: What did the rescuer do to help the victim? What other things could the rescuer have done?

Answer: (The answer will depend on how the rescuer responded.)

Question: What is the correct way to respond to this emergency?

Answer: Immediately remove any contaminated clothing and wash the affected skin areas with lots of water and soap.

Question: What if soap is not available?

Answer: Rinse with plenty of water. Use soap when available.

Question: What if the victim's clothes are contaminated?

Answer: Remove the contaminated clothing and wash the affected skin to prevent further exposure.

Question: When should you take a pesticide exposure victim to a medical facility?

Answer: For victims of skin exposure, get medical help if the affected area becomes irritated, other symptoms develop, or if it is part of company policy or label instructions. For eye, inhalation, or oral exposure, always get medical help.

Question: How could this accident have been prevented?

Possible answers: All employees should be properly trained for the types of jobs they are doing and should not handle pesticides if they are not wearing the appropriate PPE. Supervisors or employers should instruct all handlers to never handle pesticides or pesticide equipment without adequate protection.



Scenario 2—Swallowing a Pesticide

Question: What is wrong with the situation? How did the handler get exposed?

Possible answers: Someone put a pesticide in a soda bottle.

The worker drank from a container without knowing what was in it.

An incorrectly bottled pesticide was left unattended.

Question: What would be the correct response to this type of situation?

Answers: (The answers will depend on what the volunteers do to provide first aid.)

Question: Why should you not always induce vomiting when a person has swallowed a pesticide?

Possible answers: Some pesticides are caustic or cause tissue damage. If the victim vomits, the linings of the mouth and throat will

be burned in the vomiting process, causing additional damage apart from that caused by swallowing.

Sometimes, if the victim vomits, pesticides can get into the lungs and cause damage.

Question: If the victim is unconscious, should you attempt to induce vomiting?

Answer: No, because an unconscious person can choke and suffocate if you try to induce vomiting.

Question: How could this situation have been avoided?

Possible answers: Pesticides should never be stored in unmarked containers, or stored or measured in any type of food and beverage container.

No one should ever drink or eat something they find near a pesticide mixing site.



Activity: Interpreting Label First Aid Instructions

This training activity requires participants to use actual pesticide labels to obtain the first aid information so they can respond correctly to the different types of pesticide exposure incidents that could occur in the workplace.

Procedure. Divide participants into groups of two or more, and give each group a different pesticide label. Allow each group about 5 minutes to find the first aid instructions on their label and share this information with the others. After each group has discussed the first aid instructions for their label, have them discuss the differences, if any, between the first aid instructions for the various pesticides.

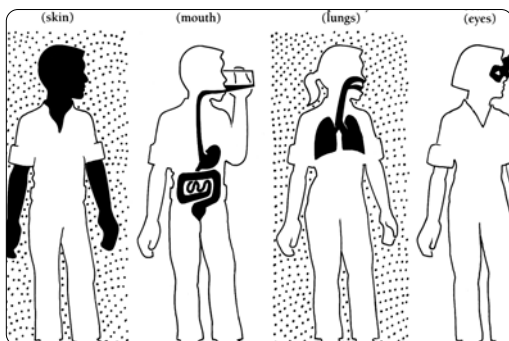
Required Materials

Obtain copies of several labels of pesticides that are commonly used by the participants.

Activity: Routes of Entry for Pesticides

This activity uses drawings to stimulate discussions about the ways that pesticides can enter the tissues of the body and cause injury or illness.

Procedure. Begin by showing Figure 3, *The Four Modes of Entry*, to the participants. Have them name each mode of entry and then provide examples of how each type could occur when working with pesticides. Proceed to show them Figures 4, 5, 6, 7, and 8. After each illustration, ask participants to describe what is happening and to identify the mode of entry the drawing represents.



Then, have them describe how these situations can be prevented.

Required Materials

Make copies of Figures 3, 4, 5, 6, 7, and 8, pages 11 through 21.

Figure 1



Figure 2

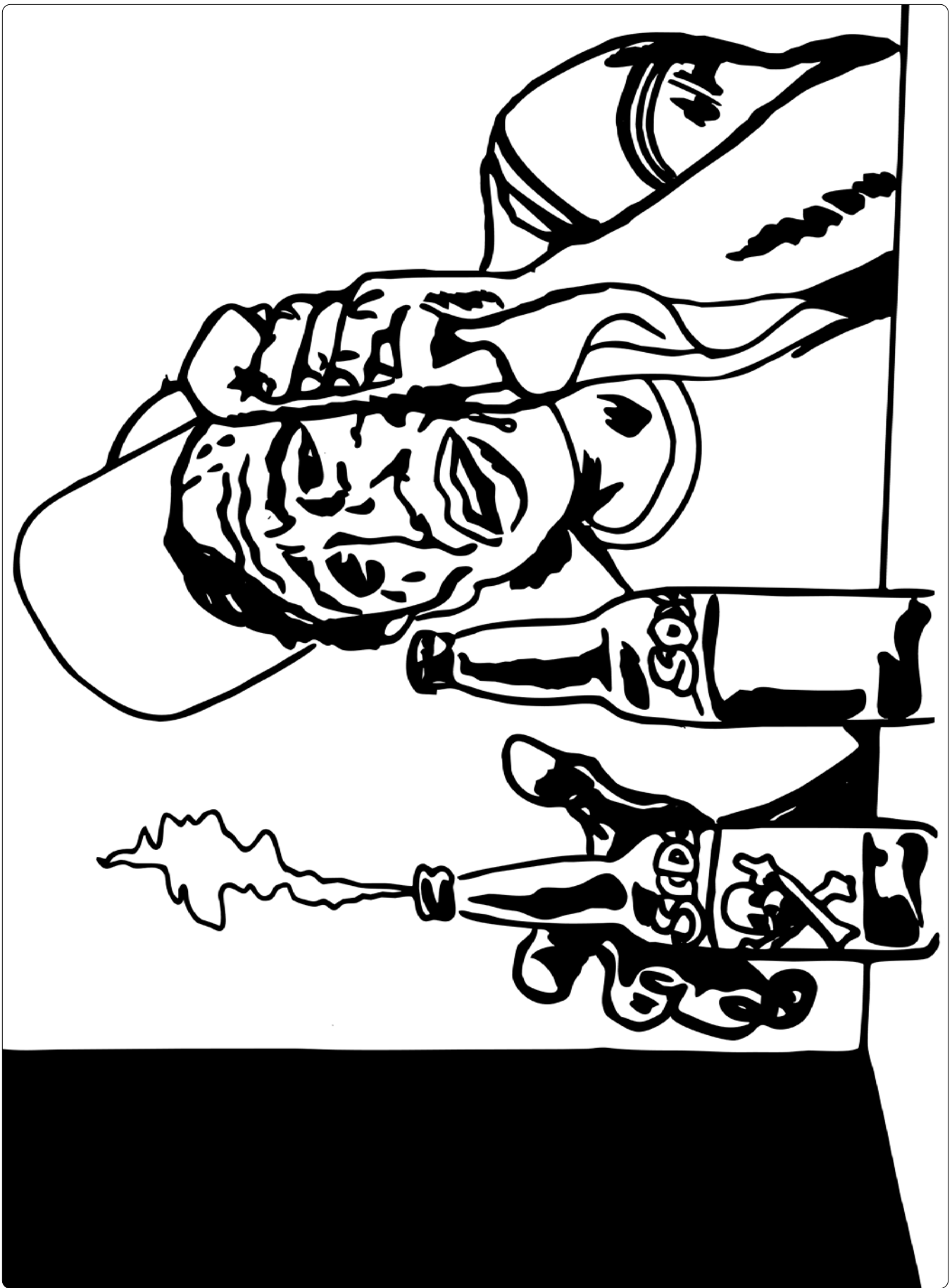


Figure 3

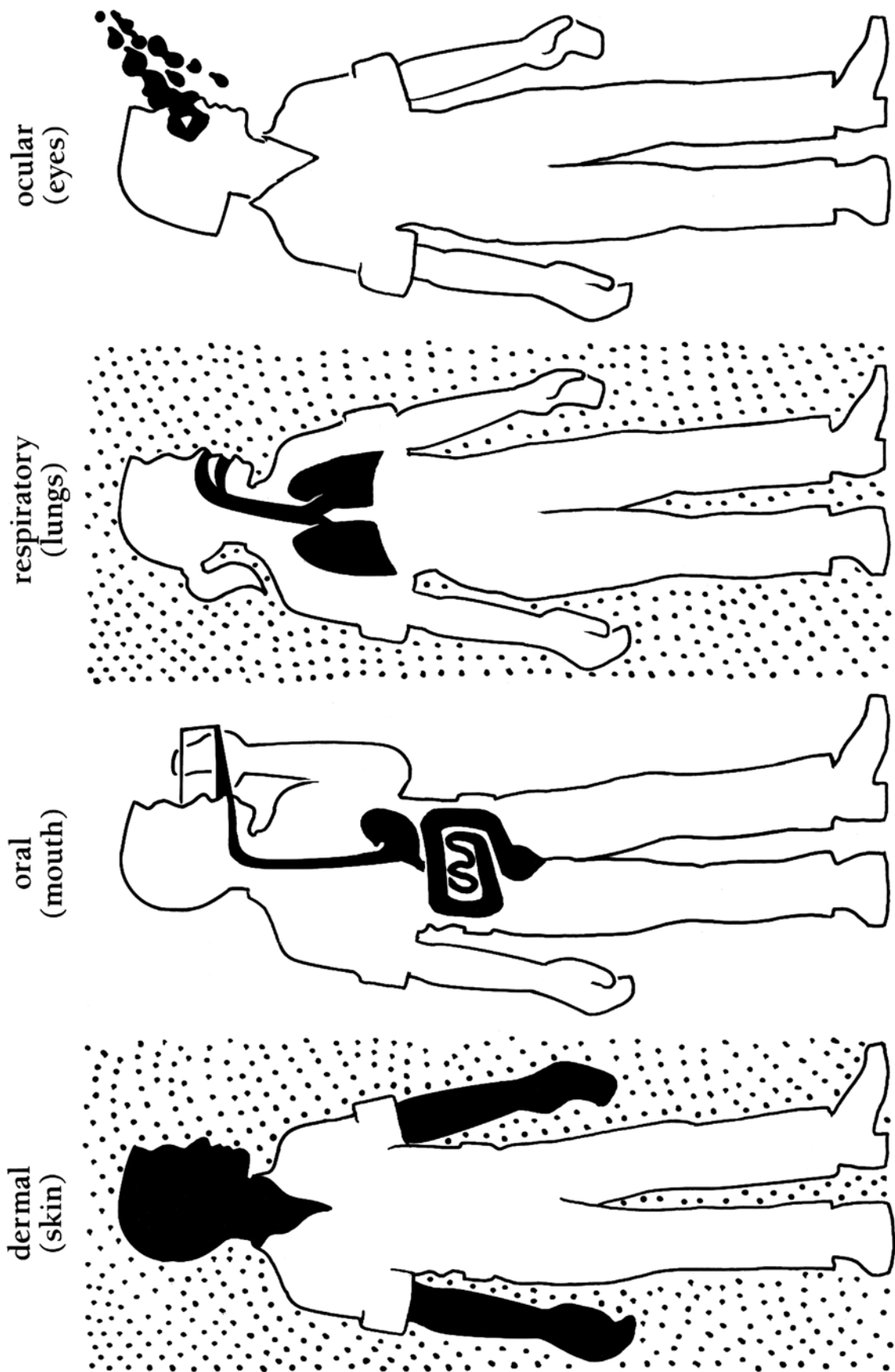


Figure 4



Figure 5



Figure 6



Figure 7

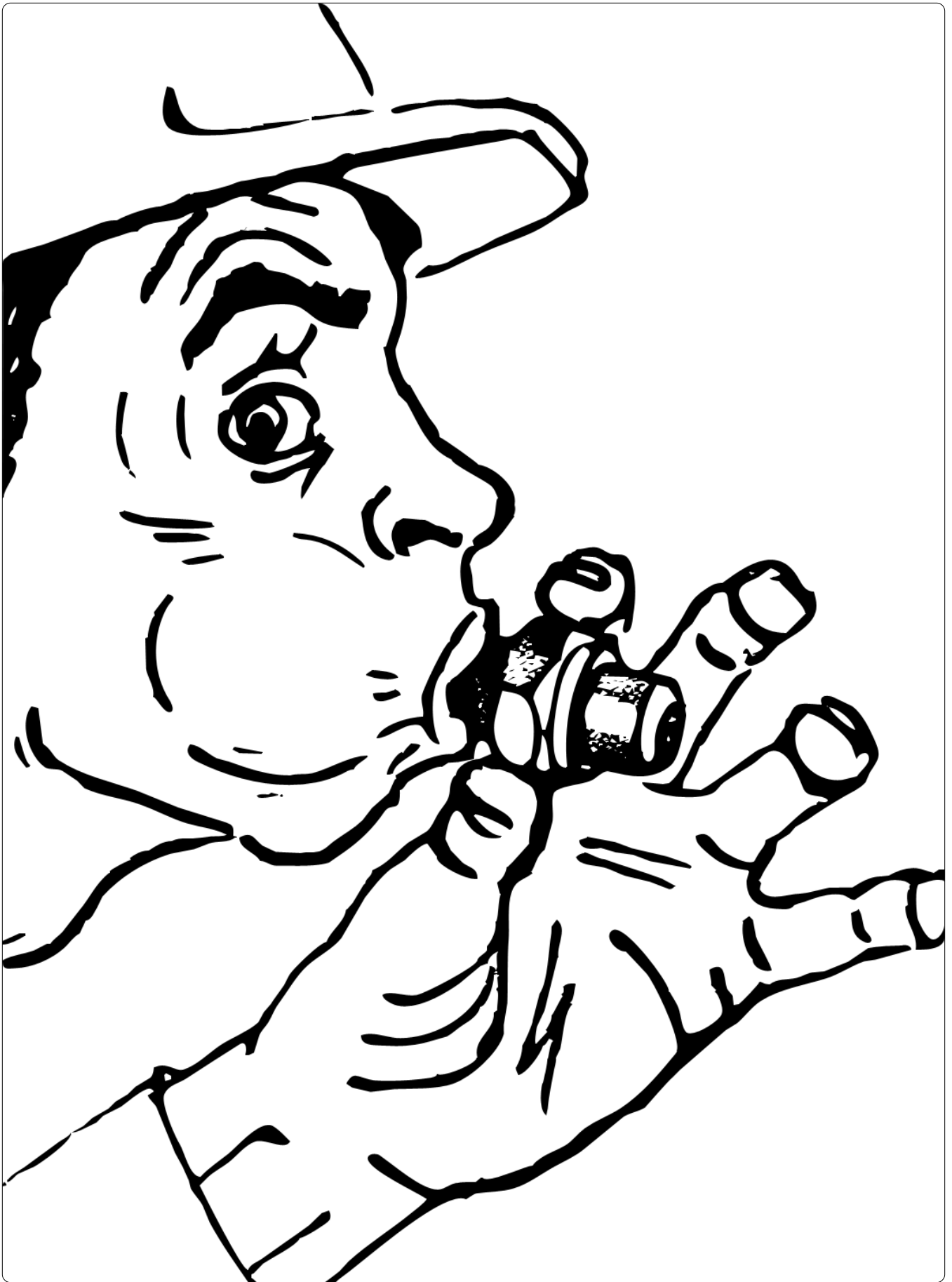


Figure 8



SCRIPT FOR EPISODE 1

(Murray walks up to Richard.)

Murray: Richard, you seem to learn quickly. How would you like to do some pesticide spraying? I remember that you've worked with pesticides before.

Richard: I helped with some pesticide spraying a couple of years ago. I'd like to learn more about it.

Murray: Excellent. But, before I get you started, I need to give you some training.

Richard: O.K. When should we start?

Murray: Right now! Let's go to the shop. First, let me show you some pesticide labels. You need to learn how to protect yourself from pesticide exposure and what to do if you get exposed.

Richard: I've never had problems, but I'm sure it's better to be prepared.

Murray: The most important thing you need to know is how to handle pesticides safely. Pesticides are important to our operation, but some of the ones we use here are pretty hazardous.

Richard: *(as they turn around and start to head back)*
Right. I appreciate knowing that.

(They are now in the farm workshop, sitting at a table. There is an EPA handler manual and several pesticide labels on the table.)

Murray: The pesticide label is a legal document. You need to read it carefully and follow the requirements and use directions.

Richard: What do you mean when you say "legal document?"

Murray: I mean that the law obligates me to make sure that anyone handling pesticides on my property follows these directions.

Richard: And if I didn't do that would I be breaking the law?

Murray: Yes. The laws are there to protect you.

Richard: I never realized that. I guess pesticide labels deserve serious attention.

Murray: They do. Labels contain a lot of important information such as...how to avoid exposure...what personal protective equipment to wear... crops the pesticide can be used on ...what rates to use, and which pests they control.

Richard: All that?

Murray: Even more. Sometimes there's too much information to fit on the pesticide container, so manufacturers print this supplemental labeling. *(Murray holds up a supplemental label.)*

Murray: This is just as important as the container label.

Richard: Okay.

Murray: Let's begin by looking at the signal words, the precautionary statements, and the first aid instructions on a few pesticide labels.

Richard: What's a signal word?

Murray: It's this word here. *(Murray points to a signal word on a label.)* It gives you an idea of how hazardous the pesticide is.

Richard: And what does that word "Warning" mean? *(He points to the word "Warning" on a label.)*

Murray: This pesticide is moderately hazardous.

Richard: So each pesticide has its own signal word? How many signal words are there?

Murray: Three. The most hazardous pesticides have the word "Danger." This could indicate the possibility of severe eye or skin injury. If the pesticide is highly toxic, you'll also see the word "Poison" together with this skull and crossbones symbol. *(Murray unfolds another label and points to the word "Poison" and the skull and crossbones symbol. The camera does a close-up of the word and symbol.)*

Richard: Interesting. So that's two signal words: "Danger" and "Warning." What's the third one?

Murray: The least hazardous pesticides have the signal word "Caution."

Richard: Okay, "Danger," "Warning," and "Caution." I'll remember that. What are some of the other parts of the label?

Murray: *(Murray points to another part of the label and the camera focuses on the precautionary statements.)* Precautionary statements tell you what equipment you need to wear to protect parts of your body. If the stuff can burn your eyes or irritate your skin, this section tells you so. A warning about inhaling the pesticide vapors, spray, or dust may be included.

Richard: That sounds useful.

Murray: Remember, if you ignore label instructions, you're breaking the law. For example, if the label tells you to wear chemical-resistant gloves, you're required by law to wear them.

