

3 Pesticide Information

3.1 Use Pesticides Safely

All pesticides are regulated by state and federal laws to protect the user and consumer. Read labels carefully. Follow instructions.

Most pesticides are poisonous to humans and animals, but when properly used they are not harmful. Handle them with care. Store them in closed, plainly labeled original containers, out of the reach of children and animals. Keep pesticides in locked storage facilities.

When handling, do not allow pesticides to come in contact with the skin. Do not apply on a windy day. Do not smoke while handling pesticides. Do not inhale dusts, sprays, or vapors. After handling pesticides, wash hands and face before eating or smoking.

To avoid accidental injury to susceptible plants, avoid drift of sprays and dusts. Use separate equipment for applying hormone-type herbicides such as 2,4-D.

Dispose of empty containers so that children cannot play with them.

Please refer to the state pesticide regulating agency, in the state that you are spraying in, for specific rules and regulations in that state.

3.2 Protect Honey Bees from Insecticides

Honey bees, wild bees, and other insects are important for proper pollination of many vegetables. Vine crops, for example, must be pollinated because they have male and female flowers, and pollen must be transferred from the male to female flowers if fruit is to set. Poor pollination results in small or odd-shaped fruit as well as low yields. Each flower must be visited eight or more times for adequate pollination to occur.

To avoid harming bees with insecticide treatments, remember these points: do not spray crops in bloom; mow blooming weeds before treatment or spray when the blossoms are closed; avoid application during the time of day when field bees are most numerous; make application in the early morning or evening; and always read the label before use.

If pesticides that are highly toxic to bees are used in strict accordance with label directions, little or no harm should be done to bees. Label statements on pesticides that are highly toxic to honey bees may carry a caution statement such as the following: “This product is highly toxic to bees exposed to direct treatment or residues on crops or weeds. Do not apply or allow to drift to weeds in bloom on which an economically significant number of bees are actively

foraging. Protective information can be obtained from your Cooperative Extension.”

3.3 Verifying Pesticide Registration and Restricted-Use Status

Any pesticide used must be currently registered with the state pesticide regulating agency and the USEPA. Applicators can easily verify whether pesticides are currently registered and classified as restricted-use by contacting the state pesticide regulating agency, in the state that you are spraying in, for specific rules and regulations in that state.

3.4 Applicator Certification

Commercial applicators using restricted-use and general-use pesticides as well as private applicators using restricted-use pesticides must be certified. Certification training, exams, and recertification courses are continually given in each state in New England. Please consult your Cooperative Extension or the state pesticide regulating agency if you have questions concerning certification.

3.5 Pesticide Recordkeeping/Reporting

Each state in New England has pesticide recordkeeping requirements and reporting. Contact the state pesticide regulating agency if you have questions concerning pesticide recordkeeping requirements and reporting.

3.5.1 Federal Private Applicator Recordkeeping Requirements

Federal regulations require private applicators to keep records of the restricted-use pesticides they apply. Federally required records need to contain the following elements:

- Applicator name;
- Applicator certification number;
- Month, day, and year of application;
- EPA registration number for product applied;
- Brand or product name of pesticide applied;
- Crop, commodity, or site treated;
- Size of area treated;
- Total amount of pesticide product applied; and
- Location of the application.

Spot applications are applications of a restricted-use pesticide to less than 1/10 of an acre on the same day. Spot application records need to include: month/day/year of application; brand or product name of pesticide applied; EPA registration number; total amount of pesticide applied;

and location of the application designated as a “spot treatment” with a brief description. **NOTE:** Spot treatments do not apply to nurseries or greenhouses. Applications at these locations need to be recorded as if they are a non-spot application.

Federally required records must be made within 14 days of the application and need to be maintained for 2 years following the application. Access to the record information is limited to: USDA-authorized representatives presenting identification; state-authorized representatives presenting identification; and attending licensed health care professionals (or those acting under their direction) when treating individuals who may have been exposed to a restricted-use pesticide.

More specific information on federal recordkeeping requirements can be found on-line at <http://www.ams.usda.gov/science/prb/sdpr.htm>.

