



Grounds Maintenance

Weeds

What is a Weed?

A weed is a plant that is growing in an area where it doesn't belong. Generally, most weeds are very good at surviving and can multiply more quickly than most plants. In a garden or on a lawn, weeds can rob other plants and grasses of nutrients and water from the soil, and light from the sun. Weeds must always be controlled. Weeds, like flowers, can be perennials or annuals. As a horticulture technician, it's important that you recognize some of the more common types of weeds and learn some of the basic techniques of weed control.

Annuals

Annual weeds complete their life cycle in one growing season. They have a fibrous root system that spreads out just beneath the surface of the soil. Annual weeds seem to pop up suddenly in little clusters around the parent weed. Some examples of annual weeds are thistles, crabgrass and chickweed.

Maintenance

The best defense against annual weeds is to “nip them in the bud”. It is important that you remove the weeds while they are still small and before they flower and spread their seeds. Annuals generally can be pulled by hand because their root system is close to the surface of the soil. You can also use a steel rake, hoe or cultivator to gently uproot them. You don't have to dig into the soil too deeply, just on the surface. Some annual seeds can lie dormant for up to seven years. The warm, wet, spring weather can encourage the seeds to sprout. It is a good practice to check for weeds every other day. If the weeds **have not flowered** you can pull them and leave them in the sun, and when they are dry, you can work them back into the soil. Remember, the weeds suck up a lot of nutrients, so recycle them and give the soil a boost.

Perennials

Perennial weeds live for many years. They have a taproot system that can grow deep into the soil. Perennial weeds are tough and well anchored, unlike the surface root system of annual weeds. The underground root system can stretch up to 20 feet away from the parent plant's location. If the taproot is cut, new plants will grow from the site. Some perennial weeds also have hard, woody stems which are very difficult to pull.



Maintenance

Perennial weeds must be carefully dug up. Cut back all stems above the ground and dig up the underground root. You must dispose of the seed heads and the roots carefully. Do not recycle or compost. It is important to dig up perennial weeds before you cultivate or rototill your soil. It is also important to keep the root intact to prevent new plants from sprouting. Pulling up perennial weeds is a strenuous job. The best time to attack these hardy weeds is after the first freeze and thaw in the late fall. Remember, soil contains pockets of air that collect water; when these pockets freeze and then thaw out, they **heave** the soil. When the soil heaves, it loosens and breaks apart, making it easier to pull up these tough weeds.



Weed Control

The first step in weed control is recognizing problem plants. If you know what belongs, it will be easier to know what shouldn't be there. It is important that you take the time to learn what some of the most common weeds look like. The second step in weed control is action. If you see a weed, pull or dig it out. If you are not sure if it is a weed, ask your supervisor. Weed control is a task that all members of a landscaping crew share.

Prevention

Herbicides can also be used to control weeds and prevent them from growing. Other ways to keep weeds from sprouting include the use of landscape fabrics and mulches.





Learning Activity – Weeds

1. Why is it important to control weeds?

2. Discuss the differences in the root systems of annual weeds and perennial weeds.

3. What are two things you can do to help control on-site weeds?

4. Why is it easier to dig up perennial weeds after the first freeze and thaw?



Learning Activity – Canadian Weeds

1. Go online using a computer or a tablet to find the answers to the following questions about the common Canadian weeds listed below. Use a separate piece of paper for each answer.
 - a) Chickweed
 - b) Queen Anne’s Lace
 - c) Dandelion
 - d) Goldenrod
 - e) Canada Thistle
 - f) Quack Grass
 - g) Creeping Charlie
 - h) Crabgrass
 - i) Ragweed
2. Print a picture of the weed.
3. Write a brief description of what the weed **looks** like.
4. Is it an annual or perennial weed?
5. What type of soil does it like?
6. Without using chemicals, what is the best way to control it?



Plant Pests

Plant pests include small animals that dig up plant materials and insects that can kill large numbers of plants if they are not controlled. Recognizing and controlling bugs that hurt plant materials is an important part of grounds maintenance work. Not all bugs found on plants are harmful; for example, ladybugs eat aphids. Aphids are a serious threat to plants, specifically roses. In this unit, we will look at some common insects that can damage plant materials, and some of the ways we can control them without using insecticides.

Mouthparts

Insects that attack plants can be grouped into three categories, according to the damage they do to plant materials.



Chewing and biting insects

This includes insects like caterpillars, grasshoppers and beetles, bite or chew holes in leaves, bark and stems of plants. Signs of damage by chewing and biting insects may include holes in leaves, brown and brittle leaves, and yellow or white spots.

Sucking and piercing insects

This includes insects like aphids, leafhoppers and mealy bugs, have needle-like mouths that they use to pierce and suck out plant juices. Signs of damage by sucking and piercing insects may include yellowing flecks, wilting leaves, curling leaves and/or a shiny, sticky coating.