Richard: So basically, I have to wear the personal protective equipment listed on the label.

Murray: Yes. That information is there to protect you. I expect you to take the instructions I give you and the ones you find on pesticide labels very seriously.

Richard: I understand. You can depend on me to follow the instructions.

Murray: Fine. It's good to make those things clear from the beginning.

Richard: This is really good information.

Murray: (*Murray nods, and then indicates another label section.*) Many labels include emergency numbers you can call in case there is an exposure incident, a pesticide spill, or some other emergency. We'll talk about spills later. Right now let's talk about how handlers can get exposed. We'll start by defining the term "pesticide handler."

Richard: Um. That would be like the spray guy. Right? And someone who mixes pesticides and puts them into spray tanks.

Murray: Right. Can you think of any other handling activities?

Richard: Let's see. (*pauses to think*) How about the people who do flagging for the spray planes? Are they handlers?

Murray: Very good. Yes, flaggers are considered handlers because they work where pesticides are being applied. (*As he is speaking, we see a flagger working.*)

Murray: And they are responsible for making sure no people, pets, or livestock are in or near the area during aerial applications. Who else is a pesticide handler?

Richard: What about people who transport pesticides from one place to another?

Murray: People who transport pesticides are considered handlers only if the containers they carry have been opened. If the seal hasn't been broken, the person isn't considered a handler.

Richard: How about people who repair the application equipment? That equipment could be covered with residues.

Murray: Right. People who clean up or repair contaminated equipment are pesticide handlers and must wear the appropriate PPE. In fact, anyone who assists with a pesticide application in any way is a pesticide handler. Now let's think about how and when handlers can get exposed to pesticides.

Richard: Well, it seems to me that the guy who mixes and loads the tank is most at risk.

Murray: Yes. When you are putting a pesticide into the spray tank you need to be especially careful. You are working with concentrated pesticides so if they spill on your skin, or splash into your eyes, or if you breathe in the vapors, you could get very sick.

Richard: How about someone who works with pesticides and then eats something without washing their hands first?

Murray: Now that's something I don't ever want to see you do! I'm required by law to provide you with soap and water for routine washing and emergency decontamination.

Richard: You mean there will be wash water and soap near the areas where I'll be spraying?

Murray: Yes. Within 1/4 mile of where you'll be working, there will be soap, towels, and enough water to wash yourself off in case of an accident. And there will also be a clean set of clothes for you to change into.

Richard: That's a good idea.

Murray: Exactly. But remember it's up to you to wash when you need to and use common sense to avoid exposure.

Richard: I'll be careful.

Murray: I'm sure you will. Now there are four ways pesticides can get into the body: through the skin and the eyes, by breathing them in, and by swallowing them.

Richard: O.K.

Murray: (*nods*) What are some other ways that a handler could get exposed?

Richard: Well, let's say you're out spraying and some of the pesticide you are spraying drifts onto your skin?

Murray: That's one possibility. Defective or leaking equipment could also lead to skin exposure.

Richard: If you have a cut or scratch, are pesticides more likely to get through your skin?

Murray: Yes, but even if you don't have an open wound, skin exposure is the most common route of exposure among handlers. (*pauses*) Now, how do you think eye exposure might happen?

Richard: What if you rub your eyes and your hands or gloves have pesticide residues on them? Or how about if a pesticide splashes while you're pouring it? That could really be bad for the eyes!

Murray: And remember your example of the guy eating while he's handling pesticides? Tobacco and food can absorb pesticides and shouldn't even be carried into areas where pesticides are being applied. And to protect yourself you need to wash your hands before you use the bathroom, touch any part of your body, put on makeup...

Richard: Makeup?

Murray: There are women who handle pesticides too. I just want to make sure I cover everything.

Richard: (*embarrassed*) Oh yes, I understand.

Murray: Contact with pesticide residues can also cause exposure.

Richard: You mean like from treated plants?

Murray: Yes, and from the soil in areas where we've sprayed. Sometimes pesticides are applied through the irrigation system, so the water may contain pesticide residues. And vapors and mist may be in the air after a pesticide application. Now, let's talk about symptoms of poisoning from some of the commonly used pesticides.

Richard: I've heard that they could be things like tiredness, dizziness, headaches, blurred vision, throwing up, stomach cramps, um... (*hesitates and thinks*)

Murray: Excessive sweating, drooling, and with some types of pesticides, rashes or eye irritation. Not all pesticides cause these symptoms, and even if someone is exposed to a pesticide that could produce the symptoms we've mentioned, the person won't necessarily have all the symptoms.

Richard: (*remembering*) Is it true that you can be allergic to some pesticides and start sneezing, or get a runny nose, itchy eyes, or a skin rash?

Murray: Yes. It's called sensitization. Some people can develop a sensitivity to certain pesticides as a result of repeated exposures.

Richard: So far, we've talked about getting exposed and feeling the effects right away. But I've heard about people who get sick a long time after being exposed. Is that possible?

Murray: A good question, and a tough one to answer.

Richard: Tough? Why?

Murray: Well, it's really hard to connect an exposure that occurred months or years earlier with a present illness. There could be many other factors that contribute to the illness.

Richard: So some exposures could cause a problem that you don't even know about until later on?

Murray: Exactly. But since many of these effects develop very slowly, several years may pass after a pesticide exposure before the effects are noticed.

Richard: I've heard about things like birth defects, sterility, and damage to the nervous system.

Murray: It's the same problem. When a long time has passed between the onset of illness and the exposure that may have caused the illness, it's usually impossible to establish a definite connection.

Richard: Sounds to me like with so much uncertainty, anyone working around pesticides had better do everything possible to avoid getting exposed.

Murray: Good. I was hoping you'd come to that conclusion. Still, since people sometimes do get exposed while

working with pesticides, we need to talk about first aid.

Richard: Are first aid instructions on pesticide labels?

Murray: Yes. They are usually found on a section called "Statement of Practical Treatment." If you ever feel sick while working with a pesticide, stop what you are doing at once and get away from the pesticide. Then, if you think the pesticide is making you sick, let me know right away so we can send you to the doctor.

Richard: Where should I go? Is there a specific doctor or clinic?

Murray: Remember when you first started here, I showed you the emergency information posted on the side of the shop with the name, address, and telephone number for Loma Linda Medical Center?

Richard: Oh that's right. I remember.

Murray: Well, I'm required to have that information posted in a central location, like here at the shop, where everyone who works for me can see it. The clinic that is listed is the one that I expect employees to go to if they get injured at work.

Richard: Right. (*looking at a label*) It says something about emergency decontamination here. What's emergency decontamination?

Murray: Emergency decontamination is the first thing you do after someone has been exposed to a pesticide.

Richard: I thought the first thing you were supposed to do is take the person to a doctor!

Murray: No, first take away the source of exposure. But make sure to protect yourself from any pesticide that might be on the person, the person's clothing, or the surrounding area.

Richard: How do you do that?

Murray: Well, wear the same PPE required for handlers on the label, or if in doubt, wear chemical resistant PPE to prevent getting exposed to the pesticide. If a pesticide spills on a person's clothes, you should remove the clothing and wash the person's contaminated skin before much of the pesticide has time to penetrate the skin. By doing this you can actually save that person from injury.

Richard: Oh. That makes sense. What if a pesticide splashes into the eyes?

Murray: You should immediately rinse the person's eyes. We have an eye flush kit here, but you can use any gentle stream of clean water. And you need to turn the person's head so the pesticide doesn't run out of one eye and into the other.

Richard: How do you keep their eyes from closing while you're rinsing?

Murray: Hold the lids open with your fingers and continue rinsing for at least 15 minutes. Now, what should you do if someone is affected by breathing pesticide fumes?

Richard: I suppose you need to get the guy away from the pesticide and get him to fresh air.

Murray: Right. But remember, if they are in an enclosed area wear a respirator. Once you've taken the person outside, loosen any tight-fitting clothing. If they have stopped breathing, you need to give mouth-to-mouth resuscitation.

Richard: Do the first aid instructions on all pesticide labels give the same information you just told me?

Murray: For skin, eye, or inhalation exposure, label first aid instructions are similar to what I just told you. But always check the label first aid instructions if someone has swallowed a pesticide. Some labels recommend inducing vomiting, but others warn against this because the pesticide is corrosive, and vomiting could increase the damage to the person's throat and lungs.

Richard: Then what's the first aid for someone who swallows a corrosive pesticide?

Murray: The label may tell you to have the person drink water, milk, or egg whites to dilute the poison. But never try to make an unconscious person swallow anything. The most important thing when someone swallows a pesticide is to get them to a doctor quickly.

Richard: I can see that. So in all cases, you should get the exposed person to the emergency room as soon as possible?

Murray: Well, if the person has inhaled or swallowed a pesticide or gotten pesticide in their eyes, take them to the doctor immediately. But for skin exposure, if you decontaminate the affected area immediately and the person feels okay, it may not be necessary to take him to the doctor unless the label specifically says to. But whenever someone is exposed to pesticides, call the office immediately. Explain the situation to us and we'll tell you if a trip to the emergency room is necessary.

Richard: Are there any special things to consider when taking someone who has been injured by a pesticide to the doctor?

Murray: Yes. First, never let the person drive alone. Someone else should drive.

Richard: O.K., is there anything else?

Murray: Labels often have a "Note to the Physician" with medical instructions. If you take someone who has been injured by a pesticide to a medical facility, bring a copy of the label and the Material Safety Data Sheet, and be able to explain how the person got exposed.

Richard: What if the only label around is the one from the container and it's covered with pesticide?

Murray: Then copy down the brand name, the common names of the active ingredients, the EPA registration number, and the medical instructions.

Richard: Well, I can see there's a lot to learn about pesticides.

Murray: And we're just getting started! But that's enough for one day. Tomorrow morning I'll meet you back here and we can talk about how to avoid exposure.

Richard: All right, Murray. I'll be here tomorrow morning.

EPISODE 2

PROTECTING YOURSELF WHILE HANDLING PESTICIDES



Richard's pesticide training continues. Murray instructs Richard about ways to avoid pesticide exposure. They look at the PPE instructions on various pesticide labels, discuss choosing the correct PPE based on label instructions, and talk about wearing, cleaning, storing, and inspecting PPE. They then talk about the problems of heat and heat-related illness

when wearing personal protective equipment in hot weather. Finally, Murray describes the different types of respirators used by pesticide handlers.

Each pesticide label lists the PPE needed when handling or working with that pesticide. It is essential that people working with pesticides read and follow the PPE requirements listed on the label so they can comply with the law and minimize exposure.

Various types of handling tasks require different types of PPE. For example, the label may list specific PPE for mixing and loading tasks that is not required when applying the pesticide. Occasionally a person may need to work in an area that is still under restricted-entry. This person is considered an early-entry worker and may have PPE requirements that are different from those for pesticide handlers. PPE requirements for early-entry workers are listed on the label.

IMPORTANT POINTS INCLUDED IN EPISODE 2

This episode covers the personal protective equipment training requirements mandated by the WPS. The points emphasized in this episode include

- the need for and appropriate use of personal protective equipment (PPE)
- recognizing, preventing, and treating heat-related illness
- WPS requirements for employers to provide safety training to pesticide handlers

Showing Episode 2

After a quick break, have the participants return to view the next episode of the video. Explain to them that this episode deals with the personal protective equipment that is required to be worn by pesticide handlers and early-entry workers. As with the previous episode, there will be an opportunity for questions and activities that will promote discussion. Remain with the participants throughout the viewing of Episode 2.

The script for Episode 2 begins on page 35.

Discussion Activities:

Two interactive activities are included here to stimulate discussion and reinforce information presented in Episode 2. One activity involves selecting appropriate PPE based on label recommendations, and the other activity is a case study. Before beginning the activities, pass out copies of Handout #1, *Avoiding Heat Stress*. (This handout is on page 31.)



Activity: Selecting Personal Protective Equipment

This activity gives participants an opportunity to locate personal protective equipment requirements on pesticide labels and select the appropriate equipment that meets these requirements.

Required Materials

For this activity, assemble the following materials:

- two or three different pesticide labels commonly used at the worksite of the participants
- various types of personal protective equipment, including all types that are listed on the labels being used in this exercise

Procedure. Divide the participants into three groups and give each group a different pesticide label. Ask participants to locate the PPE section of their labels and decide what PPE is required to be worn when mixing and loading the pesticide, applying the pesticide, and during early-entry activities. Instruct the groups to locate the proper PPE, and have one member of the group put it on. Have each group explain to the other participants their choices and describe differences, if any, between the PPE requirements for mixing and loading, application, and early-entry activities.

Activity: Evaluating a Handler's Responsibility for Wearing the Proper PPE

This activity uses a case study to present a simulated situation in which a pesticide handler makes an improper decision regarding the use of the label-required PPE. After you present the case, generate a discussion among the participants by asking several questions. Design the questions so the participants have to explore other ways the situation in the case study could be handled.

Required Materials

For this activity, use the case study on page 32, or make up other case studies that portray situations in which a pesticide handler makes an unwise decision.

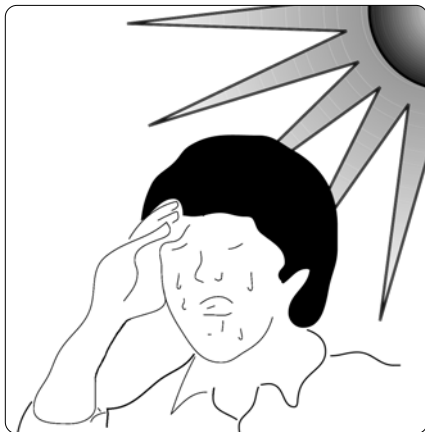
Procedure. Read the following case study to the participants and show them a copy of Figure 9 (on page 33). Ask the participants a series of questions following the case to lead them through the steps of analyzing and drawing conclusions about the situation, what the person should have done, and how this situation could have been avoided or improved.

Sample Questions:

- What problems are presented in this case study?
- How could this situation be avoided?
- What should the worker have done when he realized that he had forgotten his respirator?
- What role could the employer have played to prevent this from happening?
- What other situations can you think of that would prevent a pesticide handler from wearing the proper PPE?

AVOIDING HEAT STRESS

Heat stress is the illness that occurs when the body builds up more heat than it can cope with. Wearing personal protective equipment—clothing and devices that protect the body from contact with pesticides,



for example—can increase the risk of heat stress by limiting the body's ability to cool down.

Avoid Heat Stress

Several factors work together to cause heat stress. Before beginning a task that requires the use of personal protective equipment, think about whether any of these factors are likely to be a problem. Consider making adjustments in the task itself or in the workplace conditions, including:

- heat factors—temperature, humidity, air movement, and sunlight
- workload—the amount of effort a task takes
- personal protective equipment (PPE)
- drinking water intake
- scheduling

Heat and Workload

High temperatures, high humidity, and sunlight increase the likelihood of heat stress. Air movement,

from wind or from fans, may provide cooling. Because hard work causes the body to produce heat, a person is more likely to develop heat stress when working on foot than when driving a vehicle. Lifting or carrying heavy objects or equipment also increases the likelihood of becoming overheated.

Signs and Symptoms of Heat Stress

Heat stress, even in mild forms, makes people feel ill and impairs their ability to do a good job. They may get tired quickly, feel weak, be less alert, and be less able to use good judgment. Severe heat stress (heat stroke) is a serious illness. Unless victims are cooled quickly, they can die. Severe heat stress is fatal to more than 10 percent of its victims, even young, healthy adults. Victims may remain sensitive to heat for months and be unable to return to the same work.

Learn the signs and symptoms of heat stress and take immediate action to cool down if they appear. Signs and symptoms may include:

- fatigue (exhaustion, muscle weakness)
- headache, nausea, and chills
- dizziness and fainting
- loss of coordination
- severe thirst and dry mouth
- altered behavior (confusion, slurred speech, quarrelsome or irrational attitude)

Heat cramps can be painful. These are muscle spasms in the legs, arms, or stomach caused by loss of body salts through heavy sweating. To relieve cramps, drink cool water. Stretching or kneading the muscles may temporarily relieve the cramps.

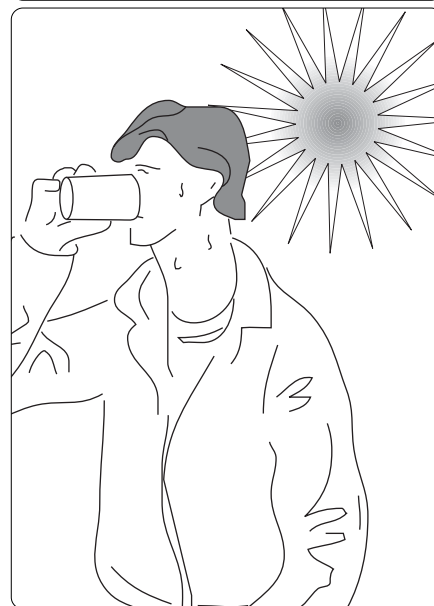
First Aid for Heat Stress

It is not always easy to tell the difference between heat stress illness and pesticide poisoning. The signs and symptoms are similar. Don't waste time trying to decide what is causing the illness. Get medical help right away.

Severe heat stress (heat stroke) is a medical emergency! Cool victim immediately. Brain damage and death may result if treatment is delayed.

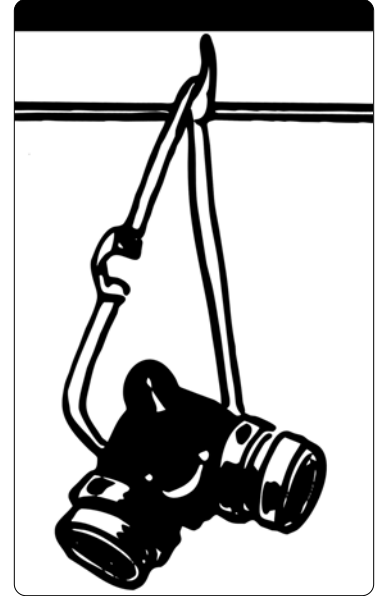
FIRST AID

- Get the victim into a shaded or cool area.
- Cool victim as rapidly as possible by sponging or splashing the skin, especially around the face, neck, hands, and forearms, with cool water or, when possible, immersing in cool water.
- Carefully remove all PPE and any other clothing that may be making the victim hot.
- Have the victim, if conscious, drink as much cool water as possible.
- Keep the victim quiet until help arrives.



The Missing Respirator

An employee on a large farm is instructed to spray a blooming fruit orchard that is located two miles from the farm headquarters. The material he is spraying is a fungicide that requires the use of a chemical-resistant suit, chemical-resistant gloves, goggles, rubber boots, and an organic vapor-filtering respirator. This fungicide will protect the blossoms on the fruit trees from a brown rot disease organism that would cause serious damage if it should rain during the bloom.

