

# Cranberry

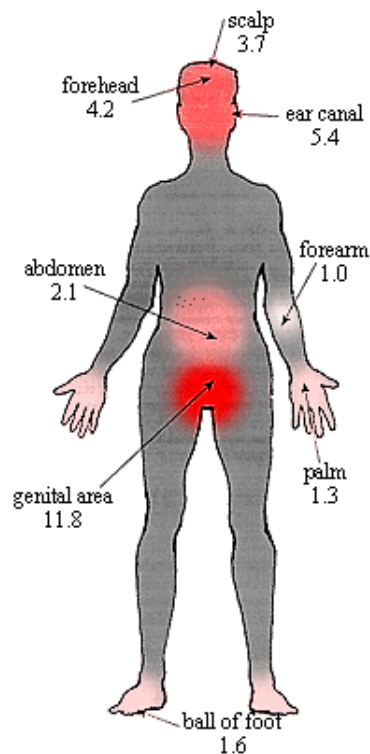
## Crop Management Newsletter

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### Reducing Pesticide Exposure

With the growing season well underway growers are on the constant lookout for pests that will need to be managed if populations exceed action thresholds. Most growers use some sort of pesticide product to manage pest outbreaks. When used in accordance with the label directions pesticides can be an effective and safe method of managing pests. However, the use of any pesticide product creates risk to the people who mix, load, and apply the product. Minimizing our exposure to pesticides will protect our health and that of our families.

Pesticides can enter the body through four main routes: Dermal (through the skin), Oral (through the mouth), Inhalation (through the lungs), and Ocular (through the eyes). Not all of these routes are equal. Oral, inhalation, and ocular are particularly dangerous because they all lead directly into internal parts of the body. The skin (dermal) receives the greatest amount of exposure and it is the most common route for pesticides to enter the body. The amount of pesticide that your skin absorbs depends not only on the chemical itself and the extent of the exposure, but also on the product's formulation, the area of your body



**Relative absorption rates, as compared to the forearm (1.0)**

that is exposed, and the condition of the exposed skin.

Different parts of the body absorb pesticides more efficiently than others. Figure 1 shows the relative absorbance compared to skin on the forearm. The head and the genital area are particularly absorbent. It is easy to pass pesticides from the hand to the head by such a simple action as wiping a sweaty forehead. Cuts and abrasions to the skin also allow pesticides to enter the body more readily.

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Oral exposure is very dangerous, but relatively uncommon. It is almost always a result of extreme carelessness. The most common cause of human oral exposure is putting pesticides in unlabeled bottles or food containers.

Inhalation exposure is very hazardous because the lungs can rapidly absorb pesticides, especially vapors and dusts. When inhaled in sufficient quantities, pesticides can damage nose, throat, and lung tissues.

Ocular exposure is also rare. The eyes are very absorbent. Not only may your eyes be damaged by pesticide exposure, but enough pesticide may be absorbed through the eyes to cause serious illness or death.

### **Pesticide protection**

Wearing personal protective equipment greatly reduces your dermal, inhalation, and ocular exposure to pesticides. The personal protective equipment that is to be worn while mixing, loading, or applying any pesticide is listed on the product label in the Agricultural Use Requirements box.

Hands and forearms receive the most pesticide exposure. 85% of dermal exposure occurs on the hands and forearms. This can be reduced to 3% with the use of unlined chemical resistant gloves. Wear chemical resistant gloves when using any type of pesticide in any form of application. This includes wiping with Roundup. Leave the gloves on when adjusting equipment or opening pesticide containers. Do not wipe your face when wearing gloves. Leave the gloves on until the entire job is completed. After completing the task, wash your hands with the gloves on, then remove the gloves and thoroughly wash and dry your hands.

Faceshields will protect the eyes and head from pesticide exposure. Face protection is required when mixing and loading some pesticides. Wearing a

chemical resistant hat with a wide brim will also reduce exposure.