Borers and miners

Borers and miners are the insect larvae. Larvae are worm-like creatures that hatch from the eggs of some insects. Maggots are the larvae form of flies. These larvae can be buried in the bark, leaves and stems of plants. They carve tunnels in the plant as they eat the plant's nutrients. Flies, beetles and moths are common sources of borers and miners.

Signs of damage include sudden wilting and discoloration, and circular or oval exit holes. Borers like to attack weakened trees and plants. In trees, you will often see signs of borers near the top (also known as the crown) of the tree.

Maintenance (Control)

The best way to help control these pests is to pick them off the plant and destroy them. Borers and miners can be further avoided by maintaining strong, healthy plants. If a plant is infected with borers, you may have to cut off and destroy the infected part by burning or chipping it.



Other Plant Pests

Snails and Slugs

Snails and slugs are not considered insects. They are molluscs, similar to clams and oysters. They eat odd-shaped holes in the lower leaves of plants. Snails and slugs also leave a slimy trail wherever they go. They like dark, damp conditions and usually feed at night. Slugs don't have a shell and are vulnerable to dehydration, whereas snails have a shell that protects them from drying out. If you see snails or slugs on plants, pick them off and destroy them.

Small Animals

Small animals can cause a lot of damage to plant materials. Skunks will dig up lawns as they look for grubs to eat. Squirrels will dig up flower bulbs looking for food. Rabbits and mice can kill some trees and plants by eating their bark. Moles can cause damage by burrowing in lawns and gardens. Animal urine can also cause burn problems in trees, plants and lawns. Recognizing the signs of animal and insect damage is important when you are working as a grounds maintenance worker. You will not always be expected to know what caused the damage, but you will be expected to report the damage to your supervisor. The more pests you can recognize, the better you will be able to do your job.





Learning Activity – What’s the Problem?

1. Read the following scenarios and make a guess as to what caused the problem.
 - a. John was sent to deadhead the flowerbeds at the Queen Plaza site on Monday. When he arrived, he noticed many of the lower leaves of the plants had irregular holes in them. When he looked closer, he noticed a slimy trail on some of the leaves. What should he report to his supervisor?

- b. Anna was pruning the rose bushes at the Bell estate when she noticed some of the leaves were covered in yellow flecks and were starting to curl. What should she report to her supervisor?

- c. Sahid was pruning some shrubs along the city bike path when he noticed that the tops of the shrubs were beginning to discolour. When he looked closer, he saw signs of circular exit holes. What should he report to his supervisor?

- d. Ipeelee was asked to cut the grass in the southeast section of the memorial gardens at the Rest-A-While cemetery. When he arrived, the lawn was full of holes. Tufts of grass were ripped up everywhere. What should he report to his supervisor?



2. Match the following plant pests to the description of plant damage. Draw a line to the correct match. Some may have more than one answer.

- | | | |
|----|----------------------------------|--------------|
| a. | tunnels in plant leaves | beetles |
| b. | curling leaves | mice |
| c. | missing tree bark | slugs |
| d. | odd-shaped holes on lower leaves | aphids |
| e. | chewed leaves and yellow spots | caterpillars |
| f. | burn areas on plants | rabbits |

3. Go to the website listed below and play the Pest Paparazzi game. On a separate sheet, list the ten pests that you found.

<http://www.bbc.co.uk/gardening/htbg/module6>



Learning Activity – Evidence

Go outside and collect some evidence of pest activity on plants in your area. Present what you find to your group or your practitioner.

Remember to examine leaves, stems, roots, grass and tree bark for pest activity. Write two paragraphs discussing your findings. Take some photos with a camera or cell phone to add to your findings.

Plant Diseases

Plants, like humans, can get sick from many types of diseases. Like humans, plants also show symptoms of diseases. Plant diseases can be caused by living organisms and non-living environmental stresses. Let's look at some of the diseases caused by living organisms first.

Fungi

Fungi are the most common of all the plant diseases. They are primitive organisms that act like parasites. Unlike most plants, fungi can't make their own food so they must invade other plants to survive. You can usually see fungi on plants. Most fungi grow in the dark. Mushrooms are an example of fungi.

Fungi spread quickly by sending out flying spores. These spores are transported to other healthy plants by wind, rain, insects, animals, and human activities. Fungi infections are difficult to control.





Learning Activity – Dutch Elm Disease

Go online and find the answers to the following questions about Dutch elm disease.

1. What is Dutch elm disease?

2. How is the disease spread from one tree to the next?

3. What are the symptoms of Dutch elm disease?

4. What can be done to stop the spread of Dutch elm disease?



Bacteria

Bacteria are single-celled organisms that can only be seen under a microscope. Some of the plant diseases caused by bacteria are blights, galls, and rots. Bacteria enter plants the same way they do in humans, through cuts or openings. Bacteria spread very quickly in plant materials. An infected part will ooze milky pus which contains thousands of bacteria.