3.6 EPA Worker Protection Standard (WPS) for Agricultural Pesticides

The Worker Protection Standard contains requirements designed to reduce the risks of illness or injury resulting from occupational pesticide exposures to pesticide handlers and agricultural workers. They include the following:

- Restricted-entry intervals (REIs) for most pesticides
- Personal protective equipment (PPE) for handlers and early-entry workers
- Decontamination supplies and emergency assistance
- Pesticide safety training and posting
- Revised labeling that includes specific WPS instructions.

For more complete information on reentry and farmworker protection standards, please contact your local Cooperative Extension office or the state pesticide regulatory agency.

3.7 Reduced-Risk Pesticides, Minimum-Risk Pesticides, and Biopesticides

Since 1993 EPA has expedited the registration of conventional pesticides with characteristics such as very low toxicity to humans and nontarget organisms including fish and birds, low risk of groundwater contamination or runoff, low potential for pesticide resistance, demonstrated efficacy, and compatibility with IPM. Materials meeting these criteria are referred to by EPA as “reduced-risk.” The “reduced-risk” designation applies only to certain uses of a particular pesticide, which may not be all label uses for that product.

Minimum-risk pesticides are products that are exempted from EPA registration (and therefore have no EPA registration number). They contain only active ingredients outlined in FRFRA 40 CFR 152.25(g) (“the 25b list”) and inert ingredients currently identified on Federal Register Notice 59 FR 49400 (“the 4a list”). The lists can be accessed from the following link: <http://www.epa.gov/pesticides/biopesticides/>. All ingredients and percent concentrations must also be listed on the label. Policies may differ in each New England state, which sometimes require such products to carry a state registration number. Contact the state pesticide regulating agency for specific rules and regulations.

Biopesticides, or biological pesticides as defined by EPA, are certain types of pesticides derived from such natural materials as animals, plants, bacteria, and certain minerals. These include microbial pesticides, which contain bacteria, fungi, virus, etc., as the active ingredient; plant-pesticides, i.e., pesticidal substances that plants produce from added genetic material (such as corn genetically modified to produce *Bacillus thuringiensis* toxins); and biochemical pesticides comprised of naturally occurring substances that control pests by nontoxic mechanisms (such as pheromones or some insect growth regulators). Biopesticides must be registered with EPA. More information on biopesticides is available at <http://www.epa.gov/pesticides/biopesticides/>.

3.8 FIFRA 2(ee) Recommendations

Certain limited variations from the use directions specified on pesticide labels are authorized under FIFRA Section 2(ee).

These “2(ee) recommendations” allow:

- 1) Use at any dosage, concentration, or frequency less than specified on the labeling.
- 2) Use against any target pest not specified on the labeling.
- 3) Methods of application not prohibited on the labeling.
- 4) Mixtures with fertilizer unless prohibited on the labeling.

No fee is required for a 2(ee) recommendation request.

3.8.1 Requirements:

- 1) Anyone receiving approval of a 2(ee) recommendation is responsible for distributing the recommendation to all users of the product pursuant to the approved recommendation.
- 2) Any user must have the 2(ee) recommendation in his or her possession at the time of application.

3.8.2 Information required for submission of 2(ee) recommendations:

- 1) Requests for approval of 2(ee) recommendations must be made in writing by recognized research institutions, certified crop advisers, manufacturers (registrants), or organizations representing individual users. Individual users may not request approval of 2(ee) recommendations.
- 2) Requests must be accompanied by data demonstrating that the use will be effective.

3.9 Prepare for Emergencies

Call a POISON CONTROL CENTER or physician in ALL cases of suspected poisoning. It is better to be too cautious than too late.

During an emergency call, tell the physician the chemicals listed on the label, the EPA registration number, antidotes given on the label and other information about the accident that could aid in treatment. Be prepared! READ and POST SAFETY RULES. Fill in the phone number of your local ambulance service, doctor and hospital as well. Inform your doctor of the *Notes to Physicians* on labels of the pesticides you plan to use, and get his/her advice on whether antidotes should be kept on site.