### **Laundry**

Clothing worn while working with pesticides should be laundered after each use. Wash this clothing separately from the family laundry. Put the clothing through one rinse cycle and then a complete washing/rinsing cycle using plenty of detergent.

### **Vehicles**

Keep farm vehicles interiors clean so that pesticide contaminated dust will not be picked up when others people ride in the vehicle. Vacuum out the interior periodically and wipe down smooth surfaces with soap and water. One research study found that the level of pesticide contamination in dust found in farm homes correlated closely with that found in vehicles used by members of that family. Wipe off the seat and interior of tractors used to pull sprayers after each application.

Using pesticides in a safe manner will protect your health and the health of your family. Pesticide exposure can be minimized by following the label and using personal protective equipment and required.

Teryl Roper

UW-Madison, Extension Horticulturist

## **HOW MUCH NUTRIENT DOES THE CRANBERRY CROP REMOVE?**

The reason behind adding fertilizers to soil for crop production is to make certain that the plant will be provided with the nutrients it needs. Part of the reason fertilizers are needed is that the soil alone may not provide enough nutrients to the plant when it needs them to ensure the

desired yield. Another reason fertilizers are needed is that soils can tie up certain elements and they may not be available to the plant when the plant needs them most.

One of the criteria used to determine a crop's fertilizer requirements is the amount of removal of a certain nutrient. In cranberry there are some figures on the amount of nutrients a crop will use in a given year. These are estimates, since the absolute amount of growth will vary from year to year, and there likely is some variation in fruit dry matter content that results in the estimates from fruit removal to vary slightly. Table 1 lists the amount of nutrients expected to be removed by a crop with a given yield in a year on a per acre basis. The amount used for tissue is based on total new growth of roots and tissue in one year (numbers derived from research by C. DeMoranville, UMass). The removal by the cranberries harvested is based on unpublished data from Lloyd Peterson, UW-Madison.

**Table 1.** Estimated annual nutrient use by cranberry.

	Lbs N/a	Lbs P/a <sup>1</sup>	Lbs K/a <sup>1</sup>
Fruit (100 bbl/a)*	3.5	1	9
New tissue †	56.5	18	30
100 bbl/a + tissue	60	19	39
150 bbl/a + tissue	63.5	20	48
200 bbl/a + tissue	67	21	57
250 bbl/a + tissue	70.5	22	66
300 bbl/a + tissue	74	23	75
350 bbl/a + tissue	77.5	24	84

1. These are actual P and K. The numbers expressed on a fertilizer bag are P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O. Multiply P by 2.29 to get P<sub>2</sub>O<sub>5</sub> and K by 1.2 to get K<sub>2</sub>O.

\* Estimates from Lloyd Peterson, unpublished data.

† Derived from research by C. DeMoranville, UMass.

Looking at the numbers, the amount of nitrogen removed seems much higher than annual applications, whereas the amounts of P and K are less than annual fertilizer applications. Soils typically supply a lot of nitrogen through breakdown of soil organic matter that is naturally in soil and organic matter from dead leaves, old roots, and old stems, the soil actually already supplies a lot of N to the crop each year. This 'recycling' actually is part of the reason it is so hard to control vine overgrowth in a pure peat marsh.

For P and K the situation is different. Each soil can supply a given amount of each nutrient over the growing season, but the soil actually can tie up some of these elements as well. When phosphorus fertilizer is added to the soil and dissolves to become plant available, the P that is not taken up by the plant forms relatively insoluble complexes with iron, aluminum, and calcium in the soil. How quickly this happens and the extent of binding is related to soil pH and the levels of iron, aluminum, and calcium in the soil. With the pH ranges found in most cranberry marshes, phosphorus is most stable in complexes with iron and aluminum.

