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Recommended Citation
Deer, Howard M., "Protective Clothing for Pesticides" (1999). *All Archived Publications.* Paper 70.
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Pesticides Fact Sheet

PROTECTIVE CLOTHING FOR PESTICIDES

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November 1999 AG/Pesticides/09

Protective clothing used when mixing, loading, or applying pesticides provides a barrier between the pesticide and the human body. Respirators and gas masks protect against oral and respiratory exposure by covering the nose and mouth and by filtering inhaled air. Gloves, boots, hats and body coverings protect against dermal exposure. Goggles and face shields protect the eyes.

Respirators can be half face (cover nose and mouth) or full face (cover nose, mouth and eyes). Gas masks are full face. They generally have replaceable filter cartridges and pesticide users need cartridges specifically made for pesticides. Cloth masks or dust masks are not recommended as they provide no protection against vapors. Full face provides both respiratory and eye protection and is needed when irritating or highly toxic fumes and/or vapors are a concern.

Body coverings can be made of cotton, blended fabric, vinyl, neoprene, rubber, or lightweight synthetic garments. Almost any body covering provides some protection. Conventional work clothes usually of cotton or blended fabric provide protection when mixing, loading or applying dry or dilute field concentrations of pesticides. They are not recommended during mixing and loading of liquid concentrates or liquid spray applications where contact is likely to occur. Vinyl, neoprene or rubber garments provide adequate protection if kept free of chemical contamination, but under hot and/or humid conditions they can be very uncomfortable and can lead to heat exhaustion or hyperthermia. The lightweight synthetic garments can provide adequate protection if used in conjunction with a liquid proof apron during mixing and loading. These garments can have added coatings for additional protection when spraying more toxic pesticides. Important points to keep in mind are that applicators often begin spray operations wearing minimal protective clothing and then add more at a later point thus covering the contaminated skin or garments; this may increase dermal absorption of the pesticide that is under the added protective clothing. Secondly, hot weather may increase the rate of dermal absorption when spray applicators tend to use less protective clothing.

Foot protection is always important when working with pesticides, especially when mixing and loading liquid concentrates and when walking through sprayed areas. Boots and shoes made of leather or canvas are not recommended when working with liquid pesticides as they absorb the liquids and hold them against the foot. They are difficult to decontaminate and the continual wetting and drying causes cracking which makes pesticide penetration to the foot even easier. Rubber boots are best for working with organophosphate insecticides while all

waterproof boots are generally adequate for other pesticides. Boots should be worn with the pant legs on the outside to prevent pesticides from entering the top of the boot. Boots should be unlined for easy cleaning.

Gloves are helpful during all pesticide operations, but especially during mixing and loading of liquid concentrates. Canvas, cloth, or leather gloves should not be used for liquid operations for the same reasons as with canvas or leather boots. Lightweight plastic and rubber gloves provide some protection, but heavyweight waterproof gloves are recommended. Gloves should be unlined and have a cuff or anti-drip line so liquids do not run down the arm. Rubber gloves are recommended for organophosphate insecticides. Rubber or plastic gloves are suitable for most other pesticides.

Head protection should always be worn when working with pesticides especially during liquid spray operations. Billed caps provide some protection but not to the lower head, neck and ear areas. Additionally, they absorb pesticides and are difficult to decontaminate. Plastic hard hats with wide brims and nonabsorbing liners are better. However, because of air circulation space over the head, they are not adequate protection when working with highly toxic mists and dusts. Sou'wester style hats (those with a wide slanting brim longer in back than in front) are most often recommended. Generally they have brims that protect the front, side and back of the head and neck. A front brim is very beneficial protection against downward drift to the face. Waterproof hoods provide little face protection unless they have front brims.

Eye protection is important during mixing and loading operations with all pesticides especially liquids or where irritating fumes or vapors may be present. Full face respirators are recommended for eye protection against highly toxic pesticides. Face shields provide protection against pesticide splash but not dusts, mists, fumes or vapors. Cup goggles will seal out splashes, mists, dusts, fumes, and vapors. Single lens goggles with hooded or baffled ports protect against splashes, mists, and dusts but not fumes or vapors.

All protective clothing must be kept clean and be decontaminated after use. Failure to do this can make exposure more severe than if no protective clothing were used. Contaminated protective clothing holds the pesticide against the skin frequently under hot, moist conditions which can lead to increased rates of absorption. Wash protective clothing in detergent and water and air dry preferably exposed to sunlight. Check the condition of protective clothing periodically and replace torn or perforated items. Change respirator cartridges as recommended by the manufacturer or whenever chemical odors are detected during use or when breathing becomes difficult because of filter plugging. Always have spare cartridges available. Wash the face piece, with the filters removed, in detergent and water, rinse thoroughly, and dry in a well ventilated area. Do not use alcohol or solvents to clean the face piece.