3.10 Organophosphate Poisoning

The effects of organophosphate and carbamate poisoning are rapid. Poisoning must be recognized early for effective treatment. Early symptoms are usually a headache, feeling of weakness, blurred vision, excessive perspiration, and nausea. Abdominal cramps, vomiting, and excessive salivation may set in with, or without, diarrhea. The throat and chest will feel constricted, making breathing difficult. In mild poisoning, some of these symptoms may be absent. Heat stress causes symptoms similar to pesticide poisoning.

If breathing stops, artificial respiration is the most important first-aid. While waiting for medical help, give first-aid as indicated on the label. Never try to give anything by mouth to an unconscious person. Get the victim to a doctor as soon as possible. If you know which pesticide is involved, take the container along so the doctor can read the label. If this is impractical, remove the label and take it with you. Re-label the container as soon as possible.

Cholinesterase is an enzyme necessary for the proper function of the nervous system in humans and several other animals. Organophosphate pesticides (dimethoate, diazinon, azinphosmethyl, phosmet, chlorpyrifos and methidathion) and carbamate pesticides (carbaryl, methomyl, oxamyl), and many other natural and synthetic chemicals, interfere with the action of cholinesterase. An applicator that uses these types of pesticides regularly would be wise to have a cholinesterase activity test. This is a simple blood test that

can be taken at many hospitals. The test finds the base line or “normal” level of cholinesterase in your blood. If pesticide poisoning is suspected, the cholinesterase level can be checked again at that time for confirmation. The best time to establish the base line is before the spray season. The important level is the total or true cholinesterase. Discuss this with your physician beforehand. Inform your doctor of the *Notes to Physicians* on labels of the pesticides you plan to use, and get their advice on whether antidotes should be kept on site.

3.11 Your Responsibility as a Pesticide User

This guide summarizes information from product labels and other sources, but it **does not include** all of the information for which users are responsible.

Contact Cooperative Extension for pesticide safety training materials, and your state Department of Agriculture for current pesticide regulations. A primary requirement is that no owner or lessee shall permit pesticide application in such a manner as to directly, or through drift, expose workers or other persons to spray or dust.

Pesticide product labels are the legal documents governing proper usage. Always read the label before using any pesticide. If you are unsure about any aspect of safe or proper use, contact the dealer, manufacturer or Cooperative Extension before use.

Wear the appropriate personal protective equipment (PPE) listed on the label when working with any pesticide.. At a minimum you should wear long sleeve shirt, long pants, shoes plus socks and chemical resistant gloves. Do not allow pesticides to contact your skin. Read and follow all safety precautions on labels.

After handling pesticide, wash hands and face before eating, smoking, or using a restroom. Instruct your family, coworkers and farm laborers on pesticide safety procedures. Post safety rules and emergency information where workers will see them.

Tree fruit growers sometimes need to use pesticide in areas where residences, cropland, pasture, or bodies of water are nearby. Pesticide drift from orchards to off-target areas presents a hazard. Avoid application when conditions favor drift.

3.12 Field Use and Care of Respirators

Wear the label-recommended respirator with a filter for powders and an activated charcoal filter for organic vapors. Write the date of first use on the cartridge. Change the filters and cartridges after the number of hours specified, or more often if breathing becomes difficult or if pesticide odor is detected. Respirators do not provide adequate

protection from inhalation of pesticide dust, mist or vapors when mixing pesticide in closed or poorly ventilated areas.

The respirator should be fitted properly on the face, not too high on the nose, with narrow portion over the bridge of the nose, and chin cup contacting under side of the chin. Headbands should be adjusted just tight enough to insure a good seal. Refer to the directions for respirator fit testing which should be included with the respirator packaging.

Remove filters and cartridges and wash face piece with soap and warm water after use. Dry face piece with a clean cloth and/or place face piece in a well-ventilated area to dry. Store respirator, filters, and cartridges in a clean, dry place, preferably in a tightly closed plastic bag.

3.12.1 Other Safety Equipment

- Chemical resistant gloves.
- Personal protective clothing, such as rubber apron, coveralls and cap.
- Chemical resistant work shoes or boots.
- Chemical resistant goggles.

