

Health Hazards in the Nursery and the Landscape

Dr. Russell Balge

Area Extension Agent

Agricultural Science/Commercial Horticulture

Cockeysville, MD

Whether it be as a nurseryman, landscape contractor, grounds manager, or homeowner, working with plants and pesticides presents certain health hazards. Among these hazards, either directly or indirectly, are plant and pesticide induced dermatitis, cutaneous sporotrichosis, "atypical mycobacterium type IV", and eczema.

Plant and Pesticide Induced Dermatitis

Agriculture has the highest occupational skin disease risk of all major industrial classifications, including manufacturing and construction. In a recent survey, nursery workers were part of the highest risk group of all agricultural workers that may develop skin disease. This high risk is the result of their occupational exposure to plants and pesticides. Symptoms range from simple allergies to skin cancer.

When the records of those instances in which nursery workers in California filed workman's compensation claims for allergic skin reactions were examined, it was found that plants caused three times more skin problems than agricultural chemicals. It would seem that, since landscape contractors, grounds managers, and gardeners handle plants and sometimes apply pesticides, they are equally at risk to plant and pesticide induced dermatitis as nursery workers.

Among the types of plant induced dermatitis and some plants that are to blame are:

- **Primary irritant dermatitis**, or direct irritation caused by chemicals in plants such as alstromeria, buttercup, carrot, castor bean, celery, cucumber, cowslip, dieffenbachia, foxglove, milkweed, mushrooms, narcissus bulbs and plants, parsley, parsnip, rubber tree, tomato, tulip, and turnip.
- **Allergic contact dermatitis**, in which the skin becomes sensitized to chemicals in plants such as cedar, English ivy, garlic, lichens, liverwort, onions, pine, poison ivy, poison oak, poison sumac, and primrose.
- **Photosensitive dermatitis**, in which the chemicals from plants are activated by exposure to sunlight in plants such as buttercup, carrots, celery, dill, figs, Klamath weed, limes, mustard, and parsley.

While not all of these plants are found in the nursery or landscape, many are found in vegetable gardens and homes. Plants capable of causing dermatitis in these environments may exacerbate dermatitis problems caused by plants in the nursery or the landscape.

Exposure to pesticides can cause two of the above three kinds of dermatitis.

- **Primary irritant dermatitis**, or direct irritation of the skin may be caused by benomyl, captan, chlorothalonil, Dacthal, endosulfan, glyphosate, Kelthane, lindane, maneb, many organophosphates, methomyl, propargite, sulfur, thiram, weed oil, zineb, or ziram.
- **Allergic contact dermatitis**, in which the skin becomes sensitized to the pesticide, can be caused by benomyl, captan, cresol, dichlorvos, formaldehyde, malathion, maneb, naled, parathion, PCNB, thiram, triazines, and zineb.

In response to the twin dangers of allergic plants and pesticides, the Environmental Protection Agency is due to release changes in the laws governing worker health and safety guidelines as early as this spring. Most of these changes will be aimed at circumventing problems with pos-

Pesticides that may cause dermatitis by category include:

Fungicides	Insecticides	Herbicides	Miticides
benomyl	chloropicrin	Dacthal	dicofol
captan	cresol	glyphosate	endosulfan
chlorothalonil	dichlorvos (DDVP)	triazines	Kelthane
cresol	endosulfan	weed oil	naled
folpet	lindane		propargite
mancozeb	malathion		sulfur
maneb	methomyl		
PCNB	naled		
sulfur	organophosphates		
thiram	parathion		
zineb			
ziram			

sible pesticide contamination. Meanwhile, the easiest way to prevent dermatitis and other skin problems is to wear hats, gloves, and long-sleeved shirts when working with pesticides and among those plants that can cause dermatitis. Use standard leather or cloth gloves for most situations. If dexterity is needed, such as in plant propagation, use surgical gloves.

Poison Ivy

Perhaps the most commonly encountered dermatitis-causing plant in the nursery and the landscape is *Rhus radicans* L., poison ivy. Despite its lovely fall color, poison ivy is no friend of man. Anybody who has ever experienced the itching skin rash, pain, or actual illness that poison ivy can cause, will want to avoid the plant or eliminate it from the nursery or landscape.

