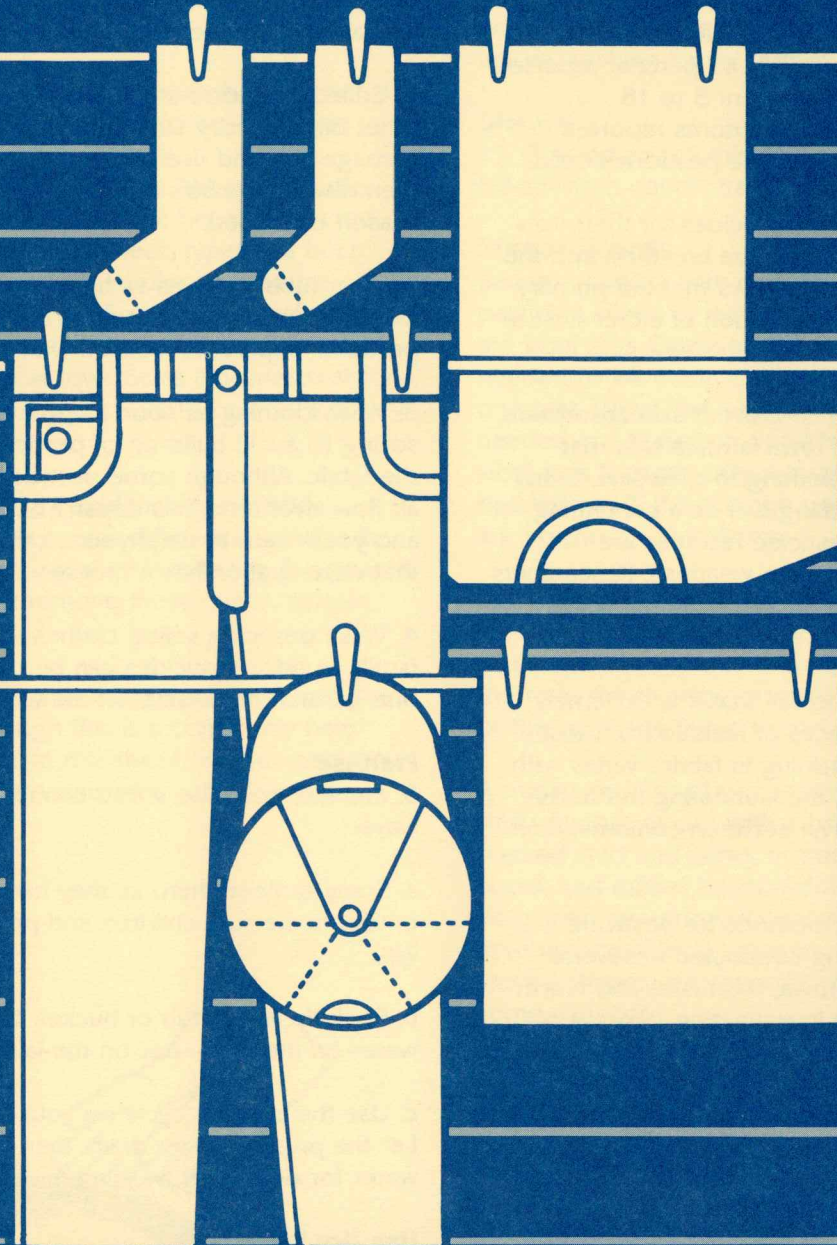




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What to Do When Clothes Are Soiled With Pesticide



**IOWA STATE
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EXTENSION

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Agricultural chemicals make an important contribution to crop management on most farms today. These products vary in toxicity, but all must be used with care to avoid accidental poisoning.

A 1984 survey of Iowa farmers showed that although 27 percent reported never experiencing pesticide poisoning symptoms, 43 percent reported 1 to 4 symptoms, and 30 percent 5 to 18 symptoms. The number of symptoms reported increased with the toxicity of the pesticides used.

You don't have to swallow pesticides for them to enter your body. They also can be breathed into the lungs as dust. But research shows that the primary route of entry is by skin absorption of either dust or liquid.

Clothing acts as a barrier to prevent skin absorption, but about 80 percent of Iowa farmers said that pesticide gets through clothing to their skin. Other research shows that clothing can be a continuing source of exposure if pesticide residues are not completely removed between wearings. Researchers agree that clothing worn for pesticide application needs to be washed after every wearing.

Laundering research indicates that it is extremely difficult to remove all traces of residue from test fabrics. The amount remaining in fabrics varies with the pesticide, the fabric, the laundering methods used, and the time interval between contamination and laundering.

Research on laundering methods for pesticide removal is currently being conducted in several states including Illinois, Iowa, Nebraska, and North Dakota. Researchers are investigating removal of chemicals widely used on crops in their states. In Iowa, investigation has centered on removing alachlor (Lasso) and fonofos (Dyfonate). Regardless of chemicals studied or laundering procedures tried, it has never been possible to remove all traces of any pesticide from cotton or cotton/polyester blend fabrics similar to those used in farm work clothing.