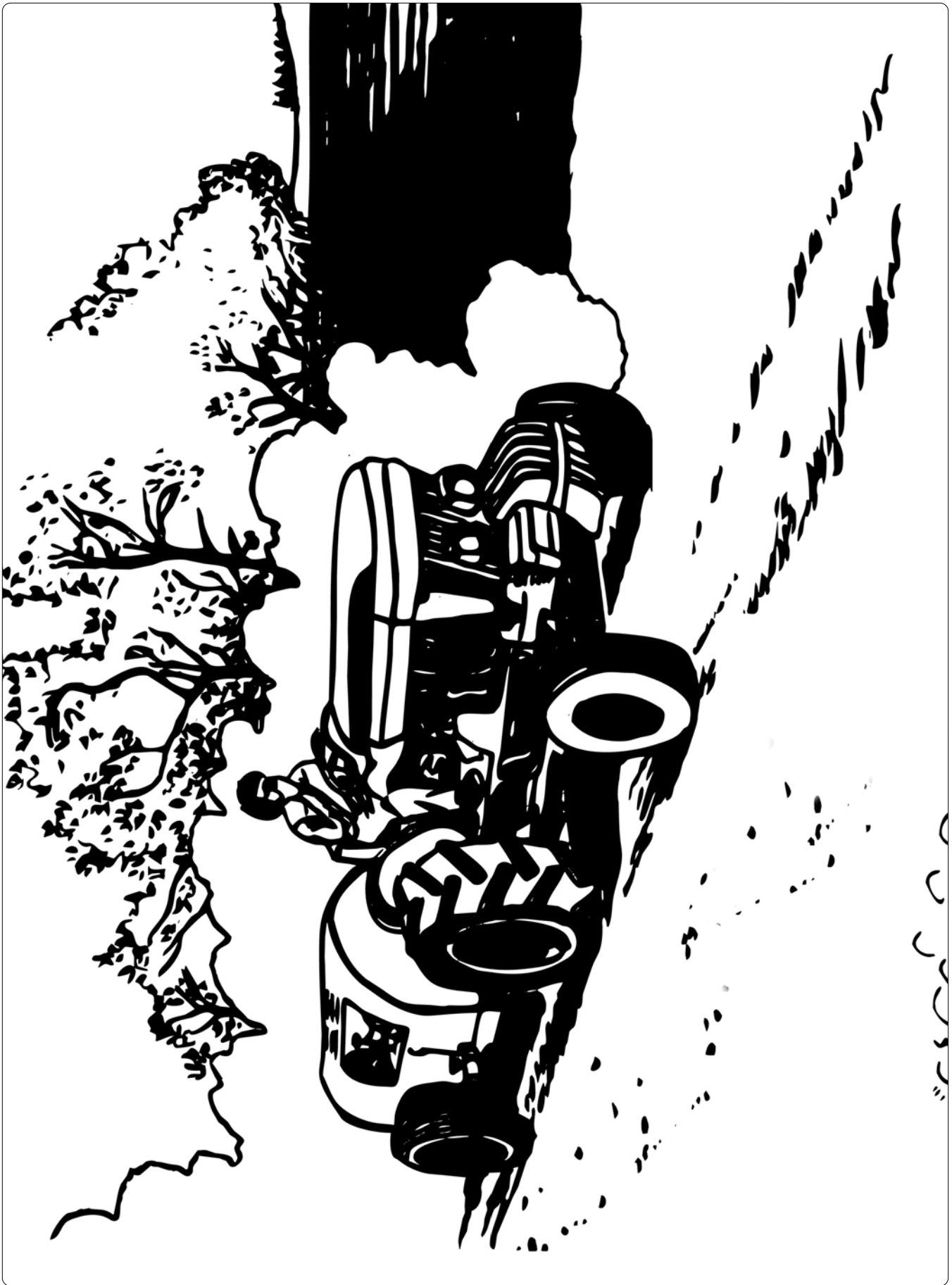


It takes him a little more than 30 minutes to travel to the application site after each time he fills the spray equipment. He has already put on four tanks of spray and has just returned to the orchard with his final load. When he arrives, he realizes that he left his respirator back at the mixing site. He considers going back to pick up the respirator but hesitates for three reasons:

- He is in a hurry to finish because his son is graduating from grade school that evening. If he takes the time to go back he is likely to miss the ceremony.
- He is concerned that his employer will be upset because he is wasting time.
- There is a prediction of rain that evening and he is worried that if he goes back to pick up the respirator he may not finish the job in time for the spray to thoroughly dry before the rain starts.

He decides not to go back for the respirator. Instead, he will tie his bandanna over his mouth and nose to keep him from inhaling the fungicide vapors.

Figure 9



SCRIPT FOR EPISODE 2

(Murray and Richard arrive at the shop and go in.)

Murray: *(as they sit down)* Yesterday we talked about how pesticide exposure can affect you. Now we need to review how to avoid exposure.

Richard: That sounds important.

Murray: We'll start by looking at more pesticide labels. The label on this container tells you what personal protective equipment you need to wear. *(Murray points out the PPE section of a label and Richard looks at it.)* What does it say?

Richard: Let's see. It says "long-sleeved shirt and long pants, and shoes and socks."

Murray: Yes, that is the protective clothing you need to wear when applying this pesticide. Some pesticides require you to wear additional personal protective equipment, such as a pair of coveralls. What about for the person who is mixing and loading the tank?

Richard: You mean the person mixing and loading the pesticide needs different PPE than the guy who sprays?

Murray: Yes. Look again.

Richard: Oh. You're right. The part I read is just for the applicator. The mixer and loader also needs chemical-resistant gloves, a faceshield, and a chemical-resistant apron. *(Smiles, as if this seems silly to him.)* An apron?

Murray: The mixer/loader handles the concentrated pesticide. If the container accidentally tips over and spills on him, the concentrate could seriously injure him. Therefore, the apron.

Richard: I know that if I forget to wear some of the required PPE I'm breaking the law, but what if I want to wear more PPE than the label requires? Like, let's say the label calls for long pants and a long sleeve shirt, but I wear coveralls. Is that O.K.?

Murray: Yes, that's fine. You can always wear more protection than what the label requires; you just can't wear less.

Richard: What if the label specifies coveralls? In that case, would long pants and a long-sleeved shirt be enough?

Murray: No, because coveralls provide more protection than long pants and a long-sleeved shirt. If you decide to wear something other than what is on the label, check with me first, so I can make sure you are still in compliance.

Richard: Do I have to wear the goggles, or are the glasses enough protection? What about replacing a piece of PPE

with something similar? Like, if I wear glasses and the label requires goggles?

Murray: Glasses won't give you enough protection. If the label says goggles, then you must wear goggles. Some labels, however, require eye protection but don't specify the type.

Richard: When a label just says eye protection what should I use?

Murray: You can use safety glasses with brow and side protection, goggles, or a faceshield. *(Murray pulls a pair of goggles, in their original plastic wrap, off a shelf or out of a drawer, and shows them to Richard. We see them in closeup.)*

Richard: And face shields are okay too?

Murray: A faceshield is usually recommended for mixers and loaders working with pesticide concentrate, because it will protect your eyes and face from splashes. If the label doesn't specify the type of eye protection, a faceshield is legal. And if the label tells you to wear protective headgear, they aren't talking about a baseball cap. *(Indicates the baseball cap Richard is wearing.)*

Richard: Okay. What kind of head protection should I use?

Murray: Some labels require a chemical-resistant hood or helmet for certain types of applications. You'll be using a helmet when you need to protect your head from overhead spraying, but some handlers use chemical-resistant suits with a hood. But remember no matter what type you use, make sure that the pesticide doesn't run off into your coveralls or chemical-resistant suit. For example, for a suit with a hood, you need to make sure that the bottom of the hood overlaps the coveralls.

Richard: So, I need to wear my PPE a certain way if I want to protect myself.

Murray: Yes. Your pant legs should be outside your boots, so that any runoff from the spray can't run into your boots and contact your feet.

Richard: Oh. I never would've thought of that! What else?

Murray: Your gloves should come at least halfway to your elbows. Like these. *(He pulls a pair of gloves out of a locker and shows them to Richard.)*

Richard: Okay, right. But how do you keep pesticides from getting inside your gloves?

Murray: Good question. If you're applying a pesticide toward the ground, wear your sleeves over your gloves.

Richard: And if you're spraying overhead?

Murray: Put the gloves on the outside so the pesticide can't get into your sleeves and onto your arms.

Richard: Okay, but when you are spraying, there must be times when your arms move enough that sometimes they are above your shoulders and sometimes they are lower. Are you supposed to keep tucking and untucking your gloves every time you move your arm?

Murray: No. If you're spraying both above and below shoulder level, attach the tops of your glove to your sleeves with duct tape. That way, nothing can get into your gloves or your sleeves, no matter where your arms are.

Richard: Oh. That's a good idea. (*Consulting the label, Richard points at a particular section and says:*) Speaking of gloves, here it lists chemical-resistant gloves and coveralls. Then it goes on to list what they should be made of.

Murray: It lists different types of plastics and rubber, right?

Richard: Yes. It even tells you how thick these materials should be. (*Richard looks at a different label.*) But on this label it talks about chemical-resistant equipment, without saying what it should be made of. How do you know what materials will work?

Murray: If the label doesn't specify, any waterproof rubber gloves, boots, and water-resistant coveralls should work.

Richard: Okay. What else do I need to know about protective gear?

Murray: Let's see. Remember to button your coveralls up all the way, including the top button to protect your neck.

Richard: All this PPE could be very uncomfortable on hot days.

Murray: True. In fact, let's talk about that. Heat-related illness can be very serious—even fatal. You need to know the symptoms and how to give first aid to someone who is suffering from it. Most of all, you need to know how to avoid this problem altogether.

Richard: How can you tell if you're getting sick from the heat?

Murray: Some of the symptoms include tiredness, weakness, headache, dizziness, nausea....

Richard: (*interrupting*) That sounds a lot like the symptoms of pesticide poisoning!

Murray: It's hard to tell them apart, but someone affected by the heat may act confused, or get angry and aggressive for no apparent reason. At any rate, if someone gets sick in the field, it is important to get the person out of the direct sunlight and away from pesticides.

Richard: What kind of first aid should you give?

Murray: Take off the person's outer clothes, wet the person with cool water, and fan them to lower their body temperature. Then wrap the person loosely in wet towels, and take them to the doctor.

Richard: Okay. Right. (*pauses*) How do you avoid heat problems?

Murray: Take it easy when you first start to work in the heat. Your body needs a chance to get used to it. You can avoid heat-related illness by drinking lots of water before, during, and after work and taking frequent breaks in the shade. (*As he speaks, we see a worker with PPE walking over to drink water from a field water station.*) (*Same worker under a tree, loosening his collar, or slightly unbuttoning his coveralls.*)

Murray: There are other ways to keep you cool. For example, some spray rigs have an air-conditioned cab.

Richard: Great! But what about operations that don't have air-conditioned cabs?

Murray: Well, there's a vest designed to keep you cool. The vest has inside pockets that hold ice packs to keep your body cool while you are working. (*pauses*) Okay. We've covered most of the info about PPE, but we still need to talk about respirators.

Richard: Do I always need to wear a respirator when I work with pesticides?

Murray: No, not always. And there are different kinds of respirators depending on what pesticide you are handling and what type of handling activity you are performing.

Richard: How do you know which type to use?

Murray: By checking the label. The label tells you if you need to use a respirator, and what type to use. (*Murray starts leafing through the label.*) Let's take a look. Okay. Here we are. This label is a good example. See if you can find the respirator instructions.

Richard: (*He moves his finger down the page as if he were trying to locate something.*) Here they are, but it lists lots of handler situations. There are airblast applicators, non-airblast applicators, and then it says "all other handlers."

Murray: (*looking with Richard at the same section*) Careful....

Richard: Oops. This is... "all other handlers" except mixers and loaders. And for the mixers and loaders there are different respirators for people working in enclosed areas than for those working out in the open.

Murray: So all of these different types of handlers need respirators?

Richard: (*Richard studies the label.*) Yes. It says here that airblast applicators need cartridge-type or canister-type respirators.

Richard: Will any respirator and any kind of cartridge protect me when I work with pesticides?

Murray: No. There are a lot of different kinds of respirators, and they come in different sizes to conform to the user's face. (*Murray takes a new respirator out of a box and attaches a new set of cartridges that still have their covers. He hands the respirator to Richard.*) Put on this respirator and I'll show you how to do a negative fit test to make sure your respirator forms a tight seal around your face.

Richard: Like this? (*Richard puts the respirator on.*)

Murray: Yes. That's right. Now, adjust it so it fits snugly. (*Richard adjusts the respirator.*) Leave the covers on the cartridges and breathe in.

Richard: (*Richard places his hands over the cartridges and tries to inhale.*) I can't get any air!

Murray: Good. That means the respirator is fitting correctly. The cartridges are covered and no air is getting in. Air shouldn't be able to pass through the seal between the mask and your face. You can also do a positive fit test by covering the cartridges with your hands, like with the negative test, but try to exhale. The air should not be able to escape the mask if it is forming a tight seal around your face. You can actually see the mask inflate with the exhaled air if it is fitting correctly.

Richard: (*looking at the label again*) It says here that applicators using non-airblast equipment should use a respirator that filters dust and mist. Is that a particular type of cartridge?

Murray: No. Those are the soft throwaway masks.

Richard: So, anyone who applies this pesticide needs a different type of respirator depending on the type of application.

Murray: Very good. This label mentions the most common types of respirators, but there are other kinds too. For example, if someone needs to wear a cartridge respirator but has a beard or other facial hair that would keep a regular respirator from sealing tightly around their face, they need the type that has a fan to pump air through a filter and into a helmet. (*The face of an applicator with a beard is seen on the screen.*)

Richard: I think I've seen those.

Richard: Getting back to the cartridge respirators, how often should I change the cartridges?

Murray: We change the cartridges according to the manufacturer's instructions. Replace them immediately if you smell or taste the pesticide while you're wearing the

respirator. I always keep a supply of cartridges on hand, so don't hesitate to ask me for new ones. (*pauses*) I think that's enough information for today, Richard.

Richard: Thank you for explaining all of this to me. There's a lot I need to know.

Murray: Well, I am required by law to train everyone who handles pesticides on my farm. And it's also my responsibility to provide you with the necessary PPE and to make sure you know how and when to use it. Tomorrow we'll do some hands-on practice at the pesticide loading area first thing in the morning.

Richard: All right Murray. I'll see you then.

3 EPISODE

SAFELY HANDLING PESTICIDES AND THEIR CONTAINERS



The scene opens the following morning at the pesticide storage and loading area. Richard is wearing coveralls. There are two water-filled plastic jugs with pesticide labels attached to them sitting on the spray rig. Looking at the pesticide labels, Murray reminds Richard how important the label instructions are and goes through the procedures with Richard on how to correctly transport pesticides. Using the labels, Richard selects his PPE. Murray tells him what application rates to use, and has him practice measuring the liquid and loading it into the spray tank. They conclude this session by talking about spill cleanup and the procedures for correctly storing pesticides and disposing of empty containers.

IMPORTANT POINTS INCLUDED IN EPISODE 3

Episode 3 deals with the safe handling of pesticides and containers during transport, mixing and loading, storage, and disposal. This episode emphasizes the following training points:

- safety requirements for handling, transporting, storing, and disposing of pesticides, including general procedures for spill cleanup
- warnings about taking pesticides or pesticide containers home

Showing Episode 3

Remind participants in the training session to pay close attention to the points made in this episode. This segment covers important rules for handling pesticides and pesticide containers. As you have done when viewing the previous episodes, remain with the participants while they view this episode. Explain that once again there will be opportunities for questions and some interactive activities after Episode 3 concludes.

The script for Episode 3 begins on page 73.

Discussion Activities

The following four discussion activities will assist you in reviewing the major points of Episode 3 with the people you are training. Each activity covers a different step in the handling of pesticides and pesticide containers.



Activity: **Planning for Mixing and Loading Pesticides**

Planning is an important first step before actually mixing and loading pesticides. This activity points out the importance of planning and generates discussion on the types of hazards that must be considered and the steps to take when mixing and loading pesticides.

Required Materials

Obtain copies of several labels of pesticides that are commonly used by the participants.

Procedure. Ask participants if any of them are involved in mixing pesticides and loading them into the sprayer. Of those who do this type of work, ask what problems or difficulties they have experienced. List these on the flip chart or chalkboard. Next, ask participants to list the reasons for planning a mixing/loading procedure, and write these on the flip chart or chalkboard. These reasons might include:

- anticipating accidents or emergencies
- making sure all the necessary equipment and tools are available
- rehearsing the sequence of steps for mixing
- making certain the proper amounts of pesticide are used

On the flip chart or chalkboard, make four columns and label these as follows:

<u>Emergency Preparedness</u>	<u>Specific Precautions</u>	<u>Mixing Procedures</u>	<u>Empty Containers</u>
-------------------------------	-----------------------------	--------------------------	-------------------------

Ask participants to list all the things that must be considered under each column before beginning to mix one or more pesticides.

Divide participants into three groups and give each group one of the pesticide labels. Give them a few minutes to review the labels and then have each group report to the rest of the participants the items they should consider when planning to mix the pesticide. These should include the hazards, personal protective equipment requirements, special mixing and loading equipment needs, and unique disposal requirements.

Activity: Mixing and Measuring Pesticides

This exercise gives the participants an opportunity to measure and weigh several types of simulated pesticide formulations. The process will stimulate discussion and allow participants to ask questions about the mixing and loading process. It is suggested that this activity take place out of doors, preferably at a mixing/loading site.

Procedure. (Make the following preparations before beginning this session.) Put one or two pounds of the sugar or salt into one of the paper bags and label this bag “soluble powder.” Put one or two pounds of the powdered milk or chocolate drink mix into another paper bag and label this “wetable powder.” Pour the oil-based cleaning concentrate into the plastic jar and label this “emulsifiable concentrate.”