3.13 Acute Toxicity of Pesticide

A pesticide's hazard to warm-blooded animals, including humans, is usually determined in relation to the way it enters the body. Methods of entry include the respiratory system, digestive system and skin. The greatest hazard is from pesticide entry via the respiratory system (inhalation).

Pesticide toxicity by this route is not much different from that of intravenous injection because membranes of the lungs that separate air from blood are extremely thin, and absorption is therefore very rapid (this is also true for the eyes). Oral absorption (through the digestive tract) is the next most hazardous avenue for poisoning. Dermal (skin) absorption is less immediate than respiratory or oral. However, there is considerable variation in the rate of penetration through the skin by different materials and formulations, and by different areas of the body.

When spraying, many airborne spray particles are trapped in the secretions of the upper respiratory tract and swallowed, thereby providing exposure by inhalation and ingestion. Assuming that the person applying the pesticide takes adequate precaution (respirator, goggles, etc.) to prevent inhalation and oral exposure, dermal toxicity is probably a more realistic index of occupational hazard than oral toxicity.

3.13.1 Danger — Poison; Warning; Caution:

One of these “signal words” appears on the label of every pesticide. Acute (or immediate, single dose) toxicity is reported as an LD₅₀ value. The LD₅₀ for a chemical is the dose that has been found in controlled experiments to kill

50% of a large number of test animals. The LD₅₀ dose is usually expressed as the number of milligrams (mg) of pure active ingredient per kilogram (kg) body weight of the test animals. The lower the LD₅₀, the more toxic the chemical is.

Because the LD₅₀ is based on animal tests, uses pure active ingredient rather than formulated product, and does not account for individual sensitivity, it does not necessarily represent the toxic dose for an individual human. The LD₅₀ of a chemical gives no information on the possible long-term chronic health effects from repeated exposure at low levels.

Toxicity Category & Signal Word on Label	LD ₅₀ Oral (mg active ingredient per kg body weight)	LD ₅₀ Dermal (mg active ingredient per kg body weight)
I DANGER – POISON	0 to 50	0 to 200
II WARNING	>50 to 500	>200 to 2,000
III CAUTION*	>500 to 5,000	>2,000 to 20,000
IV none*	>5,000	> 20,000

* Category IV materials may have Caution signal word due to skin irritation or other hazard.

READ THE LABEL FOR PRESCRIBED SAFETY EQUIPMENT AND PRECAUTIONS!

In addition to oral or dermal acute toxicity, a pesticide may also carry the **DANGER - POISON**, **DANGER**, or **WARNING** signal words because of other potential hazards, such as inhalation toxicity or the ability to cause severe eye or skin damage.

LABEL COMPLIANCE

Under the present EPA regulations, pesticides may be applied:

- at a different rate per 100 gallons dilute than stated on label as long as the application stays within the dose per acre limit;
- at a lower rate per acre than on label; and
- less frequently than on label.

IMPORTANT — it is **illegal** to:

- increase amount applied per acre (overdosage);
- use shorter intervals between sprays than minimum interval stated on label; and
- shorten intervals to harvest (illegal residues on crop).

State regulations may be more restrictive than those of the EPA.

3.14 Protecting Water Quality

Tree fruit growers have a responsibility to prevent pesticide from contaminating surface bodies of water and groundwater supplies. Over 90% of the rural population in the U.S. depends on groundwater as their supply of drinking water. Groundwater is very difficult to clean if it does become polluted. Listed below are a few practices that can help prevent water contamination. Contact Extension for more information.

- Consider the potential for rinse water, spills, application or erosion to create pesticide laden runoff which can reach a surface body of water. If you do not have a self-contained mixing pad, use an area where the run-off risk is low. If you are working near a stream or pond, do not allow runoff to occur.
- Use an anti-backflow device when filling the spray tank.
- Periodically change the location of field mixing areas. Be aware of the location and condition of wells; stay at least 50 feet away from wells. Special caution is needed around wells with cracked casings.
- Be aware of the soil types, geology, and depth of water table in your local area. The potential for pesticide leaching into groundwater is generally greater on ledge, sandy soils, or other soils low in organic matter. The risk increases when the water table is close to the surface. Try to choose pesticides with a low leachability hazard if you are working under these conditions.
- Keep spray equipment accurately calibrated.
- Use proper procedures for pesticide storage and disposal. Keep pesticide storage and mixing areas away from streams, ponds, and springs.