However, with careful attention to laundering methods, the amount of residue left is extremely small (measured in parts per million or billion). It has not been established that residues remaining after laundering constitute a health hazard for humans, even though they remain biologically active—killing fruit flies and in some tests even cockroaches.

Washing Helps

Minimize Pesticide Exposure

The following laundering suggestions for care of pesticide-soiled clothing are based on findings from many studies in various parts of the United States as well as on ISU research:

1. Collect pesticide-soiled clothing separately from other dirty laundry. Line a cardboard box with a garbage bag and use this as a disposable hamper; then discard the box when the pesticide application season is finished.
2. Wear rubber gloves to handle pesticide-soiled clothing. Dispose of gloves at the end of the pesticide application season with the hamper.
3. Wash clothing as soon as possible after each day's soiling to avoid build-up of pesticide residues within the fabric. Although some pesticides deteriorate in air flow over time, this doesn't happen overnight, and you'll want to wear your clothing again before that deterioration has a measurable effect.
4. Wash pesticide soiled clothes separately from family laundry. Pesticides can be transferred from one garment to another in the wash water.

Prerinse

5. Prerinse pesticide-soiled clothes in one of these ways:
 - a. Spray or hose them as they hang on a line outdoors. Be sure children and pets are out of the way.
 - b. Soak them in a tub or bucket. Throw the dirty water on the field—not on the lawn or garden.
 - c. Use the presoak cycle on your automatic washer. Let the presoak water drain, then refill with fresh water for detergent washing.

Use Hot Water

6. Use hot water (140 degrees F.) setting on your washer. More pesticide is removed when hot water is used, especially with heavyweight fabrics. Limited research with fonofos has shown that water hardness does not interfere with its removal.

Wash Only a Few

7. Avoid over-crowding clothes in the washer. Wash only a few items at one time.

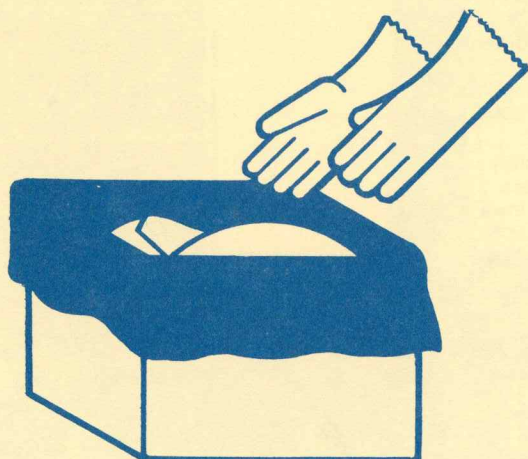
8. Use the full water level. If your washer has a sudsaver feature, don't use it for pesticide-soiled clothing.

9. Use the normal 12-14 minute wash cycle (not a shorter knit cycle) and a double rinse if possible.

10. Use a heavy-duty detergent. Although studies comparing detergent types have been conducted, no significant difference between types has been established with pesticides studied in Iowa for heavyweight fabrics. A 1984 survey showed that most Iowans use powdered phosphate detergents. Laundering research at Iowa State indicates that for Lasso and Dyfonate this appears to be a satisfactory choice.

11. Repeat laundering if evidence of pesticide staining, odor, or other color difference remains in pesticide-soiled clothing after laundering. If repeated laundering does not remove these traces, discard the clothing.

12. Using bleach or ammonia probably will not give added benefit, although this is a commonly held belief. Be careful not to mix these two because they react together to form poisonous chlorine gas.



Line Dry

13. Line dry clothes to avoid possible contamination of your dryer and other family clothes.

14. Rinse washing machine with a load of hot water with detergent, but without clothing, to reduce pesticide residue levels in your washing machine before washing family clothes.

Discard

15. Discard any clothing that is fully saturated with full-strength concentrate.

Signal Words

Become familiar with signal words that appear on pesticide labels to indicate the level of toxicity. When the label says **Caution**, the approximate amount needed to kill the average person is one ounce to one pint. When the label says **Warning**, the amount needed is a teaspoon or tablespoon. But when the label says **Danger**, only a taste or a teaspoon is needed to kill the average person. Smaller amounts are poisonous to children.

Protective Clothing

No one garment offers complete protection for all situations. The type of clothing needed varies with the task, the toxicity, formulation, and concentration of the pesticide being used.

A minimum level of protection is offered by a washable hat or cap with a brim, firmly woven long-sleeved shirt and pants, cotton underwear and socks, and rubber boots. Additional protection may be gained by using cotton coveralls, waterproof aprons, face shields, goggles, respirators, and gloves. Disposable coveralls may be appropriate in some situations.