The actual skin-poisoning element, urushiol, is contained in the leaves, stems, roots, and fruit of poison ivy. Urushiol is potent the year round. Even plant fragments such as roots that have been dead for a long time retain their potency.

Most poisoning occurs from direct contact with the plant. Handling clothing that has been worn while walking through poison ivy, petting a cat or dog that has come in contact with the plant, or inhaling the fumes from burning brush which includes poison ivy can also cause infection.

The surest way to avoid contamination from poison ivy is to be able to recognize the plant and avoid contact with it. Poison ivy grows as a low shrub or a climbing vine. Each leaf has a slender stem (petiole), often 10 to 20 cm (6- to 8-inch) long, attached to a woody stem. The three individual leaflets of each leaf are 5 to 10 cm (2- to 4-inch) long. The leaflet margins may be smooth, toothed, or somewhat lobed. All of these variations may occur on the same plant.

The leaves are a reddish tint when they unfold in spring, but shortly

thereafter become a glossy to dull green. In early fall, the leaves become yellow, scarlet, and red. Loose clusters of small, waxy, white berries follow the greenish-white spring flowers.

Herbicides offer the best means of controlling poison ivy, as it is difficult to eliminate by digging. Use 2,4-D or glyphosate according to the manufacturer's directions. Be sure to apply the herbicides before the leaves begin to color or the leaves will simply abscise, or drop before the herbicide is translocated to the root system of the plant. An easy way to eliminate poison ivy that is growing among desirable plants is to use a sponge brush and wipe the poison ivy leaves with a solution of glyphosate without getting any of the mixture on the desirable plants. It may be necessary to retreat the site with either of these methods. Wear a long-sleeved shirt and gloves whenever working around poison ivy.

Several products already on the market to aid persons likely to be exposed to poison ivy include protective ointments to coat the skin that may be exposed to poison ivy and an orally administered product that imparts resistance to poison ivy. Physicians can also assist people in developing resistance to poison ivy through a series of injections of a weakened form of the toxic substance itself, urushiol. More recently, researchers at the University of Mississippi have developed a vaccine that will prove a boon to anyone working or playing outdoors where there is poison ivy. The vaccine is effective for a year with a single annual vaccination. The vaccine may also give relief with a single post-infection treatment. The vaccine, like the series of injections in current use, consists of a very weakened form of the oily urushiols that cause the immune-system response in most people. The vaccine is still being tested and may not be available until the end of the decade. Once it is released, the vaccine is expected to beget a \$200 million annual

market. The vaccine is equally effective against poison oak and poison sumac.

Cutaneous sporotrichosis

Cutaneous sporotrichosis is a serious lymphatic disease occurring in people and animals throughout the United States most frequently in the Midwest, and especially in Wisconsin. The disease occurs primarily among greenhouse workers and nurserymen, tree planters, grounds maintenance workers, and more recently, home gardeners. In fact, of 84 people afflicted by cutaneous sporotrichosis in 1988, over 50% of the victims were home gardeners.

The causal fungus organism, *Sporothrix schenckii*, is most frequently found in sphagnum peat moss. While the fungus has never been isolated from native peat bogs, it is found in fresh peat bales, especially those bales stored where they remain moist. Researchers have no idea of how the fungus is introduced into the sphagnum peat moss. Outbreaks of cutaneous sporotrichosis throughout the United States are often traceable to sphagnum peat moss originating in Wisconsin.

S. schenckii has also been found in nursery soil, flowers, hay, lumber, and prickly shrubs like roses and conifers. In New York, all of the individuals contracting cutaneous sporotrichosis following Arbor Day in 1988 had handled Colorado Blue Spruce.

The fungus is introduced into its victims through cuts, abrasions, and puncture wounds on unprotected hands, arms, and legs. The infection is usually confined to the skin and begins as a small blister within one to four weeks of introduction. The blister becomes inflamed and slowly enlarges into boil-like abscessed ulcerations.

If the disease is untreated, it spreads into the lymph vessels, developing nodules there and in the lymph glands of the armpit and elbow. With

time, cutaneous sporotrichosis spreads into the bones, abdominal organs, and the lungs. Ultimately the disease can result in death, making proper early diagnosis imperative.