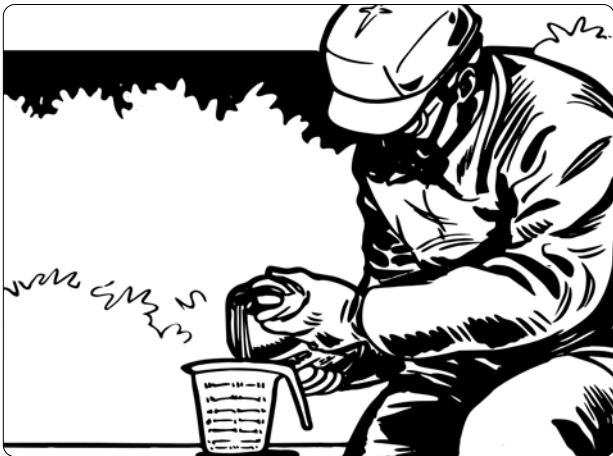
Required Materials

Assemble the following materials for this activity:

- three pesticide labels: Handout #2 for an emulsifiable concentrate (pages 47 and 49), Handout #3 for a wettable powder (pages 51 and 53), and Handout #4 for a soluble powder (pages 55 and 57)
- three different “mixing sheets” (Handouts 5, 6, and 7 on pages 59, 61, and 63)
- an assortment of measuring devices and a small scale
- personal protective equipment that matches the requirements for mixer/loaders on the pesticide labels
- two small paper bags for the “wetable powder” and “soluble powder” formulations
- a small plastic bottle with lid for the “emulsifiable concentrate” formulation
- a one-gallon plastic pail to represent the spray tank into which the pesticides are being poured
- powdered milk or powdered chocolate drink mix for the “wetable powder” formulation
- granulated sugar or salt for the “soluble powder” formulation
- oil-based cleaning concentrate (e.g. *Lysol*) for the “emulsifiable concentrate” formulation
- Handout #8, *Comparison of Pesticide Formulations* (see page 65)
- Handout #9, *Order of Mixing Pesticide Formulations* (see page 67)

During the session, divide the participants into three groups and assign each group one of the “mixing sheets.” Give them copies of the labels and handouts. Have each group select the appropriate personal protective equipment for the person performing the mixing/loading. Once this person is properly attired, instruct

the group to have this person follow the “mixing sheet,” measuring/weighing out the appropriate amounts of simulated pesticide and pouring these into the spray tank (plastic bucket). The participants in each group should describe what they are doing and demonstrate proper methods, including proper order of mixing different formulations, pouring below eye level, standing upwind, working in a well-lighted area, anticipating what to do in case of a spill, etc.



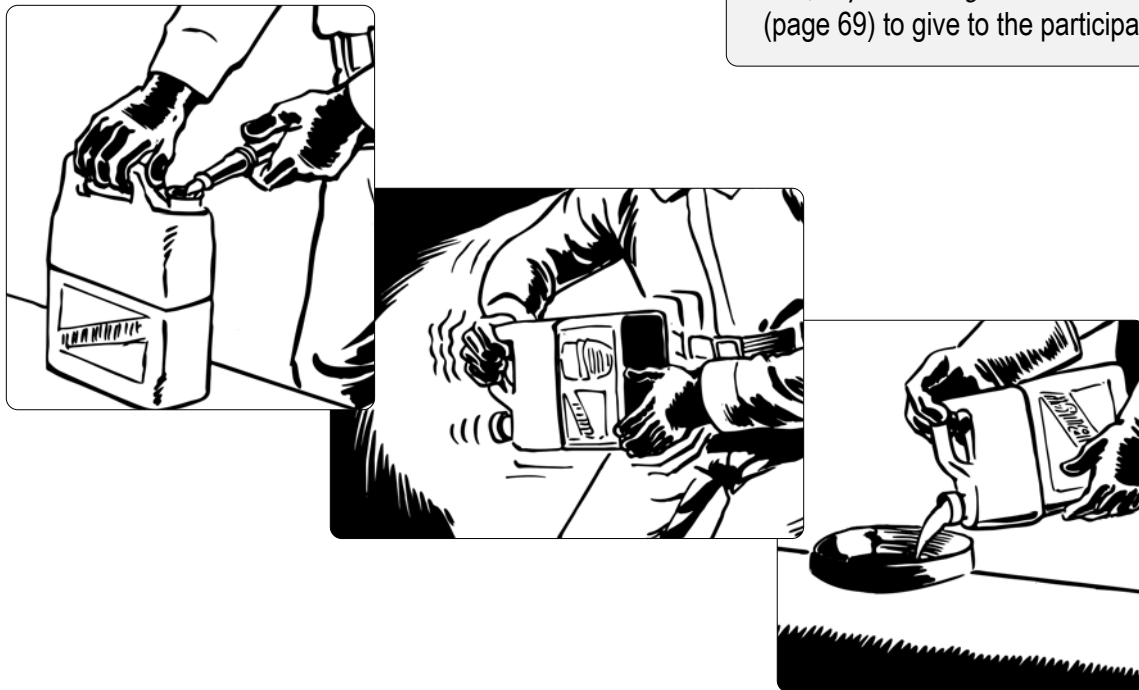
Activity: Triple Rinsing Pesticide Containers

Empty pesticide containers are hazardous until they have been properly triple rinsed. For instance, after draining, a 5-gallon container is assumed to still contain one ounce of formulated pesticide. After proper triple rinsing, it is estimated that only 0.000035% of this ounce remains. This activity gives participants the opportunity to practice triple rinsing and to visualize the amount of residue that can be removed through this process.

Procedure. Divide the participants into three groups. Give them an empty 2½ gallon container and have them put 10 drops of food coloring inside. Using the *Triple Rinsing Pesticide Containers* handout, have each group practice the triple rinsing recommendations. Be sure they actually drain the containers for the prescribed time (30 seconds each drain). Have them observe and discuss the reduction of color in the rinse water as the rinsing takes place.

Required Materials

For this activity you will need a source of water, several 2½ gallon plastic jugs with lids (to simulate liquid pesticide containers), a 5-gallon bucket or other container to pour the rinsate into, and a small bottle of food coloring. Make copies of Handout #10, *Triple Rinsing Pesticide Containers*, (page 69) to give to the participants.



Activity:**Storage and Disposal of Pesticide Containers**

The final part of any mixing/loading operation is the proper storage and ultimate disposal of partially-filled and empty pesticide containers. This discussion-based activity involves participants in exploring options for the proper storage and disposal of pesticide containers.

Procedure. Ask participants what to do with partially-filled pesticide containers after the application has been completed. (They must be stored in a locked pesticide storage area.)

Required Materials

Flip chart or chalkboard, Handout #11, *Disposing of Empty Pesticide Containers*, (see page 71).

Ask participants to list various ways to treat and dispose of empty pesticide containers. List these on the flip chart or chalkboard. As each new method is added to the list, ask participants to discuss the legality and practicality of the method (some methods may apply to certain areas but be prohibited in others; some methods may apply to certain types of pesticides or pesticide formulations). Examples of treating and disposing of empty containers include:

- triple rinse
- puncture containers
- store in locked area
- deliver to disposal site
- burn
- return to supplier
- recycle

Have participants discuss how to keep containers secure while making a pesticide application. Ask several of them what they do. (The requirement is to make sure that unauthorized people do not have contact with the container. If the application is made in a place with public access, a responsible person must keep the container in sight at all times.)

Pass out Handout #11, *Disposing of Empty Pesticide Containers*.

RESTRICTED USE PESTICIDE

Due to High Acute Toxicity to Humans

For retail sale and use only by Certified Applicators or persons under their direct supervision and only for those uses covered by the Certified Applicator's certification. Direct supervision for this product requires the certified applicator to review federal and supplemental label instructions with all personnel prior to application, mixing, loading, or repair or cleaning of application equipment.

Reckon® EC

insecticide by **ToxCo®**

Active Ingredient:	By Weight
Methomyl (S-methyl-N-[(methylcarbamoyl)oxy]thioacetimidate)	29%
Inert Ingredients	71%
TOTAL	100%

Emulsifiable Concentrate

Contains 2.4 lbs active ingredient per gallon.

EPA Reg. No. 000-000

EPA EST. No. 0000-XX-0

Net 5 gallons

KEEP OUT OF REACH OF CHILDREN
DANGER  **POISON**
PELIGRO **VENENO**

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand this label, find someone to explain it to you in detail.)

STATEMENT OF PRACTICAL TREATMENT

This Product is an N-Methyl Carbamate insecticide.

If swallowed: Call a physician or Poison Control Center. Drink 1 or 2 glasses of water and induce vomiting by touching the back of throat with finger. Do not induce vomiting or give anything by mouth to an unconscious or convulsing person.

If inhaled: Remove victim to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. Get medical attention.

If in eyes: Hold eyelids open and flush with a steady gentle stream of water for 15 minutes. Get medical attention.

If on skin: Wash with plenty of soap and water. Get medical attention.

ATROPINE IS AN ANTIDOTE—SEEK MEDICAL ATTENTION AT ONCE IN ALL CASES OF SUSPECTED POISONING.

If warning symptoms appear (see WARNING SYMPTOMS), get medical attention.

For medical emergencies involving this product, call toll free 1-000-000-0000.

PRECAUTIONARY STATEMENTS HAZARDS TO HUMANS AND DOMESTIC ANIMALS

DANGER! CONTAINS METHANOL. FATAL IF SWALLOWED. MAY CAUSE BLINDNESS IF SWALLOWED. MAY BE FATAL IF INHALED OR ABSORBED THROUGH EYES. CAUSES IRREVERSIBLE EYE DAMAGE.

(Precautionary Statements continued in next column.)

Do not get in eyes, on skin, or on clothing. Do not breathe vapors or spray mist. Pilot should not assist in the mixing and loading operation.

WARNING SYMPTOMS—Methomyl poisoning produces effects associated with anticholinesterase activity which may include weakness, blurred vision, headache, nausea, abdominal cramps, discomfort in the chest, constriction of pupils, sweating, slow pulse, muscle tremors. If warning symptoms appear, refer to Statement of Practical Treatment on front panel of RECKON® EC label and seek medical attention at once.

PERSONAL PROTECTIVE EQUIPMENT

Some materials that are chemical-resistant to this product are listed below. If you want more options, follow the instructions for category B on an EPA chemical-resistance category selection chart.

Applicators and other handlers must wear:

- Long-sleeved shirt and long pants.
- Chemical-resistant gloves, such as barrier laminate or butyl rubber.
- Shoes plus socks.
- Protective eyewear.

For exposure in enclosed areas, a respirator with either an organic vapor-removing cartridge with a prefilter approved for pesticides (MSHA/NIOSH approval number prefix TC-23C or a NIOSH-approved respirator with any R, P, or HE filter [also N if product does not contain oil and bears no instructions that will allow application with an oil-containing material]), or a canister approved for pesticides (MSHA/NIOSH approval number prefix TC-14G).

For exposures outdoors, dust/mist filtering respirator (MSHA/NIOSH approval number prefix TC-21C or a NIOSH-approved respirator with any R, P, or HE filter [also N if product does not contain oil and bears no instructions that will allow application with an oil-containing material]).

Cleaners and repairers of application equipment must wear:

- Long-sleeved shirt and long pants.
- Chemical resistant gloves.
- Chemical resistant footwear.
- Protective eyewear.
- Respirator as outlined above.
- Chemical resistant apron.

Discard clothing or other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them. Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

ENGINEERING CONTROL STATEMENTS

Human flaggers must be in enclosed cabs.

When handlers use closed systems, enclosed cabs, or aircraft in a manner that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides [40 CFR part 170.240 (d)(4-6)], the handler PPE requirements may be reduced or modified as specified in the WPS. The enclosed cabs must be used in a manner that meets the requirements listed in the WPS for agricultural pesticides. The handler PPE requirements may be reduced or modified as specified in the WPS.

ENVIRONMENTAL HAZARDS

This pesticide is toxic to fish and wildlife. Drift and runoff from treated areas may be hazardous to aquatic organisms in neighboring areas. Do not apply directly to water, or to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwaters.

This product is highly toxic to bees exposed to direct treatment on blooming crops or weeds. Do not apply this product or allow it to drift to blooming crops or weeds while bees are actively visiting the treatment area.

PHYSICAL AND CHEMICAL HAZARDS

Combustible. Do not use or store near heat or open flame. Keep container closed. Use with adequate ventilation.

DIRECTIONS FOR USE

It is a violation of federal law to use this product in a manner inconsistent with its labeling.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

Do not apply this product through any type of irrigation system.

Do not formulate this product into other end-use products without written permission.

ToxCo RECKON® EC Insecticide should be used only in accordance with recommendations available through local dealers.

ToxCo will not be responsible for losses or damages resulting from use of this product in any manner not specifically recommended by ToxCo. User assumes all risks associated with such non-recommended use. RECKON® EC is an emulsifiable concentrate to be diluted with water for application by mechanical ground or air equipment only. Use only in commercial and farm plantings. Not for use in home plantings nor on any commercial crop that is turned into a "U-Pick," "Pick Your own" or similar operation. Pilot should not assist in the mixing and loading operation.

AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE) and restricted-entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not enter or allow worker entry into treated areas during the restricted entry interval (REI). PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is:

- Coveralls.
- Chemical-resistant gloves, such as barrier laminate or butyl rubber.
- Shoes plus socks.
- Protective eyewear.

GENERAL INFORMATION

Scouting—Monitor insect populations to determine whether or not there is a need for application of RECKON® EC based on locally determined economic thresholds. More than one treatment of RECKON® EC may be required to control a population of pests.

Insect Predators—RECKON® EC at rates of 2/5 to 3/4 pt. per acre helps conserve certain beneficials, including big-eyed bugs, damsel bugs, flower bugs and spiders in cotton and soybeans. While these beneficials cannot be relied upon to control pests, they are of potential value and should be monitored along with pests in pest management programs on these crops.

Resistance—Some insects are known to develop resistance to products used repeatedly for control. When this occurs, the recommended dosages fail to suppress the pest population below the economic threshold. Because the development of resistance cannot be

predicted, the use of this product should conform to resistance management strategies established for the use area. These strategies may include incorporation of cultural and biological control practices, alteration of active classes of insecticides on succeeding generations and targeting the most susceptible life stage. Consult your local agricultural authorities for details.

Compatibility—Since formulations may be changed and new ones introduced, it is recommended that users pre-mix a small quantity of desired tank mix and observe for possible adverse changes (settling out, flocculation, etc.). Avoid mixtures of several materials and very concentrated spray mixtures.

Do not use RECKON® EC with Bordeaux mixture, "Du Ter" (triphenyltin hydroxide), lime sulfur, "Rayplex" iron or in highly alkaline solutions. Use mildly alkaline mixtures immediately after mixing to prevent loss of insecticidal activity.

SPRAY PREPARATION

Spray equipment must be clean and free of previous pesticide deposits before applying RECKON® EC.

Fill spray tank 1/4 to 1/2 full of water. Add RECKON® EC directly to spray tank. Mix thoroughly. Use mechanical or hydraulic means; do not use air agitation. Spray mix should not be stored overnight in spray tank.

(Directions for Use continued on supplemental labeling.)

STORAGE AND DISPOSAL

STORAGE: Do not subject to temperatures below 32° F. Store product in original container only. Do not contaminate water, other pesticides, fertilizer, food or feed in storage. Not for use or storage in or around the home.

PRODUCT DISPOSAL: Do not contaminate water, food, or feed by disposal. Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal Law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

CONTAINER DISPOSAL: Triple rinse (or equivalent), then offer for recycling or reconditioning if container reuse is permitted, or puncture and dispose of in a sanitary landfill, or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke. Return empty stainless steel containers for refilling and reuse.

LIMITATION OF WARRANTY AND LIABILITY

NOTICE: Read This Limitation of Warranty and Liability Before Buying or Using This Product. If the Terms Are Not Acceptable, Return the Product at Once, Unopened, and the Purchase Price Will Be Refunded.

It is impossible to eliminate all risks associated with the use of this product. Such risks arise from weather conditions, soil factors, off target movement, unconventional farming techniques, presence of other materials, the manner of use or application, or other unknown factors, all of which are beyond the control of ToxCo. These risks can cause: ineffectiveness of the product; crop injury; or injury to nontarget crops or plants.

ToxCo does not agree to be an insurer of these risks. WHEN YOU BUY OR USE THIS PRODUCT, YOU AGREE TO ACCEPT THESE RISKS.

(Warranty information continued on supplemental labeling.)

Crops	Insects	Rate	Last Application—Days		
		Reckon® EC Pts. Per Acre	To Harvest	To Livestock Grazing/Feeding	REI
Anise (fennel)	Cabbage Looper	3	7		48 hrs
	Beet Armyworm	1-1/2 to 3			
	Do not apply more than 4.5 lbs a.i./acre/crop. Do not make more than 10 applications/crop.				

(Restricted-entry information continued on supplemental labeling.)

RESTRICTED USE PESTICIDE

Due to High Acute Toxicity to Humans

For retail sale and use only by Certified Applicators or persons under their direct supervision and only for those uses covered by the Certified Applicator's certification. Direct supervision for this product requires the certified applicator to review federal and supplemental label instructions with all personnel prior to application, mixing, loading, or repair or cleaning of application equipment.

Stunt® WP

insecticide by Dylco®

Active Ingredient:	By Weight
Methomyl (S-methyl-N-[(methylcarbamoyl)oxy]thioacetimidate)	29%
Inert Ingredients	71%
TOTAL	100%

Wettable Powder

Contains 0.3 lbs active ingredient per pound.

EPA Reg. No. 000-000

EPA EST. No. 0000-XX-0

Net 5 pounds

KEEP OUT OF REACH OF CHILDREN
DANGER  **POISON**
PELIGRO **VENENO**

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand this label, find someone to explain it to you in detail.)

STATEMENT OF PRACTICAL TREATMENT

This Product is an N-Methyl Carbamate insecticide.

If swallowed: Call a physician or Poison Control Center. Drink 1 or 2 glasses of water and induce vomiting by touching the back of throat with finger. Do not induce vomiting or give anything by mouth to an unconscious or convulsing person.

If inhaled: Remove victim to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. Get medical attention.

If in eyes: Hold eyelids open and flush with a steady gentle stream of water for 15 minutes. Get medical attention.

If on skin: Wash with plenty of soap and water. Get medical attention.

ATROPINE IS AN ANTIDOTE—SEEK MEDICAL ATTENTION AT ONCE IN ALL CASES OF SUSPECTED POISONING.

If warning symptoms appear (see WARNING SYMPTOMS), get medical attention.

For medical emergencies involving this product, call toll free 1-000-000-0000.

PRECAUTIONARY STATEMENTS HAZARDS TO HUMANS AND DOMESTIC ANIMALS

DANGER! CONTAINS METHANOL. FATAL IF SWALLOWED. MAY CAUSE BLINDNESS IF SWALLOWED. MAY BE FATAL IF INHALED OR ABSORBED THROUGH EYES. CAUSES IRREVERSIBLE EYE DAMAGE.

(Precautionary Statements continued in next column.)

©2001 Dylco, Inc., Villageton, Yourstate, 01234

Do not get in eyes, on skin, or on clothing. Do not breathe vapors or spray mist. Pilot should not assist in the mixing and loading operation.

