Chapter 4

ENVIRONMENT

Turf and landscape maintenance programs may include the application of pesticides in areas that are in close proximity to people, pets, sensitive plants, and wildlife. Pesticide applicators must always be aware of their surroundings. They must use care at all times to reduce non-target exposure and protect the environment. This chapter describes ways to protect important parts of the urban environment from pesticides.

Learning Objectives

Completing this chapter will help you to:

- **Know the impact that improper pesticide use can have on the environment, public, and pets.**
- **Know how to prevent contamination in an urban environment.**

Environmental Exposure

There is always a risk that landscape pesticide applications may affect the public, pets, sensitive plants, and the environment. People may walk into an area that is being treated. Children and pets may cross a newly treated playground. Pet dishes and toys may be accidentally exposed to pesticides.

During turf and landscape pesticide applications, care must be taken to avoid:

- Exposing people, pets and wildlife
- Pesticide runoff into storm sewers or open bodies of water
- Contaminating fishponds and pools
- Creating drift or leaching onto nearby properties
- Contaminating nesting birds and foraging bees when spraying trees
- Damaging sensitive plants and food gardens

General Guidelines for Protecting the Environment

To protect humans, pets, and the environment when working with pesticides:

- Develop integrated pest management (IPM) programs for the sites being managed.
- Follow all label directions.
- Use IPM principles.
- Avoid applications during nesting or feeding times for sensitive animal species.
- Select pesticides that reduce hazards to sensitive species (e.g., nesting birds, bees).
- Use equipment or spray methods that reduce drift (e.g., basal bark treatments, wipe-on or wick applicators for herbicides, low pressure settings, and coarse spray nozzles for sprayers). Reduce

spray pressure to increase droplet size. (Refer to **Nozzle Pressure** and **Spray Droplet Size** in **Chapter 7**.)

- Reduce the distance between the nozzles and the target.
- Add only approved drift control adjuvants or surfactants to the spray tank.
- Consider the site when choosing pesticides (e.g., granules for soil applications, sprays for foliar applications).
- Follow all provincial and municipal requirements (e.g., sign posting, permits, etc).
- Check wind speed and direction. Make sure conditions are within provincial and/or label wind speed guidelines.
- Do not apply volatile formulations such as ester formulations.
- Increase spray contact on the target by not spraying in high temperatures (especially with volatile pesticides). This also reduces the amount of pesticide that moves off-target through vapour drift.

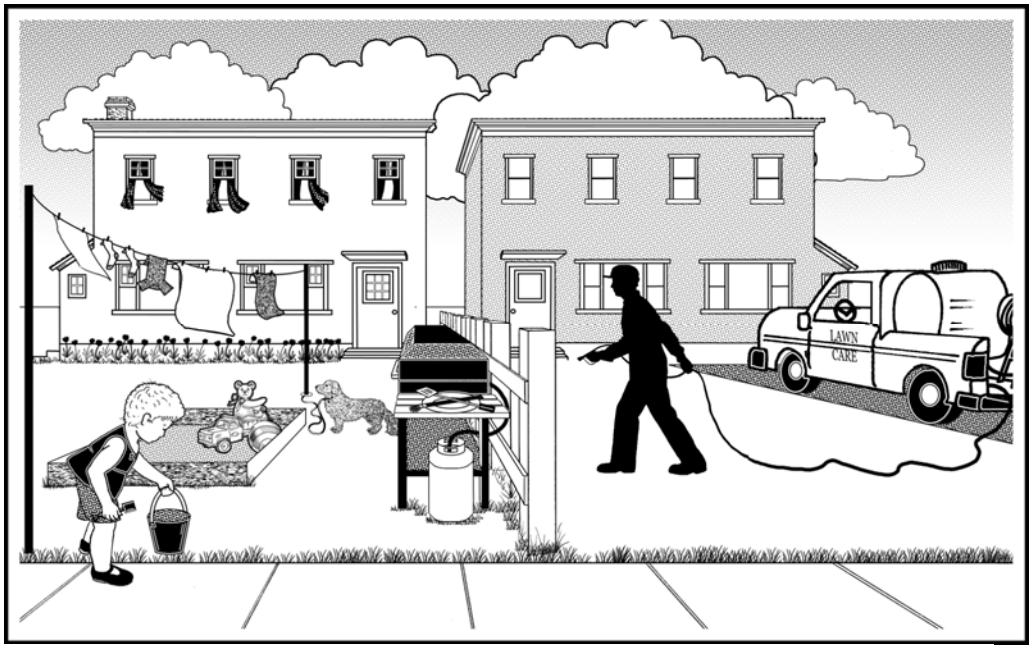

Figure 4-1: Notify nearby property owners before applying a pesticide so that they can keep children, pets, food and toys away from the area to be treated.