Potassium acts differently. It competes with many other nutrients (e.g. calcium, magnesium, iron) for a place in the cation exchange complex (CEC) of the soil. Any element held in the CEC reservoir will be come available slowly with time, but this does not guarantee that the right amount will be released when the plant needs it. The pH of cranberry soils does not always favor a high amount of K on the exchange complex, so some may also be leached away.

In addition, not all of the N, P, and K found in fruit or new growth comes from the soil each year. These elements can be remobilized from other tissues and used to support new vegetative and fruit growth.

In summary, then, the amount of nutrients the cranberry needs in a year is different from the amount supplied to the

crop in fertilizers. Some N, P, and K are available naturally in the soil, but must be supplemented to make certain that the nutritional demands of the crop are met. In applying fertilizers to the marsh, the best times to apply materials are at peak demand times, which is why fertilizer timing by growth stage—such as a fruit set—provides the most effective timing.

*Joan Davenport, formerly of Ocean Spray Cranberries, Inc. This article is reprinted from a 1992 CCM newsletter.*

## SUN SAFETY

Skin cancer is one of the most common forms of cancer in the United States. The American Cancer Society estimates that 900,000 new cases of the highly curable forms of skin cancer are diagnosed each year. New cases of melanoma, the most serious and life-threatening skin cancer, were expected to be 40,300 in 1997, with 7,300 cases resulting in death. Skin cancer has increased at a rate of 4 percent each year since 1973, and is 20 times higher among whites than African Americans.

These trends have serious implications for farmers and others who spend much of their working hours outdoors.

### Sun exposure

Research has shown that cumulative sun exposure is a major factor in development of skin cancer. Small changes occur in the skin each time it is exposed to sunlight. People who burn easily, rarely tan, freckle or have a fair complexion, have blonde or red hair, or have blue or gray eyes, experience greater skin changes. Skin cancer usually is not associated with a single, painful sunburn, but rather with repeated exposure to the sun and changes in the skin's makeup. The sun's rays are more damaging during summer months and at midday hours

than other times. However, you can get a sunburn on a cloudy day during other seasons, and at other times of the day. Cumulative sun exposure is the major concern.

If you notice a new growth, mole or discoloration, or a sudden change in an existing mole, see a physician. Early detection of skin cancer is the first step for successful treatment.

The back of the neck, ears, face, and eyes are sensitive to sun exposure. Luckily, these and other body parts easily can be protected by wearing proper clothing, sunglasses, or sunscreen. By taking precautions and avoiding the sun's most damaging rays, you may be able to reduce your risk.

**Hats.** Protection for the face and other parts of the head can be as simple as wearing a hat. A classic study by the Wisconsin-based National Farm Medicine Center found no "perfect hat" among 11 styles, however, some are better than others. When selecting a hat, consider the following questions, and balance your needs in each of these areas.

**Coverage:** How much of your face, ears, and neck are shaded by the hat? Although the baseball cap has been the Midwestern farmer's trademark, it does not protect vulnerable areas on the ears, temples, face, and neck. Other hats provide better protection, such as wide-brimmed hats, pith helmets, hats with double brims or removable flaps, and an Australian-style hat with a full brim.

**Coolness:** Is it cool enough to be worn on hot days? The hat also must be practical for other conditions, such as high humidity, strong winds, blowing dust, and sporadic rain showers.

**Comfort:** How does the hat feel? Will it stay on during various tasks? Does it limit vision or hearing?

**Commitment:** Will you wear it? The most well-designed hat is ineffective if it's seldom worn. An ISU study found that farmers think

it is most important for a hat to be made of sun-blocking material, have a full brim, be light weight and low in cost.

**Clothing.** The thought of wearing long-sleeved shirts and long pants in the summer might sound uncomfortable, but proper clothing can protect against the sun and minimize heat stress. Lightweight clothing, preferably 100 percent cotton, provides both comfort and protection.

**Sunscreen lotions.** Parts of the body that are not covered by clothes can be protected with sunscreen lotions. Sunscreens are not a substitute for wearing proper clothing. They also can give users a false security.

