



# Pesticide Applicator Report



a Publication of the Vermont Agency of Agriculture, Food & Markets  
For Vermont's Pesticide Applicators

Volume 8, Issue 3

December 2006

## In This Issue:

<b>News from the Agency</b> .....	1
❖ Just Another reason to buy locally.....	1
❖ More Discussion of the Insecticide Mode of Action Classification Article.....	2
❖ Private Applicators – Time to check that Expiration Date.....	2
❖ Review of Pesticide Formulations.....	3
❖ Special Notice to Corn Growers.....	6
<b>News from the UVM Extension Service</b> .....	7
❖ Choosing the Right Gloves for the Job.....	7
<b>Home Study Quiz 1 – Pesticide Formulations</b> .....	9
<b>Home Study Quiz 2 – Choosing the Right Gloves for the Job</b> .....	11

## ❖ News from the Agency

### *Just Another reason to buy locally...*

Not only should you buy produce and milk from local providers, but recently there have been some developments that highlight the importance of purchasing pesticides from local, trusted sources as well.

Topaz Turf and Southern Chemical Supply have been soliciting sales over the phone and then supplying off-spec and mis-branded pesticides to customers, possibly as far back as 2003. This case prompted law enforcement from New York State and the EPA to take action against these companies, located on Long Island and in Florida.

EPA regional Administrator Alan J. Steinberg said, "Companies that sell pesticides that are misformulated, unregistered or mis-branded to unsuspecting customers and telemarketers that make misstatements are not only doing a disservice to the public and the environment, they are shooting their business in the proverbial foot." Huge fines totaling over a million dollars have been levied against these companies.

As purchasers of pesticides, you should be wary of pesticide solicitors from outside your community, and especially telemarketers who call promising just about anything to make the sale. Stick with your trusted local suppliers in order to ensure you get products that are registered, properly formulated and accurately labeled.

## **More Discussion of the Insecticide Mode of Action Classification Article**

In the last issue of the *Pesticide Applicator Report* (June 2006) there was an article titled "IRAC (Insecticide Resistance Action Committee) Mode of Action Classification" and an accompanying quiz.

I am glad to see so many of Vermont's Pesticide applicators completing and returning the quizzes from these newsletters, but I became a bit concerned when a significant portion of the quizzes came back with wrong answers to three particular questions. These errors led me to believe that some readers misunderstood how to use the table because they answered exactly opposite how they should have. I hope I am able to clarify the proper use of the table here.

The three main points for using the table were:

- Avoid exclusive repeated use of insecticides from the same chemical subgroup, (indicated by the IRAC Mode of Action Group number).
- Alternate with products from other IRAC Mode of Action Groups.
- Integrate other control methods (chemical, cultural, biological) into insect control programs.

In other words, don't keep using insecticides that are listed in the same group in the table (they are grouped together because they have the same mode of action). Rotate to other products that are in a different chemical subgroup and therefore have a different mode of action than the one you are currently using. That way, you will prevent resistance from forming within the insect population that you are treating.

Please feel free to call me at 802-828-3482 or email me at [matthew.wood@state.vt.us](mailto:matthew.wood@state.vt.us) if you have any questions.

## **Private Applicators – Time to check that Expiration Date**

Remember; check the expiration date on your certificate to see if it is "up" at the end of this year. Private Applicator certificates (not commercial) are good for (5) years and it is easy to lose track of when they expire.

- If your certificate expires at the end of 2007, you will receive a reminder letter from us showing how many credits you have earned (you need (8) in a five year period). No action required until next year, other than continuing to earn credits.
- If your certificate expires at the end of 2006 and you have at least (8) credits, you will be receiving a renewal form from us in the mail which you will need to sign and mail back to us.
- If your certificate expires at the end of 2006 and you do not have (8) or more credits, you will need to re-take the exam in order to stay certified.
- If you cannot find your certificate in order to check the expiration date, call Matt at 802-828-3482 so I can mail you a new one.
- If you have moved recently and haven't updated your address, please call or write to let me know your new address.
- On the other hand, Commercial (and non-commercial and Government) applicators must renew their certificate EVERY year and earn (16) credits every five years in order to stay certified.



