

## CHAPTER 5 METRIC CONVERSIONS

Metric	Imperial Equivalent
5 cm	2 inches
7 cm	3 inches
30 cm	1 foot
0.5 m	1.5 feet
10 m	30 feet
15 m	50 feet
30 m	100 feet
30.5 m	100 feet
200 m	650 feet
100 km	62 miles
8 km/hr	4.9 mph
5 kg	11 pounds
1500 kg	3,300 pounds
5 litres	1.3 gallons
6000 litres	1,585 gallons

Conversions in this table are rounded to a convenient number.  
See Appendix E for exact conversion factor.

Values from tables and examples are not included in Metric Conversions

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# PEST MANAGEMENT

## INTRODUCTION

This chapter describes how Integrated Pest Management practices contribute to reduce the impact of managing agricultural pests on the environment. It contains introductory information on the relationship between pest management and the environment. It also contains information on environmental concerns, legislation and beneficial management practices related to:

- ◆ Pest management,
- ◆ Pesticides.

## PEST MANAGEMENT AND THE ENVIRONMENT

Pests are a constant threat to the economical production of food crops and animals. They may also affect food safety and reduce natural biodiversity. The proper implementation of Integrated Pest Management (IPM) practices helps to protect the environment from the potential adverse effects of pests and pest management, and is also a very important component in helping agricultural operations adapt to climate change.

### Integrated Pest Management (IPM)

Integrated Pest Management is a decision-making process for pest control. The process contributes to effective, economical and environmentally sound suppression of pests for crop and livestock production. IPM incorporates several methods to achieve pest control (e.g., crop rotation, crop variety selection, soil amendments, pesticides, time of planting and harvest, etc.). IPM will have added importance as pest populations shift in response to climate change.

### Noxious weeds

Noxious weeds are typically non-native plants that have been introduced to British Columbia without the insect predators and plant pathogens that normally keep them in check in their native habitats. For this reason and because of their aggressive growth, these plants can be highly destructive, competitive, and difficult to control. Noxious weeds are among the top causes for loss of natural diversity in the environment.

### Pesticides

Pesticides are any kind of chemical (organic or synthetic) used to kill, control, or manage pests. Fungicides, insecticides, miticides, herbicides, rodenticides and plant growth regulators are all types of pesticides. Pesticides are chemicals designed to protect crops and animals from pests and can pose risks to the environment. Pesticides are regulated to minimize known and potential risks through prescribed storage, handling, application and disposal practices.

## Pests

Pests are organisms that cause undesirable effects to agricultural production and include fungi, bacteria, viruses, nematodes, insects, mites, weeds, slugs, rodents, birds and wildlife. They may occur naturally or be introduced from other areas.

## Invasive Pests

Invasive pests not only pose a threat to crops and livestock, but also threaten native biodiversity by competing with local species for food and space. Many of the pests affecting cultivated and native plants in BC have been inadvertently introduced into the Province. In the absence of natural controls, some have become established and have extended their range as the environment and as availability of host plants permits. Examples of invasive pests include gypsy moth, spotted wing drosophila, brown marmorated stink bug, purple loosestrife, knapweed, yellow nutsedge, Japanese knotweed, canola blackleg, puncturevine, blueberry scorch virus and European chafer.

# PEST MANAGEMENT



## PEST MANAGEMENT ENVIRONMENTAL CONCERNS

Primary environmental concerns related to pests are:

- ◆ lack of control of pests that results in loss of biodiversity and natural beneficial organisms through invasive diseases, insects, and weed infestations
- ◆ improper choice of pest management strategies that results in soil erosion, water or air pollution, or increased greenhouse gas emissions, or impacts to non-target organisms

For environmental concerns related to use of pesticides to control pests.

→ see Pesticides, **page 5-15**

For information on these concerns:

→ see Impacts on Biodiversity and Habitat, **page 7-7**

→ see Soil Quality Factors, **page 8-1**, and refer to Contaminants

→ see Water Quality and Quantity Factors, **page 9-1**, and refer to Contaminants

→ see Air Contaminants, **page 10-1**

→ see Climate Change Factors, **page 12-1**

## PEST MANAGEMENT LEGISLATION

The following is a brief outline of the main legislation that applies to pest management.

→ see **page A-1** for a summary of these and other Acts and Regulations

### Local Bylaws

Many local governments have specific bylaws or restrictions on noise scaring devices for bird control. Some local governments have by-laws that require the control of specific pests. Local governments may also have by-laws restricting the use of “cosmetic” pesticides; these do not apply to agriculture.



### Environment Management Act

This Act describes responsibilities for use of pesticides in agriculture and other sectors and spill reporting, response, and recovery, which are supported by several regulations.

The *Code of Practices for Agricultural Environmental Management* regulates pesticide movement from the applicator’s property.

SECTION 77.1: Unless an adjacent property owner agrees otherwise, a person who uses pesticides for the purpose of an agricultural operation must ensure that a no-treatment zone between an outdoor pesticide use area and the adjacent property is sufficient to prevent the unreasonable release of pesticide spray or runoff onto the adjacent property.

- ◆ “No-treatment zone” means an area of land that must not be treated with pesticide.

It is important for producers to ensure that their pesticide application practices adhere to SECTION 77.1 as described above, because it may be applied when a drift incident is being investigated in order to determine if the use of the pesticide resulted in an unreasonable release of pesticide to the adjacent property.



## Integrated Pest Management Act

Administered by BC Ministry of Environment and Climate Change Strategy, this Act regulates the sale, containment, transportation, storage, preparation, mixing, application and the disposal of pesticides and their containers.

The *Integrated Pest Management Act* and Regulation establish conditions for the sale and use of pesticides in BC through a classification system and regulatory provisions for licences, certification, permits, Pest Management Plans and ministry confirmations of receipt of a pesticide use notice. The Regulation also contains public notification, consultation, reporting, and record keeping provisions – as well as standards for use of Integrated Pest Management and for human health and environmental protection.

Under the *IPM Act*, a person must not “use, handle, release, transport, store, dispose of or sell a pesticide in a manner that causes or is likely to cause an unreasonable adverse effect.” This general prohibition, in concert with requirements for Integrated Pest Management (IPM), underpins the ministry’s approach to regulation of pesticide use in BC.

SECTION 3(1): Without limiting any other provision of this Act, a person must not (a) use a pesticide that causes or is likely to cause, or use, handle, release, transport, store, dispose of or sell a pesticide in a manner that causes or is likely to cause, an unreasonable adverse effect.

It is important for producers to ensure that their pesticide application practices adhere to Section 3(1), as described above, because it may be applied when a drift incident is being investigated in order to determine if the use of the pesticide resulted in an unreasonable adverse effect, or if the action was likely to cause the unreasonable adverse effect.

SECTION 4(1): Except as provided in the regulations, a person must not use a pesticide for a prescribed use unless the person holds the licence that is, under the regulations, required for that purpose, and complies with the terms and conditions in or attached to that licence. When hiring a custom applicator (or when providing a spray service to another grower/farmer), a pesticide user licence and an applicator certificate are required.

Pesticide storage and safe handling practices may be reviewed by a Ministry inspector or a Conservation Officer (also designated as an inspector under the *IPM Act*) during a farm inspection.



## Plant Protection Act

Administered by AFF, this Act is the provincial counterpart to the federal *Plant Protection Act* that focuses on plant protection issues affecting Canada. It provides for the prevention of the spread of pests destructive to plants in BC. Inspectors have powers to enforce the provisions of the Act, including the authority to establish quarantine areas. To assist in the enforcement of the Act, the BC Plant Protection Advisory Council advises and co-ordinates the actions of provincial and federal officials to deal with potential hazards to BC agriculture and forestry from insects, plant diseases, weeds or other biotic agents. The Council’s power comes from the mandates of the agencies whose members sit on committees struck to deal with plant protection issues in specific commodity sectors.

The purpose of this Act is to prevent the deleterious spreading of insects, pests, or diseases that are destructive to plants. Under this Act, inspectors may enter premises at any reasonable time for an inspection of the premises, plans, root mediums, or containers. They can order the treatment, confiscation, or destruction of plants. Regulations under this Act include:

- ◆ *Bacterial Ring Rot Regulation,*
- ◆ *Balsam Woolly Adelgid Regulation,*
- ◆ *Blueberry Maggot Control Regulation,*
- ◆ *Domestic Bacterial Ring Rot Regulation,*
- ◆ *Golden Nematode Regulation,*
- ◆ *Little Cherry Control Regulation,*
- ◆ *Northern American Gypsy Moth Eradication.*



## Weed Control Act

Administered by AFF, this Act places the responsibility for the control of noxious weeds on the occupiers of the land. It provides for the appointment of inspectors to ensure compliance and, failing that, for a method by which they can control weeds and recover the costs from the occupier. Weed Control Committees may be established by municipal councils to administer the Act within a municipality. Committees report to the municipal council and the Minister.



## Wildlife Act

The provincial *Wildlife Act* protects wildlife designated under the Act from direct harm, except as allowed by regulation (e.g., hunting or trapping), or under permit. Legal designation as Endangered or Threatened under the Act increases the penalties for harming a species. The Act also enables the protection of habitat in a Critical Wildlife Management Area.

Agriculture Environment Management Code, Administered by BC Ministry of Environment and Climate Change Strategy, this AEM Code regulates pesticide movement from the applicator's property.

SECTION 77.1: Unless an adjacent property owner agrees otherwise, a person who uses pesticides for the purpose of an agricultural operation must ensure that a no-treatment zone between an outdoor pesticide use area and the adjacent property is sufficient to prevent the unreasonable release of pesticide spray or runoff onto the adjacent property.

- ◆ "no-treatment zone" means an area of land that must not be treated with pesticide.

It is important for producers to ensure that their pesticide application practices adhere to Section 77.1 as described above, because it may be applied when a drift incident is being investigated in order to determine if the use of the pesticide resulted in an unreasonable release of pesticide to the adjacent property.



## Fisheries Act

Administered by both Fisheries and Oceans Canada and Environment and Climate Change Canada, this Act is established to manage Canada's fisheries resources, including fish habitat. The Act can also be administered provincially by FLNRORD and ENV. The Act applies to all Canadian waters that contain fish, including ditches, channelized streams, creeks, rivers, marshes, lakes, estuaries, coastal waters and marine offshore areas. It also applies to seasonally wetted areas that provide fish habitat such as shorelines, stream banks, floodplains, intermittent tributaries and privately owned land. The Act includes provisions for stiff fines and imprisonment to ensure compliance.