WARNING SYMPTOMS—Methomyl poisoning produces effects associated with anticholinesterase activity which may include weakness, blurred vision, headache, nausea, abdominal cramps, discomfort in the chest, constriction of pupils, sweating, slow pulse, muscle tremors. If warning symptoms appear, refer to Statement of Practical Treatment on front panel of Stunt® WP label and seek medical attention at once.

PERSONAL PROTECTIVE EQUIPMENT

Some materials that are chemical-resistant to this product are listed below. If you want more options, follow the instructions for category B on an EPA chemical-resistance category selection chart.

Applicators and other handlers must wear:

- Long-sleeved shirt and long pants.
- Chemical-resistant gloves, such as barrier laminate or butyl rubber.
- Shoes plus socks.
- Protective eyewear.

For exposure in enclosed areas, a respirator with either an organic vapor-removing cartridge with a prefilter approved for pesticides (MSHA/NIOSH approval number prefix TC-23C or a NIOSH-approved respirator with any R, P, or HE filter [also N if product does not contain oil and bears no instructions that will allow application with an oil-containing material]), or a canister approved for pesticides (MSHA/NIOSH approval number prefix TC-14G).

For exposures outdoors, dust/mist filtering respirator (MSHA/NIOSH approval number prefix TC-21C or a NIOSH-approved respirator with any R, P, or HE filter [also N if product does not contain oil and bears no instructions that will allow application with an oil-containing material]).

Cleaners and repairers of application equipment must wear:

- Long-sleeved shirt and long pants.
- Chemical resistant gloves.
- Chemical resistant footwear.
- Protective eyewear.
- Respirator as outlined above.
- Chemical resistant apron.

Discard clothing or other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them. Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

ENGINEERING CONTROL STATEMENTS

Human flaggers must be in enclosed cabs.

When handlers use closed systems, enclosed cabs, or aircraft in a manner that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides [40 CFR part 170.240 (d)(4-6)], the handler PPE requirements may be reduced or modified as specified in the WPS. The enclosed cabs must be used in a manner that meets the requirements listed in the WPS for agricultural pesticides. The handler PPE requirements may be reduced or modified as specified in the WPS.

ENVIRONMENTAL HAZARDS

This pesticide is toxic to fish and wildlife. Drift and runoff from treated areas may be hazardous to aquatic organisms in neighboring areas. Do not apply directly to water, or to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwaters.

This product is highly toxic to bees exposed to direct treatment on blooming crops or weeds. Do not apply this product or allow it to drift to blooming crops or weeds while bees are actively visiting the treatment area.

PHYSICAL AND CHEMICAL HAZARDS

Combustible. Do not use or store near heat or open flame. Keep container closed. Use with adequate ventilation.

DIRECTIONS FOR USE

It is a violation of federal law to use this product in a manner inconsistent with its labeling.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

Do not apply this product through any type of irrigation system.

Do not formulate this product into other end-use products without written permission.

Dylco STUNT® WP Insecticide should be used only in accordance with recommendations available through local dealers.

Dylco will not be responsible for losses or damages resulting from use of this product in any manner not specifically recommended by Dylco. User assumes all risks associated with such non-recommended use. RECKON® WP is a water soluble liquid to be diluted with water for application by mechanical ground or air equipment only. Use only in commercial and farm plantings. Not for use in home plantings nor on any commercial crop that is turned into a "U-Pick," "Pick Your own" or similar operation. Pilot should not assist in the mixing and loading operation.

AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE) and restricted-entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not enter or allow worker entry into treated areas during the restricted entry interval (REI).

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is:

- Coveralls.
- Chemical-resistant gloves, such as barrier laminate or butyl rubber.
- Shoes plus socks.
- Protective eyewear.

GENERAL INFORMATION

Scouting—Monitor insect populations to determine whether or not there is a need for application of STUNT® WP based on locally determined economic thresholds. More than one treatment of STUNT® WP may be required to control a population of pests.

Insect Predators—STUNT® WP at rates of 2/5 to 3/4 pt. per acre helps conserve certain beneficials, including big-eyed bugs, damsel bugs, flower bugs and spiders in cotton and soybeans. While these beneficials cannot be relied upon to control pests, they are of potential value and should be monitored along with pests in pest management programs on these crops.

Resistance—Some insects are known to develop resistance to products used repeatedly for control. When this occurs, the recommended dosages fail to suppress the pest population below the economic threshold. Because the development of resistance cannot be

predicted, the use of this product should conform to resistance management strategies established for the use area. These strategies may include incorporation of cultural and biological control practices, alteration of active classes of insecticides on succeeding generations and targeting the most susceptible life stage. Consult your local agricultural authorities for details.

Compatibility—Since formulations may be changed and new ones introduced, it is recommended that users pre-mix a small quantity of desired tank mix and observe for possible adverse changes (settling out, flocculation, etc.). Avoid mixtures of several materials and very concentrated spray mixtures.

Do not use STUNT® WP with Bordeaux mixture, "Du Ter" (triphenyltin hydroxide), lime sulfur, "Rayplex" iron nor in highly alkaline solutions. Use mildly alkaline mixtures immediately after mixing to prevent loss of insecticidal activity.

SPRAY PREPARATION

Spray equipment must be clean and free of previous pesticide deposits before applying STUNT® WP.

Fill spray tank 1/4 to 1/2 full of water. Add STUNT® WP directly to spray tank. Mix thoroughly. Use mechanical or hydraulic means; do not use air agitation. Spray mix should not be stored overnight in spray tank.

(Directions for Use continued on supplemental labeling.)

STORAGE AND DISPOSAL

STORAGE: Do not subject to temperatures below 32° F. Store product in original container only. Do not contaminate water, other pesticides, fertilizer, food or feed in storage. Not for use or storage in or around the home.

PRODUCT DISPOSAL: Do not contaminate water, food, or feed by disposal. Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal Law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

CONTAINER DISPOSAL: Triple rinse (or equivalent), then offer for recycling or reconditioning if container reuse is permitted, or puncture and dispose of in a sanitary landfill, or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke. Return empty stainless steel containers for refilling and reuse.

LIMITATION OF WARRANTY AND LIABILITY

NOTICE: Read This Limitation of Warranty and Liability Before Buying or Using This Product. If the Terms Are Not Acceptable, Return the Product at Once, Unopened, and the Purchase Price Will Be Refunded.

It is impossible to eliminate all risks associated with the use of this product. Such risks arise from weather conditions, soil factors, off target movement, unconventional farming techniques, presence of other materials, the manner of use or application, or other unknown factors, all of which are beyond the control of Dylco. These risks can cause: ineffectiveness of the product; crop injury; or injury to nontarget crops or plants.

Dylco does not agree to be an insurer of these risks. WHEN YOU BUY OR USE THIS PRODUCT, YOU AGREE TO ACCEPT THESE RISKS.

(Warranty information continued on supplemental labeling.)

Crops	Insects	Rate	Last Application—Days		
		STUNT® WP Lbs. Per Acre	To Harvest	To Livestock Grazing/Feeding	REI
Anise (fennel)	Cabbage Looper	2	7		48 hrs
	Beet Armyworm	1-1/2 to 3			
	Do not apply more than 4.5 lbs a.i./acre/crop. Do not make more than 10 applications/crop.				

(Restricted-entry information continued on supplemental labeling.)

RESTRICTED USE PESTICIDE

Due to High Acute Toxicity to Humans

For retail sale and use only by Certified Applicators or persons under their direct supervision and only for those uses covered by the Certified Applicator's certification. Direct supervision for this product requires the certified applicator to review federal and supplemental label instructions with all personnel prior to application, mixing, loading, or repair or cleaning of application equipment.

Aware[®] SP

insecticide by Logoco[®]

Active Ingredient:	By Weight
Methomyl (S-methyl-N-[(methylcarbamoyl)oxy]thioacetimidate)	29%
Inert Ingredients	71%
TOTAL	100%

Soluble Powder

Contains 0.3 lbs active ingredient per pound.

EPA Reg. No. 000-000

EPA EST. No. 0000-XX-0

Net 2 pounds

KEEP OUT OF REACH OF CHILDREN
DANGER  **POISON**
PELIGRO **VENENO**

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand this label, find someone to explain it to you in detail.)

STATEMENT OF PRACTICAL TREATMENT

This Product is an N-Methyl Carbamate insecticide.

If swallowed: Call a physician or Poison Control Center. Drink 1 or 2 glasses of water and induce vomiting by touching the back of throat with finger. Do not induce vomiting or give anything by mouth to an unconscious or convulsing person.

If inhaled: Remove victim to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. Get medical attention.

If in eyes: Hold eyelids open and flush with a steady gentle stream of water for 15 minutes. Get medical attention.

If on skin: Wash with plenty of soap and water. Get medical attention.

ATROPINE IS AN ANTIDOTE—SEEK MEDICAL ATTENTION AT ONCE IN ALL CASES OF SUSPECTED POISONING.

If warning symptoms appear (see WARNING SYMPTOMS), get medical attention.

For medical emergencies involving this product, call toll free 1-000-000-0000.

PRECAUTIONARY STATEMENTS HAZARDS TO HUMANS AND DOMESTIC ANIMALS

DANGER! CONTAINS METHANOL. FATAL IF SWALLOWED. MAY CAUSE BLINDNESS IF SWALLOWED. MAY BE FATAL IF INHALED OR ABSORBED THROUGH EYES. CAUSES IRREVERSIBLE EYE DAMAGE.

(Precautionary Statements continued in next column.)

©2001 Logoco, Inc., Villageton, Yourstate, 01234

Do not get in eyes, on skin, or on clothing. Do not breathe vapors or spray mist. Pilot should not assist in the mixing and loading operation.

WARNING SYMPTOMS—Methomyl poisoning produces effects associated with anticholinesterase activity which may include weakness, blurred vision, headache, nausea, abdominal cramps, discomfort in the chest, constriction of pupils, sweating, slow pulse, muscle tremors. If warning symptoms appear, refer to Statement of Practical Treatment on front panel of AWARE[®] SP label and seek medical attention at once.

PERSONAL PROTECTIVE EQUIPMENT

Some materials that are chemical-resistant to this product are listed below. If you want more options, follow the instructions for category B on an EPA chemical-resistance category selection chart.

Applicators and other handlers must wear:

- Long-sleeved shirt and long pants.
- Chemical-resistant gloves, such as barrier laminate or butyl rubber.
- Shoes plus socks.
- Protective eyewear.

For exposure in enclosed areas, a respirator with either an organic vapor-removing cartridge with a prefilter approved for pesticides (MSHA/NIOSH approval number prefix TC-23C or a NIOSH-approved respirator with any R, P, or HE filter [also N if product does not contain oil and bears no instructions that will allow application with an oil-containing material]), or a canister approved for pesticides (MSHA/NIOSH approval number prefix TC-14G).

For exposures outdoors, dust/mist filtering respirator (MSHA/NIOSH approval number prefix TC-21C or a NIOSH-approved respirator with any R, P, or HE filter [also N if product does not contain oil and bears no instructions that will allow application with an oil-containing material]).

Cleaners and repairers of application equipment must wear:

- Long-sleeved shirt and long pants.
- Chemical resistant gloves.
- Chemical resistant footwear.
- Protective eyewear.
- Respirator as outlined above.
- Chemical resistant apron.

Discard clothing or other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them. Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

ENGINEERING CONTROL STATEMENTS

Human flaggers must be in enclosed cabs.

When handlers use closed systems, enclosed cabs, or aircraft in a manner that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides [40 CFR part 170.240 (d)(4-6)], the handler PPE requirements may be reduced or modified as specified in the WPS. The enclosed cabs must be used in a manner that meets the requirements listed in the WPS for agricultural pesticides. The handler PPE requirements may be reduced or modified as specified in the WPS.

ENVIRONMENTAL HAZARDS

This pesticide is toxic to fish and wildlife. Drift and runoff from treated areas may be hazardous to aquatic organisms in neighboring areas. Do not apply directly to water, or to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwaters.

This product is highly toxic to bees exposed to direct treatment on blooming crops or weeds. Do not apply this product or allow it to drift to blooming crops or weeds while bees are actively visiting the treatment area.

PHYSICAL AND CHEMICAL HAZARDS

Combustible. Do not use or store near heat or open flame. Keep container closed. Use with adequate ventilation.

DIRECTIONS FOR USE

It is a violation of federal law to use this product in a manner inconsistent with its labeling.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

Do not apply this product through any type of irrigation system.

Do not formulate this product into other end-use products without written permission.

Logoco AWARE® SP Insecticide should be used only in accordance with recommendations available through local dealers.

Logoco will not be responsible for losses or damages resulting from use of this product in any manner not specifically recommended by Logoco. User assumes all risks associated with such non-recommended use. AWARE® SP is a water soluble liquid to be diluted with water for application by mechanical ground or air equipment only. Use only in commercial and farm plantings. Not for use in home plantings nor on any commercial crop that is turned into a "U-Pick," "Pick Your own" or similar operation. Pilot should not assist in the mixing and loading operation.

AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE) and restricted-entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not enter or allow worker entry into treated areas during the restricted entry interval (REI).

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is:

- Coveralls.
- Chemical-resistant gloves, such as barrier laminate or butyl rubber.
- Shoes plus socks.
- Protective eyewear.

GENERAL INFORMATION

Scouting—Monitor insect populations to determine whether or not there is a need for application of AWARE® SP based on locally determined economic thresholds. More than one treatment of AWARE® SP may be required to control a population of pests.

Insect Predators—AWARE® SP at rates of 2/5 to 3/4 pt. per acre helps conserve certain beneficials, including big-eyed bugs, damsel bugs, flower bugs and spiders in cotton and soybeans. While these beneficials cannot be relied upon to control pests, they are of potential value and should be monitored along with pests in pest management programs on these crops.

Resistance—Some insects are known to develop resistance to products used repeatedly for control. When this occurs, the recommended dosages fail to suppress the pest population below the economic threshold. Because the development of resistance cannot be predicted, the use of this product should conform to resistance management strategies established for the use area. These strategies may include incorporation of cultural and biological control practices, alteration of active classes of insecticides on succeeding generations and targeting the most susceptible life stage. Consult your local agricultural authorities for details.

Compatibility—Since formulations may be changed and new ones introduced, it is recommended that users premix a small quantity of desired tank mix and observe for possible adverse changes (settling out, flocculation, etc.). Avoid mixtures of several materials and very concentrated spray mixtures.

Do not use AWARE® SP with Bordeaux mixture, "Du Ter" (triphenyltin hydroxide), lime sulfur, "Rayplex" iron nor in highly alkaline solutions. Use mildly alkaline mixtures immediately after mixing to prevent loss of insecticidal activity.

SPRAY PREPARATION

Spray equipment must be clean and free of previous pesticide deposits before applying AWARE® SP.

Fill spray tank 1/4 to 1/2 full of water. Add AWARE® SP directly to spray tank. Mix thoroughly. Use mechanical or hydraulic means; do not use air agitation. Spray mix should not be stored overnight in spray tank.

(Directions for Use continued on supplemental labeling.)

STORAGE AND DISPOSAL

STORAGE: Do not subject to temperatures below 32° F. Store product in original container only. Do not contaminate water, other pesticides, fertilizer, food or feed in storage. Not for use or storage in or around the home.

PRODUCT DISPOSAL: Do not contaminate water, food, or feed by disposal. Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal Law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

CONTAINER DISPOSAL: Triple rinse (or equivalent), then offer for recycling or reconditioning if container reuse is permitted, or puncture and dispose of in a sanitary landfill, or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke. Return empty stainless steel containers for refilling and reuse.

LIMITATION OF WARRANTY AND LIABILITY

NOTICE: Read This Limitation of Warranty and Liability Before Buying or Using This Product. If the Terms Are Not Acceptable, Return the Product at Once, Unopened, and the Purchase Price Will Be Refunded.

It is impossible to eliminate all risks associated with the use of this product. Such risks arise from weather conditions, soil factors, off target movement, unconventional farming techniques, presence of other materials, the manner of use or application, or other unknown factors, all of which are beyond the control of Logoco. These risks can cause: ineffectiveness of the product; crop injury; or injury to nontarget crops or plants.

Logoco does not agree to be an insurer of these risks. WHEN YOU BUY OR USE THIS PRODUCT, YOU AGREE TO ACCEPT THESE RISKS.

(Warranty information continued on supplemental labeling.)

Crops	Insects	Rate	Last Application—Days		
		AWARE® SP Lbs. Per Acre	To Harvest	To Livestock Grazing/ Feeding	REI
Anise (fennel)	Cabbage Looper	1/2 to 1	7		48 hrs
	Beet Armyworm	1-1/2 to 2			
Do not apply more than 4.5 lbs a.i./acre/crop. Do not make more than 3 applications/crop.					

(Restricted-entry information continued on supplemental labeling.)

Mixing Sheet B

Crop: Anise (fennel)
Acreage: 0.1 acre
Pest: Beet armyworm
Pesticide: Reckon EC *plus* Aware SP
Rate: 2 Pints per acre of Reckon EC
 1 pound per acre of Aware SP
Procedure: Weigh out the amounts of Reckon and Aware to treat 0.1 acre of anise.

1 Determine the amount of Reckon EC and Aware SP to use:

Amount needed = rate/acre × number of acres
 Reckon = 2 pints/acre × 0.1 acre = (a) _____ pints
 Aware = 1 pound/acre × 0.1 acre = (b) _____ pounds

2 Convert pints to liquid ounces:

1 pint = 16 liquid ounces
 (a) _____ pints Reckon EC × 16 liquid ounces/pint
 = (c) _____ liquid ounces

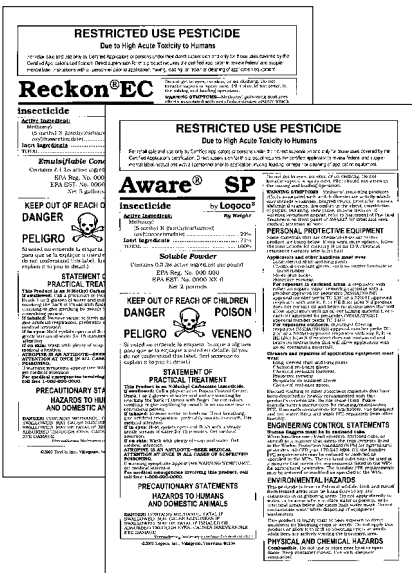
3 Convert pounds to dry ounces:

1 pound = 16 dry ounces
 (b) _____ pounds Aware SP × 16 dry ounces/pound
 = (d) _____ dry ounces

4 Measure out the number of liquid ounces of Reckon EC (c) calculated in step 2.

5 Weigh out the number of dry ounces of Aware SP (d) calculated in step 3.

These are the amounts needed to treat 0.1 acre of anise.