## Review of Pesticide Formulations

Source: Cornell Pesticide Safety Education Core Manual (that's right, you've see this before)

A pesticide chemical can rarely be used as originally manufactured. The pesticide must be diluted with water, oil, air or chemically inactive (inert) solids so that it can be handled by application equipment and spread evenly over the area to be treated. Usually the basic chemical cannot be added directly to water or mixed in the field with solids, so the manufacturer must further modify his product by combining it with other materials such as solvents, wetting agents, stickers, powders, or granules. The final product is called a pesticide formulation and is ready for use either as packaged or diluted with water or other carriers.

### Types of Formulations

A single pesticide is often sold in several different formulations. The applicator should choose the formulation that will best meet his requirements for a particular job. Considerations in making a choice include effectiveness against the pest, habits of the pest, the plant, animal or surface to be protected, application equipment, danger of drift and runoff, and possible injury to the protected surface. Abbreviations are often used to describe the type of formulation involved. These abbreviations are used on labels and in recommendations. Some of the common ones are: WP for wettable powder; F for flowable; G for granules or granular; D for dusts; SP for soluble powder; EC for emulsifiable concentrate; and SC for spray concentrate.

### Aerosols (A)

**Aerosols** (pressurized cans, "bug bombs") contain a small amount of pesticide, or a combination of pesticides that are driven through a fine opening by a chemically inactive gas under pressure, when the nozzle is triggered. Usually they are small, weighing about one pound.

**Advantages.** Aerosols are very convenient in that they are always ready to use. They are also a convenient way to buy small quantities of a pesticide. They are easily stored and the pesticides do not lose their strength (potency, activity) while in the can during their normal period of use.

**Disadvantages.** Aerosols are only practical for use in small areas. There is not much active ingredient in any one can. Because of this, it is an expensive way to buy pesticides. Unfortunately, they are also attractive playthings for small children and, if left within reach, are hazards. Aerosols can be dangerous if punctured or overheated. They may explode and injure someone. Don't ever try to burn aerosol cans.

**Principal Uses.** Aerosols are most often used in households, backyards, tents and other small areas. They may be used either as space sprays for flying insects or as residual sprays. Usually they are used against insects, but some are designed for plant diseases or weed killers. There are commercial models available for use in greenhouses, barns, etc. These are larger models holding five to ten pounds of material, and are usually refillable.

### Dusts (D)

A prepared dust is a finely ground, dry mixture combining a low concentration of the pesticide with an inert carrier such as talc, clay, or volcanic ash. There is a wide range in size of the dust particles in any one formulation.

**Advantages.** Dusts are ready to use as purchased and require no mixing. They can be applied with simple, lightweight equipment even in commercial use.

**Disadvantages.** Because dust particles are finely ground, they may drift long distances from the treated area and may contaminate off target areas. While drifting they are highly visible and may cause public criticism. When used outside, they are easily dislodged from the treated surface by wind and rain and soon

become inactive. Never apply dust formulations on a windy day.

**Principal Uses.** Because of drift, dusts are not recommended for large scale outside use. Outside they are used principally for spot treatments and home gardens. They work best when applied to dewy surfaces in the early morning. Inside, they are used in cracks and crevices for roaches and other domestic insects. Dusts are also used to control lice, fleas, and other external parasites on pets and livestock.

### **Poisonous Baits**

Poisonous bait is a food or other substance mixed with a pesticide that will attract and be eaten by pests and eventually cause their death.

**Advantages.** Baits are useful for controlling pests such as flies, rats, etc., that range over a large area. Often the whole area need not be covered, just those spots where the pests gather. Baits may be carefully placed in homes, gardens, granaries, and other agricultural buildings so that they do not contaminate food or feed, and can be removed after use. Usually only small amounts of pesticide are used in comparison to the total area treated, so potential environmental pollution is minimized.