3.15 Restricted Entry Interval

Manufacturers may write the label with a longer REI than required by the EPA, or the EPA may change its minimum REI requirement. To know the use restrictions for a pesticide you must READ THE LABEL!

3.16 Pesticide Residue Tolerances

Federal laws warn that food shipments bearing residues of pesticide chemicals in excess of established tolerances will be contraband and subject to seizures as “adulterated.” This applies to both raw and processed foods.

The amount of pesticide residue in or on a food material at harvest must fall into established tolerances, expressed in “parts per million” (ppm). The actual amount of pesticide chemical found in a food at harvest depends in part on the amount applied to the crop and the length of time since the last application. Therefore, growers are responsible for strictly following label information as to:

- maximum spray dosage, and
- the preharvest interval: which is the required length of time between the final pesticide application and harvest.

3.17 Worker Protection

3.17.1 EPA Worker Protection Standard (WPS)

This section is adapted from *Worker Protection Standard Brochure #1: Duties of Employers* by the Maine Board of Pesticides Control. **This is only a very brief summary of the WPS.** Check with the pesticide regulatory agency in your state for complete information.

3.17.1.1 Who Must Comply?

The U.S. Environmental Protection Agency (EPA) has issued rules governing the protection from occupational exposure to agricultural pesticides of workers on farms, in forests, nurseries, and greenhouses. Chemical growth regulators and thinning agents are included as “pesticides.” These regulations apply if you are an employer with workers that fit in either of the two following categories:

- **agricultural workers** – performing tasks related to the cultivation and harvesting of plants on farms, greenhouses, nurseries, or forests; or
- **pesticide handlers** – assigned to mix, load or apply agricultural pesticides; clean or repair equipment, act as flaggers, or IPM scouts, etc.

Employers are responsible for making sure that workers and handlers receive the protection required by the pesticide labeling and the WPS. There are two types of employers:

- **agricultural employers** – employ or contract for the services of workers or own/operate an establishment that employs workers, and;
- **handler employers** – hire pesticide handlers or are self-employed as handlers. This definition includes commercial applicators and companies that supply crop advisory services.

3.17.1.2 What Must an Employer Do?

It is the responsibility of the employer to provide the following to all employees who meet the WPS definition of an agricultural worker or pesticide handler.

1) Pesticide Safety Training:

Handlers and workers must be trained every 5 years unless they are certified applicators. Handlers must be trained before they do any handling activity. Workers must be provided with basic pesticide safety information before entering an area of your agricultural establishment that is or has been under a restricted

entry interval (REI) within the last 30 days. Full WPS training must be done within 5 days of employment.

2) Information at a Central Location:

- a. Facts about each pesticide application – product name(s), EPA registration number(s), and active ingredient(s); location and description of treated area(s); the time and date of the application and the restricted-entry interval (REI);
- b. The name, address and telephone number of the nearest emergency medical facility;
- c. An EPA WPS safety poster.

3) Decontamination Sites:

- a. A decontamination site must be provided within 1/4 mile of the employee's work site.
- b. A decontamination site must contain enough water for routine and emergency whole-body washing (3 gallons for handlers and 1 gallon for workers) and for eye flushing; plenty of soap and single-use towels; and a clean overall, for use by handlers.
- c. Handler employers must also provide a decontamination site where handlers remove their personal protective equipment (PPE) at the end of a task and at each mixing site.

4) Emergency Assistance:

- a. Employer must provide product name(s), EPA registration number(s) and active ingredient(s);
- b. All first aid and medical information from the label(s);
- c. Description of how the pesticide was used and;
- d. Information about the victim's exposure.
- e. Transportation to the hospital if necessary.

5) Restrictions During Applications:

An employer must keep all workers, other than trained and equipped handlers, out of areas being treated with pesticides.