Mixing Sheet C

Crop: Anise (fennel)
Acreage: 0.1 acre
Pest: Beet armyworm
Pesticide: Reckon EC *plus* Aware SP *plus* Stunt WP
Rate: 2 Pints per acre of Reckon EC
 1 pound per acre of Aware SP
 2 pounds per acre of Stunt WP
Procedure: Weigh out the amounts of Reckon, Aware, and Stunt to treat 0.1 acre of anise.

- Determine the amount of Reckon EC, Aware SP, and Stunt WP to use:

Amount needed = rate/acre × number of acres
 Reckon = 2 pints/acre × 0.1 acre = (a) _____ pints
 Aware = 1 pound/acre × 0.1 acre = (b) _____ pounds
 Stunt = 2 pounds/acre × 0.1 acre = (c) _____ pounds

- Convert pints to liquid ounces:
 1 pint = 16 liquid ounces
 (a) _____ pints Reckon EC × 16 liquid ounces/pint
 = (d) _____ liquid ounces

- Convert pounds to dry ounces:
 1 pound = 16 dry ounces
 (b) _____ pounds Aware SP × 16 dry ounces/pound
 = (e) _____ dry ounces
 (c) _____ pounds Stunt WP × 16 dry ounces/pound
 = (f) _____ dry ounces

- Measure out the number of liquid ounces of Reckon EC (d) calculated in step 2.

- Weigh out the number of dry ounces of Aware SP (e) and Stunt WP (f) calculated in step 3.

These are the amounts needed to treat 0.1 acre of anise.

Handout #8

Comparisons of Pesticide Formulations

Formulation	Mixing/Loading Hazards	Phyto-Toxicity	Effect on Application Equipment	Agitation Required	Visible Residues	Compatible with Other Formulations
Wettable powders	Dust inhalation	Safe	Abrasive	Yes	Yes	Highly
Dry flowables/ water dispersible granules	Safe	Safe	Abrasive	Yes	Yes	Good
Soluble powder	Dust inhalation	Usually safe	Non-abrasive	No	Some	Fair
Emulsifiable concentrates	Spills and splashes	Maybe	May affect rubber pump parts	Yes	No	Fair
Flowables	Spills and splashes	Maybe	May affect rubber pump parts; also abrasive	Yes	Yes	Fair
Solutions	Spills and splashes	Safe	Non-abrasive	No	No	Fair
Dust	Severe inhalation hazards	Safe	–	Yes	Yes	–
Granules and pellets	Safe	Safe	–	No	No	–
Microencapsulated formulations	Spills and splashes	Safe	–	Yes	–	Fair

Order of Mixing Pesticide Formulations

When combining chemicals for either the compatibility test or for mixing in the spray tank, add the materials in the following order:

- ① wettable powders
- ② flowables
- ③ water-soluble concentrates
- ④ emulsifiable concentrates

For example, when combining a water-soluble concentrate with a wettable powder, always add the wettable powder to the spray tank first. When mixing an emulsifiable concentrate with a flowable, add the flowable first.

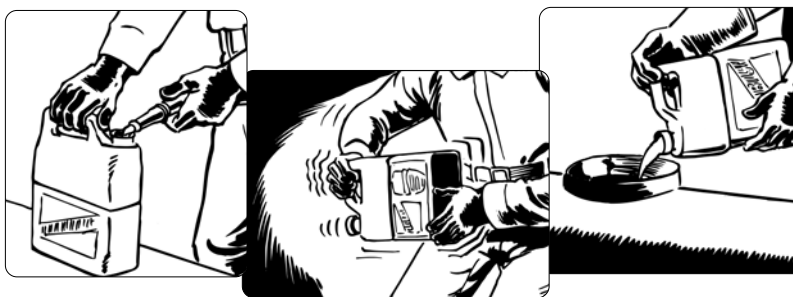
Triple Rinsing Pesticide Containers

Procedure:

1. When container is empty, let it drain into spraying or mixing tank for at least 30 seconds.
2. Add correct amount of water to container as follows:

<u>Container Size</u>	<u>Rinse Solution Needed</u>
Less than 1 gallon	1/4 of the container volume
1 gallon	1 quart
5 gallons	1 gallon
30 to 55 gallons	5 gallons

3. Close container.
4. Shake container or roll to get solution on all interior surfaces.
5. Drain container into sprayer or mixing tank. After empty, let drain for an additional 30 seconds.
6. Repeat steps 2 through 5 two additional times.



Amount of Active Ingredient Removed from a 5-gallon Container by Triple Rinsing:

	<u>Amount of Active Ingredient Remaining*</u>
Drain	14.1875 g a.i.
1st rinse	0.2183 g a.i.
2nd rinse	0.0034 g a.i.
3rd rinse	0.00005 g a.i.

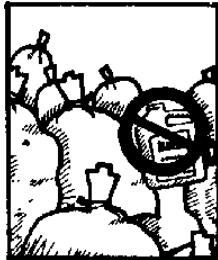
*After draining, a 5-gallon container is assumed to still contain 1 ounce of formulated pesticide. This would amount to 14.1875 g of active ingredient (a.i.) if the formulation contained 4 pounds a.i. per gallon.

Disposing of Empty Pesticide Containers

Farmers and ranchers are often concerned about disposing of potentially hazardous pesticides and their containers. Here are the disposal options available in most states:

All Trash Is Not Alike

Most ordinary trash in the U.S. is disposed of in sanitary landfills. However, these sites are generally prohibited from accepting waste classified as hazardous by the federal Resource Conservation and Recovery Act (RCRA). Since contaminated pesticide containers and waste chemicals often fall into this category, farmers frequently have difficulty disposing of them properly.

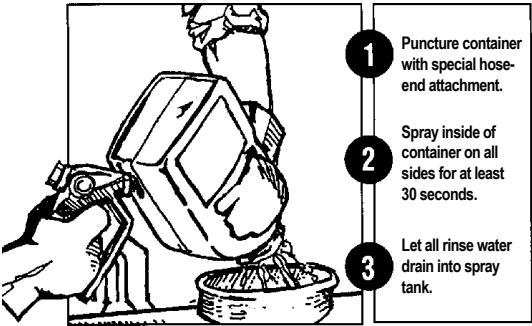


An easy solution to this problem is to rinse the chemical containers properly. Rinsed containers aren't hazardous. Laboratory tests have shown that proper rinsing results in essentially harmless, 99.999% pesticide-free containers, regardless of which product they originally contained.

Probably the fastest, most efficient and convenient container rinse method is pressure rinsing. Special hose-end attachments are available that easily puncture

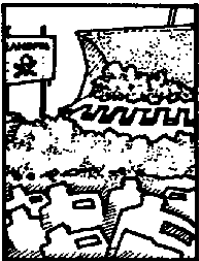
plastic and metal containers, producing a forceful spray inside the empty container. By holding the container over the opening to the spray rig or holding tank while rinsing, rinse water can be captured as it drains from the container spout. Be sure to rinse any pesticide residue from the outside of the container, too.

Manual rinsing methods (i.e., triple rinsing) can be as effective as pressure rinsing, although they are more time-consuming and labor intensive.



Disposing of Rinsed Containers

Rinsed according to label directions, pesticide containers are classified as ordinary solid waste. Be aware, however, that some waste disposal operators will still turn away rinsed containers, even if they have adequate landfill capacity.



States also have jurisdiction over burning and burying containers on private property. While these disposal methods don't violate federal laws, the states frequently apply different rules. For example, open burning and burial of containers is outlawed in some states. Contact your ag chemical dealer for state disposal regulations.

cyclers, wary of handling hazardous waste, won't accept the containers.

If you have the opportunity to participate in a recycling program, be sure to rinse all containers properly. Contact the Agricultural Container Research Council (919-549-2101) for more information about container recycling programs near you.

Leftover Chemicals

Applying leftover pesticides over as large an area of land as possible, such as on a field where the chemical was originally used, is a common disposal practice acceptable in most states. Off the farm, however, disposing of banned chemicals or hazardous ag chemical waste is generally much more difficult and expensive. Contact your chemical dealer for more information on amnesty (chemical return) programs near you.



To learn more about the requirements for hazardous waste treatment and disposal, contact the EPA hazardous waste hotline at 800-424-9346, or your pesticide retailer.



Recycling Containers

Collection and recycling programs are being organized in a number of states as pilot programs. But the success of any disposal or recycling program hinges on the guarantee that only properly rinsed containers will be brought in by farmers. Without this guarantee, landfill operators and re-

SCRIPT FOR EPISODE 3

Murray: Okay, Richard. Today we're going to talk about transporting pesticides, opening containers, and mixing and loading. Then we will cover spill cleanup and container storage and disposal.

Richard: Great. I'm looking forward to getting some experience. It's been a while since I've done this.

Murray: First let's talk about transporting pesticides. When you transport pesticides, there are some rules you need to follow.

Richard: Okay.

Murray: *(indicating the pickup parked nearby)* Never put pesticides in the passenger compartment. They should only go in the back of the truck. And don't let people or pets ride in the back with the pesticides.

Richard: And the containers need to be tied with a rope or something so they can't tip over, right?

Murray: Yes. Secure the containers to make sure they can't fall out, tip over, or roll around. Make sure there's no food, animal feed, clothes, or anything else in the back of the truck that could later be eaten or touched by people or animals.

Richard: Can I carry the pesticides I'm going to use on the back of the spray rig?

Murray: As long as they are secure and far enough away from you so you won't get contaminated if a container opens and splashes or spills.

Richard: All right. I'll remember.

Murray: Now, let's go over the procedures for preparing for a pesticide application.

Richard: Okay. What should I do first?

Murray: Before you even open the pesticide container, make sure the weather isn't a problem. You don't want to mix up a tank of pesticide if it's too windy to spray or it's about to rain.

Richard: I shouldn't spray if it's windy?

Murray: Right. Too much wind causes pesticides to drift. There's the risk of contaminating the environment or exposing other people to the pesticide.

Richard: What if there's just a breeze?

Murray: A slight breeze is okay, but even moderate wind could carry the spray away from the area. And you shouldn't apply most pesticides if it's about to rain. If you have any doubts about an application, check with me before you start.

Richard: I will. I don't want to make any mistakes. After I check to make sure the weather's okay, what's next?

Murray: Never mix or load pesticides near ponds, streams, wells, or ditches.

Richard: Would that be true for cleaning the spray equipment after the application too?

Murray: Yes. Definitely. Thanks for thinking of that. It is important to protect water sources. Keep the label with you so you can easily check it. *(Murray indicates the 2 plastic jugs with pesticide labels attached. One is a gallon jug and the other is larger.)*

Richard: *(puzzled)* Are these pesticides?

Murray: We're going to work with plastic jugs filled with water as if they were pesticides. You'll make a tank mix of these two and later on I'll have you spray. I want you to get some hands-on practice before you start working with real pesticides. Check these labels to find out what PPE you need.

Richard: Which label should I check? *(Richard examines one of the labels carefully to find the section where required PPE is listed.)*

Murray: You need to look at both labels and compare PPE recommendations. Then choose the PPE that provides the most protection. For example, if one label says to wear coveralls and the other says long sleeves and long pants, wear coveralls, because they provide more protection.

Richard: *(looks at both labels)* Let's see. I've got a facemask, my arms and legs are covered, I'm wearing shoes and socks... *(glancing back at the labels)*... Now I need a pair of chemical-resistant gloves. *(looks at a pile of gloves and grabs the top pair which happens to be a pair of cotton-lined gloves)*

Murray: Aha, I was hoping that you would grab those. I put them in the pile on purpose so we could cover a very important point. *(takes the glove from Richard and turns the cuff inside-out to show the cotton lining)* These gloves are lined with cotton, which absorbs pesticides.

Richard: Oh, right—and if that happens then I would be exposed to pesticides every time my skin touches the inside of the glove.

Murray: Exactly, these are the gloves that you would use when handling those pesticides. *(grabs the correct pair of gloves and hands them to Richard)*

Murray: What do the labels say about a respirator?

Richard: *(consulting the label)* Well, this one *(indicates the gallon jug)* doesn't mention respirators, but this one *(indicates the other jug)* says that if you measure the pesticide in an enclosed area you need a cartridge respirator. The kind that's used for organic vapors. But I'll be doing this outside, right?

Murray: Yes. We do all our mixing and loading out-of-doors.

Richard: Okay, *(looking at the label on the larger container)* then, I need one of these dust/mist-filtering masks. *(He pulls one out of his pocket.)* Is there any other PPE I need for mixing and loading?

Murray: Yes. Whenever you mix and load, I want you to wear a face shield and a chemical-resistant apron.

Richard: Even if the label doesn't say so?

Murray: Absolutely. Unless you're already wearing a chemical-resistant suit. When you mix and load you need extra protection because you are working with the concentrated materials.

(Richard puts on the apron and the face shield.)

Murray: To treat this particular field you need to mix one gallon of this pesticide *(Murray indicates the gallon jug, and stresses the word "insecticide" and smiles in acknowledgement of the fact that it is really just water)* and 28 ounces of this one *(indicates larger jug)*. Don't forget your respirator.

Richard: *(as Richard puts on his dust/mist respirator he asks)* Am I ready now to measure the pesticides and put them into the tank?

Murray: Not quite yet. Add some water to the tank first. *(Richard starts adding water to the tank.)* We keep our equipment in good working condition and calibrate it regularly, but just to get you in the habit, I want you to check it out. Now with water in the tank, look at the hoses and all the connections to see that everything is attached right and the hoses are in good condition. *(Richard does all this as Murray watches.)* Any signs of leaks?

Richard: No, not that I see.

Murray: Okay. This is the measuring container you'll use to measure the 28 ounces. *(He hands Richard a large measuring cup.)*

(For the rest of the mixing and loading section of this segment, Murray is talking as we watch Richard carry out his instructions.)

Murray: Put the measuring container down on a flat surface, so that if the pesticide splashes it won't get on your face and into your eyes. Measure out 28 ounces from the larger jug then pour that into the tank. *(Richard puts the measuring container on a flat, low surface, and opens the pesticide container. He pours out 28 ounces, and adds them to the tank.)*

Murray: That's good. Always work slowly.

Murray: Measure exactly. Using too much or too little pesticide can cause problems for you, the crop, and the

environment. Close the container as soon as you finish measuring. *(Richard replaces the container cap.)*

Murray: Since the other one is a gallon container, and you need a gallon of the pesticide, you'll empty the whole jug into the tank. *(Richard empties the jug into the tank.)*

Murray: Whenever you empty a pesticide container, rinse it immediately. Fill it about 1/4 full with clean water. *(We see Richard do this.)*

Put the cap on tightly and shake it up. *(We see Richard do this.)*

Now pour it into the spray tank, and let it drain for about 30 seconds. *(Richard pours the contents into the tank.)* Do this two more times. If you empty a container that can't be triple rinsed, for example a paper bag, empty it as well as you can, and close it tightly. *(A short time lapse and we see Richard pouring the last drops of the rinsate into the spray tank.)*

Murray: *(back to Murray and Richard)* Don't forget to rinse your measuring container, and pour the water into the tank. *(We see Richard rinse the measuring container.)* Now finish filling the tank. Always keep an air gap between the hose and the liquid in the tank so the pesticide won't backflow into the water source.

Richard: *(taking hose to finish filling the tank)* When it's full, should I close the top?

Murray: Yes. Then screw the cap on the rinsed bottle and lock the container up right away. *(Richard closes the sprayer and the bottle and puts the jug on the self-propelled boom sprayer.)* Now, these *(indicates the jugs)* are liquid formulations, but you'll work with powders too. There is a special way to open the bags.

Richard: Okay.

Murray: *(As Murray explains the procedure for opening paper containers, we see a handler carrying out the activity.)* Use a sharp knife or scissors. I keep scissors in the storage room just for opening bags. Always wash them with soap and water after each use.

(The handler is seen in the storage area picking up labeled scissors from a counter. The handler carefully opens a paper container with the scissors.)

Murray: If you rip the bag open, you risk spilling the powder, and it can get all over you.

Murray: Let's talk about what to do if you spill some pesticides.

Richard: Does that happen a lot?

Murray: Not if you're careful. But I want you to know what to do just in case. First tell me about any spill that occurs. Always carry spill cleanup materials with you

and never try to clean up a spill if you don't have the right PPE and cleanup equipment.

Richard: Where is the spill kit?

(Murray nods, and walks over to a shed. He goes inside, brings out a spill kit, and sets it down. He opens it and pulls out a Tyvek suit and other PPE.)

Murray: It's in the shed. Bring it with you whenever you handle pesticides. It includes cleaning equipment and PPE.

Richard: What PPE do I need to clean up a spill?

Murray: Wear the same PPE required for a mixer and loader working in an enclosed area.

Richard: Yeah. That makes sense. What else do I need to know about cleaning up spills?

Murray: Keep people and animals away, and keep the pesticide from spreading. It's especially important to protect water sources.

Richard: How?

Murray: The first thing you should do is control the spill, so if a container has tipped over, set it upright so the pesticide doesn't continue spilling out.

Richard: What if the spray rig is leaking?

Murray: Shut it off and fix the leak right out there in the field, but keep all your PPE on while you are doing the repair.

Richard: Okay, once I stop a leak or spill, what comes next?

Murray: Let's suppose you spill a pesticide on concrete or asphalt. You need to contain the spill by surrounding it with some absorbent material. This keeps the pesticide from spreading to other areas.

Richard: And after I contain the spill?

Murray: Then it's time to clean it up. Never hose down a spill with water.

Richard: That would just spread it around and make things worse!

Murray: Exactly. If it's a liquid spill, soak it up with cat litter or soil.

Richard: What if it's a spilled powder?

Murray: In that case, moisten it very lightly with water from this spray bottle *(shows Richard the spray bottle)* to keep it from blowing around, and cover it with this tarp until you are ready to sweep it up. *(He shows Richard the tarp.)*

Richard: Okay, then what?

Murray: Use the broom from the spill kit to sweep the pesticide and cleanup materials toward the middle of the spill. Shovel all the contaminated material and put it and

the tarp into this container. *(indicates the sealable plastic barrel)*

Richard: What do I do with the stuff in the container?

Murray: That's where I come in. It's considered hazardous waste, and I'll take care of disposing of it. Put the broom and any other cleanup materials that can't be adequately cleaned in the same container. Just let me know afterwards what clean-up equipment I need to replace.

Richard: Let's say I spill a pesticide out in the field, and it starts soaking into the soil. How would I clean that up?

Murray: In that case we have to collect all of the contaminated soil and put it in containers.

Richard: Unless it's a really small spill, that would take a lot of containers!