Viruses

Viruses are tiny particles of infective agents that cannot even be seen by regular microscopes. They can cause serious damage to plant materials and need a living organism to reproduce. They are spread by sucking insects and by human activities such as pruning. Some symptoms of plants that are infected with viruses include yellowing, ring spots, deformities and stunted growth in plants. Some viruses only attack a certain type of plant. Viruses are controlled by the use of chemicals.

Learning Activity – Bacteria and Viruses

Go online and find the following definitions.

1. Plant blight: _____
2. Plant gall: _____
3. Plant rot: _____
4. Now research **one plant virus** and answer the following questions:
 - a. What is the name of the virus? _____
 - b. What type of plants does it infect? _____
 - c. What are the symptoms of the infected plant? _____
 - d. How is the virus transmitted? _____
 - e. How is the virus controlled? _____



Symptoms of Plant Diseases

Anyone who works with plant materials should always be on the lookout for signs of plant injury. When a plant is weakened, it is more likely to be attacked by harmful, dangerous diseases. Some of the things to look for are:

- Discolouration – yellowing or browning
- Odd shaped holes
- Parts of the plant (new shoots) dying
- Dead spots on leaves
- Stems or branches with sunken areas
- Abnormal swelling or growths
- Blisters
- Bad odour
- Mildew (soft fuzz that grows on the plant) or a powdery coating
- Mushy decay
- Powdery orange-red spores
- Wilt

Learning Activity – Plant Problems

Go online and find the definitions and a picture for each of the following plant problems.

- Canker
- Blotch
- Damping-off
- Leaf scorch
- Needlecast
- Blackleg
- Leaf spot
- Wilt

The material and learning activities in the Grounds Maintenance section of the Foundational Skills module of the Prior Learning Toolkit were originally created by Community Literacy of Ontario and the Tri-County Literacy Council (based on Curriculum originally produced by Literacy Link Eastern Ontario). These organizations have given their permission for Landscape Ontario to use this material in this Prior Learning Toolkit.



Foundational Skills: Grounds Maintenance Answer Key

Activity – Weeds

1. Weeds grow faster than other plants. They rob other plants and grasses of nutrients and water from the soil and light from the sun.
2. **Annual weeds:** roots have a fibrous system that spreads out just beneath the surface of the soil. Annual weeds seem to pop up suddenly in little clusters around the parent weed. They are surface roots so they are easy to remove.

Perennial weeds: roots have a taproot system that can grow deep into the soil. They are tough and well anchored and can stretch up to 20 feet away from the parent plant. If the taproot is cut, new plants will grow from the site. Some perennial weeds have woody stems and are very difficult to remove.

3. What are two things you can do to help control on-site weeds?
 - a. Recognize weeds
 - b. Take action – pull or dig weeds out
4. Soil contains pockets of air that collect water, when these pockets freeze and then thaw out, they heave the soil. When the soil heaves, it loosens and breaks apart, making it easier to pull up the tough perennial weeds.

Activity – Canadian Weeds

- Answers will vary.



Activity – What’s the Problem?

1. What caused the problem? Students should be expected to write in simple, clear sentences. Answers should include a statement of the problem and a suggested possible cause.
 - a. Snails/slugs
 - b. Aphids
 - c. Fly larvae/beetle or moth activity
 - d. Grubs
2. Matching plant pests to the description of plant damage
 - a. Beetles
 - b. Aphids
 - c. Mice and rabbits
 - d. Slugs
 - e. Beetles and caterpillars
 - f. Rabbits
3. Answers will vary.

Activity – Evidence

Answers will vary.

Activity – Dutch Elm Disease

Answers will vary but should include the following facts:

1. Fungal disease of elm trees
2. Spread by a bark beetle
3. Upper branches begin to wither and turn yellow in the summer months – spreads down the entire tree, the tree loses its leaves and thereby starves the roots.
4. There has not been much success in treating Dutch elm. Once a tree is infected, it likely will die.



Activity – Bacteria and Viruses

Answers will vary but should include the following facts:

1. Blight
 - Complete dieback of shoots, branches or entire plants
 - Can be caused by bacteria or fungi
 - Contaminated tissues remain attached to healthy plants
2. Gall
 - Abnormal swelling of plant tissue
 - Can be caused by bacteria, fungi and insects
3. Rot
 - Any of several plant diseases, especially a disease of peach, plum, apricot, cherry, and related plants, characterized by wilting and browning of the flowers and leaves and rotting of the fruits
4. Researching one plant virus

Answers will vary.

Activity – Plant Problems

Answers will vary.

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