The purpose of this Act is to provide a framework for (a) the proper management and control of fisheries; and (b) the conservation and protection of fish and fish habitat, including by preventing pollution.

This Act was updated in 2019 and now empowers the Minister to make regulations for the purposes of the conservation and protection of biodiversity.

The definition of fish habitat is: "water frequented by fish and any other areas on which fish depend directly or indirectly to carry out their life processes, including spawning grounds and nursery, rearing, food supply and migration areas". The quantity, timing and quality of the water flow that are necessary to sustain fish habitat are also deemed to be a fish habitat. Furthermore, serious harm to fish includes the death of fish or any permanent alteration to, or destruction of, fish habitat.

Provisions of the Fisheries Act relevant to agricultural operations include:

- ◆ Protection for all fish and fish habitats;
- ◆ Prohibition against the death of fish or the 'harmful alteration, disruption or destruction of fish habitat';
- ◆ A permitting framework and codes of practice to improve management of large and small projects impacting fish and fish habitat;
- ◆ Protection of fish and/or fish habitats that are sensitive, highly productive, rare or unique; and
- ◆ Consideration for the cumulative effects of development activities on fish and fish habitat.

Specific Sections of the Act include:

SECTION 34.2(1) The Minister may establish standards and codes of practice for:

- (a) The avoidance of death to fish and harmful alteration, disruption or destruction of fish habitat;
- (b) The conservation and protection of fish or fish habitat; and
- (c) The prevention of pollution.

SECTION 34.4(1) No person shall carry on any work, undertaking or activity, other than fishing, that results in the death of fish.

SECTION 35 (1) No person shall carry on any work, undertaking or activity that results in the harmful alteration, disruption or destruction of fish habitat.

Every person who contravenes subsection 34.4(1) or 35(1) is guilty of an offence and liable.

Notifying authorities about serious harm to fish or deposit of a deleterious substance:

SECTION 38 (4.1) Every person shall without delay notify an inspector, a fishery officer, a fishery guardian or an authority prescribed by the regulations of a harmful alteration, disruption or destruction of fish habitat that is not authorized under this Act, or of a serious and imminent danger of such an occurrence, if the person at any material time

- (a) Owns or has the charge, management or control of the work, undertaking or activity that resulted in the occurrence or the danger of the occurrence; or
- (b) Causes or contributes to the occurrence or the danger of the occurrence.

SECTION 38 (5) If there occurs a deposit of a deleterious substance in water frequented by fish that is not authorized under this Act, or if there is a serious and imminent danger of such an occurrence, and detriment to fish habitat or fish or to the use by humans of fish results or may reasonably be expected to result from the occurrence, then every person shall without delay notify an inspector, a fishery officer, a fishery guardian or an authority prescribed by the regulations.

SECTION 38 (7) As soon as feasible after the occurrence or after learning of the danger of the occurrence, the person shall provide an inspector, a fishery officer, a fishery guardian or an authority prescribed by the regulations with a written report on the occurrence or danger of the occurrence.



## Migratory Birds Convention Act

Under this Act, the federal government is responsible for implementing a Convention between Canada and the U.S. for the protection of migratory birds and nests. The Canadian Wildlife Service of Environment Canada administers the regulations.

- ◆ SECTION 35(1): prohibits the deposit of oil, oil wastes or any other substance harmful to migratory birds in any area frequented by migratory birds

Migratory waterfowl populations create demands on the use of adjacent agricultural lands. Under the Act, it is an offence to harm the habitat of any migratory bird while the bird is resident at the site or to release any substance (including pesticides) harmful to migratory birds into areas frequented by them.

## Plant Protection Act

Administered by Agriculture and Agri-Food Canada, this Act is to protect plant life and the agriculture and forestry industries by preventing the importation, exportation, and spread of injurious pests.

## Species at Risk Act

This Act has sections that protect listed species, their residence and critical habitat. It applies to federal lands, internal waters (i.e., all watercourses), territorial sea of Canada, and the air space above them.

The provisions of the *Species at Risk Act* (known as the 'safety net') could be invoked on BC crown and private lands using a federal order under the Act if provincial action is not sufficient to protect listed species.

## Pest Control Products Act

Under this Act and its regulations, Health Canada has the authority to regulate pest control products used in agriculture, forestry, industry, public health and domestic situations.

The Act is intended to ensure that no person shall store, display, distribute or use a pest control product under conditions that are unsafe to human or animal health or that will adversely affect the environment.

Pest control products include herbicides, fungicides, insecticides, rodenticides, biological controls such as bacteria and viruses and antimicrobial agents such as those used in wood preservation, water purification systems and material preservatives. The intent of the legislation is to ensure the safety, merit and value of pesticides used in Canada.

## PEST BENEFICIAL MANAGEMENT PRACTICES

Comply with applicable pest management related legislation, including the above, and where applicable, implement the following beneficial management practices to protect the environment.

### Integrated Pest Management (IPM)

Integrated Pest Management is an approach that relies on the appropriate use of various sound practices to protect crops, animals, and the environment from the adverse impact of pests. Integrated Pest Management does not mean that chemical pesticides are never used nor does it require complete elimination of all pests. A properly designed program aims to create conditions that are optimal for crop production and less favourable for pest development.

Integrated Pest Management includes the use of production practices that prevent or reduce pest problems as well as use of monitoring to determine the need and correct timing of control methods, including pesticide applications. When used, IPM practices reduce potential impact to the environment by means of:

- ◆ Less reliance on pesticides by effective use of non-chemical methods, including biological, cultural, behavioural, and mechanical control practices either alone or in combination with pesticides.
- ◆ Less risk of development of pesticide resistance that can lead to increased pesticide use and poor pest control.
- ◆ Encouraging use of least-toxic, target-specific pesticides as appropriate.


## INTEGRATED PEST MANAGEMENT

**Integrated Pest Management (IPM)** is promoted and explained in the commodity-specific

 [Crop Production Guides, shown below.](#)

They form a part of the Environmental Farm Plan series of Beneficial Management Practices. This detailed information is recommended for use by producers of these crops. **Table 5.1**, outlines the basic steps in an Integrated Pest Management

A complete list of Production Guides is available at

 [Species At Risk Act; Information for Private Landowners](#)

For more detailed information on Integrated Pest Management for specific crops, refer to the following publications.

-  [BC Berry and Vegetable Production Guides](#)
-  [Best Practices Guide for Grapes for British Columbia Growers](#)
-  [Floriculture Production Guide](#)
-  [Fresh Market Grape Production – Best Practices Guide in British Columbia](#)
-  [Greenhouse Production in British Columbia](#)
-  [Home and Garden Pest Management Guide for British Columbia](#)
-  [IPM for Turfgrass Managers](#)
-  [Integrated Fruit Production Guide for Commercial Tree Fruit Growers](#)
-  [BC Tree Fruit Production Guide](#)
-  [Mushroom Production Guide to Best Management Practices in British Columbia](#)
-  [Nursery Production Guide \(Pesticides Registered in Nurseries\)](#)
-  [Vegetable Production Guide – Beneficial Management Practices for Commercial Growers in British Columbia](#)



## Invasive Pests

It is important that any unusual or unfamiliar diseases, insects, or weed species be reported to AFF, the Ministry of Forests, Lands, Natural Resource Operations and Rural Development Invasive Alien Plant Program, or the Canadian Food Inspection Agency (CFIA) so that the species can be identified and so any necessary actions can be taken. Check the Weeds BC website, the AFF website on invasive plants and biosecurity, and the Invasive Plant Program website for additional information on new and threatening invasive species.

→ see Weeds, **page 5-12**, and

→ see **Chapter 7**, Biodiversity

 [Weeds BC](#)

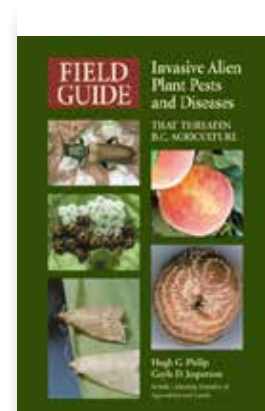
 [Invasive Pests and Biosecurity](#)

Identifying and rapidly responding new pest issues will take on added importance with projected climate change. Climate change can have a strong influence on agricultural pest dynamics and their impacts on agricultural production. A changing climate will also allow some insects, fungi, weeds and bacteria to more easily overwinter and expand their ranges into new regions.

 [Enhancing Information and Collaboration for Managing Emerging Pests](#)

To reduce the possibility of introducing invasive pests to a farm, check with the Canadian Food Inspection Agency for permit requirements and other restrictions before importing plant material from outside B.C.

 [Canadian Food Inspection Agency](#)



**TABLE 5.1** Steps to Developing an Integrated Pest Management (IPM) Plan

**1. Plan & manage crop and animal production to avoid pest problems**

- Select a site that is environmentally suited to the crop, or select a crop or crop variety suited to the growing site to minimize predisposition of the crop to pest attack or competition.
- Optimize crop and animal health to avoid predisposition towards pest infestation.
- Encourage the establishment of available biological control agents that can keep pests from becoming problems.
- Use recommended crop and manure management practices to prevent or reduce the risk of attracting and establishing pests.
- Seek out new crops and varieties that can be best adapted to local agronomic and storage conditions.

**Example:** Practices such as crop rotation and alternating pesticide products can help avoid development of pest resistance

**2. Understand & Identify the pest**

Develop a management strategy using information on how the pest, crop and environment affect one another. Determine:

- How to correctly identify the pest and the damage it causes to a crop.
- The pest's life cycle and its preferred food and environment requirements—most pests go through at least one developmental stage where control measures and products are most effective:
  - Different products may target a different life cycle stage.
  - Timing the use of control tools and actions to occur at the pests' susceptible stage.
- What conditions promote pest introduction, development and population increase.
- How to identify any beneficial organisms that eat, compete with, or parasitize the pest.

**Example:** Two fungal diseases of chrysanthemum must be properly identified because one (brown rust) causes minor damage and is not of regulatory significance and the other (white rust) is an invasive pest regulated by the Canadian Food Inspection Agency (CFIA). Improper identification or a delay in action will result in greater infestation and significant crop losses.