Treatment consists of taking saturated solutions of potassium iodine orally several times daily. The lesions usually disappear within two months, but treatment must continue for another three months. Ingestion of potassium iodine may lead to an upset stomach during treatment and some digestive problems after treatment. Antibiotics are ineffective against cutaneous sporotrichosis.

The easiest way to avoid contracting cutaneous sporotrichosis is to avoid contacting sphagnum peat moss, especially that from Wisconsin. The State Forest Tree Nurseries in Wisconsin and the Department of Agriculture Forest Service Nursery in Michigan discontinued using sphagnum peat moss. Since that time, no cases of cutaneous sporotrichosis have occurred in those nurseries. Another way to reduce the chance of contracting cutaneous sporotrichosis, and one that is environmentally conscious, is to use composted municipal sludge, paper mill sludge, yard waste, or garbage, as a substitute for sphagnum peat moss. The risk of contracting cutaneous sporotrichosis when sphagnum peat moss must be used, can be reduced by:

- Storing sphagnum peat moss under dry conditions.
- Disinfecting those areas where sphagnum peat moss is stored.
- Wearing protective clothing like rubber gloves, long-sleeved shirts, and long-legged pants when working with sphagnum peat moss.
- Thoroughly washing hands and arms with soapy water upon completion of working with sphagnum peat moss.
- Seeking immediate help for any lacerations or abrasions.
- Informing a doctor of the possibilities of cutaneous sporotrich-

osis if the wounds do not heal in a reasonable time.

An accurate diagnosis for cutaneous sporotrichosis has been developed by: **Dr. Michael W. Rytel**

Medical College of Wisconsin
Department of Medicine
Division of Infectious Diseases
8700 West Wisconsin Avenue
Milwaukee, Wisconsin 53226

"Atypical Mycobacterium Type IV"

Another little gem waiting out there in the nursery and the landscape is "atypical mycobacterium type IV". One gardener who punctured his finger while pruning a rose bush developed a cramp in his finger by the evening of the day that he punctured his finger. By the morning of the next day the finger was inflamed. The gardener ended up in emergency surgery as the infection spread from the finger to the entire arm. The surgeon had to open an incision from the index finger to mid-forearm and administer antibiotics. It took two additional operations to save the hand. It was speculated that the microorganism, "atypical mycobacterium type IV", might have been contracted from a wet compost mixture containing poultry manure that lay beneath the rose bush. The microorganism may enter through any break in the skin.

Wear gloves when performing all landscape functions. If a surface wound occurs, wash it thoroughly with soapy water. Consult with a physician if a deep cut, one that penetrates to tendons or joints, occurs.

Eczema

There is a certain irony in that one of the recommendations to help avoid plant and pesticide induced dermatitis and to protect against infection by cutaneous sporotrichosis and "atypical mycobacterium type IV" through the inevitable cuts and punctures due to thorns, splinters, and tools, washing thoroughly with soapy water, may present its own problem. The practice of washing hands and arms

frequently with strong soapy water may cause eczema. Eczema is characterized by red, tender, cracking, peeling, or blistered skin. The skin is irritated by the soap and the friction of drying the skin. On the job, the skin is irritated by wind chapping and soil abrasion. To reduce the chance of having eczema, use a skin moisturizer upon completion of washing your hands.

Pesticide Safety

No discussion of pesticides would be complete without discussing pesticide safety. To safely use pesticides to prevent or control pests and pathogens in the nursery and landscape:

- Store pesticides away from dwellings and work areas.
- When opening packages and pouring powders or liquids into the tank, handle them carefully to prevent billowing of dust or splashing of liquids.
- Follow all safety directions on the label.
- Do not breathe dust or vapor, or get pesticides in eyes, on skin, or on clothing.
- Wear a gas mask or respirator that has been tested and found safe by the United States Department of Agriculture.
- Wear clean natural rubber gloves and clean protective clothing.
- Wash hands and face thoroughly before eating and smoking.
- Avoid contamination of streams, ponds, and water supplies.
- Wrap empty containers in newspaper and place them in the trash just before trash pick-up.
- If you get any of the warning signs of pesticide poisoning such as headaches, giddiness, vomiting, and contraction of the eye pupils, get away from further exposure at once and seek medical aid. □