Gloves are controversial because they can become contaminated on the inside, and the moist warm conditions there may foster pesticide absorption. For mixing or direct handling of pesticides, unlined rubber gloves may be helpful, but they need to be decontaminated after use, and satisfactory methods to decontaminate have not been established. Laundering research suggests that washing in hot water with a heavy-duty detergent, multiple rinsing, and air drying would be needed. Disposable rubber gloves may be preferable if disposed of frequently.

Exposure can be minimized with careful attention to labeling recommendations, good safety habits, and personal hygiene. After handling pesticides, wash your hands before eating, smoking, or going to the bathroom.

Suggestions in this publication are intended to alert farm workers to pesticide safety concerns. However, following these procedures cannot guarantee total protection from pesticides.

Following is a list of companies selling protective clothing and equipment.

Ag Chem Equipment Co., Inc.
2701 Ford St.
Ames, Iowa 50010
(515) 233-2261
and
609 7th Street N.
P. O. Box 86
Northwood, Iowa 50459
(515) 324-2745

Agri-Safety, Inc.
Box 1870, Covington Rd.
Palo, Iowa 52324
(319) 396-2010

Anderson Equipment
5532 Center St.
Omaha, Neb. 68106
(402) 558-1200

AVANDACO, Inc.
14 Locust St.
Manhasset, N.Y. 11030
(516) 627-4554

Daffin Disposables, Inc.
One Daffin Square
Secretary, Md. 21664
(301) 943-8777

Davis Equipment Corp.
5225 N.W. Beaver
Johnston, Iowa 50131
(515) 270-8300

Durafab Disposables, Inc.
P. O. Box 658
Cleburne, Tex. 76031
(817) 645-8851

Gempler's Inc.
P. O. Box 270
102 E. Lincoln
Mt. Horeb, Wis. 53572
(800) 382-8473

Gen'l Fire & Safety Equip.
3210 E. 14th St.
Des Moines, Iowa 50316
(515) 265-3206
and
3920 N. 27th St.
Lincoln, Neb. 68521
(402) 467-4497
(800) 228-4555

Hantover, Inc.
P. O. Box 410
2548 Campbell
Kansas City, Mo. 64108
(816) 221-0727

Helget Safety Supply, Inc.
4144 S. 87th St.
Omaha, Neb. 68127
(402) 339-1066

Iowa Continental
Safety Equipment Co.
710 58th Ave. Ct. SW
Cedar Rapids, Iowa 52404
(319) 364-7757

Jomac Products, Incorporated
863 Easton Road
Warrington, Pa. 18976
(215) 343-0800

Kappler Disposables, Inc.
P. O. Box 218
Guntersville, Ala. 35976
(205) 582-2195

Lab Safety Supply
3430 Palmer Drive
P.O. Box 1368
Janesville, Wis. 53547-1368
(608) 754-2345
(800) 356-0783

No endorsement of companies or their products mentioned is intended, nor is criticism implied of similar companies or their products not mentioned.

Prepared by Janis Stone, extension textiles and clothing specialist, Iowa State University, and Wendy Wintersteen, extension entomology associate, Iowa State University.

File: Textiles and Clothing 1

Lyons Safety, Inc.
1 Westview Acres R6
Iowa City, Iowa 52240
(319) 351-7773
and
N92 W14350 Anthony Ave.
P. O. Box 9006
Menomonee Falls, Wis. 53051
(800) 558-8900

Magid Glove Mfg. Co., Inc.
2060 N. Kolmar Ave.
Chicago, Ill. 60639
(312) 384-2070

Mine Safety Appliances Co.
1000 Nicolas
Elk Grove Village, Ill. 60007
(800) 672-2222

Omark Corporation
3505 104th St.
Des Moines, Iowa 50322
(515) 278-5422
(800) 383-7233

Quad City Safety Service
206 Forty-Third Street
Moline, Ill. 61265
(309) 762-6850

Rainfair, Incorporated
P. O. Box 1647
Racine, Wis. 53401
(800) 558-5990

Reliance Safety
11245 Aurora
Urbandale, Iowa 50322
(515) 276-5051
(800) 552-7233

Superior Surgical
10099 Seminole Blvd.
P. O. Box 4002
Seminole, Fla. 34642
(813) 397-9666

Tempo Glove Manufacturing,
Incorporated
3820 West Wisconsin Avenue
Milwaukee, Wis. 53208
(414) 344-1100
(800) 558-8520

U.S. Safety Parmelee
Industries, Inc.
P. O. Box 417237
Kansas City, Mo. 64141-7237
(816) 842-8500

Vallen Safety Supply
1601 Detweiller
Peoria, Ill. 61615
(800) 372-3389

Worksafe, Incorporated
147 West 25th Street
New York, N.Y. 10001
(212) 989-4802

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