The following companies stock or can order types of protective clothing:

Industrial Supply Co. Inc.
1635 South 300 West
Salt Lake City, UT 84115
484-8644, 1-800-288-3838

Safety Master
6952 Hightech Drive
Midvale, UT 84047
255-5321, 1-800-457-6633

Allwest Sales and Service
1365 S. Gladiola St. Ste. 1
Salt Lake City, UT 84104
886-9100, 1-800-326-5421

Mine Safety Appliances Co.
P. O. Box 426
Pittsburg, PA 15230
1-800-672-2222

Bonneville Industrial Supply
45 South 1500 West
Orem, UT 84058
225-7770, 1-800-892-7534

Safety West, Inc.
2500 S. Decker Lake
Blvd.#10
W. Valley City, UT 84119
972-5800, 1-800-533-8565

For further information, you may order a Guidance Manual from the EPA:
Guidance Manual for Selecting Protective Clothing for Agricultural Pesticides Operations
EPA Publication Number: 736-B-94-001 September 1993 [300 pages]
Prevention, Pesticides and Toxic Substances (7509C)
Risk Reduction Engineering Laboratory, Office of Research and Development
U.S. Environmental Protection Agency
Cincinnati, OH 45268

PRECAUTIONARY STATEMENT

All pesticides have both benefits and risks. Benefits can be maximized and risks minimized by reading and following the labeling. Pay close attention to the directions for use and the precautionary statements. The information on pesticide labels contains both instructions and limitations. Pesticide labels are legal documents and it is a violation of both federal and state laws to use a pesticide inconsistent with its labeling. The pesticide applicator is legally responsible for proper use. Always read and follow the label.

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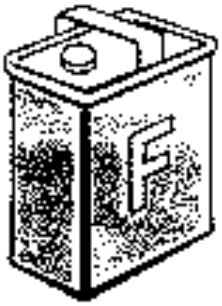
Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Robert L. Gilliland, Vice-President and Director, Cooperative Extension Service, Utah State University, Logan, Utah. (EP/DF/02-2000)

Formulations

Granules
Generally low exposure.
No wetting spray.
Little dust.

Wettable Powders
All routes of exposure can be high during mixing due to high percentage of active ingredient.

Dusts
Exposure can be high through inhalation and dermal contact.



Flowables
Dermal exposure to mixer/loader and applicator may be high.

Emulsifiable Concentrates
Exposure dermally may be high during mixing/loading/ application.
Adsorption is enhanced by solvents which easily penetrate the skin.

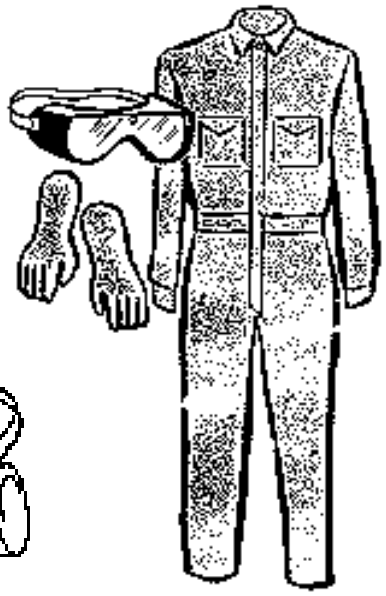
Any formulation applied as a spray may cause a dermal exposure.

Hazards to Humans

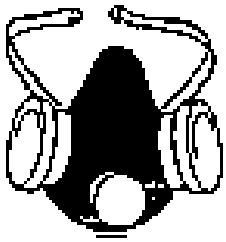
Precautionary Statements

Look on the pesticide label under the boldface heading "Hazards to Humans." The statements in this section indicate which part or parts of the body should be protected.

"May be fatal if absorbed through skin. Do not get in eyes, on skin, or on clothing."

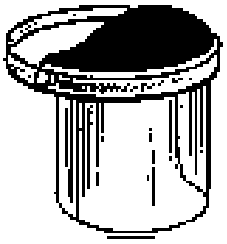


"May be fatal



if inhaled.
Do not breathe dust, vapor, or spray mist."

"Corrosive: causes irreversible eye damage."



"Causes skin irritation."
or
"Causes burns. Do not get on skin or on clothing."

DILUTE PESTICIDES

You need to decide! Read the label. The formulation, signal word, precautionary statements, personal protective equipment statements, the application method, and the projected length of exposure indicate the personal protective equipment you need.