**3. Monitor populations of pests and beneficial organisms, pest damage & environmental conditions**

Monitor the crop, flock or herd regularly to collect information on:

- The abundance and stage of development of pest populations;
- The numbers of beneficial organisms present;
- The crop stage and vigour;
- The amount of crop damage;
- Temperature and moisture conditions - used in models to predict the occurrence of specific pest stages which can assist in decisions regarding the timing of pest management actions.

**Example:** Using an apple scab forecasting model to determine when fungicides should be applied to protect apple orchards. The model uses leaf wetness and temperature data to predict the most likely period of infection.

**4. Use economic thresholds (where possible) and past experience in making pest control decisions**

Ideally, pests are controlled in advance of reaching a level that causes unacceptable economic damage. However, such threshold data do not exist for many pests. Take the following considerations into account when deciding if and when control actions are necessary:

- Use pest numbers and life stage information from monitoring:
  - The susceptibility of the crop to damage at various stages of growth.
  - Pesticide use restrictions such as pre-harvest interval, re-entry interval, buffer zone.
- Compare the pest control cost with the value of potential losses (quantity and/or quality) if the pest is not controlled (cost/benefit analysis):
  - Economic thresholds are specific for given crop/pest combinations and can vary depending on local crop values and control costs.
- Consult with local experts or use past experiences to make control decisions.

**Example:** Leaf rollers are counted in raspberry buds in spring and insecticide is used only if more than 10% of buds are affected (i.e., more than 10 leaf rollers per 100 buds).

## 5. Choose appropriate control methods

Use a combination of biological, cultural, mechanical, behavioural and chemical controls as described below.

**Biological Control:** beneficial organisms such as predators and parasites will help control pests. They are naturally occurring or can be released into an area to control pests when needed.

- Predators eat the pest.
- Parasites and some predators live in or on the pest to weaken or kill it:
  - Parasites are often very small but can be extremely important in controlling pests.
- Some microorganisms (i.e., bacteria, fungi, nematodes) reduce populations of plant pathogens or insect pests:
  - Healthy soils often have high populations of “good” microorganisms.
  - Commercially available beneficial microorganisms available (predators, parasites, nematodes, microbes are readily available).
- Monitoring and encouraging beneficial organisms is an important part of an Integrated Pest Management program.

**Example 1:** The controlled introduction of two moth species, (one feeds on roots and the other on leaves), and one flea beetle species, has provided successful control of the noxious weed Tansy Ragwort in localized areas on Vancouver Island and the Fraser Valley.

**Example 2:** Livestock grazing can help prevent weed seed production and gradually weaken the roots, reducing weed establishment and proliferation.

**Cultural Control:** production practices that discourage the introduction, establishment or development of pest populations, such as

- Selection of varieties resistant to pests.
- Planting cover crops that compete with weeds and provide shelter or food for beneficial insects.
- Rotating of crop species to reduce pest population levels.
- Timing of cultivation or soil disturbance.
- Pruning to remove diseased material, thinning fruit or plants to create an environment less attractive or conducive to pests.
- Planting certified clean material.
- Reducing the accumulation of plant residues and animal waste where pests can breed.

**Example:** Removal of waste material from confined livestock and poultry operations at least once every 10 to 12 days during the fly breeding season helps with fly control.

**Mechanical Control:** involves the use of barriers or devices to exclude or control pests. These include window screening, netting, rodent traps, seed cleaning to remove weed seeds, air curtains, fly paper, ground fabric, mulches

**Example:** Netting on grape vineyards to prevent bird damage on ripening fruit; audible scare devices to prevent bird damage of ripening fruit in orchards; timing tillage operation for weed control

**Behavioural Control:** takes advantage of specific attraction or repellent responses of pests to certain odours, sounds, and colours in order to cause confusion or disorientation and prevent mate or host finding

**Examples:** Insect mating disruption using sex attractants (pheromones), odour-baited traps, yellow sticky traps, distress recordings, repellents, and black light electrocutors for flies

**Chemical Control:** Can be considered when other preventive and non-chemical control options fail to prevent or reduce pest numbers or damage to an acceptable level. Pesticides vary greatly in risks posed to the environment, human health, and toxicity to non-target organisms (e.g., birds, fish, pollinators).

refer to  [Crop Production Guides](#)

- When possible, use lower risk pesticides that are compatible with Integrated Pest Management practices.
- Pesticides labels are legal documents and must be read prior to selecting and using the pesticide. Pesticide labels contain detailed information on how to use the product correctly and safely.
- In order to prevent or delay the development of pesticide resistance, always follow the general and product-specific resistance management directions on the label.

**Example:** Herbicides in pasture and rangeland, along with primary weed management strategies such as grazing and correct fertilizer applications can lead to good weed control.

## 6. Evaluate the effects & efficacy of the program

- Keep good records such as: pest and weather monitoring, pesticide application (site or area treated, products and amounts used, crop stage, application dates, application methods, spray volume), crop harvest dates, crop yield and quality, and any other observations related to the condition or appearance of the crop or animals.
- Annually review this information to decide how to improve the Integrated Pest Management program.

## Pathogens

Pathogens (disease-causing organisms) are easily spread and diseases impact the host (plant or animal). Prevention is the best management strategy, but early detection and treatment can also be effective. While many pathogens are crop-specific, some may affect a wide range of crops. Implement the following practices:

- ◆ Use clean certified seed or plant sources, where available.
- ◆ Remove infected plants or affected plant parts to prevent further spread.
- ◆ Practice crop rotation to discourage the build up of specific pathogens.
- ◆ Select disease-resistant varieties, where available.
- ◆ Use qualified laboratories to confirm pathogen identification and then follow their recommendations.

**Soil Fumigation.** This technique is used to control soil borne pests such as nematodes. Implement the following practices:

- ◆ Have a fumigation management plan.
  - ◆ Follow label restrictions.
  - ◆ Ensure applicators have been certified and are using proper equipment.
  - ◆ Do not apply when the weather forecast is for heavy rain.
  - ◆ Ensure that adequate moisture is in the soil prior to fumigation.
  - ◆ Use plastic tarps to seal in the fumigant to reduce air pollution and to increase effectiveness of treatment.
  - ◆ Ensure that adequate buffers are in place to prevent soil loss from fumigated fields left bare through winter.
- see Buffers, **page 11-4**

## Insects and Mites

Insects and mites are easily spread and can impact the host (plant or animal). The life cycles for many insect pests are well known and most management strategies target a specific developmental stage. Implement the following practices:

- ◆ Remove insects to prevent their spread to other hosts.
- ◆ Practice crop rotation to discourage the build up of pests.
- ◆ Select insect-resistant or tolerant varieties of crops, where available.
- ◆ Monitor population levels of both pests and beneficial organisms.
- ◆ Learn to identify all species and development stages of pests and beneficial organisms.
- ◆ Protect and encourage the establishment of beneficial organisms.
- ◆ When possible and appropriate, release (introduce) beneficial organisms.

**Flies in Confined Livestock Facilities.** An integrated fly management program involves a combination of appropriate animal waste management and fly prevention measures. Implement the following practices:

- ◆ Begin a fly control program early in the year.
- ◆ Maintain low fly populations by using.
  - Biological fly control programs.
  - Electronic zappers.
  - Chemicals such as fly cake and/or insecticidal bait bands or boards.

Implement the following practices to reduce the need for pesticides to control nuisance fly populations:

- ◆ Reduce or periodically remove fly breeding materials such as manure, bedding, and spoiled feed.
- ◆ Ensure that potential breeding materials are dried quickly and remain dry.
- ◆ Store manure in enclosed structures if it cannot be dried easily or if it cannot be spread every 10-12 days.
- ◆ Dispose of dead animals using approved disposal methods.

➔ see Livestock Mortality Disposal, **page 3-52**

In some situations, regular spraying with insecticides may be necessary for effective fly control. Seek advice from a qualified pest control specialist before embarking on any spraying programs. Ensure that only approved chemicals are used. Spraying should never be considered a substitute for proper waste management.

 [Management of Flies in Layer Barns](#)

## Weeds

Weeds reduce crop growth and affect the ability of crops to effectively use nutrients. Although some weeds can use a significant amount of soil moisture and nutrients, as they are not harvested, the nutrients remain in the field and will be released when the weed material breaks down. To reduce the impact of weeds, implement the following practices:

- ◆ Always use clean certified seed.
- ◆ Control problem weeds before they go to seed.
- ◆ Practice crop rotation to discourage build up of specific weeds.
- ◆ Learn to identify weeds, particularly at the seedling stage.
- ◆ Apply appropriate controls at the recommended stage of crop and weed development.
- ◆ Control persistent perennial weeds prior to planting crops.
- ◆ Use plastic and organic mulches to control or suppress weeds when appropriate.
- ◆ Prevent the movement of weeds to new locations via movement of livestock or equipment.
  - Discourage visits to the farm if the potential for weed movement exists.

➔ see Invasive Pests, next page

**Sawdust Mulch.** The use of sawdust mulch is a regular practice for some producers, particularly in the cultivation of blueberries, in reducing weeds.

- ◆ See the [Blueberry Production Guide](#) for more information.

 [Seven Steps to Managing Your Weeds: A Manual for Integrated Weed Management in British Columbia](#)

 [Rangeland Management BC](#)

 [Rangeland Handbook for BC](#) (not available online)

 [A Guide to Weeds in British Columbia](#)

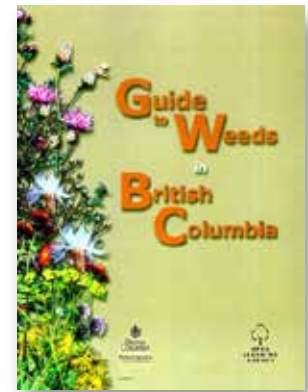
 [Enhancing Information and Collaboration for Managing Emerging Pests](#)

(Climate & Agriculture Initiative BC)

**Noxious Weeds.** Noxious weeds should be prevented from becoming established on a farm and, if present, prevented from spreading to neighbouring properties by following the above beneficial management practices for weeds. Noxious weeds are listed in the *Weed Control Regulation*.

