

PREVENTATIVE CLOTHING AND TREATMENT FOR PESTICIDE SAFETY

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In the last four years, the use of pesticides has increased dramatically. Because of this increase, there is growing concern about the harmful effects pesticides could have on those applying them.

Pesticide applicators should wear clothing of special designs and fabrics that will provide the maximum amount of protection. Poisonings most often result from pesticides entering the body through the skin and lungs rather than the digestive tracts. Pesticide residues are also absorbed through the skins at different rates on different parts of the body.

The problem of how to launder pesticide contaminated clothing has puzzled and become a concern of many applicators and their families. A program, Designer Clothing for Pesticide Applicators, at the Michigan Potato Growers Conference in Grayling, February 1, 1984, indicated that less than 3% of those attending followed the basic recommendation for selecting, caring for and using appropriate clothing for pesticide applicators.

Today I hope to create additional awareness of the hazards involved in pesticide applications and also to show clothing designs that will provide maximum safety during the application process.

According to advertisements in the media, the usual solution to laundry problems is a cup of brand X detergent and water. That approach may work for many types of soiled articles, but not for pesticide contaminated clothing. Insecticides, herbicides, fungicides and other products are widely used, especially in agriculture. Some of these products are extremely toxic and potentially dangerous. Clothing worn by persons handling, mixing, or applying pesticides may become contaminated. Pesticides in clothing can be a serious health hazard. Therefore, clothing that has been contaminated with pesticides should be laundered very carefully. In this presentation, we will examine why special precautions are needed. We will also discuss specific methods that you can use if you must launder pesticide contaminated clothing.

When a person is working with pesticides, there is a possibility of exposure or contamination. In some cases, contact with a pesticide may be particularly hazardous. Pesticide labels may indicate that protective clothing or equipment should be used.

Pesticides normally enter the body through one of three routes. They may be ingested orally, that is by mouth. Gases, vapors and residues in the air may be inhaled into the respiratory system. Many pesticides can also be absorbed through the skin. Studies have shown that among agricultural workers, dermal (skin) absorption is the principle route of pesticide exposure. The risk of dermal exposure increases markedly when clothing becomes contaminated with pesticides. Clothing worn by pesticide applicators

contaminated with pesticides. Clothing worn by pesticide applicators can readily become contaminated. Sources of this contamination may range from residues on granular insecticide sacks to accidental spills and splashes. Obviously, the extent of contamination can vary widely. One of the prelaundering considerations is the toxicity of the pesticide that has become a contaminant. The toxicity of a pesticide is determined by how poisonous the product is. Container labels indicate the degree of toxicity and relative danger of the pesticide to a user. Products having a label with a signal word "Caution", have low toxicity and are less dangerous to the user. One tablespoon to one pint of these pesticides may cause serious illness or death in an average size person. But those labeled "Warning" are moderately toxic and therefore, more dangerous. One teaspoon to 1 tablespoon of such pesticides is sufficient to cause serious illness or death. Pesticides labeled "Danger, Poison", are highly toxic and must be handled with utmost caution. A teaspoon or less of these pesticides, in some cases, just a drop will cause illness or death. Regardless of the signal words on the label all pesticides should be handled, mixed and applied with proper care. Toxicity levels are not always related to the difficulty encountered in laundering pesticide contaminated clothing. Another key factor is the formulation of the pesticide, that is the way in which the manufacturer produced it. University of Nebraska researchers found that some pesticide formulations are more difficult than others to remove by laundering. They impregnated cloth samples with a mulsifiable concentrate, wettable powders and encapsulated pesticide formulations. Tests of the cloth samples after laundering showed that EC formulations which are oil-based, were most difficult to remove. What do you do with clothing that becomes heavily contaminated with a concentrated pesticide that is both highly toxic and extremely difficult to remove? Thorough cleaning of such garments is virtually impossible. Laundering should not be attempted. Instead, destroy them by burning or burial.

During mixing and loading operations, applicators often must handle concentrated pesticides. Most accidents resulting in contamination to the applicator, occur during these procedures. Whenever another type of protection is not specified by the label, disposable garments are ideal to use while mixing, loading, or applying pesticides. Some types of application equipment have an enclosed operator's station and air filtration systems. In these cases, protective clothing should be removed before entering to avoid possible contamination of the operator's station. In addition, some disposables can be laundered and reused. Laundering instructions are printed on the package labels. Those heavily contaminated with highly toxic pesticides should be destroyed. Clothing worn by persons who work with moderately or highly toxic pesticides should be laundered daily. If you are uncertain about the type of pesticide an applicator has been using, read the container label. Look for both the formulation and the signal word indicating toxicity of the pesticide. Clothing contaminated with low toxicity pesticides such as sevin or malathion, can be laundered quite safely, even when the contamination is extensive. However, clothing contaminated by highly toxic pesticides, such as parathion, must be handled with extreme caution.

Prerinsing contaminated clothing before washing will help remove a substantial amount of pesticide, especially wettable powder formulations. Prerinsing can be done by presoaking the contaminated clothing in a suitable container, prerinsing with agitation in an automatic washing machine, or hanging the contaminated clothing outdoors, then spraying or hosing them. In

at a time. Garments contaminated with different pesticides should be sorted and laundered separately. Limit your load to contaminated clothing only. Avoid washing contaminated clothing with any other item to be laundered. Even though contaminated clothing may be only a partial load, fill the machine with water, this will insure thorough washing of the contaminated garment. Always wash pesticide contaminated clothing in hot water. Laboratory comparisons showed a relationship between water temperature and the amount of pesticide removed. Hot water, 140° or higher, removes more pesticides from clothing than other water temperatures. Results of washing with warm water are acceptable, however, cold water temperatures are less effective in removing some pesticides from clothing. Like ground-in dirt, some pesticide formulations are harder to remove. Researchers have found that heavy duty liquids are consistently more effective in removing these problem pesticides. Heavy duty liquids are noted for their ability to remove oils from fabrics. Research today does not indicate that additives, such as bleach or ammonia, contribute to pesticide removal. Either may be used if desired, but be careful, never mix them together. Bleach mixed with ammonia forms chlorine gas which can be fatal if inhaled. As we noted earlier, most low toxicity pesticides can be removed in a single washing. However, some contaminated clothing may need 2, 3 or more washings.

Contaminated clothing worn by applicators who have been using highly toxic pesticides regardless of formulations, should always get multiple washings. But remember, if garments have been saturated with concentrated pesticides, don't try to launder them, burn or bury them. Line drying is also recommended for clothing which was contaminated with pesticides. Exposure to sunlight may help in the chemical breakdown of many pesticides.

Finally, when an applicator is working with pesticides daily, clothing needs to be laundered daily. Contamination left in clothing may be absorbed into the body.

In summary, applicators count on their equipment and clothing for protection while using pesticides. Laundering pesticide contaminated clothing is a vital part of the safe use of pesticides. Be sure you know both the formulations and toxicity of the pesticide being used. Prerinsing helps remove a considerable amount of contamination in clothing. Then, wash contaminated clothing in hot water, using a heavy duty liquid detergent. Multiple washings may be needed for some pesticides. For more detailed information and a copy of the printed materials, contact the extension agent in your county.