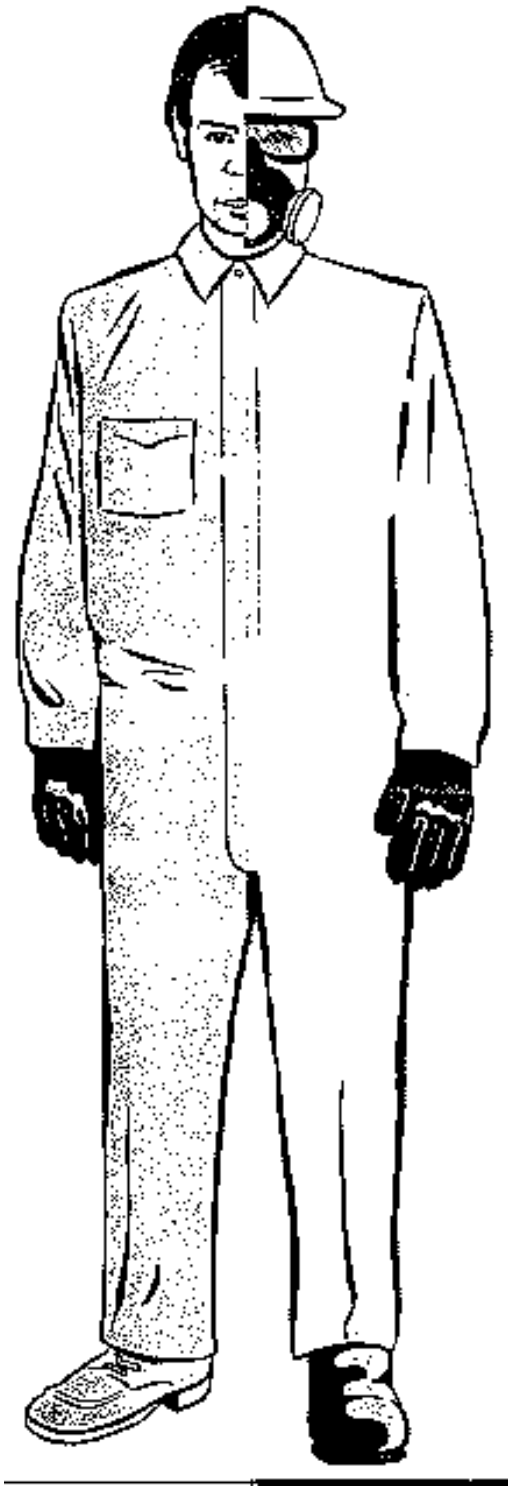
Minimum Exposure

(Such as granular applications and many other routine pesticide activities.)

Protective suit (such as fabric coveralls) worn over normal work clothes.

Chemical-resistant gloves such as rubber, vinyl, or plastic.
(Never use fabric, leather, or paper cloves.)

Socks and shoes or boots.



Maximum Exposure

(Such as direct contact with drenching spray, mist blower or knapsack applications, or handling very highly toxic pesticides.

Chemical-resistant hood or hat.

Goggles or face shield.

Respirator
(If the label requires it or if dusts, mists, fogs, or vapors will be generated.)

Chemical-resistant protective suit worn over normal work clothes
(A chemical-resistant protective suit may cause heat stress under some conditions.)

Chemical-resistant gloves such as rubber, vinyl, or plastic.
(Never use fabric, leather, or paper gloves.)

Chemical resistant boots or footwear.
(Never wear leather or canvas footwear.)

HANDLING CONCENTRATES

This is the **MINIMUM** protective clothing and equipment you should wear while mixing and loading pesticides which are moderately to highly toxic.

Face shield or goggles.

Respirator (If the label requires it.)

Protective suit (such as fabric coveralls) worn over normal work clothes.

Chemical-resistant apron.

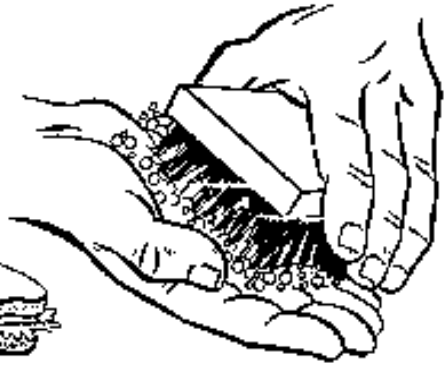
Chemical-resistant gloves such as rubber, vinyl, or plastic.
(Never use fabric, leather, or paper gloves.)

Chemical-resistant boots or footwear.
(Never wear leather or canvas footwear.)

WASHUP DURING USE

Wash hands and fact before eating, drinking, toileting, or using tobacco.

Avoid touching fact or other bare skin with contaminated gloves or clothing.



WASHUP AFTER USE

Immediately remove clothing and take a shower in case of excessive contamination.

Shower at the end of the day before changing into clean clothes.

Wash body and hair thoroughly with soap and water.

TOXICITY

Signal Words

DANGER		Highly Toxic
WARNING		Moderately Toxic
CAUTION		Low Toxicity

If the pesticide is ***highly*** toxic orally, dermally, or through inhalation, the signal word "DANGER" in large boldface letters will be on the front of the pesticide label. If the pesticide is ***moderately*** toxic, orally, dermally, or through inhalation, the signal word "WARNING" will be used. The labels of ***slightly*** toxic pesticides will bear the signal word "CAUTION."