 [Invasive Species Council of British Columbia](#)

 [Field Guide to Noxious and Other Selected Weeds of British Columbia](#)



## Wildlife

Some wildlife, such as rodents and some birds, are managed as pests. Other wildlife, such as deer, elk, or beaver, are managed as problem wildlife. For problem wildlife information,

→ see Biodiversity Conflicts, **page 7-25**

## Rodents

Rodents are a concern on the farm because they can spread diseases and bacteria (e.g., salmonella) and contaminate feed and other livestock and crop products. Rodents also cause structural damage by tunnelling through soil and buildings and chewing through wiring. To effectively ward off rodent infestations, implement the following practices:

- ◆ Control food and water supplies by:
  - Avoiding spillage of feed both inside and outside barns.
  - Keeping all feed in covered containers.
  - Eliminating water sources like leaky taps, sweaty pipes and open drains.
- ◆ Rodent-proof buildings and eliminate nesting sites by:
  - Keeping buildings in good repair.
  - Keeping areas next to buildings free of weeds, long grass, and debris.
  - Screening ventilation ports and other openings.
- ◆ Maintain good general sanitation and cleanliness throughout the farmstead.

When rats and mice are established, they can be controlled by poisoning with rodenticides, fumigating, trapping or any combination of such practices. Always place rodenticides in covered bait stations. If placed in and around manure piles, collect before the manure is removed for land spreading. Rodenticides spread on land with waste products pose a serious threat to pets, birds, farm animals, and wildlife.

 [Control of Rats and Mice on Poultry Farms](#)

## Birds

Starlings, robins, crows, magpies and other bird species may cause significant crop loss, are a nuisance to livestock and crop producers, and have been implicated in the spread of diseases. Control measures are usually less effective once birds have established feeding patterns. Implement the following practices:

- ◆ Bird-proof structures that store or contain grain.
- ◆ Clean up spilled grain immediately.
- ◆ Drain or fill-in water pools and puddles as starlings are attracted to water.
- ◆ Keep water in livestock waterers at levels low enough to prevent birds from drinking when perched on the waterer edge.

To manage damage to crops, use techniques or equipment such as bird distress calls, noisemakers, netting, population control, and starling traps. Check local municipality bylaws before using any methods.

 [Berry Production Guide](#)

 [Bird Predation Management Plan - Blueberries](#)

 [Starlings and Livestock Farms](#)

Manage audible bird scaring devices according to Normal Farm Practices as set out in established standards and decisions issued by the BC Farm Industry Review Board.

 [Audible Bird Scare Devices in BC](#)

Also refer to AGRI's Wildlife Damage Control guidelines.

 [Wildlife Damage Control – Interior BC](#)

 [Wildlife Damage Control – South Coastal BC](#)



# PESTICIDES



## PESTICIDE ENVIRONMENTAL CONCERNS

Primary environmental concerns related to pesticides are:

- ◆ Pesticides inappropriately applied, spray or vapour drift, spills, backflow and improper disposal of chemicals or containers that results in soil, water or air pollution; or in damage to non-target organisms.
- ◆ Birds and wildlife coming into contact with pesticides or crops receiving pesticide application that results in damage to birds and wildlife.
- ◆ Excessive application of petrochemical-based pesticides contributes to greenhouse gas emissions causing climate change. Increased application of all pest-control products adds to the farm energy consumption through elevated equipment use.

For detailed information on these concerns:

- ➔ see Impacts on Biodiversity and Habitat, **page 7-7**, and refer to Impacts to Biodiversity and Habitat
- ➔ see Soil Quality Factors, **page 8-1**, and refer to Contaminants
- ➔ see Water Quality and Quantity Factors, **page 9-1**, and refer to Contaminants
- ➔ see Air Contaminants, **page 10-1**

## PESTICIDE LEGISLATION

The following is a brief outline of the main legislation that applies to pesticides that are related to environmental protection.

- ➔ see **page A-1** for a summary of these and other Acts and Regulations

The *National Farm Building Code 1995* outlines standards for pesticide storage and **is enforced only where proclaimed by local governments.**

- ◆ SECTION 4.1.4: requires storage facilities for pesticides to:
  - Be vented to the outdoors, accessible from outdoors only, secured against unauthorized entry.
  - Have an impervious floor that is curbed to contain spills.
  - Be identified with a sign at entrance stating “Danger – Chemical Storage – Authorized Person Only” or words to that effect.
  - Be separated from all food, feed and water supplies.
  - Be insulated and have a heated cabinet for chemicals requiring frost protection.
  - Separate oxidizing and flammable chemicals.

Local governments may also have by-laws restricting the use of “cosmetic” pesticides; these bylaws do not apply to land used for agriculture, residential areas of farms or for the management of pests that impact agriculture



## Drinking Water Protection Act

This Act and Regulations have requirements regarding the protection of drinking water quality and regulate domestic water systems (those serving **more** than one single-family residence).

- ◆ SECTION 23(1): subject to subsection (3), a person must not (a) introduce anything or cause or allow anything to be introduced into a domestic water system, a drinking water source, a well recharge zone or an area adjacent to a drinking water source, or (b) do or cause any other thing to be done or to occur if this will result or is likely to result in a drinking water health hazard in relation to a domestic water system.



## Environmental Management Act

This Act describes responsibilities for use of pesticides in agriculture and other sectors and spill reporting, response, and recovery, which are supported by several regulations.

The *Code of Practice for Agricultural Environmental Management* requires persons to use environmentally responsible and sustainable agricultural practices when carrying out agricultural operations, for the purpose of minimizing the introduction of waste into the environment and preventing adverse impacts to the environment and human health. The AEM Code is expected to regulate discharges with respect to pesticides, with specific regulations coming into effect at a later date.

The *Code of Practices for Agricultural Environmental Management* regulates pesticide movement from the applicator's property.

SECTION 77.1: Unless an adjacent property owner agrees otherwise, a person who uses pesticides for the purpose of an agricultural operation must ensure that a no-treatment zone between an outdoor pesticide use area and the adjacent property is sufficient to prevent the unreasonable release of pesticide spray or runoff onto the adjacent property.

- ◆ "No-treatment zone" means an area of land that must not be treated with pesticide.

It is important for producers to ensure that their pesticide application practices adhere to SECTION 77.1 as described above, because it may be applied when a drift incident is being investigated in order to determine if the use of the pesticide resulted in an unreasonable release of pesticide to the adjacent property.

The *Spill Reporting Regulation* requires spills of a polluting substance be reported immediately to the Provincial Emergency Program (PEP) at [1-800-663-3456](tel:1-800-663-3456) (24 hour service). Report spills of pesticides (pesticide, pesticide mixture or waste) if the spill enters, or is likely to enter, a body of water, or if the spill is greater than 5 kg or 5 litres.

The *Hazardous Waste Regulation* (section 42(1)) specifies measures for the cleaning and disposal of pest control products and containers.



## Integrated Pest Management Act

This Act and the *Integrated Pest Management Regulation* have numerous requirements regarding the use, containment, transport, storage, disposal and sale of pesticides.

The *Integrated Pest Management Act* and Regulation establish conditions for the sale and use of pesticides in BC through a classification system and regulatory provisions for licences, certification, permits, Pest Management Plans and ministry confirmations of receipt of a pesticide use notice. The Regulation also contains public notification, consultation, reporting, and record keeping provisions – as well as standards for use of Integrated Pest Management and for human health and environmental protection.

Under the *IPM Act*, a person must not "use, handle, release, transport, store, dispose of or sell a pesticide in a manner that causes or is likely to cause an unreasonable adverse effect." This general prohibition, in concert with requirements for Integrated Pest Management (IPM), underpins the ministry's approach to regulation of pesticide use in BC.

Pesticide storage and safe handling practices may be reviewed by a Ministry inspector or a Conservation Officer (also designated as an inspector under the *IPM Act*) during a farm inspection.

- ◆ SECTION 3(1): Without limiting any other provision of this Act, a person must not (a) use a pesticide that causes or is likely to cause, or use, handle, release, transport, store, dispose of or sell a pesticide in a manner that causes or is likely to cause, an unreasonable adverse effect.

It is important for producers to ensure that their pesticide application practices adhere to Section 3(1), as described above, because it may be applied when a drift incident is being investigated in order to determine if the use of the pesticide resulted in an unreasonable adverse effect, or if the action was likely to cause the unreasonable adverse effect.

- ◆ SECTION 4(1): Except as provided in the regulations, a person must not use a pesticide for a prescribed use unless the person holds the licence that is, under the regulations, required for that purpose, and complies with the terms and conditions in or attached to that licence. When hiring a custom applicator (or when providing a spray service to another grower/farmer), a pesticide user licence and an applicator certificate are required.

#### *Integrated Pest Management Regulation*

- ◆ SECTION 18(1): Permit-restricted pesticides are considered to be prescribed for the purpose of the Act.
- ◆ SECTION 18(2): Except as provided in subsection (4), the following uses of a pesticide are prescribed for the purpose of the Act:
  - Aerial application of a pesticide.
  - Use of a pesticide, other than an excluded pesticide, in or on a body of water, unless a licence is required for the use or a confirmation is required for the use.

Aerial applications to private land used primarily for agriculture do not require a Pesticide Use Permit.

- ◆ SECTION 18(4): A use described in subsection (2) is not prescribed if:
  - The use is aerial application to private land used primarily for agricultural production, the use is aerial application of a Scheduled Pesticide, in accordance with a licence or a confirmation, and to land that is neither in an urban area nor used for residential purposes.

SECTION 33(1): A person who stores a pesticide must store it in a manner that:

- Minimizes hazards to human health and the environment, and
- Is in accordance with the standards prescribed in Sections 65 [pesticide container and labeling standards], 66 [pesticide storage] and 67 [pesticide storage — licensee], as applicable.
- ◆ SECTION 33(2): A person who transports or causes or allows the transport of a pesticide must ensure that the pesticide is secured and transported in accordance with the applicable standards prescribed in Division 7 [Standards for Use, Containment, Transport, Storage or Sale of Pesticide] of Part 2 and in a manner that prevents:
  - The escape, discharge or unauthorized removal of the pesticide from the transport vehicle, and
  - The contamination of food or drink intended for animal or human consumption, bedding or similar items that are transported with the pesticide.
- ◆ SECTION 33(3): A person who uses a pesticide must use it in a manner that:
  - Minimizes hazards to human health and the environment, and
  - Is in accordance with the applicable standards prescribed in Division 7 [Standards for Use, Containment, Transport, Storage or Sale of Pesticide] of Part 2 in relation to the handling, mixing, applying or disposing of pesticides, and the handling and disposal of containers used for pesticide.
- ◆ SECTION 65(1): Pesticide must be kept, handled, stored or transported:
  - In the container in which it was originally packaged and with the label originally affixed by the manufacturer, or
  - In a container designed for containing the pesticide and labeled in accordance with subsection (2).