Murray: True. For large spills or spills on public roadways, you need professional help from a spill cleanup team. But never abandon the site to go look for help. Stay there to keep people away and send someone to the office to let us know what's happened. I'll contact the right people.

Richard: Well, I'll do my best to make sure there are no spills.

Murray: Good idea! That would be a lot easier and safer for everyone. *(pauses)* Okay... You've measured out the pesticide, loaded the tank, and we've talked about spills. Now, let's check the label for storage and disposal instructions.

Richard: *(studies the label)* Here's the information. It says to store the pesticide in its original container with the label attached. Keep the container upright with the cap tightly closed.

Murray: Does it say where you should keep it?

Richard: Yeah. It talks about a locked area with a warning sign telling people that pesticides are being stored there.

Murray: What else does it say about storage?

Richard: It says to check the container for cracks, holes, and weak spots where the pesticide could leak out.

Murray: That applies to all stored pesticides. For liquids, you need to check containers frequently. If the pesticide is leaking you should put it into another container and attach a copy of the label.

Richard: What about powders and other dry pesticides?

Murray: Check the bags for tears. Tape rips to prevent leaks, or seal the pesticide, torn bag and all, in a plastic bag. Anything else about storage?

Richard: Yes. You're supposed to keep the pesticide in a dry, cool area, never below freezing or above 90°F

Murray: Good. Now check for container disposal instructions.

Richard: (*studies the label again*) Oh, here they are. It says here to make sure that the container is completely emptied and rinsed before throwing it away, and never use empty containers for food, feed, or drinking water.

Murray: A very good rule. No one should use pesticide containers for any other purpose! They have pesticide residues no matter how well they are washed. Go on.

Richard: (*looking at the label and reading*) Emptied containers need to be disposed of in a sanitary landfill or according to local or state regulations regarding disposal.

Murray: Exactly. Different states have different rules for container disposal.

Richard: So, when I empty a container how do I find out what I am supposed to do with it?

Murray: Getting rid of empty containers and of leftover pesticides that we can't use is my responsibility. Your job is to never leave empty containers lying around. Triple-rinse them so that they can't be used again. Then lock them up in the shed in back of this building. (*indicates building*)

Richard: There sure are a lot of rules! And a lot I need to know about working with pesticides!

Murray: Yes. Being a pesticide handler is a serious job, but I'm sure you are up to it. Now let's go out and I'll show you how to apply pesticides correctly.

4 EPISODE

APPLYING PESTICIDES SAFELY



Richard meets Murray in the field to become familiar with the application equipment and to practice spraying. Richard is wearing disposable coveralls and has his gloves, dust/mist respirator, and other PPE with him. A spill kit is also nearby. Murray begins the training by discussing the requirements to check the area to be treated to be sure there are no people or livestock present and what

to do if there are. They then talk about sensitive areas, such as creeks, and how to protect these areas when making pesticide applications. After this, they check the label to be sure that Richard has all the correct personal protective equipment. He then practices spraying under Murray's supervision. However, shortly after he begins, one of the nozzles on the sprayer plugs up, so Murray teaches him how to unplug it.

IMPORTANT POINTS INCLUDED IN EPISODE 4

This episode covers the fundamentals of making a pesticide application and protecting people and the surrounding environment from pesticide residues. The points emphasized in this episode include

- never apply pesticides so they can get onto people—either directly or through drift
- protect the environment and wildlife by controlling drift and runoff
- unclog nozzles safely

Showing Episode 4

Explain to participants that this episode will cover some important points about making a pesticide application. Ask them to take notes on how these points are addressed so they can discuss them later. Remain with the participants throughout the viewing of Episode 4.

The script for Episode 4 begins on page 93.

Discussion Activities

The activity for this episode gives the participants an opportunity to lead short discussions on various topics related to making a pesticide application. These discussions will help them review the points made in Episode 4. The topics are

- protecting people while applying pesticides
- how weather influences a pesticide application
- keeping pesticides out of sensitive areas
- special hazards at the application site
- the application pattern
- using buffer strips to protect sensitive areas
- pesticide application equipment problems

Procedure. Assign each of the seven topics to participants and give them the appropriate “Discussion Topic Sheet.” If you are training more than seven individuals, divide the group up so they can lead their topics as teams. If there are fewer than 7 individuals, assign more than one topic to some so that all the topics are covered in the discussions. Inform the participants that they are to lead short discussions based on the “Discussion Topic Sheets” that were provided to them. They are to use the flip chart or chalkboard to list the important points in dealing with the topic to which they are assigned.

Allow everyone about 5 minutes to read the information on the “Discussion Topic Sheet” they received. Then have each individual or team lead a discussion based on this information. Allow about 5 minutes for each topic.

Required Materials

For this activity, you will need a flip chart or chalkboard and copies of the seven “Discussion Topic Sheets” found on pages 79 through 91.

PROTECTING PEOPLE WHILE APPLYING PESTICIDES

It is illegal to expose people to pesticide spray or drift. A pesticide application should not be made if anyone is in the treatment area who is not involved with the application. People working in adjacent areas must not be exposed to drift or overspray.

DISCUSSION QUESTIONS

- What do you do if you discover that a person is working in a field you are about to spray?
- What should you do if a crew is working in the field next to the one you are spraying and the wind is blowing from the field you are spraying towards the crew?
- What would you do if you see a jogger running through the field you are spraying?
- What steps could you take to protect people who work in nearby fields from spray drift? (Possible answers: spray early or late in the day when people are not present; notify their crew chief and try to arrange for them to work elsewhere during the application.)
- A busy road runs alongside the field you are spraying. How would you protect people and their vehicles from spray drift while you are making an application?



HOW WEATHER INFLUENCES A PESTICIDE APPLICATION

Weather has a significant influence on pesticide applications. Components of weather include temperature (heat and cold), moisture (such as rainfall and fog), and wind. Wind not only contributes to drift but also affects the stress of plants that may be sprayed to protect them from pests.

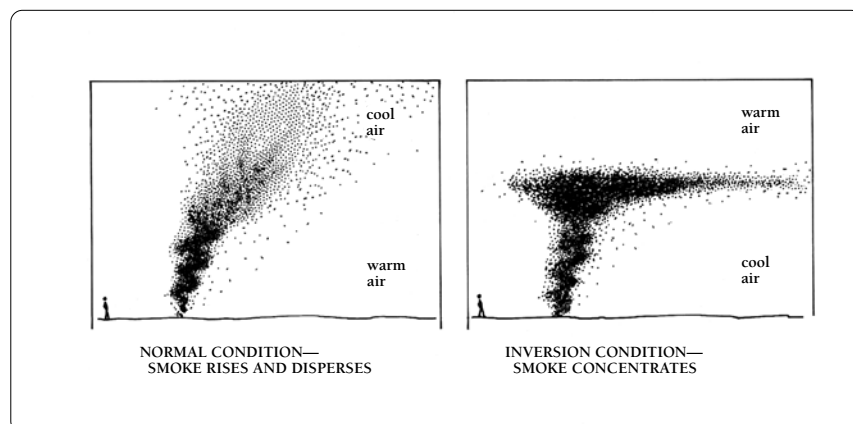
Temperature. Temperature affects the phytotoxicity (ability to injure treated plants) of certain pesticides. High temperatures accelerate pesticide breakdown and volatilization. Clear, sunny weather causes pesticides to break down rapidly while cool, cloudy weather slows the breakdown. Air temperature is responsible for the inversion phenomenon that may often cause pesticide drift.

Moisture. Rainfall, fog, and even heavy dew affect pesticide applications. This is because the moisture dilutes and degrades pesticides and may wash the material off treated surfaces. Rainwater washes pesticides into the soil, producing possible groundwater and surface water contamination. Fog plays a role in offsite pesticide movement.

Wind. Wind influences pesticide drift and affects volatilization. Strong air movements cause uneven pesticide deposition.

DISCUSSION QUESTIONS

- How can you reduce pesticide drift? (Possible answers: spray when it is not windy; lower the spray pressure; use larger nozzle orifices; keep nozzles low and close to treated surfaces; use drift retardants.)
- How would a heavy fog affect a pesticide application?
- What is pesticide volatilization and how can this be a problem when making an application?
- What weather conditions would increase the chances of a pesticide being phytotoxic? (Possible answers: high temperatures, drying winds.)
- How can a heavy rainfall after a pesticide application create a hazard to the environment?



KEEPING PESTICIDES OUT OF SENSITIVE AREAS

Sensitive areas include residences, schools, parks, playgrounds, and other locations where people live, work, play, or travel through. They also include pastures or other areas where livestock or pets are confined. Sensitive areas may be adjacent crops. Forests, streams, lakes, ponds, wildlife habitats, and other parts of the environment are sensitive areas.

DISCUSSION QUESTIONS

- Describe sensitive areas that you must protect from pesticide exposure in locations where you make pesticide applications.
- How can you keep sprays from drifting onto nearby streams or ponds?
- If you are applying pesticides to a field that has a residence in one corner, how would you protect the people who live in this residence from pesticide exposure?
- Why must you be concerned about applying pesticides to a field that is next to a naturally forested area?
- List all the ways you can reduce pesticide exposure to sensitive areas.

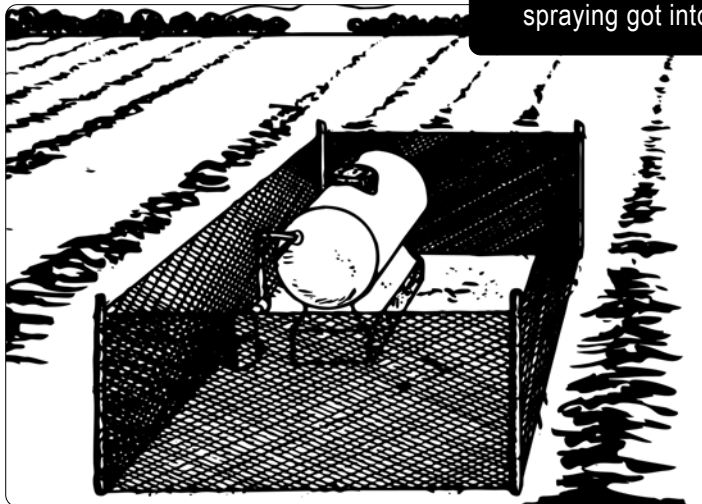


SPECIAL HAZARDS AT THE APPLICATION SITE

A field or other site may contain many hazards that a person making a pesticide application must avoid. These may be such things as ditches, embankments, steep slopes, electrical wires, or electric fences that could injure the operator or damage the equipment. They could be wells, irrigation ditches, or holding ponds that could become contaminated with pesticide residues. They could even be low, muddy areas where the equipment could become stuck. Before beginning a pesticide application, the person operating the equipment must become familiar with the site and location of the special hazards.

DISCUSSION QUESTIONS

- Name some of the special hazards that you might encounter on a piece of property where you are making a pesticide application.
- What steps can you take to become aware of and to avoid special hazards at an application site?
- Describe the potential consequences if a spray rig rolled over into a ditch and the tank, filled with a pesticide mixture, ruptured.
- What precautions should be taken when filling a spray tank or making a pesticide application near a well?
- What problems might occur if a pesticide you were spraying got into an irrigation ditch?



THE APPLICATION PATTERN

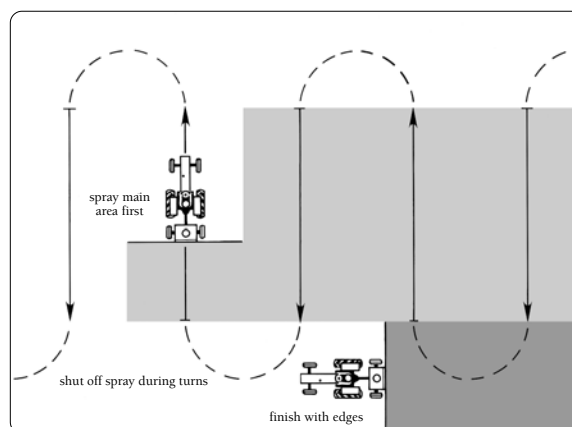
An application pattern is the route you follow while applying a pesticide. The purpose of any application pattern is to provide an even distribution of pesticide over the treated area. To do this, you must avoid overlaps and gaps. Pesticide application speed usually determines the uniformity of the application pattern. At higher speeds, the equipment bounces more. When establishing an application pattern, consider

- prevailing weather conditions
- what is being sprayed
- hazards in or near the application site

Design a pattern that eliminates the need to travel through airborne spray or walk or drive through freshly treated areas. Operating the application equipment (such as boom applicators) during turns produces an uneven application.

DISCUSSION QUESTIONS

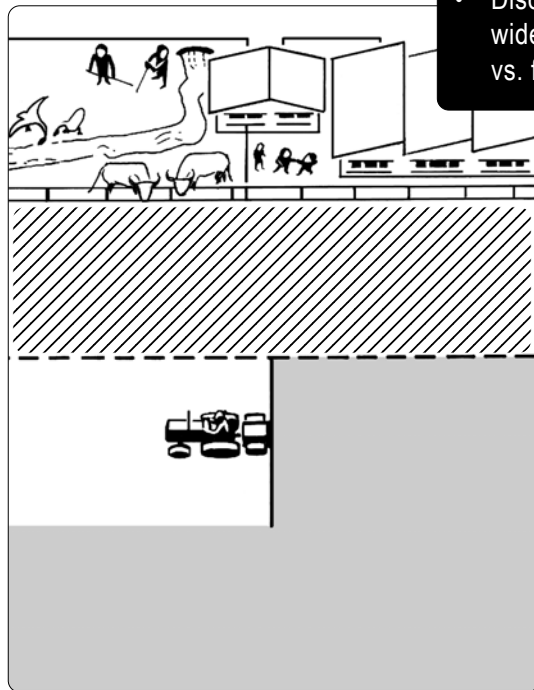
- What is the purpose of an application pattern?
- How can you achieve an even application during turns at the ends of rows?
- What are the consequences of uneven pesticide application patterns?
- What impact would prevailing weather conditions have on the application pattern?
- What would be the impact of uneven speed of the equipment during a pesticide application?



USING BUFFER STRIPS TO PROTECT SENSITIVE AREAS

Buffer strips are unsprayed areas of a field that adjoin sensitive areas. These are locations where applications might expose people, organisms, structures, or nontarget plants to pesticides. As a general rule, the buffer should be no less than the width of one spray swath. Regulations may specify the buffer strip width for certain pesticides and for certain sensitive areas. Often, the size of the buffer strip depends on the

- type of application equipment you are using
- prevailing weather conditions
- nature of pesticide being applied
- type of pest problem being treated
- sensitive nature of the adjoining areas



DISCUSSION QUESTIONS

- Name situations where you would leave a buffer strip when making a pesticide application.
- What conditions would require the buffer strip to be larger than ones used in other situations.
- Why would differences in application equipment require different sizes of buffer strips?
- Discuss the possible consequences of leaving an unsprayed portion of the crop as a buffer strip. (Possible answers: greater pest damage to the unsprayed crop area; possibly better control of some pests because beneficials are not destroyed in the unsprayed area.)
- Discuss why some pesticide formulations would require wider buffer strips than others. (For example, granules vs. fumigants; dusts vs. sprays.)

PESTICIDE APPLICATION EQUIPMENT PROBLEMS

Equipment breakdowns, plugged nozzles, ruptured hoses, leaks, and other malfunctions can cause serious problems when making a pesticide application. However, many of these problems can be anticipated and steps can be taken to avoid them. Some of the consequences of equipment failure may include

- pesticide exposure to the equipment operator and others
- environmental contamination from leaks or ruptures
- improper application rate
- uneven applications
- waste of pesticide materials
- increased labor costs

A thorough and frequent equipment maintenance program will help to prevent in-field breakdowns. Checking and replacing worn hoses and fittings will prevent ruptures that could injure the equipment operator. To prevent nozzle plugging, filters and strainers should be cleaned regularly or replaced if missing.

DISCUSSION QUESTIONS

- What would be the various consequences of a plugged nozzle on a boom sprayer being used to apply an herbicide across a 12 foot swath?
- Name the problems that would be caused by accidentally spilling a full tank (approximately 200 gallons) of a pesticide spray mixture into a ditch alongside a creek.
- Describe the steps that should be taken if a sprayer hose ruptures and soaks the operator with a pesticide mixture.
- Assume you are getting ready to start a pesticide application. List all the parts of a sprayer that you would inspect and maintenance you would perform before filling it with water and pesticide.
- Describe the process for cleaning plugged spray nozzles.



SCRIPT FOR EPISODE 4

Murray: Okay, Richard, you've loaded the tank and you're ready to begin spraying. But before you start, there are certain things you need to think about.

Richard: What sorts of things?

Murray: Before you begin, make sure there are no people, pets, or livestock in or near the application site.

Richard: If someone is already there should I ask them to leave?

Murray: Yes. And don't start spraying until they do.

Richard: Okay. What else do I need to check before I apply pesticides?

Murray: Well, there's a creek running through my property. Make sure you never allow pesticides to get into the water, either directly or from drift. Have you noticed how I've left an unplanted area along the edge of the creek? That's so there's no need to spray close to the water.

Richard: Oh. I sort of wondered why you'd done that.

Murray: It's worth leaving a little land unplanted in order to protect the environment. And speaking of the environment, that's something on the label we haven't discussed yet.

Richard: Do all pesticide labels mention environmental hazards?

Murray: Yes. Every pesticide label has an Environmental Hazard Statement that lists animals and other organisms that are likely to be harmed by the pesticide. What does the Environmental Hazard Statement include on that label?

(Murray shows Richard the Environmental Hazard Statement on the product label.)

Richard: It talks about bees and other beneficial species.

Murray: Right. Bees help with pollination and produce honey. Beneficial species might include certain insects, birds, and other wild animals that eat pests. They can reduce the need to use pesticides in the first place.

Richard: Here it says something about sensitive areas. What's that mean?

Murray: Remember when I mentioned the creek?

Richard: Yes?

Murray: Well, that's one example of a sensitive area, and there are other areas around the treatment site that are considered sensitive, such as my neighbor's crops or the roadways around my property. The way my farm is situated, we're not near any schools, houses, or populated areas. But if we were, you'd need to be especially

careful to keep pesticides away from those sensitive areas.

Richard: I'll make sure that when I apply a pesticide, all the pesticide stays in the field I am treating.

Murray: Good.

Murray: Now... Can you think of anything else you should consider or do before you start spraying?

Richard: Yes. I need to be sure I'm wearing the right PPE and I need to make sure I am wearing it correctly, with my pant legs over the boots, gloves and sleeves in the right position.

Murray: Very good. And always check your PPE for tears, stretched elastic, broken seals, and any other defects before you put it on. *(Richard examines the PPE, puts it on, and adjusts it.)*

Richard: O.K. Looks good.

