

6.0 PESTICIDES

Farmers must have an application licence to purchase or apply commercial or restricted pesticide.

It is important to understand safe and responsible handling and application procedures once the decision has been made to use a pesticide. Before purchasing a pesticide, you must first ensure that:

- ! you have correctly identified the pest;
- ! the product is registered for the intended use;
- ! the pesticide is suitable for use with the application equipment on your farm;
- ! the pesticide will work effectively under your specific farm conditions and for that specific pest;
- ! you understand the life cycle of the pest and know when the pesticide should be applied to be most effective;
- ! you have the appropriate protective clothing and equipment; and
- ! you calculate the correct amount of pesticide needed for no more than one year of use and purchase only that amount.

Once identified, it is important to understand the life cycle of the pest you wish to control and the limits to the effectiveness of the pesticide you have chosen. For example, a major pest of cole crops in Newfoundland and Labrador is the cabbage root maggot which attacks many vegetable crops such as cabbage, turnips, rutabagas, broccoli, cauliflower, Brussels sprouts and some Chinese vegetables. Large numbers of this pest can cause complete crop loss by larvae feeding on the roots. Some maggots can be tolerated in healthy, well-established cole crops as the marketable part is not damaged. Therefore, only the first generation of the pest needs to be controlled. However, even a small amount of feeding on a mature rutabaga lowers the grade and affects marketability, forcing control of the second generation of the pest as well.

Some operators have in the past applied granular forms of pesticides to control this pest. (The Department of Environment is not encouraging the use of granulars. The Department instead recommends farmers first scout and monitor fields and then apply drenches when eggs are found.) Granular pesticides only remain effective in the soil over a prescribed period. Late emergence of the pest can render the pesticide treatment ineffective if the application and emergence periods do not overlap.

The use of pesticide drenches (high water volume and low pressure spray containing the pesticide directly over the plants) has proven effective in controlling this pest. More information on control of this pest is provided in the document "*The Cabbage Root Maggot in Newfoundland and Labrador*" which can be obtained from the Pest Management/Crop Specialist or the Agricultural Representative of the Department of Forest Resources and Agrifoods, or from the Entomologist at

the Agriculture and Agri-Foods Canada Research Station in St. John's.

Transporting

When transporting pesticides you must:

- ! cap and pack containers securely to prevent them from leaking or being punctured or broken;
- ! place pesticides in a metal or plastic storage box or on a waterproof tarp to prevent leaks;
- ! do not transport pesticides on a wooden truck bed which will absorb spilled pesticides and contaminate future loads;
- ! never transport pesticides with food, animal feed, fertilizer, clothing, household goods or living plants which could lead to contamination;
- ! lock your vehicle as you are responsible during transport if anyone is accidentally poisoned by pesticides you have left unattended;
- ! protect paper or cardboard containers from rain;
- ! never transport pesticides in the passenger compartment of the vehicle where you or any other passenger is at risk from fumes or residues of spilled containers;
- ! placard your vehicle or sprayer and carry shipping papers as per the Transportation of Dangerous Goods Act for loads more than 500 kilograms (1,100 lb) of solid material, liquid formulations in containers greater than 100 litres (22 gallons) each or if carrying fumigants; and,
- ! carry protective clothing and gloves, clean-up materials (such as absorbent materials eg: kitty litter, peat moss), plastic bags and a shovel and bucket in case of a spill.

Storage

Safe pesticide storage must include the following:

- ! store all restricted and commercial pesticides in a shed, room or locker which is locked, well ventilated, has warning signs and a source of water in or near the storage area;
- ! alert emergency agencies (such as the fire department) as to the location and type of hazardous chemicals stored on your farm;
- ! store pesticides in their original containers with original labels;
- ! keep herbicides separate from insecticides and fungicides;
- ! never store pesticides near livestock, food, animal feed, wells, water supplies, or in your home;
- ! ensure there is an approved fire extinguisher for chemical fires located nearby (but not in the storage area); and,
- ! store protective clothing and equipment near, but not in, the storage area.