Guidelines to Protect Bystanders from Pesticides

Turf and landscape pesticide applications often take place in urban settings. This increases the risk of bystander exposure. Exposure can be direct (e.g., exposure to spray drift) or indirect (e.g., walking on recently treated turf). To reduce the risk of exposure, follow all provincial and municipal requirements. These may include requirements to:

- Notify the owners of nearby properties prior to a pesticide application. This allows nearby property owners to remove pets, pet dishes, children's toys etc., close windows and turn off air exchangers located near the treatment area if they wish.
- Post public areas with signs stating where and when treatments are planned, or have occurred.
- Use pesticides only during times of low public activity (e.g., weekends for school grounds, early morning for parks).
- Avoid spraying near public roadways when children or pedestrians are present.
- Tell owners or occupants of private land what to do to prevent exposure (e.g., avoid newly treated areas).

Guidelines to Prevent Contamination of Adjacent Land and Water Bodies

Water and land next to a property being treated should be protected from pesticide contamination. Contamination of water can occur as a direct or indirect result of runoff, leaching, or drift. Protect non-target areas near the application site by following the guidelines found in this chapter.

We all depend on clean drinking water. Water supplies must be protected from contamination. Prevention is key.

- Consult provincial or municipal regulatory bodies to find out the locations of municipal surface or groundwater supplies.

- Ask the property owner for the location of any private wells. Follow all set back requirements.

- Protect water bodies by mixing pesticides and washing equipment away from them.

- Leave an appropriate buffer between the treatment area and the water body. This reduces the risk of pesticide contamination. The buffer width may be governed by the label, or provincial authorities. The required buffer width may vary from site to site. It may depend on the slope of land, presence of vegetation, and type of soil. Fish-bearing waters must be protected. Refer to the **Applicator Core Manual - Environment** and **Applicator Core Manual - Pesticide Safety.** These chapters tell how to prevent surface and groundwater contamination and include information on buffer zones.

- For liquid formulations, water used to rinse containers should be put into the spray tank. This should be applied to the treatment area.

- Contact your proivincial regulator for guidance before disposing of mixed pesticide.

- Always direct spray inward from property lines. The risk of contaminating nearby properties is reduced by spraying away from them.

- Use no-spray setbacks to protect nearby properties. Where possible, ensure that any children's toys and pet food dishes located near the property line are moved prior to the pesticide application.

Guidelines to Protect Non-Target Vegetation from Herbicides

Tree roots often extend some distance from the tree. Care must be taken to prevent herbicides from being carried to the roots of trees and other non-target plants.

- Follow label directions that call for a buffer zone between the treatment area and non-target plants.

- If not stated on the label, herbicides should be applied no closer than one metre out from the drip line of trees. The drip line is the area on the ground that corresponds to the outer edge of the leaf canopy. This is where a tree tends to have many roots. Non-selective residual herbicides should be applied no closer than a distance that is twice the height of a tree (measured from the base of the trunk). Further distances or the use of shrouded sprayers may be required depending on:

    - Plant sensitivity to herbicides
    - Soil type
    - The herbicide used

Most ornamentals are sensitive to broadleaf herbicides. Extra care must be taken to prevent exposure to spray or drift.

Guidelines to Prevent Accidental Release of Pesticides

To prevent pesticides from being accidentally released:

- Keep spray equipment (power hoses, backpacks, tanks etc.) locked in vehicles or service truck compartments when not in use and during transport.

- Always be prepared to deal with pesticide spills and other emergencies. Have a pesticide spill kit, and emergency phone numbers on hand. Contact your provincial regulator to find out if an emergency response plan is also required.

- Never dispose of pesticide concentrates, empty containers, or excess spray mix on the client's property. Do not leave pesticides or containers behind for the client to dispose of.

Guidelines to Prevent Property Damage from Pesticides

Some pesticides can stain stucco, siding, wooden fences, or cement sidewalks. Check labels for precautions if there is a risk of spray landing on such surfaces. When in doubt, test the spray on a small area before applying it to the treatment area. Contact the provincial regulator for requirements (buffers or setbacks) when using pesticides near properties or occupied buildings.

Residual Activity

Residual activity is the length of time a pesticide remains in the environment. Use a pesticide with the least residual activity. **Table 4-1** lists herbicides registered for landscape use and their residual activity. **The use of herbicides with a long residual activity (e.g., "soil sterilants") is not covered under the Landscape Pesticide Applicators Certification. Contact your provincial regulator to find out if permits or additional certificates are required prior to using any of these products.**

Toxicity of Pesticides to Non-Target Plants

Pesticide injury to plants is called **phytotoxicity**. Phytotoxicity most often occurs when poor application of herbicides injures non-target plants. Insecticides, miticides, and fungicides may also injure the plants being protected. Phytotoxicity may occur when lawns are treated for broadleaf weed control without care to prevent exposure of sensitive ornamentals. Injury can be minor (e.g., slight burning or browning of leaves) or severe (e.g., death of the whole plant).