Murray: Also, before you begin to apply a "danger" or "warning" pesticide, make sure that you have an extra set of clean work clothing, and that there are soap, water, and single-use towels nearby. If the label requires eye protection, then you must also have a pint of clean water within your reach while you spray.

Murray: Now it looks like you're ready to do a little spraying.

(Richard gets on the ATV, which is attached to a boom sprayer.)

Murray: Keep an eye on the areas you've treated to make sure the plants are receiving uniform, thorough coverage.

(Richard nods, drives to the field, and starts to spray. He looks back and observes the spray as he goes, to make sure everything is okay. After a while he seems to notice a problem and stops. He gets off his rig and walks back to where Murray is standing. He says:)

Richard: Say, Murray, I think one of the nozzles is clogged or something.

Murray: Yeah, that happens.

Richard: How do I fix it?

Murray: Well, in a way, it's good that the nozzle clogged. It gives me a chance to explain how to clean it. See this brush?

(He pulls a small brush from the spray rig.)

Murray: Always use this brush to clean nozzles. Never try to unclog a nozzle with your mouth, a piece of wire, or anything metallic.

Richard: I know that you could get exposed to pesticides if you try to blow through the nozzle, but why can't you use a wire or other type of metal to unclog it?

Murray: Nozzles are made so that an exact amount of spray flows through them. Metal can distort nozzle openings and affect the spray.

Richard: Oh.

Murray: Here. Take this brush and see if you can unplug the nozzle.

(Richard walks off. There is a brief time lapse. We see Richard spraying again. There's another time lapse, and then we see Richard walking back to Murray.)

Richard: I unplugged the nozzle. It's working perfectly now.

Murray: Great. Well, Richard, you've had a little practice spraying. I think you've got the idea. Now let's talk about personal cleanup.

5 EPISODE

CLEANING UP AFTER HANDLING PESTICIDES



This is the final step in Richard's training. He and Murray are back at the farm shop area. The application seen in the previous episode is completed, and Richard is learning about end-of-the-day cleanup. This includes how to launder his work clothing and how to clean and inspect his personal protective equipment.

This is the last video episode. In addition to the discussion activities included in this section, use the discussion time to review and to answer any other questions that the participants may have. It is especially important for them to understand that the federal Worker Protection Standard (WPS) mandates that an employer cannot retaliate against them in any way if they are trying to comply with the requirements of the WPS.

IMPORTANT POINTS INCLUDED IN EPISODE 5

Episode 5 finishes off the handler training by covering personal cleanup and care of work clothing and personal protective equipment. Points covered in this episode include

- personal cleanup after applying pesticides
- care of and laundering of contaminated work clothing
- cleaning and maintenance of personal protective equipment
- protection against retaliatory acts

Showing Episode 5

Let the participants know that this is the final episode and last part of the video and their handler training. Ask them to pay particular attention to the information in the video that will cover personal cleanup, what to do with their work clothing, and cleaning their personal protective equipment. Tell them there will be a discussion about these procedures after they see this episode. Also let them know that there will be time for general questions on all of the information they have received during this training. Remain with the participants throughout the viewing of Episode 5.

The script for Episode 5 begins on page 107.

Discussion Activities

Participants will have the opportunity to describe and discuss the cleaning requirements for work clothing and personal protective equipment. Supplemental information that you can give to participants is included at the end of this section.



Required Materials

For this session, assemble the following items:

- one large plastic bag (for contaminated work clothing)
- one pair of jeans and one work shirt (representing contaminated clothing)
- a cartridge respirator
- one pair of rubber boots
- one pair of unlined nitrile or latex gloves
- one pair of goggles
- one waterproof protective garment
- Handout #12, *Techniques for Washing Pesticide-Contaminated Clothing* (see page 99)
- Handout #13, *Cleaning Up after Pesticide Use* (see page 101)
- Handout #14, *Cleaning and Maintenance of Protective Equipment* (see pages 103 and 105)

Procedure. Pass out copies of the three handouts to each participant. Give the plastic bag and work clothing to one participant and then distribute the personal protective equipment among the remainder of participants. Ask them to read through the three handouts and find out how to clean the work clothing or PPE they have been given so they can describe the process to the rest of the group. Starting with the work clothing, have the person simulate removing the clothing and placing it into the plastic bag. Then ask this person to describe to the other participants the proper procedure for laundering this clothing. Other participants can ask questions and provide additional information.

Next, have each person describe to the other participants the proper way to clean, inspect, and store the piece of personal protective equipment that was given to them. Other participants can ask questions and provide additional information.

Wrap Up. Ask participants if they have any other questions about the training they have received. Complete the training records, if necessary. Finally, let the participants know that the federal WPS mandates that an employer cannot retaliate against them in any way if they are trying to comply with the requirements of the WPS. Ask if there are any questions about this.

Commend the participants for their attention and active participation in the training session and thank them for attending.

Techniques for Washing Pesticide-Contaminated Clothing

1. Keep pesticide contaminated clothing separate from all other laundry.
2. Do not handle contaminated clothing with bare hands; wear rubber gloves or shake clothing from plastic bag into washer.
3. Wash only small amounts of clothing at a time. Do not combine clothing contaminated with *different* pesticides—wash these in separate loads.
4. Before washing, presoak clothing:
 - a. Soak in tub, automatic washer, or spray garments out of doors with a garden hose.
 - b. Use a commercial solvent soak product, or apply prewash spray or liquid laundry detergent to soiled spots.
5. Wash garments in washing machine, using hottest water temperature, full water level, and normal (12-minute) wash cycle. Use maximum recommended amount of *liquid* laundry detergent. Neither bleach nor ammonia seem to affect the removal of most pesticides. Never use both.
6. If garments have pesticide odor, visible spots, or stains before washing, rewash one or two more times as in step 5.
7. Clean washing machine before using for other laundry by repeating step 5, using full amount of hot water, normal wash cycle, laundry detergent, *but no clothing*.
8. Hang laundry outdoors on clothesline to avoid contaminating automatic dryer.

Do not attempt to wash heavily contaminated clothing; destroy it by burning or by transporting to an approved disposal site. Follow these suggestions for reducing chances of contaminating the family laundry and endangering family members.

1. Whenever possible, wear disposable protective clothing that can be destroyed after use.
2. Always wear all required PPE when working with pesticides.
3. Wear clean clothing daily when working with pesticides. Wash contaminated clothing *daily*.
4. Remove contaminated clothing at work site and empty pockets and cuffs. Place clothing in clean plastic bag until it can be laundered. Keep contaminated clothing separated from all other laundry.
5. Remove work clothing immediately if it has had a pesticide concentrate spilled on it.

Cleaning Up After Pesticide Use

At the end of a long day of field or yard work, your first thought is probably eating a hot meal or sinking into your favorite chair to relax. But if your work included applying pesticides, the first thing you should do is change out of your clothes and head for the shower or sink.

Like any hazard, the potential health risks associated with pesticide use not only depend on the toxicity of the product, but the extent of your exposure to it ($\text{Risk} = \text{Toxicity} \times \text{Exposure}$). Reduced exposure = reduced risk.

One key way to reduce exposure—in addition to wearing personal protective equipment—is to make sure you properly clean yourself and your clothing following each contact with the product.

From Hand To Mouth



Exposure studies show that when someone works with pesticides, the greatest amount of exposure occurs on the forearms and hands. In fact, the skin is the main route for chemical entry into the body. This isn't surprising when you consider a typical day—hands open containers, turn valves, adjust nozzles, carry hoses, and sometimes clean up spills. There are plenty of opportunities to get chemicals on the

skin.

In addition, consider the number of times you touch your face, neck, or other parts of your body during the day; how you wipe perspiration from your face or blow your nose; and the conditions present when chewing gum or tobacco, smoking, drinking beverages, or eating a sandwich or candy bar. It shouldn't surprise you that most chemical exposure comes from your hands.

Although chemical-resistant gloves make a big difference, a good safety practice before eating, drinking, smoking, or using the restroom, is to rinse gloves thoroughly before taking them off, then wash your hands. At the end of each day, wash your gloves and hands again, but this time fill the gloves with clean water and squeeze. Throw away any gloves that leak.

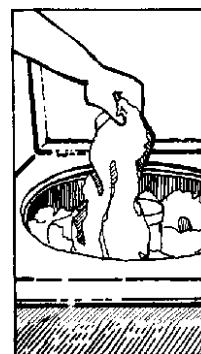


Clothing In Contact With Chemicals

You should consider any clothing worn while handling, mixing, or applying pesticides as being "contaminated." It's important to wash this clothing daily because the longer it's stored, the harder it is to remove contamination. If liquid concentrated pesticide is spilled on clothing other than rubber gloves or boots, throw the clothing away; it can't be completely cleaned.

Follow the steps in the accompanying box whenever washing contaminated clothing.

Changing and washing work clothes daily and washing hands and other exposed skin frequently throughout the day will greatly reduce any potential adverse effects from contact with pesticides.



Here's how to wash pesticide contaminated clothing:

- 1** Assume clothing worn while working with pesticides to be contaminated. Be sure to keep them separate from your other clothes or the family washload before and during washing.
- 2** Pre-rinsing, followed by a regular wash, is the most effective method of removing contamination from clothing. Pre-rinse or pre-soak the clothing in a washing machine filled with hot water and heavy-duty liquid detergent. Then spin out and drain the contaminated water before running the wash cycle. Wash just a few items at a time, again using hot water and heavy-duty liquid detergent.
- 3** Clean the empty machine after washing contaminated clothing by running a complete wash cycle with detergent and hot water.
- 4** Line dry the clothing to avoid possible dryer contamination.

You may also want to apply starch to your clothing as an added protective measure. Recent research by Cornell University textile scientists showed that starch provides a finish that traps pesticides and helps prevent their transfer to skin. The starchbound chemicals are then rinsed away in the wash.

Cleaning and Maintenance of Protective Equipment

Always keep protective safety equipment in proper working condition. Protective equipment is effective only as long as it is free from pesticide contamination and works properly, therefore frequent cleaning and inspection are required.

Respirators

Extend the life of respirators through proper care, regular cleaning and safe storage. The ability of a respirator to protect you from harmful pesticide dusts, mists, and vapors depends in part on how well you maintain it.

Inspection. Before cleaning your respirator at the end of each day, inspect it for wear and damage. Check the headbands for fraying, tears, or loss of elasticity, and replace them if necessary. Remove filters and, if filter holders are equipped with gaskets, replace them if they are defective. (Never use these types of cartridge respirators without gaskets since gaskets prevent contaminated air from bypassing the filter cartridge). Valve assemblies are essential parts of a cartridge respirator and must be in good working order. Disassemble and inspect valve flaps for wear, deformities, or punctures. Replace parts if you suspect they might leak. Check the threads of all valves and cartridge parts to make sure they are in good condition and not cracked or scratched.



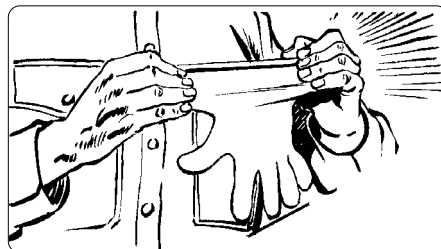
Examine the facepiece for cracks, cuts, scratches, and signs of any aging. If damage is found, defective parts must be replaced.

When replacing items on a respirator, use only approved replacement parts of that specific brand and model. If unapproved parts are used, the respirator will not be in compliance with the law and the respirator may be dangerous to use.

Cleaning. After removing filters and cartridges, soak respirator, gaskets, and valve parts in a solution of warm water and mild liquid detergent. Do not use abrasives or cleaning compounds containing alcohol or other organic solvents. Germicidal cleaners must be used if the same respirator is worn by more than one worker. Use a soft brush or cloth to remove any pesticide residue. Rinse the respirator and valve parts with clean water. Air dry rather than using applied heat. After it is completely dry, reassemble the respirator and store it in a clean plastic bag to protect it from dirt and environmental deterioration.

Boots and Gloves

Rubber boots and gloves should be rinsed of pesticide residue under running water before you take them off. Use a detergent solution and soft brush before washing, then rinse with clean water. Do not get the insides of the boots wet. At the end of each day, wash rubber gloves with soap and warm water. Inspect them for holes while washing and discard the gloves if any are found. Gloves may be washed in a washing machine by placing them into a cloth net bag. Use warm water and wash according to the instructions given below for protective clothing. Turn gloves inside out for drying. Store dry boots and gloves in plastic bags to keep them clean and prevent deterioration.



Faceshields and Goggles

Use care when washing faceshields and goggles to prevent scratching the lenses. Submerge them in warm, soapy water and, if necessary, remove pesticide residue with a soft, wet cloth or soft brush. Lenses that are treated with anti-fogging materials should not be rubbed, since this reduces their effectiveness. Rinse well with clear water and air dry or blot with a soft cotton cloth; rubbing increases chances of scratching. Inspect goggles and faceshields for excessive scratches and for cracks and loss of elasticity in headbands. Scratched lenses can be replaced on many styles without replacing the entire goggles. Store goggles and faceshield in paper or plastic bags to keep them clean.

Protective Clothing

Contaminated protective clothing must not be reworn until it has been washed. Wash contaminated garments at the end of each work day if possible, since immediate washing reduces the chances of you or others being exposed to any residues. Discard clothing that has had large quantities of pesticides spilled on it and do so in a site approved for pesticide residues. Burning may be allowed in some locations. Moderately or lightly contaminated clothing can be cleaned by washing.

Change out of contaminated clothing at your work site if possible. Empty pockets and cuffs of garment to remove excess pesticide residue. Place contaminated clothing into a clean plastic bag until it can be laundered; never reuse plastic bags since they may build up pesticide residues. Do not combine contaminated clothing with any other laundry before, during, or after washing.

SCRIPT FOR EPISODE 5

Murray: Now that we're getting to the end of your training we need to talk about how to clean, store, and take care of your personal protective equipment. Remember, start each day with clean PPE that's in good working order. Although I'm responsible for providing you with clean PPE, I want you to clean some of the equipment as part of your job.

Richard: Do I clean it before I put it on?

Murray: No. The time to clean your PPE is when you take it off at the end of each day.

Richard: Are there special ways to clean and store my PPE?

Murray: As a matter of fact, there are. *(As Murray describes the cleanup process, we see a worker following his instructions.)* As soon as you've finished working, wash your boots, eyewear, and headgear with soap and warm water. After using a cartridge respirator, take it off, remove the cartridges, and wash the respirator. Check to make sure that the straps aren't losing their elasticity and that the seals and valves are in good condition.

Richard: I suppose all those rubber and elastic parts can wear out over time.

Murray: Yes, and that's why it's so important to inspect your PPE before and after you wear it. Once you've inspected and washed all your other PPE, you can wash your gloves.

Richard: Why are the gloves last?

Murray: You want to keep them on until the end to avoid touching any PPE with your bare hands.

Richard: Oh. So I keep my gloves on to protect my hands from exposure.

Murray: Right. Wash the outside of the gloves, take them off, turn them inside out and wash the inside. Then check for holes and tears by filling them with water and looking for leaks.

Richard: What do I do with my coveralls?

Murray: Coveralls must be washed after each use. I'll provide you with clean coveralls and take care of cleaning them. Just leave them in this bucket. *(Murray indicates a bucket marked "pesticide-contaminated clothes.")* When you use disposable coveralls, put them in this plastic bag so I can dispose of them. If your coveralls or other clothes get soaked with pesticides, they can't be adequately cleaned and need to be disposed of.

Richard: Where do I dispose of contaminated PPE?

Murray: Just put the disposable coveralls, used respirator cartridges, torn gloves, and any other PPE you need

to dispose of in one of these bags. *(He shows Richard a stack of large, sealable plastic bags.)* Then seal the bag and put it in this bin. In fact, if for some reason your personal clothing gets contaminated with a concentrated pesticide or even saturated with a diluted spray, put them in this bin too. *(He indicates a bin marked "Throw-away PPE.")* I'll take care of the rest.

Richard: Where should I store my protective equipment?

Murray: PPE has to be stored in a clean place away from pesticides. That's what this locker is for. *(Murray indicates the locker.)* Make sure all your equipment is dry before you put it away.

Richard: What do I do if some of my PPE needs to be replaced?

Murray: Talk to me. If any of your PPE is damaged or defective, I have to replace it before you work with pesticides again.

Richard: So, if I use the right PPE, wear it correctly, and take care of it, I won't get exposed to the pesticides I apply?

Murray: Well, there are other things you need to do to avoid exposure. Always follow the instructions I've given you about safe handling and personal hygiene. And we still need to talk about personal cleanup, both during pesticide handling activities and afterwards.

Richard: Okay.

Murray: After you've finished working with pesticides and put away all your protective equipment, wash your hands with plenty of soap and water. Bathe or shower as soon as you get home from work.

Richard: It sounds like cleaning up right away is very important.

Murray: It is, and so is laundering your work clothes. Even if you wear coveralls over your work clothes while applying pesticides, give your work clothes special attention when you do the laundry.

Richard: How's that?

Murray: As soon as you get home from work, take off your work clothes and put them in a plastic bag or other container until you are ready to wash them.

Richard: I can't just put them with the rest of the wash?

Murray: No. Wash your work clothing separately from the other family laundry to reduce any chances of pesticide residues getting onto the other laundry.

Richard: Oh, I see.

Murray: Don't wait until you have a big pile of dirty work clothes. Do small loads so the clothes get washed with plenty of detergent and hot water, and the longest wash cycle.

Richard: O.K.

Murray: Use two warm-water rinse cycles, just to make sure you get all the residues out of your clothes. And if you have reason to believe that the clothes need even more attention, wash them twice.

Richard: Any special rules for drying?

Murray: If possible, hang your work clothes outside to dry. Air drying works better than the clothes dryer to break down any pesticide residues that are left on your clothes after laundering.

Richard: After I wash my work clothes, is there something I need to do to the washing machine before using it again for other laundry?

Murray: Yes. After you finish washing your work clothes add detergent to the empty machine and run it through another full, hot-water cycle. Then it is ready for other laundry. *(pauses)* Well Richard, this is the end of your initial training. I think you're ready to handle pesticides.

Richard: There's so much information. I feel like I should have taken notes!

Murray: It's hard to remember everything at the beginning, but I'll be supervising you to make sure everything is going well. And if you ever have any questions, just ask.

Richard: Thanks, Murray. That's good to know. I'm sure there will be things that come up as I'm working.

Murray: Well, you have a right to a safe workplace, and I have the obligation to make sure you have one.



University of California
Division of Agriculture and Natural Resources
Statewide Integrated Pest Management Project
Pesticide Education Program