**Disadvantages.** Within the home, baits are often attractive and dangerous to children or pets and therefore must be used with care. Outside, they may kill domestic animals and wildlife as well as the pest. Often the pest will prefer the protected crop or food rather than the bait, so the bait may be ineffective. When larger pests are killed by baits, the bodies must be disposed of. If not, they may cause an odor and/or sanitation problem. Unfortunately, other animals feeding on the poisoned pests can also be poisoned.

**Principal Uses.** Baits are used inside buildings for pests such as ants, roaches, flies, rats, and mice. They may be used outside in gardens for control of slugs, in dumps and similar areas for

rat control, and in fields to control slugs and insects.

### **Granules (G)**

Like dusts, pesticide granules are dry, ready-to-use, low concentrate mixtures of pesticide(s) and inert carriers. However, unlike dusts, almost all of the particles in a granular formulation are about the same size and are larger than those making up a dust. A fine granular pesticide pours like ordinary salt or sugar.

**Advantages.** Granules are ready to use as purchased, with no further mixing necessary. Because the particles are large, relatively heavy, and more or less the same size, granulars drift less than most other formulations. There is little toxic dust to drift up to the operator's face and be inhaled by him. They can be applied with simple, often multi-purpose equipment such as seeders or fertilizer spreaders. They also will work their way through dense foliage to a target underneath.

**Disadvantages.** With a few exceptions, granulars are not suitable for treating foliage because they will not stick to it.

**Principal Uses.** Granular pesticides are often used for soil treatments to control pests living at ground level or underground. They may be used as soil systemics, that is, formulations applied to soil that are absorbed into the plant through the roots and carried throughout the plant. Granular herbicides and/or insecticides are frequently applied in combination with fertilizers on turf, thereby saving labor. Granular formulations may be the choice when applied by agricultural aircraft where drift is a problem, or when treating water for mosquitoes where there is a heavy foliage cover over the water.

### **Ready-To-Use (RTU)**

These preparations are usually solutions in highly refined oils that contain low

concentrations of the pesticide. They are generally used as purchased.

**Advantages.** Low concentrate solutions are designed to be sprayed as purchased. Because of this, no mixing is necessary and this lessens the chances for making mistakes. Household formulations have no unpleasant odors and usually the liquid carrier evaporates quickly and does not stain fabrics, furniture, etc.

**Disadvantages.** Low concentrate formulations are usually fairly expensive for the amount of actual pesticide bought and the uses for such materials are few and specialized.

**Principal Uses.** Low concentrate solutions may be used in the household for flying or crawling insects and for mothproofing clothes. In barns they are used as space sprays and fly sprays for livestock. They are also used as prepared sprays for mosquito control and shade tree insect control.

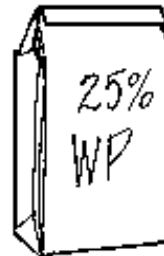
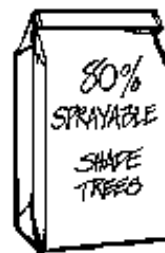
### Emulsifiable Concentrates (EC)

These preparations are usually solutions containing a high concentration of the pesticide. Most of them are designed to be mixed with water or oil and contain wetting agents, stickers, and other additives. They may contain as much as eight or more pounds of a pesticide per gallon of concentrate.

**Advantages.** These formulations contain a high concentration of pesticide, so the price per pound of active ingredient is rather low. Only moderate agitation is required in the tank, so they are especially suitable for low -pressure, low-volume weed sprayers, mist blowers, and small home ground sprayers. They are not abrasive and do not settle out when the sprayer is not running. There is little visible residue, which generally allows their use in populated areas. Because of the high pesticide content, the applicator is not required to store, transport, or handle a large bulk of chemical for a particular job.

**Disadvantages.** It is easy to under dose or overdose because of the high concentration of pesticide, if directions for mixing are not carefully followed. Mixtures of emulsifiable concentrates may be phytotoxic. Also, because of the high concentration and liquid form, which is usually easily absorbed through the skin, there may be hazard to the applicator. The hazard of improperly stored concentrates can also be high. Because of their solvents, most liquid concentrates cause rubber hoses, gaskets, and pump parts to deteriorate rapidly unless they are made of neoprene rubber.

