

PSEP Fact Sheet

Choosing Chemical- Resistant Pesticide Application Equipment

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Many pesticide labels instruct the user to wear personal protective equipment (PPE) clothing and devices that protect the body from contact with pesticides or pesticide residues. Some labels require the use of chemical-resistant PPE items that the pesticide cannot pass through during the time it takes to complete the task. The labels of a few pesticides, such as some fumigants, prohibit the use of chemical-resistant PPE.

Most chemical-resistant PPE items are plastic or rubber. But not all these materials are equally resistant to all pesticides under all conditions.

Chemical Resistance

Three factors affect a material's chemical resistance: the exposure time, the exposure situation, and the chemical properties of the pesticide product to which the material is exposed.

Exposure time

Not all types of materials that are resistant to a particular pesticide will provide protection for the same amount of time. Some will keep the pesticide out for a long time. Others will allow the pesticide to reach the skin fairly quickly. Disposable plastic gloves, shoe covers, or aprons may provide enough protection for tasks that can be done in a few minutes. Longer jobs usually require items made of a more-resistant material.

A pesticide begins to move into a material as soon as it gets on the surface. The pesticide continues to move into and through the material until the pesticide is removed. Help prevent pesticides from getting through chemical-resistant items, such as gloves, boots, and aprons, by regularly rinsing off pesticides that are splashed or spilled on protective equipment.

Chemical resistance is often stated in terms of exposure time. For example, neoprene may be resistant to one solvent for 30 minutes or less and to another solvent for more than four hours.

Exposure situation

A chemical-resistant material will not continue to be protective if it is damaged. For tasks that involve handling sharp objects or walking through rough terrain, a sturdy material is necessary to resist punctures or tears.



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Type of chemical

No single material can protect against all pesticide products. The chemical resistance of a material depends on whether the pesticide is liquid or dry and what diluents or solvents are used.

Choosing Chemical-Resistant Materials

The pesticide label may state what materials are chemical-resistant to the pesticide product; if not, look for another source of help in making a selection. The Environmental Protection Agency, the United States Department of Agriculture Cooperative Extension Service, pesticide producers, or PPE dealers may offer guidance.

Unless the pesticide label directs otherwise, do not use items that are made of or lined with absorbent materials such as cotton, leather, and canvas. These materials are not chemical resistant, and they are difficult or impossible to clean after a pesticide gets on them. Even dry formulations can move quickly through woven materials and may remain in the fibers after several launderings.

Gloves and footwear made of polyvinyl chloride (PVC) or rubber (butyl, nitrile, neoprene, or natural rubber) must be at least 14 mils thick.

Pesticides can leak through stitching holes and gaps in seams. For chemical resistance, choose PPE with sealed seams.

Barrier-laminate materials are resistant to most pesticides and are a good choice for many situations.

Barrier-laminate (Silver Shield/4-H) gloves may be uncomfortable and clumsy to wear for some kinds of tasks. Try wearing fitted rubber gloves over barrier-laminate gloves for comfort, protection, and dexterity.

Any plastic or rubber material is resistant to dry pesticides and to water-based pesticides (those that use water as the only diluents or solvent).

Dry pesticides include dusts, granules, pellets, and some baits. Water-based pesticides include wettable powders, soluble powders, some solutions, dry flowables (water-dispersible granules), and microencapsulated pesticides.

Chemical resistance to non-water-based liquid pesticides depends on the type of solvent in the formulation.

Liquid pesticides that are not water-based may be emulsifiable concentrates, ultra-low-volume and low-volume concentrates, low-concentrate solutions, flowables, aerosols, and invert emulsions. Common solvents are xylene, fuel oil, petroleum distillates, and alcohol. If the label does not indicate the types of materials that are chemical-resistant to the pesticide product, select sturdy barrier-laminate, butyl, or nitrile materials. Then watch for signs that the material is not chemical-resistant.

Sometimes it is easy to see when a plastic or rubber is not resistant to a pesticide. The material may:

- change color
- become soft or spongy
- swell or bubble
- dissolve or become jelly-like
- crack or get holes
- become stiff or brittle

If any of these changes occur, discard the item through proper disposal (call your local UW Extension office for information on proper disposal) and choose another type of material.

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