Possible reasons for phytotoxicity include the following:

- Pesticide sprays may drift through the air or move through the soil to sensitive plants near the treatment area.

- Pesticides may persist in soil. These can injure sensitive plants planted into the soil for some time after application.

- Improper pesticide dilution or using a too high application rate can cause plant injury.

- Incompatible mixtures of two pesticides or pesticides and fertilizers may damage plants. Consult the pesticide labels before tank mixing. When in doubt, contact your local pesticide vendor.

- Pesticide additives (e.g., emulsifiers) can make a pesticide phytotoxic to sensitive plants even at recommended application rates. Only add other materials to a spray mix if it is indicated on the pesticide label.

Table 4-1: Residual Activity of Some Herbicides Used in Landscape Situations.

Product Name	*Common Name*	*Notes On Residual Activity*
2,4-D	2,4-D	Rapid decomposition
Acclaim	Fenoxaprop-ethyl	None
Amiben	Chloramben	Six to eight weeks
Amitrole	Amitrole	Two to four weeks in warm, moist soil
Banvel	Dicamba	Thirty days, approximately
Basagran	Bentaxon	None
Basamid	Dazomet	Depends on rate, soil moisture, and temperature. Do a germination test to determine if soil is safe to plant in.
Betasan	Bensulide	Residual activity, one application gives season long control
Casoron	Dichlobenil	Persists two to six months, longer than one year for high rates
Compitox	Mecoprop	Up to four weeks. Grass can be seeded one to two weeks after application
Dacthal	Chlorthal-dimethyl	One hundred days, in most general soil types
Devrinol	Napropamide	Season long control for the growing season with incorporation
Gramoxone	Paraquat	None
Kerb	Propyzamide	Varies between two to nine months. Degradation increases with temperature above 15C
MCPA	MCPA	Some soil residue detected up to one month, if moist conditions, two months if dry
Poison-ivy and brush killer	Ammonium sulphamate	No longer than six to eight weeks
Reglone	Diquat	None
Round-up	Glyphosate	None
Simadex, Simazine, Princep Nine-T	Simazine	Persists more than one season, and up to two years depending on soil texture
Slow-Gro	Maleic-hydrazide	None
Treflan	Trifluralin	Season long control for the growing season

Do the following to reduce Phytotoxicity:

- Check the label for precautionary statements such as 'Harmful to sensitive plants'.
- Follow label directions when mixing and applying pesticides.
- Never combine or tank mix pesticides or adjuvants unless compatibility is known or stated on the label.
- Consider the residual activity of herbicides when establishing new turf or landscape areas. Some plants may not be able to grow in herbicide treated soil for months or years after treatment.

Summary

The use of pesticides in urban settings presents a number of challenges to landscape pesticide applicators. Guidelines must be followed to protect bystanders and other non-target organisms. Care must be taken to avoid drift and phytotoxicity, and to prevent unwanted release of pesticides into the environment. Following label directions, legislated requirements and the guidelines in this chapter help prevent contamination of nearby property and bodies of water.

Self–test Questions

Answers are located in Appendix A of this manual.

1. List two (2) things to avoid when using pesticides to protect the environment, public, sensitive vegetation, and pets from pesticide exposure.

   _____

   _____

2. Which of the following guidelines is false and would not protect the environment, public and pets?

   a. Use wick applicators, low pressures settings and coarse spray nozzles for sprayers. Use basal bark treatments to reduce drift.

   b. Increase spray pressure.

   c. Reduce the distance between the nozzles and the target.

   d. Apply under proper weather conditions. Look for low wind speeds, high humidity, and low temperatures.

3. What would you do to prevent bystander exposure to pesticides?

   _____

   _____

   _____

   _____

4. Residual activity is the length of time that a pesticide remains in the environment. **True or False?**

5. Which of the following operating guidelines prevent pesticides from being accidentally released? Select all that apply.

   a. Keep spray equipment (power hoses, backpacks, etc.) locked in vehicles, or service truck compartments when not in use and during transport.

   b. Be prepared to handle pesticide spills and other emergencies. Have a pesticide spill kit and emergency phone numbers on hand.

   c. Check hose connections every other year.

   d. Dispose of pesticides, empty containers, or excess spray mix on the client's property. Leave them behind for the client to handle.