6) Restricted-Entry Intervals (REI):

The restricted-entry interval is the period immediately after a pesticide application during which entry into the treated area is limited. The REI is located on the product label. **During an REI, do not allow workers to enter a treated area** or contact anything treated with the pesticide to which the REI applies. Pesticide handlers may reenter during the REI, but only if they wear the personal protection equipment required for early entry as stated on the label.

REIs for many labels have changed in the past 2 years, so read the label!

7) Notice About Applications:

Employers must notify workers and handlers about pesticide applications on the establishment. In most cases, employers may choose between oral warnings or posted warning signs, but they must tell employees which warning method is in effect. For some

pesticides, employers must provide both oral warnings and posted warning signs.

Posted warning signs must be:

- a. At least 14" x 16" in size, with an EPA-mandated design;
- b. Posted 24 hours or less before application; posted during the REI; removed before workers enter and within 3 days after the end of the REI;
- c. Posted so they can be seen at all normal entrances to treated areas, including entrances from labor camps.

Oral warnings must be delivered in a manner understood by workers and handlers, using an interpreter if necessary. Oral warnings must contain the following information:

- a. Location and description of treated area;
- b. The REI; and
- c. Specific directions not to enter during the REI.

3.17.1.3 Additional Duties for Handler Employers

Handler employers are also required to provide the following protection to their employees.

8) Application Restrictions:

Do not allow handlers to apply pesticide so that it contacts, directly or through drift, anyone other than trained and PPE-equipped handlers.

9) Monitoring:

Sight or voice contact must be made at least every two hours with anyone handling pesticides labeled with a skull and crossbones (signal word: DANGER-POISON).

10) Specific Instructions for Handlers:

Handler employers must make sure that before any handling task, the handlers are given: information from the pesticide labeling regarding its safe use; access to the label during the entire handling task; and instructions on the safe operation of the equipment they will be using.

11) Personal Protection Equipment (PPE):

- a. When personal protective equipment is required by the product label, the handler employer must provide the PPE; clean and maintain it correctly; make sure each handler wears and uses the PPE correctly; provide a clean place to change and store PPE; take action to prevent heat stress resulting from wearing PPE; and not allow the PPE to be worn or taken home.
- b. The employer must make sure that PPE is cleaned according to manufacturer's instructions; inspected and repaired before each use; that non-reusable or uncleanable PPE, or PPE that is drenched with pesticide concentrates labeled DANGER or WARNING, are properly disposed of; that PPE is

washed and dried appropriately and stored separately from personal clothing; and that respirator filters, cartridges, and canisters are replaced as often as required.

- c. The employer must make sure anyone cleaning PPE is informed of the potential hazards associated with the possible pesticide residues on the PPE.

12) Equipment Safety and Maintenance:

- a. Handler employers must make sure that equipment used for mixing, loading, transferring, or applying pesticides is inspected and repaired or replaced as needed.
- b. Only appropriately trained and equipped handlers may repair, clean, or adjust pesticide handling
- c. Equipment that contains pesticides or pesticide residues.

3.17.2 OSHA Hazard Communications Standard

This law (often called the “worker’s right-to know law”) requires employers to inform employees of any chemical hazards they may be exposed to while performing their work. The Bureau of Labor Standards (or the comparable agency in your state) is responsible for administering and enforcing this law.

Farmers who employ 11 or more people during a year, or who have temporary labor camps, must comply with the law by the following means:

- 1) Develop a written policy on how you comply with the law.
- 2) Inventory all hazardous materials held.
- 3) Obtain the Material Safety Data Sheets (MSDS) for each hazardous material or product to be used. (Request pesticide suppliers to provide MSDS).
- 4) Provide warning labels for secondary containers used to hold hazardous materials. Never put pesticides in secondary containers.
- 5) Provide documented annual training for each employee, including:
 - a. Explanation of the written hazard communication program, chemical inventory, MSDS, and secondary warning labels. Inform employees of the location and provide access to these documents.
 - b. The physical and health hazards of the chemicals used.
 - c. Description of areas or tasks where hazardous materials are present.
 - d. Methods of detecting presence or release of hazardous chemicals in work areas.
 - e. Protective measures, including the use and limitations of personal protective equipment.
 - f. Emergency procedures.
- 6) Report on chemicals used, and other information as requested, to the proper state agency.