Some formulations cause pitting in car finishes.



**Principal Uses.** High concentrate liquids can be diluted and used in many ways on fruit, vegetables, shade trees, for residual sprays on farm animals, for structural pests. They are adaptable to many types of application equipment ranging from household sprayers to dilute hydraulic sprayers, low-volume ground sprayers, mist blowers, low

volume agricultural aircraft sprayers, and ultra-low volume sprayers (usually on aircraft).

### Flowables (F)

Some pesticides can be manufactured only as solid materials, not as liquids. Often these pesticides are formulated as flowables. Flowables are made from very finely ground solid materials, which are suspended in a liquid. In this form, they can be mixed with water and applied. Flowables are similar to emulsifiable concentrates and are used in the same way. Flowables do not usually clog nozzles and require only moderate agitation.

### Wettable or Soluble Powders (WP or SP)

Wettable powders and soluble powders are dry preparations containing a relatively high concentration of pesticides. Wettable powders are mixed with water to form suspensions.

Soluble powders dissolve in water to form solutions. The amount of pesticide in these powders varies from 15% to 95%.

**Advantages.** As is true with liquid concentrates, the pesticides in wettable powders are relatively low in cost and easy to store, transport, and handle. They are safer to use on tender foliage and usually do not absorb through the skin as rapidly as liquid concentrates. They are easily measured and mixed when preparing spray suspensions.

**Disadvantages.** Wettable powders may be hazardous to the applicator if he inhales their concentrated dust while mixing. They require good agitation (usually mechanical) in the sprayer tank and will settle quickly if the sprayer is turned off. They cause some pumps to wear out quickly. Their residues are more subject to weathering than liquid concentrates, and being more visible may soil cars, windows, and other finished surfaces.

**Principal Uses.** Liquid concentrates and wettable powders are the formulations most widely used by commercial applicators. Like liquid concentrates, wettable powders can be used for most pest problems and in most spray machinery. Where toxicity to the plant or absorption through the skin of an animal is a problem, use a wettable powder suspension rather than a liquid emulsion or solution of the pesticide.

### Fumigants

Fumigants are pesticides in the form of poisonous gases that kill when absorbed or inhaled.

**Advantages.** A single fumigant may be toxic to many different forms and types of pests. Therefore, a single treatment with one fumigant may kill insects, weed seeds, nematodes, and fungi. Fumigants penetrate into cracks, crevices, burrows, partitions, soil, and other areas that are not gastight and expose hidden pests to the killing action of the pesticide.

**Disadvantages.** The area to be fumigated almost always must be enclosed. Even in outdoor treatments the area must be covered by a tarp or the fumigant incorporated into the soil, so that it doesn't escape. Frequently, fumigants are highly toxic. Proper techniques and all recommended protective gear must be used when applying them. Most fumigants burn the skin.

**Principal Uses.** Fumigants are used inside dwellings or other buildings to control vermin that cannot easily be reached by other pesticide formulations. They are used in ports of entry and at state borders for treatment of plants and other materials to prevent the introduction of new pests into an area. Stored grain pests are often controlled by fumigants. Soil is fumigated to sterilize it from pests before planting.

Choosing the right formulation can make the difference between a successful control job and a failed application that does more harm than good.

*Want some credit? See quiz Pg. 9→*

\* \* \*

### Special Notice to Corn Growers



If you grow field corn and sweet corn in the same field, please note that products which are labeled for use on field corn for silage may not be labeled for use on sweet corn. Application of these products in a manner inconsistent with its labeling may lead to illegal pesticide residues on the sweet corn. It is best to grow your sweet corn in a field separate from corn intended for silage, that way even unintentional application of unsuitable pesticides can be avoided.

## ❖ News from the UVM Extension Service

### *Choosing the Right Gloves for the Job*

*Ann Hazelrigg -Pesticide Education and Safety  
Program - University of Vermont*

There are four ways for pesticides to get into our bodies; through the mouth, eyes, lungs and skin. Of the four, pesticide absorption through the skin is the most common cause of poisoning. Although all parts of the body are vulnerable to dermal pesticide exposure, most pesticides are primarily absorbed through the forearm and hands. Keeping hands protected during all aspects of mixing, loading and applying pesticides is essential for limiting exposure to these harmful chemicals. It has been shown that wearing proper gloves can reduce pesticide exposure by 90% or more.