- ◆ SECTION 65(2): For the purposes of subsection (1)(b), a label must display:
  - The trade name of the pesticide,
  - The name and the concentration of the active ingredient in the pesticide, and
  - The pesticide's registration number under the federal Act.
- ◆ SECTION 65(3): Subsections (1) and (2) do not apply to tanks being used for mixing pesticides for or holding pesticides during use.
- ◆ SECTION 66(1): Pesticide, other than excluded pesticides and domestic pesticides, must be stored:
  - Separately from food intended for human or animal consumption, and
  - In a storage facility that is ventilated so that pesticide vapours are vented to the outside, not used for the storage of food intended for human or animal consumption, locked when unattended, and accessible only to persons authorized by the person storing the pesticide.
- ◆ SECTION 66(2): Each door providing access to a facility described in subsection (1) must bear a sign that:
  - Has the words "warning: chemical storage — authorized persons only" written in block letters, and
  - Is clearly visible to a person approaching the door.
- ◆ SECTION 66(3): Fumigants and other pesticides that:
  - Release vapours, and
  - Bear a "poison" symbol on the label and must be stored in a storage facility that is not attached to or within a building used for living accommodation.
- ◆ SECTION 70(1): A container used to prepare, mix or apply a pesticide must not be washed or submerged in a body of water
- ◆ SECTION 70(2): If equipment is used to draw water from a body of water or an irrigation system into a container used to contain, prepare, mix or apply a pesticide, a gap must be maintained between the pesticide and the equipment so that pesticide is prevented from entering the body of water or irrigation system

A summary of the *Integrated Pest Management Act* and *Regulation* can be found at

 [Integrated Pest Management Act and Regulation](#)

Email: [bc.ipm@gov.bc.ca](mailto:bc.ipm@gov.bc.ca) or Phone: (250) 387-9502 or

 [Pesticide Certification and Training Website BC](#)



## Public Health Act

Administered by the Ministry of Health, this Act has a specific prohibition that "a person must not willingly cause a health hazard, or act in a manner that the person knows, or ought to know, will cause a health hazard". This prohibition would apply to farm practices that may result in a health hazard, such as when nutrients, contaminants or pathogens are discharged to land, water or air so as to pose a public health problem. Any situation that entails a health hazard will enable health officers to investigate using their powers under the Act. Under the *Public Health Act*, the local Health Authority must investigate any health hazard and has authority to order that a person prevent or stop a health hazard, or mitigate the harm or prevent further harm from a health hazard amongst other powers. Similar regulatory provisions exist for addressing health hazards to drinking water supplies under the *Drinking Water Protection Act*.

This Act prohibits activities that may cause a health hazard:

- ◆ SECTION 11: requires the reporting of any health hazard to a prescribed person (a health hazard may be the escape of toxic substances).
- ◆ SECTION 15: a person must not willingly cause a health hazard, or act in a manner that the person knows, or ought to know, will cause a health hazard.

The Act has conditions under the *Health Hazards Regulation*:

- ◆ SECTION 8: separation distance of wells to be 30 metres from any probably source of contamination.



## Wildlife Act

The provincial *Wildlife Act* protects wildlife designated under the Act from direct harm, except as allowed by regulation (e.g., hunting or trapping), or under permit. Legal designation as Endangered or Threatened under the Act increases the penalties for harming a species. The Act also enables the protection of habitat in a Critical Wildlife Management Area.

Agriculture Environment Management Code: Administered by BC Ministry of Environment and Climate Change Strategy, this AEM Code regulates pesticide movement from the applicator's property.

SECTION 77.1: Unless an adjacent property owner agrees otherwise, a person who uses pesticides for the purpose of an agricultural operation must ensure that a no-treatment zone between an outdoor pesticide use area and the adjacent property is sufficient to prevent the unreasonable release of pesticide spray or runoff onto the adjacent property.

- ◆ "no-treatment zone" means an area of land that must not be treated with pesticide.

It is important for producers to ensure that their pesticide application practices adhere to Section 77.1 as described above, because it may be applied when a drift incident is being investigated in order to determine if the use of the pesticide resulted in an unreasonable release of pesticide to the adjacent property.



## Fisheries Act

Administered by both Fisheries and Oceans Canada and Environment and Climate Change Canada, this Act is established to manage Canada's fisheries resources, including fish habitat. The Act can also be administered provincially by FLNRORD and ENV. The Act applies to all Canadian waters that contain fish, including ditches, channelized streams, creeks, rivers, marshes, lakes, estuaries, coastal waters and marine offshore areas. It also applies to seasonally wetted areas that provide fish habitat such as shorelines, stream banks, floodplains, intermittent tributaries and privately owned land. The Act includes provisions for stiff fines and imprisonment to ensure compliance.

The purpose of this Act is to provide a framework for (a) the proper management and control of fisheries; and (b) the conservation and protection of fish and fish habitat, including by preventing pollution.

This Act was updated in 2019 and now empowers the Minister to make regulations for the purposes of the conservation and protection of biodiversity.

The definition of fish habitat is: "water frequented by fish and any other areas on which fish depend directly or indirectly to carry out their life processes, including spawning grounds and nursery, rearing, food supply and migration areas". The quantity, timing and quality of the water flow that are necessary to sustain fish habitat are also deemed to be a fish habitat. Furthermore, serious harm to fish includes the death of fish or any permanent alteration to, or destruction of, fish habitat.

Provisions of the Fisheries Act relevant to agricultural operations include:

- ◆ Protection for all fish and fish habitats;
- ◆ Prohibition against the death of fish or the 'harmful alteration, disruption or destruction of fish habitat';
- ◆ A permitting framework and codes of practice to improve management of large and small projects impacting fish and fish habitat;
- ◆ Protection of fish and/or fish habitats that are sensitive, highly productive, rare or unique; and
- ◆ Consideration for the cumulative effects of development activities on fish and fish habitat.

Specific Sections of the Act include:

SECTION 34.2(1) The Minister may establish standards and codes of practice for:

- (a) The avoidance of death to fish and harmful alteration, disruption or destruction of fish habitat;
- (b) The conservation and protection of fish or fish habitat; and
- (c) The prevention of pollution.

SECTION 34.4(1) No person shall carry on any work, undertaking or activity, other than fishing, that results in the death of fish.

SECTION 35 (1) No person shall carry on any work, undertaking or activity that results in the harmful alteration, disruption or destruction of fish habitat.

Every person who contravenes subsection 34.4(1) or 35(1) is guilty of an offence and liable.

Notifying authorities about serious harm to fish or deposit of a deleterious substance:

SECTION 38 (4.1) Every person shall without delay notify an inspector, a fishery officer, a fishery guardian or an authority prescribed by the regulations of a harmful alteration, disruption or destruction of fish habitat that is not authorized under this Act, or of a serious and imminent danger of such an occurrence, if the person at any material time:

(a) Owns or has the charge, management or control of the work, undertaking or activity that resulted in the occurrence or the danger of the occurrence; or

(b) Causes or contributes to the occurrence or the danger of the occurrence.

SECTION 38 (5) If there occurs a deposit of a deleterious substance in water frequented by fish that is not authorized under this Act, or if there is a serious and imminent danger of such an occurrence, and detriment to fish habitat or fish or to the use by humans of fish results or may reasonably be expected to result from the occurrence, then every person shall without delay notify an inspector, a fishery officer, a fishery guardian or an authority prescribed by the regulations.

SECTION 38 (7) As soon as feasible after the occurrence or after learning of the danger of the occurrence, the person shall provide an inspector, a fishery officer, a fishery guardian or an authority prescribed by the regulations with a written report on the occurrence or danger of the occurrence.

## Migratory Birds Act

Under this Act, the federal government is responsible for implementing a Convention between Canada and the U.S. for the protection of migratory birds and nests. The Canadian Wildlife Service of Environment Canada administers the regulations.

Under the Regulations:

SECTION 35(1): prohibits the deposit of oil, oil wastes or any other substance harmful to migratory birds in any area frequented by migratory birds

Pesticides may be considered harmful substances..

## Pest Control Products Act

The Act and *Pest Control Products Regulations* require all pesticides used in Canada to be registered and have a Pest Control Products number on the label. Pesticides can only be used according to label directions (directions include environmental protection requirements).

Pest control products include herbicides, fungicides, insecticides, rodenticides, biological controls such as bacteria and viruses and antimicrobial agents such as those used in wood preservation, water purification systems and material preservatives. The intent of the legislation is to ensure the safety, merit and value of pesticides used in Canada.

It is an offence under the Act and its regulations to use an unregistered pesticide or to use a product in a way that is inconsistent with the directions or limitations as shown on the product label.

## Species at Risk Act

This Act has sections that protect listed species, their residence and critical habitat. It applies to federal lands, internal waters (i.e., all watercourses), territorial sea of Canada, and the air space above them.

The provisions of the *Species at Risk Act* (known as the 'safety net') could be invoked on BC crown and private lands using a federal order under the Act if provincial action is not sufficient to protect listed species..

## Transportation of Dangerous Goods Act

Under this Act, Transport Canada is responsible for regulating the handling and transportation of poisonous substances, flammable and combustible liquids and other products hazardous to the environment. The Act has been adopted as provincial legislation and is administered by the BC Ministry of Transportation and Infrastructure.

Dangerous goods may include pesticides. Transportation of large quantities (more than 500 kg) of pesticides requires shipping documents, special product labels and vehicle placards.

This Act and *Transportation of Dangerous Goods Regulations* provide requirements for the handling and transportation of “poisonous substances” which includes pesticides. Farmers transporting more than 1,500 kg of pesticides in a licensed farm vehicle more than 100 km must comply with special requirements. Farmers moving a sprayer containing more than 6,000 litres of spray mixture for more than 100 km on a public road must comply with special requirements.

### PESTICIDE BENEFICIAL MANAGEMENT PRACTICES

Comply with applicable pesticide related legislation, including the above, and where applicable, implement the following beneficial management practices to protect the environment.

Since pesticides are designed to harm target organisms, take proper safety precautions to protect non-target organisms and the environment. If pesticides come in contact with surface water or groundwater there is a high risk of environmental impact.

### Pesticide Applicators Certificate

Certification and/or training is required for anyone who:

- ◆ Purchases or applies restricted class pesticides.
- ◆ Assists a certified applicator in the application, transportation, storage, and security of pesticides.
- ◆ Applies pesticides for authorization holders (business or organizations that have pesticide use permits, pest management plans or pesticide user licences).
- ◆ Dispenses (sells) pesticides for a licensed vendor.