Sunscreens recommended for outdoor workers should have a sun protection factor (SPF) rating of at least 15. This means that you are protected from a reaction to the sun's effects 15 times longer than you are without the sunscreen. Read the label to know when to re-apply sunscreen and whether it is waterproof.

### **Sun avoidance**

The easiest way to reduce exposure to ultraviolet radiation is to avoid the sun. Critical times are midday hours between 10 a.m. and 3 p.m. This may be impossible for some active individuals, but scheduling tasks around this period could reduce exposure when the sun is most dangerous.

### **Sunglasses**

Even the most effective hats can block only 50 percent of the ultraviolet rays that reach the eyes. A good shade hat combined with the use of sunglasses is a better way to protect eyes from sun exposure.

Use caution when selecting sunglasses because they vary widely in the amount of protection from ultraviolet radiation. A peel-off label on the lens indicates its UV rating, or percentage of ultraviolet rays blocked by the sunglasses (the best rating is 100). If no information is

provided by the manufacturer, the sunglasses may not offer any added protection.

Remember that people who spend a lot of time outdoors in work or leisure activities can suffer from more than just exhaustion or heat stress. They are at risk for skin cancer and other diseases that result from years of exposure to the sun. Be aware of risks and make it a habit to protect yourself from sun exposure.

*Prepared by Charles V. Schwab, extension safety specialist; Janis Stone, extension textiles and clothing specialist; and Laura Miller, extension communications. Iowa State University Extension*

## **Safe Practices to Follow When Using Flammable Liquids:**

Flammables should be stored in a self-closing safety can. Storing flammables in open containers can cause the liquid to vaporize and create an ignitable mixture. This could result in an explosion, if a lit match or spark is present.

Only store gasoline in a red container. Remember it will ignite when coming into contact with a sufficiently hot surface. This is why it is important to allow the engine to cool before refueling.

### **Storing Liquid-Soaked Rags**

Store liquid-soaked rags in a metal container with a tight-fitting lid. This keeps oxygen away from the rags, reducing the possibility of a fire. When exposed to air, some rags can produce enough heat to ignite spontaneously. Keep all flammables in a specific storage cabinet, well identified with warning signs.

### **Fire Control**

Control all ignition sources. Ignition sources around flammables increase the likelihood of a fire. Enforce the “no

**smoking”** rule around flammable liquids. Keep sparking tools away from flammables. Use explosion- proof electrical equipment.

Ground and bond all bulk containers during dispensing operations. It is important to ground and bond bulk containers because some materials can be ignited by the minimal energy in a static spark. There must be a conductive connection between the receiving container, dispensing container and a specially installed ground pipe. When drawing liquids from a bulk tank to a portable use container, the container should have a solid connection between the tank or barrel and the container. Using self-closing valves with the dispensing containers limits spills.

### **Identification**

Identify flammable liquid containers by a red diamond shape label with black lettering.

*Ohio State University Extension*

He who learns but does not think it lost. He who thinks but does not learn, is in great danger  
*Confucius*

## **Research Cooperators Needed**

We are looking for cooperators for the last phase of a project looking at phosphorus nutrition. We are looking for growers who have Stevens beds that historically have been low, medium, or high yielding for mature Stevens. We will need yield histories of the bed for the past 5 years along with records of fertilizer applications. We will be placing anion exchange membranes in slits in the beds for a one week period to monitor levels of plant available phosphorus in the soil.

We are also looking for cooperators for trials of experimental herbicides. We are most interested in beds with large patches of oldfield cinquefoil.

If you have beds that meet either condition and would be interested in participating in research please contact Teryl Roper (608-262-9751) or [trroper@wisc.edu](mailto:trroper@wisc.edu).

If you would like to receive this newsletter via e-mail contact Dr. Roper.

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If we had paid no more attention to our plants that we have to our children, we would now be living in a jungle of weeds.

*Luther Burbank.*