Gloves can be made of many different materials including natural or synthetic rubber, plastic or other materials but should always be unlined. Leather or fabric gloves should never be worn, due to the fact they cannot be washed and they can easily absorb and retain pesticide residues.

Gloves should be long enough to cover the entire hand and forearm and should be worn inside your shirt sleeve to provide an extra barrier for the skin. Wearing gloves outside the shirt sleeve during a mixing spill can funnel pesticide right down your arm to your hands. After using chemicals and before removing your gloves, rinse and clean them thoroughly. After removing your gloves, wash your hands again. Never put contaminated hands in your gloves.

Make sure you always have an extra pair of gloves on hand. When gloves wear out, throw them away and use another pair. If there is any question about whether the gloves leak, do not use them. To test for leaks, fill gloves with water and squeeze the top. If water comes out, replace the gloves.

Protective equipment should be selected by the person who is going to use it; comfort and proper fit must be considered. Tight gloves can limit dexterity and are uncomfortable whereas overly large gloves can interfere with work. Unused protective equipment does not help anyone.

All pesticide labels contain information for the pesticide handler on the protective personal equipment (PPE) that is required for that particular product.

Labels may also refer to chemical resistance categories (A-H) for PPE. Items in these categories are made of materials that the pesticide is unable to pass through during the amount of time indicated below the chart. Choose the category of resistance which best matches the handling task duration. The categories are based on the solvents used in the pesticides, NOT the pesticides themselves. Therefore, there will be instances where the same pesticide with two different formulations (wetable powder-WP and emulsifiable concentrate-EC, for example) will require PPE from two different chemical resistance categories. After checking the label of two different Malathion products; Malathion 5 Dust and Malathion 57EC, I found the Malathion Dust required only "water-proof gloves" while the Malathion 57EC required "chemically resistant gloves" such as barrier laminate, nitrile rubber, viton, or butyl rubber.

*Continued on next page→*

→Continued from previous page.

EPA Chemical Resistance Category Chart below for the categories of chemical resistant gloves. For use when PPE section on the pesticide label lists a chemical resistance category.

Labels will refer to chemical resistance categories (A-H) for PPE.

Selection Category Listed on Pesticide Label	Types of Personal Protective Material							
	Barrier Laminate	Butyl Rubber ≥ 14 mils	Nitrile Rubber ≥ 14 mils	Neoprene Rubber ≥ 14 mils	Natural Rubber ≥ 14 mils	Polyethylene	Polyvinyl Chloride (PVC) ≥ 14 mils	Viton ≥ 14 mils
A (a dry and water-based formulation)	high	high	high	high	high	high	high	high
B	high	high	slight	slight	none	slight	slight	slight
C	high	high	high	high	moderate	moderate	high	high
D	high	high	moderate	moderate	none	none	none	slight
E	high	slight	high	high	slight	none	moderate	high
F	high	high	high	moderate	slight	none	slight	high
G	high	slight	slight	slight	none	none	none	high
H	high	slight	slight	slight	none	none	none	high

**HIGH:** Highly chemical-resistant. Clean or replace PPE at end of each day's work period. Rinse off pesticides at rest breaks.

**MODERATE:** Moderately chemical-resistant. Clean or replace PPE within an hour or two of contact.

**SLIGHT:** Slightly chemical-resistant. Clean or replace PPE within ten minutes of contact.

**NONE:** No chemical-resistance. Do not wear this type of material as PPE when contact is possible.

Want some credit? See quiz pg. 11→



Some other gloves you may wear...





### ***Home Study Quiz 1 – Pesticide Formulations***

The following set of questions refers to the ***Review of Pesticide Formulations*** article on pages 3 - 6. Fill out the information on the back of the completed quiz and mail it to the Vermont Agency of Agriculture to receive **one pesticide recertification credit**.