Mixing and Loading

Spills are more likely to occur when you are mixing or loading pesticides. During mixing and loading, you must:

- ! put on protective clothing and safety equipment such as coveralls, rubber gloves, a waterproof hat and rubber boots, a face shield or goggles, a waterproof apron and, if necessary, a respirator (the label on the pesticides container will give you a list of the necessary protective clothing for safe mixing);
- ! choose a mixing site away from other people, livestock, pets and water sources when outdoors;
- ! ensure there is good ventilation and lighting when mixing indoors;
- ! always let someone know what you are mixing and make sure they are familiar with poisoning symptoms, first aid treatment and have emergency phone numbers on hand;
- ! keep soap, water, emergency first aid equipment and a spill clean-up kit nearby;
- ! mix and weigh pesticides on a sturdy level bench or table made of non-absorptive material;

- ! mix in still or low wind conditions outside and stand upwind of mixing areas;
- ! cut bags rather than tearing;
- ! mix only the amount you will use immediately;
- ! label and use all measuring and mixing equipment for pesticide use-only;
- ! pre-mix wettable powders with a small amount of water before adding to the spray tank to prevent lumps and airborne dust;
- ! fill the sprayer half full with water, turn on the agitator and then slowly add the pesticide;
- ! rinse pesticide containers as soon as they are empty - rinse three times for empty containers which held liquids and rinse bags with solids once and then pour the rinse water into the sprayer;
- ! rinse all measuring equipment and replace container caps and close bags before returning them to the storage area;
- ! stop mixing and clean up immediately if you splash or spill any pesticide;
- ! use clean water with the correct pH (take a sample to your local laboratory) since alkaline spray water leads to chemical breakdown of many organophosphates and carbamates (pesticides work best at a pH of 5.0 to 7.0); and,
- ! leave an air gap between the end of your filling hose and the water in your spray tank to avoid contamination of the water supply.

Application

Many horticulture operators in Newfoundland and Labrador have fields which are small and fragmented. Consequently, windy conditions may cause problems related to spray drift. Some pesticides also work better under specific environmental conditions. For example, synthetic pyrethroids are considered more effective in cool temperatures while others such as carbamates and organophosphates work best in warmer conditions.

During outside application, you must:

- ! use a calibrated sprayer suited to your needs;
- ! wear protective clothing;
- ! watch the weather and do not spray in winds stronger than a gentle breeze or no more than 15 kilometres per hour (for example, in the early morning or early

evening);

- ! never apply pesticides just before a heavy rain;
- ! post warning signs if necessary to keep people out of treated areas;
- ! make sure no livestock are in the area;
- ! consider when honey bees or other beneficial insects are most active;
- ! apply the pesticide at the recommended rates;
- ! shut off spray nozzles when you turn unless you have calculated this into your spray area and want to control the pest on headlands;
- ! use and maintain the correct tractor speed chosen during calibration;
- ! plan the spray route through your field so you avoid passing through airborne spray or freshly treated areas;
- ! leave a buffer zone when the spraying area is next to sensitive crops or water bodies (30 metres [100 ft] around drinking wells and 30 metres [100 ft] for field boom sprayers along fish-bearing waters);
- ! reduce spray drift by:
 - adding a drift control agent in the spray mix;
 - setting the boom only as high as necessary for good coverage;
 - using the correct nozzle and replace worn nozzles;
 - using low pressures to produce large droplets that will still cover the plant;
- ! never spray when the temperature exceeds 25°C or if the humidity is below 50%;
- ! spray downwind from sensitive areas such as houses or beehives; and,
- ! clean application equipment well before switching pesticides (use an ammonia based bleach to the rinse water which is suitable to neutralize most pesticide residue).

Be courteous to your neighbours. Where nuisance complaints are anticipated, notify neighbours of your intention to spray prior to pesticide application. This is very important where neighbors with sensitivities live nearby (such as an asthmatic neighbor).

During inside application (for example, in greenhouses or barns), you must:

- ! follow the same appropriate safety precautions as listed for outdoor use;
- ! seal treated areas for the time specified on the label, then thoroughly ventilate before re-entry and keep people and animals away from exhaust fans during ventilation; and,
- ! place a warning sign at all entrances to the building.

Disposal of Pesticides

Pesticides and pesticide containers will be safely disposed of if you:

- ! triple or pressure rinse empty drums, glass bottles, plastic and metal containers and empty rinse liquid into sprayer;
- ! single rinse paper or plastic bags containers and empty rinse liquid into the sprayer;
- ! apply rinse water that cannot be added to the sprayer tank to a non-crop area which is on your property and is at least 200 metres (660 ft) from watercourses;
- ! crush, puncture (several times) or damage empty containers so they cannot be reused once they have been rinsed; and,
- ! clean empty pesticide containers (never burn as the residues may not be destroyed and toxic fumes may be released) and then dispose of them at a landfill. Inform the landfill manager in case there is an area for more hazardous materials.

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