Pesticides listed on Schedule 2 of the *Integrated Pest Management Regulation* do not require a certificate for application. Some specific training is needed in order to become certified as a pesticide applicator.

### Pesticide Risks

**Pesticide Movement.** A pesticide is any material used to kill, control or manage pests, including products to manage the growth of plants. The primary concern related to pesticides is any unwanted movement to sensitive environmental areas such as watercourses, groundwater, fish or wildlife habitat. Pesticides can move off-target by:

- ◆ Drift – the movement of spray droplets or vapour in the air.
- ◆ Runoff – the movement across the surface of the land in water or bound to eroding soil.
- ◆ Leaching– the movement in water through the soil.
- ◆ Direct transport – the movement of soil, vegetation and other materials that contain pesticide residues.

Movement of pesticides depends on pesticide characteristics, site characteristics, and pesticide application practices.

**Pesticide Characteristics.** Once released into the environment, pesticides dissipate at varying rates. Dissipation characteristics influence a pesticides' potential to harm the environment. Such characteristics include:

- ◆ Degradation – the ability to break down in the environment.
  - Pesticides are broken down by microbes, chemical reactions, hydrolysis and sunlight.
  - The faster a pesticide degrades in the soil, the less likely it is to be carried to aquatic systems and groundwater.
- ◆ Volatility – ability to turn into fumes.
- ◆ Solubility in water – ability to dissolve in water soluble pesticides can leach through soil to groundwater.
- ◆ Adsorption – the ability to bind onto soil particles.
  - Pesticides that bind to soil particles are less likely to contaminate water.
- ◆ Absorption – ability to move into organisms or materials.
- ◆ Bio-accumulation – ability to accumulate in tissues.
- ◆ Toxicity – the degree to which a substance is harmful or poisonous.

When selecting pesticides, choose ones with the shortest degradation period, lowest volatility, lowest solubility, highest capacity to bind onto soil, and lowest toxicity.

**Site Characteristics.** Site conditions affecting pesticide movement include:

- ◆ The infiltration and permeability of soil.
- ◆ The binding capacity of soil to hold pesticides.
- ➔ see Contaminant Leaching in Soil, **page 8-15**
- ◆ The closer the water table is to the surface, the greater the contamination risk.
- ◆ The closer proximity to surface water bodies, the greater the contamination risk.
- ◆ The steeper the slope, the greater is the risk of runoff (slope direction determines runoff path).

If a site is likely to pose a high risk of pesticide movement, select crops or production methods that require little or no pesticide application.

The product label will state if there are certain environmental conditions (e.g., minimum temperature, maximum temperature, precipitation amount) that should be observed when applying that specific product.

**Pesticide Mixes.** The Pest Management Regulatory Agency provides guidance on the use of unlabelled tank mixes of commercial class pest control products used for crop production or vegetation management, as long as:

- ◆ Each tank mix partner is registered for use in Canada on the crop of interest, including genetically modified crops.
- ◆ The tank mix only includes an adjuvant, when specifically required by one of the tank mix partner labels. If an adjuvant is not required on the label of any tank mix partner, then no adjuvant may be added to the tank mix.
- ◆ The application timings of all tank mix partners are compatible with crop and pest staging.
- ◆ Each tank mix partner is applied in accordance with its registered product label (Directions for Use, Precautions, Buffer Zones, etc.). In cases where information on the tank mix partner labels differs between them, the most restrictive directions must be followed.
- ◆ The tank mix is not specifically excluded or contraindicated on either tank mix partner label.
- ◆ The use of the tank mix provides additional value to the user (e.g., increased scope of pests controlled, contributes to resistance management or integrated pest management, cost or time savings).

**Application Practices.** Application characteristics affecting the movement of pesticides include:

- ◆ Application method – direct-applied pesticides (wipe-on) have a lower risk than sprayer-applied.
- ◆ Droplet size – coarse droplets are less prone to drift than fine droplets.
- ◆ Application rate – lower rates decrease the risk of runoff and leaching.



When selecting pesticide application equipment, check the label information. If feasible, choose methods that wipe-on chemical or produce coarse droplets, and have low application rates.

## Pesticide Transport

When transporting pesticides, implement the following practices:

- ◆ Follow requirements of *Transportation of Dangerous Goods Regulations*.
- ◆ Transport only pesticide containers that are undamaged, properly labelled and securely closed.
- ◆ Secure pesticide containers in transport vehicles.
- ◆ Transport in a separate compartment from people, animals, food or clothing.
- ◆ Place pesticides on non-absorbent materials such as metal or plastic (wood is not considered a preferred material to wash spillage from).
- ◆ Carry a pesticide spill clean-up kit.

## Pesticide Storage Requirements

When storing pesticides, implement the following regulations and practices:

- ◆ Use a locked, dry building that is vented to the outside and with a “Warning– Chemical Storage – Authorized Person Only” warning sign posted on the door.
- ◆ Locate the building away from yard drains, ditches, wells, and watercourses:
  - At least 30 m from any well (*Public Health Act - Health Hazards Regulation*);
  - 15 m or more from watercourses (suggested);
  - 30 m or more from a water intake used for domestic purposes (suggested);
  - If in an area is vulnerable to flooding or surface runoff, consider moving to a different site, raising the building floor above flood levels, or wet-proofing the pesticide storage structure.
- ◆ Label container with the name, trade name, concentration of active ingredient, and Pest Control Product (PCP) registration number. PCP numbers are required under the *Pest Control Products Act* to identify pest control products that achieve a satisfactory assessment for use.
- ◆ Store pesticide-treated seed in areas where animals, including wildlife will not come in contact with the seed.
- ◆ Store pesticides in their original containers and close containers tightly.
- ◆ If the original container is damaged, place pesticide in a suitable container.
- ◆ If the original label is illegible or missing, obtain a replacement label from the supplier or website.
- ◆ Do not store food, feed, fertilizer, seed, livestock or livestock medication with pesticides.



## Pesticide Storage Recommendations

- ◆ Store following label directions – check MSDS sheets for more information:  
[www.msds-online.com/msds-search](http://www.msds-online.com/msds-search)
- ◆ Construct the storage with curbs of concrete or other impervious material that will contain spills and allow for easy clean-up.
- ◆ Site to protect the storage from collision by vehicular traffic.
- ◆ Store herbicides separate from other pesticides to prevent cross-contamination.
- ◆ Locate a pesticide spill clean-up kit nearby.
- ◆ Keep an updated list of stored pesticides in case of fire or spill emergencies.
- ◆ Keep a list of emergency phone numbers in a convenient location known by all farm workers.
- ◆ Refer to **Figure 5.1**, for an example of a pesticide storage shed.

 [On Farm Pesticide Storage and Handling Facilities](#)

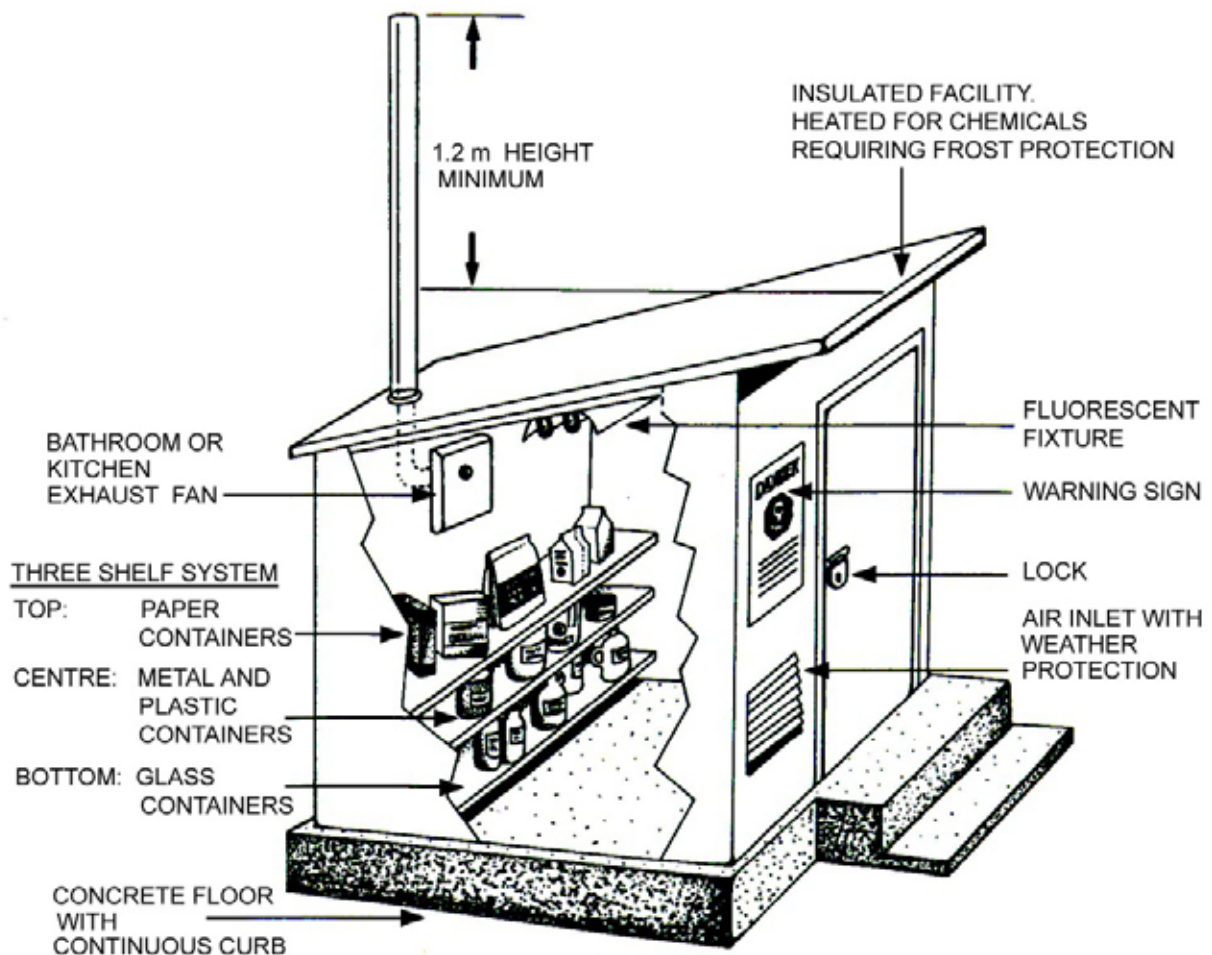


FIGURE 5.1 Pesticide Storage Shed

## Pesticide Use

Use Integrated Pest Management (IPM) principles to determine if and when pesticides may be needed. Only use pesticides that are registered for a particular pest and crop. Pesticide labels have environmental protection information (such as buffer zones). Follow the specified uses and instructions on the label to minimize impacts to the environment.