1. **True**\_\_\_\_\_, **False**\_\_\_\_\_ A single pesticide can be sold in several different formulations.
2. Which of the following does **not** need to be considered when selecting the formulation of a pesticide?
  - a. the plant, animal, or surface to be protected
  - b. danger of drift or runoff
  - c. effectiveness against the pest
  - d. habits of the applicator
  - e. habits of the pest
3. **True**\_\_\_\_\_, **False**\_\_\_\_\_ Aerosols are a convenient way to buy small quantities of a pesticide.
4. The abbreviation "D" stands for which formulation?
  - a. dolomitic
  - b. dead bug spray
  - c. dust
  - d. duster
  - e. dusty
  - f. disinfectant
5. **True**\_\_\_\_\_, **False**\_\_\_\_\_ Secondary poisoning is a concern when using Poisonous Baits.
6. **True**\_\_\_\_\_, **False**\_\_\_\_\_ Granular formulations tend to drift more than other formulations.
7. The abbreviation "F" stands for which formulation?
  - a. fowl-ables
  - b. flowables
  - c. fertilizers
  - d. fan spray
  - e. foibles
  - f. emulsifiable concentrate
8. What are three (3) of the disadvantages of wettable powders?
9. Which formulation usually contains a high concentration of pesticide?
10. **Fill in the blanks.** "Choosing the right \_\_\_\_\_ can make the difference between a \_\_\_\_\_ control job and a \_\_\_\_\_ application that does more \_\_\_\_\_ than \_\_\_\_\_."

**Pesticide Applicator Report – December 2006 – Page 10**

Fill out the following information and mail the completed quiz to the Vermont Agency of Agriculture to receive one (1) pesticide recertification credit.

<b>Name:</b>		
<b>Certificate #:</b>		Please check: <input type="checkbox"/> Commercial <input type="checkbox"/> Non-Commercial <input type="checkbox"/> Government <input type="checkbox"/> Private
<b>Street Address:</b>		
<b>City/State/Zip</b>		
<b>Company/Farm:</b>		
<b>Signature:</b>		<b>Date:</b>

Mail to:

**Vermont Agency of Agriculture  
Attn: Matthew Wood  
116 State Street - Drawer 20  
Montpelier, VT 05620-2901**



## ***Home Study Quiz 2 – Choosing the Right Gloves for the Job***

The following set of questions refers to the article ***Choosing the Right Gloves for the Job*** and table on pages 7 and 8. Fill out the information on the back of the completed quiz and mail it to the Vermont Agency of Agriculture to receive **one pesticide recertification credit**.

1. What are the four ways pesticides can get into our bodies?
2. Why should protective gloves not be leather or cloth?
3. Gloves should be worn inside or outside of shirtsleeves to provide the most protection from a pesticide mishap?
4. How can you test for leaks in gloves?
5. Why wash gloves before removing?
6. Explain chemical resistance categories.
7. Why would two formulations of the same pesticide require different kinds of gloves?
8. How do you know what kind of PPE to wear for a specific pesticide product?
9. Why should gloves be unlined?
10. By wearing gloves how much can you reduce your exposure to pesticides?
11. Extra credit: What are the two pairs of gloves pictured on pg. 8 used for? (not pesticide related)

# ***Pesticide Applicator Report***

December 2006

Vermont Agency of Agriculture  
Agriculture Resource Management & Environmental Stewardship  
116 State Street - Drawer 20  
Montpelier, VT 05620-2901

NONPROFIT  
U.S. POSTAGE PAID  
MONTPELIER, VT 05620-  
2901  
PERMIT No. 74

Fill out the following information and mail the completed quiz to the Vermont Agency of Agriculture to receive one (1) pesticide recertification credit.

<b>Name:</b>		
<b>Certificate #:</b>		Please check: <input type="checkbox"/> Commercial <input type="checkbox"/> Non-Commercial <input type="checkbox"/> Government <input type="checkbox"/> Private
<b>Street Address:</b>		
<b>City/State/Zip</b>		
<b>Company/Farm:</b>		
<b>Signature:</b>		<b>Date:</b>