6-1-2002

Personal Pesticide Protection - Gloves

Cooperative Extension Service
South Dakota State University

COOPERATIVE EXTENSION SERVICE
SDSU

Extension Extra

ExEx 8123
Updated June 2002
Plant Science

COLLEGE OF AGRICULTURE & BIOLOGICAL SCIENCES / SOUTH DAKOTA STATE UNIVERSITY / USDA

PERSONAL PESTICIDE PROTECTION
Gloves

Field studies show that wearing gloves reduces pesticide contamination on your hands. But do you find that gloves are

clumsy for adjusting equipment,
uncomfortable or hot,
difficult to get on and off,
seldom handy when needed,
or hard to keep clean?

To address these common complaints, consider the following options for choosing, using, cleaning, and disposing of gloves.

Choosing the Right Glove

Precautionary statements on pesticide labels state if chemically resistant gloves are needed. However, it's up to you to choose the glove material, design, fit, and thickness best suited to your work.

Materials. Cotton, canvas, and leather gloves are easily penetrated and hard to clean so they are not recommended for work with pesticides. Chemically resistant gloves are made with different rubbers: natural, butyl, nitrile, and fluorocarbon (Viton®); or various plastics: polyvinyl chloride (PVC), polyvinyl alcohol, and polyethylene. These materials can be blended or laminated for better performance. Silver Shield® and 4H® have good chemical resistance and are barrier laminates.

In testing gloves for comparison, scientists measure "chemical break-through" time. This is the amount of time needed for a specific pure chemical to permeate (soak) through the glove. The longer the time, the better the protection, but an 8-hour break-through time is common. When selecting glove materials, consider not only the pesticide's active ingredient, but also its formulation. Most rubbers and plastics are resistant to dry and/or water-based pesticides. However, for other pesticide formulations, such as emulsifiable concentrates, the glove material must also resist the solvent. Common solvents are xylene, fuel oil, petroleum distillates, and alcohol. If the pesticide label does not specify a glove material, select a butyl, nitrile, or a barrier laminate glove.

If the material is not resistant to your pesticide, you will probably notice some glove damage right away. If so, discard them and try a different glove material.

Design. Gloves are made two ways: 1) die-cut into a "handprint" from film layers that are heat-sealed together at the edges, or 2) formed over a hand-shaped mold that is dipped into the polymer solution. Hand-print gloves fit either hand loosely. Examples are polyethylene, Silver Shield,® and 4H® gloves. The latter two have better chemical resistance compared to rubber materials despite their thinness, crisp, slick, and stiff feel. The fit and slick texture may reduce your grip. Molded gloves differ in thumb placement and finger length. If the fingers are too long or short or the thumb is wrong, try a different brand for a better fit.

Fit, size, and length. When a glove fits, it seems less clumsy and is more comfortable. To find your size (7 to 12), measure around your hand (palm and back). If your hand measures 10 inches, get size 10. Some gloves are sized S-M-L and XL, "men's" and "women's," or "one size fits all." If so, try them on. Remember, as a glove stretches to fit, it gets thinner and will be harder to get on and off. Your hands may tire more quickly in tight gloves. If gloves are too big, you may have less dexterity and increased likelihood of getting them caught in machinery. For most tasks, use a glove that is 12 inches long and extends half-way to your elbow. If you need to reach into chemicals, you can get gloves that extend above the elbow.

Thickness. Glove material thickness is measured in mils or gauge. With both measuring systems, bigger numbers usually mean thicker gloves and greater protection, but more stiffness. For example, "surgeon's" natural rubber gloves are 4 to 9 mils in thickness (1 mil = 0.0001 inch), and are not sturdy enough for pesticide work. Gauge is measured in inches. For example, Silver Shield® is .004-inch and one Viton® design is 0.036-inch. Uniformity in thickness is difficult to produce, and the thinnest points in a glove will fail first. In general, thicker gloves are more resistant to chemicals, tearing, and puncture but are more bulky and clumsy. Thinner gloves let you manipulate tools and equipment easily, but also puncture, rip, and tear easily.

Linings. Cotton knit, woven, or flocked glove linings or fabric cuffs are comfortable to wear and absorb sweat, but are not recommended for pesticide use because they are difficult to clean.

Using Gloves

Gloves cannot help you unless you wear them. Keeping several pals of gloves handy and free of pesticide soiling, but not in your way, is a challenge. One idea is to seal clean gloves in one-gallon zip-close plastic bags. After you handle or mix pesticides and before you take off the gloves, wash your gloved hands with water (and soap, if possible). Put the gloves back into the plastic bag until they can be washed more thoroughly. Avoid leaving used gloves on the floor of your pick-up truck or in places where family members might touch them. You may not see any pesticide on them, but tests with fluorescent dyes prove it is there and can rub off onto other clothing.

Most of the time you'll probably want your gloves over your sleeve cuffs. But if you are working in a drenching spray from above, put gloves under your sleeve cuffs so the chemical doesn't run down your arm and into your glove.

To take off gloves, peel one glove off by holding the cuff, then hold it wrong-side out in the ungloved hand as you peel off the other glove. Both gloves will be wrong-side out, with the contaminated surface to the inside, ready for washing or disposal. Never pull gloves off with your teeth.

Cleaning Gloves

Wash gloves the same day they are soiled if you intend to use them again. Fill a bucket or tub with warm water and a strong detergent, submerge the gloves and stir them around with a long dowel or yardstick. Remove them out with tongs, then hang them on a line by the fingertips with clothespins to drip dry. Gloves in an automatic dryer will melt with the heat,

Deciding About Disposal

No matter which gloves you choose, they probably won't last long. Watch for these signs to tell you when to replace gloves:

- staining or color change, inside/outside gloves;
- softening, swelling, or bubbling;
- stiffening, cracking, or surface change;
- dissolving or becoming jelly-like, or leaking at any time.

Remember that pesticides can soak through glove materials or contaminate the inside without changing the glove's appearance or texture. Therefore, replace gloves when there is...

- direct glove contact with highly toxic chemicals for a short time, or
- repeated contact over a longer period.

Routine replacement on a regular schedule may be a good idea, depending on your exposure situation. Dispose of gloves as you would empty containers or bags. Cut them up so no one will ever use them again if they are discarded with your trash.

Helpful Safety Tips

Wearing the right kind of gloves and caring for them properly can protect your hands from contamination whenever you work with pesticides. Consider these tips as you select and care for gloves:

- Read your pesticide label's precautionary statements regarding glove use.
- Choose glove materials considering both the pesti cide's active ingredient and formulation.
- Always keep several pairs of clean gloves handy.
- Keep contaminated gloves stored safely until cleaning or disposal.
- Replace gloves frequently.

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For more information— A good source of information about pesticide safety is the Guide for Private and Commercial Applicators: Applying Pesticides Correctly. Distributed by the South Dakota Department of Agriculture and Cooperative Extension Service at South Dakota State University, this guide is available at your local Extension Office. This glove publication is based on this and other research articles including: Schwope et al, "Resistance of glove materials to permeation by agricultural pesticides." In J.P. McBriarty and NW. Henry (Eds.), Performance of Protective Clothing, ASTM SIP 1133, American Society for Testing Materials Philadelphia, 1992.

To simplify terminology, trade names of products or equipment are sometimes used. No endorsements of specific products or equipment named is intended, nor is criticism implied of those not mentioned.

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ExEx 8123- pdf by CES. November 1995; updated April 2002.