 [Pesticides and Pest Management BC](#)

Follow best practices to protect health and safety of workers who work with or near pesticides. WorkSafeBC has published a manual:

 [Standard Practices for Pesticide Applicators](#)

**Pre-Application.** Before mixing pesticides, implement the following practices:

- ◆ Ensure that the correct pesticide is selected for a given pest.
- ◆ Read the label carefully, including any attached booklets, and follow safety precautions and instructions.
- ◆ Pesticides can only be applied via aerial application or chemigation if it is stated on the pesticide label.
- ◆ Know the size of the crop area to be treated and know exactly how much pesticide is required for that area to avoid excess chemical disposal.
- ◆ If spraying near an environmentally sensitive area, ensure that the pesticide can be used safely.
  - Determine the size and type of buffer zone needed to protect the sensitive area.
- ➔ see Buffers, **page 11-4**
- ◆ Ensure that the application equipment is in good working order.
- ◆ Ensure that equipment is calibrated.
- ◆ Be prepared to handle a spill.

**Equipment Calibration.** Before mixing pesticides, ensure the equipment will apply the correct amount uniformly by completing a thorough calibration. Implement the following four-step equipment calibration practice:

- ◆ **Step 1:** set-up of the equipment (usually the most time-consuming step, but one that must be done to ensure uniform and properly targeted application).
  - Ensure there are no leaks, the spray boom is properly arranged for the target, and the swath width and driving pattern are determined.
  - Select nozzles, spray pressure and spray volume.
  - Measure the output of individual nozzles for uniformity and wear.
- ◆ **Step 2:** measure the delivery rate of the application equipment.
- ◆ **Step 3:** adjust the delivery rate, if required, after comparing the measured delivery rate to the rate recommended on the pesticide label or the Production Guide.
- ◆ **Step 4:** calculate the amount of pesticide to add to the sprayer tank to provide the correct pesticide application rate.

Calibration should be done:

- ◆ Before new or altered equipment is used.
- ◆ When making changes that affect the delivery rate.
- ◆ At regular intervals to see if wear is affecting output.
- ◆ At least once a year.
- ◆ Prior to the first application of the year.

 [Crop Production Guides](#)



 [Suggestions for Field Sprayer Operation and Maintenance](#)

 [Calibration Worksheet – Boom Sprayer](#)

**Sprayer Filling and Mixing.** To protect the environment at filling and mixing locations, implement the following practices:

- ◆ Install an approved back-flow prevention device on the waterline or ensure that an air gap of at least 30 cm (suggested) between the end of the water supply line and the spray tank exists.
- ◆ Locate sprayer filling sites:
  - At least 30 m from any well (*Public Health Act – Health Hazards Regulation*).
  - 15 m or more from watercourses (suggested).
  - At a lower elevation than any wells – if not at a lower elevation, have a berm around the well to divert runoff.
  - With buffer areas between it and all watercourses.
- ➔ see Buffers, **page 11-4**
- ◆ Mix only the required pesticide needed for a single day.
- ◆ Have spill cleanup equipment such as absorptive materials, personal protective equipment and shovels readily available.
- ◆ After emptying any pesticide container and prior to spraying its contents, rinse the container and pour the rinse water into the sprayer (rinse according to **Table 5.3**).

**Application.** While applying pesticides, implement the following practices:

- ◆ Have valid certification and training.
    -  [Pesticide Certification and Training BC](#)
- Conditions have been placed on fumigation certifications and pesticide licences to ensure fumigations are performed safely, and according to pesticide labels and current standards.
-  [Fumigator Applicator Certificate BC](#)
  - ◆ Use the application rate specified on the label.
  - ◆ Maintain an untreated buffer between treated areas and sensitive areas.
  - ◆ Follow pesticide label setbacks from non-target aquatic and terrestrial areas, and from wells.
  - ➔ see Buffers, **page 11-4**
  - ◆ Only apply pesticides by aircraft or chemigation if specified on the label.
  - ◆ Use GPS guidance systems where appropriate to avoid application overlap.
  - ◆ Apply pesticides in suitable weather conditions:
    - Do not spray in strong winds over 8 km/hr.
    - Do not apply if heavy rain is expected.
  - ◆ Protect bees and other beneficial insects by applying pesticides:
    - When flowers are not present.
    - During early morning or late evening hours when insects are not active.
    - Away from insect drinking water sources.
    - That are least toxic to insects.
  - ◆ Shut off spray nozzles when they are over non-targeted areas (e.g., while turning on headlands).
  - ◆ Incorporate granular insecticides into soil to protect birds and wildlife.

**Drift Control.** Drift refers to the movement of pesticide droplets, dust or vapours, by wind or air currents, away from target areas.

The degree of drift is strongly related to droplet size. The smaller the droplet, the farther wind carries them from the target area. Fine droplets can be carried several kilometres. In addition, larger distances between the sprayer nozzle and the target will result in more drift.

Vapour drift from volatile chemicals can continue long after the spraying operation is completed. Small amounts of highly volatile pesticides can impact susceptible plants and watercourses near treated areas. This can occur even under stable air conditions because vapours tend to flow along the ground without dispersal.

To minimize spray drift, implement the following practices when practical:

- ◆ Replace or clean faulty nozzles to reduce fogging.
- ◆ Use nozzles such as low-pressure, air induction, flooding, or raindrop nozzles to produce drops more resistant to drift.
- ◆ Use shrouded, air-assist or tunnel sprayers.
- ◆ Only use special, low-volume sprayers where suitable.
  - Such sprayers typically produce small droplets more subject to drift.
- ◆ Apply pesticides at low spraying pressures to reduce the number of fine spray droplets.
- ◆ Keep boom height as low as possible while maintaining uniform coverage.
- ◆ Do not spray during strong or gusty wind conditions or during dead calm.
  - Avoid spraying during conditions when temperature inversions may occur.

Use plastic tarps when fumigating soils to contain fumigant. Tarps not only reduce air pollution but increase the effectiveness of treatment. Tarp removal or cultivation of fields too soon after fumigation can result in the release of unwanted pesticide into the air. Plastic used in fumigation should go to a landfill. Soil Fumigation requires a fumigation applicators certificate.

**Buffer Zones.** Many pesticide labels have buffer zone information on the label. The pesticide labels may specify:

- ◆ Whether the buffer zone is to protect aquatic and/or terrestrial habitat.
- ◆ What is considered to be aquatic or terrestrial habitat (See **Figure 5.2**).
- ◆ The type of pesticide application equipment that requires a buffer zone.
- ◆ If and how buffer zones can be reduced; the use of drift reducing spray shields, special nozzles, or other application modifications may allow the applicator to reduce the buffer zone.
  - And any types of application equipment that do not need a buffer zone.
- ◆ That the buffer zones on a label are required between the point of direct application and the closest downwind edge of sensitive terrestrial or aquatic habitats.
  - Buffer zones may depend on wind direction.
- ◆ The size of the buffer zone (see the example in **Table 5.2**).

TABLE 5.2		Example of a Buffer Zone on a Pesticide Label			
Method of Application	Crop		Buffer Zones (metres) Required for the Protection of:		
			Freshwater Habitat of Depths:		Terrestrial Habitat
			Less than 1m	Greater than 1m	
Field Sprayer	Field crops		10	5	1
Airblast Sprayer	Stone fruits and grapes	Early Growth stage	40	30	2
		Late growth stage	30	25	1

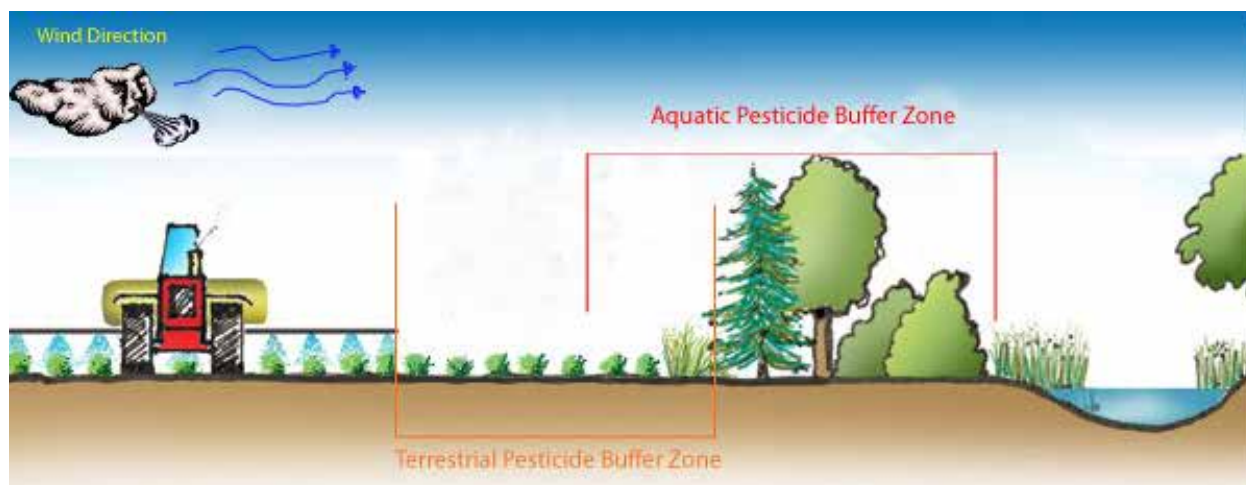


FIGURE 5.2 Identifying Aquatic and Terrestrial Buffer Zones

**Leaching Control.** Pesticides that have a tendency to leach into groundwater may have special restrictions on the label. Read and follow these instructions. Be aware of the depth of the groundwater and characteristics of the site and pesticides applied.

