

Personal Protective Equipment

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This article is the fourth in a four-part series on general pesticide principles required for the safe use and application of pesticides. The article and subsequent test have been approved for one continuing education unit (CEU) in the Core category for pesticide license renewal. The article and test set will be valid for up to one year from the publication date. After one year, they expire and CEU credit will no longer be available.

Personal protective equipment (PPE) is the clothing and/or devices that are worn by the pesticide applicator or the mixer/loader to protect themselves from pesticide exposure. More specifically, these items are designed to protect the body from contact or exposure with harmful pesticides or the residues that exist after the application of a pesticide. These protective items may include but are not limited to coveralls, protective suits, footwear, gloves, aprons, respirators, eyewear and/or some form of headgear. The required protective items will be clearly indicated on each and every pesticide label that is attached to the product container at time of delivery.

Wearing PPE may increase the risk of heat stress. Heat stress is a condition that occurs when your body is subjected to more heat than it can cope with due to its inability to properly keep cool. The PPE may impact the ability of your body to properly regulate its temperature by limiting its ability to cool thru evaporation of sweat.

While the pesticide label may indicate that regular work clothing like long-sleeved shirt, long pants, shoes and socks are recommended, these items are usually not classified as PPE. However, these items may be sufficient to adequately protect the body in some pesticide applications or handling situations. Remember you are legally required to wear at least the minimum protective clothing listed on the label.

If you choose, you can always wear more PPE than is on the label but not less.

When choosing the proper PPE to protect your body, you should also use common sense. The label cannot cover all possible application situations that you may encounter during the handling or application operations. Your PPE may need to vary with the application or application activities. Additionally, the PPE may require more protective items for the mixer/loader than the applicator. To adequately protect the handler/applicator, and to be sure what is required, always read the label prior to selecting a pesticide, applying the pesticide, cleaning application equipment or disposing of properly rinsed pesticide containers.

In some handling situations, you may be required by the label to wear PPE that is chemically resistant. These items may be manufactured of tightly woven coated fibers of plastic or rubber to minimize penetration and maximize your protection. Remember, not all materials are equally resistant to pesticide materials or suitable for all handling situations, so read the label and follow specific directions and requirements.

Multiple factors will affect the PPE's chemical resistance to a specific pesticide. That is why it is important to read and follow all applicable directions. Additionally, personal exposure to a pesticide is considered to be a function of concentration and time of

exposure, and pesticide used.

The length of exposure is important in selecting the appropriate PPE, as not all items will provide the same needed protection for the same length of time. Protection will also vary with material selected. Some PPE items provide protection for long exposures, whereas others may only provide protection for short-term exposure. PPE made of thin materials, like disposable gloves, may only provide limited protection for short-term tasks. On the other hand, heavier gloves may be suitable and protective for longer term exposure. Even PPE made of heavy chemical-resistant material will not provide adequate protection if it becomes excessively worn or damaged, so frequent inspection of these items is very important.

The type of chemical used will also impact the required PPE. Solvents, diluents, liquid or dry pesticide can affect the chances for the pesticide to be absorbed into the skin. The type of material that is resistant to non-water-based liquid pesticides depends on the type of solvent used. Cotton, leather, canvas and other materials offer little protection as they are not chemical-resistant. Powders, other dry pesticide materials or liquids may be absorbed into a woven material, and remain in the items even after laundering multiple times. Be aware that hats with cloth or leather sweatbands, cloth gloves or gloves containing fiber lining or leather footwear can absorb pesticides and potentially contaminate the individual wearing the item over time. Many of these expensive items are very difficult to clean. Plastic safari hats with a plastic sweatband may be a good choice to wear during pesticide application as they are easily cleaned and do not absorb pesticides.

By far, pesticide handlers receive the greatest pesticide exposure on their hands and forearms. With exposure in mind, one can easily understand the label requirement for the handlers and applicators to wear clothing that covers hands with gloves and the majority of the body with long-sleeved shirts, long pants, socks and shoes and/or other protective items. In addition to protective clothing, some pesticide labels may require wearing coveralls or chemical-resistant suit, or aprons during mixing and loading operations.

To adequately protect the body, protective clothing needs to fit properly. Each layer of clothing and air gap

between these items adds additional protection. However, if the clothing is too tight, an air gap between the protective item and skin does not exist, so the chemical can move through the protective items and contact the skin, especially if it is made of cloth.

Some pesticide products may require the mixer/loader or applicator to wear a respirator to protect the respiratory tract during various mixing or application operations. Respirators will vary in their ability to provide protection depending on their age (degree of use) and filtering material. The most common respirator types are dust/mist-filtering or vapor removing devices. Both types of filtering devices will have approval numbers issued by the National Institute of Safety and Health (NIOSH) and the Mine Safety Health Administration (MSHA). Dust/mist filtering devices will carry the approval number TC-21C, whereas filters that are intended to remove organic vapors will have the approval number TC-23C. Many respirators filter cartridges are available and may be required as indicated on the pesticide label for specific pesticide and methods of application.

In all cases, the respirator must fit the face correctly to provide adequate protection. To ensure a proper fit, one

should frequently conduct a fit check. This check ensures that the face piece fits properly around your face. A fit check will only take a few minutes and is well worth the time and effort to ensure your safety. Loose-fitting respirators or facial hair (beard or mustache) will keep the protective device from sealing properly around your face and adversely impact protection.

After using PPE, these items must be properly cleaned and stored for future use. When cleaning any PPE, these items should be properly washed with water and detergent. During this cleaning operation, you should continue to wear your gloves and carefully wash the outside of gloves and boots before removing them. This cleaning operation should take place between each use, even if the item is only worn briefly.

Any clothing items worn during a pesticide application should be washed separately from uncontaminated items, and never washed with family clothing. Individuals cleaning these items should consider their safety as well as others, and handle the items with caution. Consider wearing gloves when placing contaminated clothing in the washer to minimize potential contact with residual pesticide on the PPE items.

Washing non-chemical resistant items (cotton, denim, canvas, etc.) should be done by washing only a few items at a time with the washer on the maximum water setting, agitation and wash cycle length. A heavy-duty, liquid detergent with hot water should be used to provide the greatest possible cleaning potential. Clothing that has been contaminated should undergo multiple wash cycles. If heavily contaminated, it should be disposed of rather than washed, and never re-used. Drying the clothes in the sun or outside will also aid in the cleaning process. If a dryer is being used, be aware it may become contaminated with any residual material remaining after the laundry process.

Pesticide safety is important. Your health depends on proper PPE and pesticide application and following the label explicitly to ensure safety.

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