**Runoff Control.** Runoff from areas treated with pesticides can pollute streams, ponds, lakes and wells. To reduce pesticide runoff, implement the following practices:

- ◆ To prevent the application of pesticides immediately prior to a heavy rain, check the weather forecast (rain can wash pesticides off treated surfaces and can cause runoff or erosion to occur from treated areas).
- ◆ Use minimum tillage techniques to reduce soil erosion and runoff of pesticides bound to the soil.
- ◆ Leave a buffer of vegetation and plant material around ditches and natural water bodies to filter pesticide-contaminated runoff.
- ◆ Collect contaminated runoff, where feasible.

➔ see Runoff, page 9-51

**Equipment Washing.** When washing equipment used to apply or mix pesticides, implement the following practices:

- ◆ Clean sprayers as far as conveniently possible from watercourses, ditches, or wells to prevent pesticide movement from runoff into watercourses, or via leaching to groundwater.
  - Cleaning sites must be at least 30 m from any well (*Public Health Act – Health Hazards Regulation*).
  - 15 m or more from watercourses (suggested).
- ◆ Dispose of wash water by using as a pesticide or by following **Table 5.3**.

**Record Keeping.** Knowing when, where and how pesticides were applied is a critical part of an IPM program, implement the following practices:

- ◆ Maintain a record of all pesticide applications including the site (field size and location), date, target pest, pesticide and amount used, crop stage, harvest date, application method, spray volume, weather observations, and precautions followed (e.g., buffer zones).
- ◆ Food safety programs and WorkSafe BC also have record keeping requirements; incorporate their requirements into your records.

 [WorkSafeBC Standard Practices for Pesticide Applicators](#)

- ◆ Often there are examples of records in Crop Production Guides.

➔ see, page 5-8 for list of Guides

**Pesticide Application to Livestock.** Several species of insects and mites attack cattle. Pesticides are available in various formulations to protect livestock from injury and disease associated with pest attack. New livestock pests may emerge with climate change for which pesticides are not readily available.

 [Farm Practice Pest Management](#)

Pesticides applied to animals for the purposes of reducing disease or applied internally to control arthropods are not considered pesticides and are exempt from the *Integrated Pest Management Act and Regulation*.

To avoid contamination of soil and water, implement the following practices:

- ◆ Use pour-on or spot treatments in place of whole-body sprays.
- ◆ Place self-activated and forced-use pesticide backrubbers at least 30 m from wells (*Public Health Act – Health Hazards Regulation*) and 15 m from watercourses (suggested).
- ◆ Ensure that backrubbers are not leaking and are adjusted correctly for dispensing appropriate concentrations of insecticide.
- ◆ Ensure that used insecticidal ear tags are collected and properly disposed.

## Pesticide and Pesticide Container Disposal

Disposal of pesticides is complicated and expensive. The best precaution to avoid disposal is through good planning. Plan pesticide purchases to minimize the amount of pesticides stored and the accumulation of unwanted pesticides.

**Excess Mixed Pesticide.** Implement the following practices:


- ◆ Reduce the volume of waste by mixing only the amount of pesticide required for a specific application.
- ◆ Do not store excess mixture in spraying equipment for extended periods of time.
  - Some pesticides may undergo chemical degradation resulting in a decrease in efficacy.
- ◆ Use excess spray mixtures on another crop or at another site if label specifications allow.
- ◆ Do not exceed label application rates by re-spraying treated areas.
- ◆ Do not dump unused mixed pesticide on land or allow to drain into sewers or other piping systems.

**Excess Concentrated Pesticide.** Implement the following practices:

- ◆ Purchase no more than one year's supply of pesticide at a time.
- ◆ Return unopened pesticide containers to the manufacturer or dealer.
- ◆ Do not dump unused or unwanted pesticide concentrate on land or allow to drain into sewers or other piping systems.
- ◆ Contact a hazardous waste disposal company or ENV for information on disposal of leftover pesticides.
- ◆ Occasionally there are agricultural unwanted pesticide collection programs that will accept unwanted pesticides from farmers. These collections are advertised through grower associations, the BC Agriculture Council or pesticide distributors.

**Disposal of Empty Pesticide Containers.** After emptying pesticide containers it is a legislative requirement that all pesticide containers are properly rinsed and disposed of as outlined in **Table 5.3**. After rinsing the container implement the following practices:

- ◆ Crush or puncture the container so that it cannot be reused.
- ◆ Dispose of containers at pesticide container collection sites, or safely store for a short time until disposal is more convenient.
- ◆ Do not burn paper or plastic pesticide bags to prevent the release of toxic fumes.

Some pesticide dealers in BC now accept properly rinsed metal and plastic containers for recycling. This is the preferred disposal method for containers. Visit  [Clean Farms](#) to find disposal locations and procedures for your region.

**TABLE 5.3 Hazardous Waste Regulation for Empty Pesticide Containers**

Rinsing Method for Empty Pesticide Containers ★	
Type of Container	Rinsing Method
Rigid plastic or metal (non-pressurized)	Pressure rinse <sup>1</sup> for 30 seconds or single rinse 3 times
Rigid plastic or metal (pressurized)	No rinsing required
Glass bottle	Rinse <sup>2</sup> three times
Paper or plastic bag	Rinse
Containers labeled "Domestic"	No rinsing required
Any container type not listed above	As approved by ENV

**Disposal Method for Empty Pesticide Containers ★**

The owner of a waste pesticide product container that has been emptied and rinsed must recycle or dispose of it:

- (a) in an approved landfill, or;
- (b) by burying it, but only if;
  - (i) the burial location is on land owned or leased by the person owning the container or is on land owned, leased or maintained in a tree farm licence as defined in the Forest Act by the person owning that container;
  - (ii) the burial location is on flat ground, not in a swale and at least 200 m from surface water or a well;
  - (iii) the ground does not consist of gravel, sand or other similarly porous material, and;
  - (iv) the owner covers it with at least 0.5 m of soil immediately after burial.

**Disposal Method for Container and Equipment Wash Water ★**

Waste produced by cleaning pesticide application equipment or by rinsing waste product containers must, if practicable, be used in mixing a product solution but, if not practicable, it may be applied to land if the area to which it is applied.

- (a) is on land to which the product contained in the waste has been applied for purposes of pest control,
- (b) is flat ground, not in a swale, and at least 200 m from surface water or any well, and
- (c) does not consist of gravel, sand or other similarly porous material.

★ See *Hazardous Waste Regulation* section 42 - these methods must be used for the containers not to be considered a hazardous waste.  
 1 pressurized spraying of an appropriate solvent into an empty container for at least 30 seconds  
 2 introduce an appropriate solvent into an empty container in an amount not less than 20% of its volume, to close and shake the container so that the solvent makes contact with all interior surfaces, and to open and empty the container

## Pesticide Storage Fires

Pesticide fires are extremely dangerous because they may release highly toxic fumes. Implement the following practices:

- ◆ Keep an up-to-date list of stored pesticides in an easily accessible location separate from the storage.
- ◆ Inform local fire department about the type of pesticides stored and location of storage.
- ◆ Post a warning sign on all entrance doors to any pesticide storage facility.
- ◆ Keep emergency phone numbers posted in an accessible location.
- ◆ Keep pesticide storage areas locked.
- ◆ Do not store pesticide in glass containers in sunlight.
- ◆ Keep fire extinguishers approved for chemical fires near storage areas.
- ◆ Store combustible materials away from heating systems.

If a fire occurs, call the fire department and keep people upwind and away from the fire. Warn firefighters of the presence of pesticides in the building.



## Pesticide Spills

Be prepared to handle spills by having a pesticide spill cleanup kit when transporting, storing or using pesticides. Such a kit includes gloves, protective clothing, containers for contaminated waste, tools to collect the waste and absorbent materials such as clay, kitty litter or sawdust.

Report pesticide spills in accordance with all of the following:

- ◆ *Public Health Act* (a prescribed person as defined by regulation).
- ◆ The *Spill Reporting Regulation* of the *Environmental Management Act* (contact the 24-hour Provincial Emergency Program **1-800-663-3456** to report).
- ◆ The *Integrated Pest Management Act and Regulation*.

If a pesticide spill occurs, proper cleaning and decontamination of the area may avoid environmental contamination. Implement the following practices:

- ◆ Prevent exposure of people and animals to the pesticide and its fumes.
- ◆ Put on appropriate personal protective equipment.
- ◆ Prevent the spread of the pesticide.
- ◆ Cover a liquid pesticide with soil, sawdust or any absorptive material to prevent spread or entry into a watercourse or subsurface drain.
- ◆ Dry formulations can be swept up and reused if they have not become wet or contaminated with soil or debris.
- ◆ Place collected contaminated dry formulations and absorbent material into an empty clearly-labelled garbage container and contact ENV for information on appropriate disposal.
- ◆ If possible, safely decontaminate the surfaces that the spill has come into contact with.
- ◆ Check the label for specific directions – many pesticides can be detoxified by washing the area with chlorine bleach and detergent – do not use excessive amounts of water.
- ◆ Prevent the wash solution from spreading and contaminating a larger area.
- ◆ If the spill occurs on the soil, remove the top 5 to 7 cm of soil (suggested), cover the area with lime and uncontaminated soil and contact ENV for instructions on disposal of contaminated material.
- ◆ If the spill occurs beside a watercourse, remove the top layer of contaminated soil immediately and relocate it to a safe site.

### REPORTING REQUIREMENT

Under the ***Spill Reporting Regulation***, pesticide spills greater than 5 litres or 5kg of product, mixture or waste must be reported **immediately** to the Provincial Emergency Program (PEP) at **1-800-663-3456** (24hr service).

It is very easy to generate more than 5 kg or 5 L of contaminated materials. By law, ENV must be contacted for advice on the proper method for disposal. If the spill takes place in a public area like a highway, call the local police. If the spill has released pesticide into the environment, contact the 24-hour Emergency Management Program (EMP) at **1-800-663-3456**.

## Pesticide Contingency Plan

Have a list of emergency numbers so it is easy to notify emergency responders (such as the local fire department) of the amount and type of pesticide stored and the storage locations. Develop a contingency plan when storing any quantities of pesticides. The plan should provide a timely and effective response to any emergencies involving the release of pesticides into the environment, from:

- ◆ Accidental spills, such as when transporting, storing, applying or dispensing.
- ◆ Release due to building fires or natural events, such as forest fires, floods, or earthquakes.
- ◆ Release due to vandalism.
- ◆ Application errors, such as applying the wrong pesticide or too much pesticide.

 [Contingency Plan – Template for On-Farm Planning](#)