

# **Garden Pests & Diseases**

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# Garden Pests & Diseases

- Introduction
- Insects, snails and slugs, bacteria, fungi, and viruses, moles, voles
- Trees, shrubs, perennials, vegetables/fruits
- Pests by month
- Understand life cycles and natural controls
- Questions

# Be Prepared

- Row Covers
- Dormant Oil
- Regular Inspections
- Soap Spray
  - 25 mL soap in 1 L water
  - 1 part soap to 40 parts water (can add rubbing alcohol (8 parts = 200mL)
  - Use natural soap, not detergent
- Baking Soda Spray
  - 5 mL (1 teaspoon) of baking soda with 5 mL of oil and 5 mL of insecticidal or liquid soap (not detergent) to 1 L of water.
- Disinfectant (alcohol, bleach (1 to 10), Lysol)



## March

- Apply Dormant Oil with Lime/Sulphur for
  - fruit trees,
  - roses,
  - ornamental shrubs like Highbush Cranberry and European Snowball,
  - evergreens such as Cedars, Green Junipers, and Euonymus, and
  - trees such as Hawthorn, Crab Apple, and Honey Locust.
- Apply top to bottom, in the morning, need 24 hrs  $>4^{\circ}\text{C}$
- Spend a winter morning outside doing this and enjoy the rewards next summer.



## May Eastern Tent Caterpillar - *Malacosoma americana*

- Larvae feed on the leaves mainly of apple, cherry, and hawthorn.
- Control caterpillars at night when they are gathered together inside their tent.
- Either prune out the tent and destroy or poke the tent and spray with soapy water.
- Check for the egg masses (300 eggs/female) in the fall and early spring. Scrape them off with a knife and destroy.

## May Lily Beetles - *Lilioceris lili*

- They can defoliate and ultimately kill all true lilies and fritillarias.
- Adult beetles overwinter in the soil or plant debris. They emerge in early spring looking for food and a mate. They hide just under the surface, so be ready to get them when they pop out or scratch the soil.
- Remove eggs and larvae as soon as they appear.
- You can sprinkle diatomaceous earth on them.

May

## Viburnum Leaf Beetle - *Pyrrhalta viburni*

- Heavy infestations can defoliate shrubs, causing die-back and death. Highly susceptible species can be killed in 2-3 years. Both adults and larvae feed.
- Insect can be seen when:
  - Bleeding Heart is in bloom, the first Trilliums begin to bloom, Marsh marigolds are in bloom.
- Control with
  - Dormant oil
  - Scrap away eggs
  - Spray larvae with soap and water as soon as seen, and pick off adults.

## May European Pine Sawfly - *Neodiprion sertifer*

- They attack most pines - Mugho and Scotch.
- Eggs are laid in the fall on needles.
- Larvae feed when Rhododendrons are in bloom.
- Young larvae eat the surface of the previous year's needles
- Older larvae continue to eat the needles from tip to base.
- Disturbed larvae raise their heads and tails en masse.
- As soon as seen, spray with soap. Check daily.



## May Gypsy Moth - *Lymantria dispar*

- The most significant tree defoliator in North America. It attacks mostly broadleaf trees: oak, birch, poplar, willow, and maple.
- Remove egg masses in the fall or winter and destroy.
- Caterpillars can be sprayed off a tree with a high pressure hose.
- Adhesive tree bands (Bug Barrier Tree Band®) can be applied to tree trunks to prevent caterpillars from reaching the leaves.
- Traps can be baited with a pheromone that attracts male moths and prevents them from reproducing with the females.

## May Emerald Ash Borer - *Agrilus planipennis*

- Damage is usually only apparent when a tree is heavily infested.
- Larvae feed on leaves but do most damage by feeding on the inner bark (S-shaped galleries). They destroy the tree's ability to transport water and nutrients.
- Healthy trees may die in 2 to 5 years, depending on its age and the extent of infestation.
- Prohibition to move wood.
- City of Ottawa permit required for tree removal in core areas.

## May Spruce Budworm - *Choristoneura fumiferana*

- A native species and the most serious pest of Fir and Spruce trees. It also attacks Eastern Hemlock, Jack Pine, Norway Spruce, and Tamarack.
- Insects overwinter as larvae.
- Defoliation begins at the top of the tree and moves downwards. Damage occurs in May to July. Severely affected trees turn a rust colour as a result of dried-out needles held by strands of silk spun by the larvae.
- In the fall, most dead needles fall off.
- Control: *Bacillus thuringiensis* var. *kurstaki* (Btk)

May

## Iris borer, *Macronoctua onusta*

- The eggs overwinter on old foliage, and emerge in the spring as tiny caterpillars that tunnel into the newly emerging foliage.
- Look for waterlogged tunneling in the foliage and base.
- A sickly odor indicates borers have entered the rhizome and rot has set in.
- When dividing, holes can be cut out, the remaining tubers coated with a disinfectant (10 parts water, 1 part bleach), and replanted.
- Clean up all leaf material in the fall where eggs overwinter.

## May Diplodia Tip Blight - *Sphaeropsis sapinea*

- Most pines (*Pinus*) are affected.
- Watch for oozing of drops of resin from buds in early spring.
- Infected buds stop growing turn brown. Needles remain attached and coated with small black fungi.
- Lower branches are usually first to be infected.
- Prune branches and destroy all blighted needles, twigs, and cones.
- Spray with a fungicide three times: once when buds swell, secondly before new needles begin to elongate, and thirdly, 10-14 days later.

## May Cytospora canker - *Leucostoma kunzei*

- Common on spruces (*Picea*).
- The needles turn brown and fall off. Infected stems can be swollen and exude resin, which dries to a whitish crust. The disease normally starts on the lowest branches and moves upward. Usually, trees older than 15-20 years are attacked.
- Pruning and fertilizing may help.
- Both too much or too little water can weaken the trees.

- Cutworms are the larvae of several species of night-flying moths (family Noctuidae).
- They are a common pest of many vegetable crops.
- Larvae feed on young plants at night and sever stems. Tilling before planting can expose the larvae.
- Foil or cardboard collars (> 5 cm above and below ground) around new transplants provide barriers.
- Many insects and birds can reduce the population.
- Weeding can reduce the populations.

- Flea beetles (Chrysomelidae) attack many vegetables shortly after transplanting.
- Adults create small rounded holes in the leaves.
- A heavy flea beetle attack can result in wilted or stunted plants.
- Cover with floating row covers at least for the first several weeks. Inspect at least every other day.
- Plant trap crops such as curled mustard (*Brassica juncea* var. *crispifolia*), with radishes (Chinese Daikon or Snow Belle). Dill and parsley can attract beneficial insects.



May onwards

## Stink Bugs

Brown Marmorated Stink bug – *Halyomorpha halys*

- An excellent long-distance hitchhiker on cargo and vehicles.
- Overwinters as an adult, often in homes.
- Feeds leaves and fruits from spring to frost.
- Protect with floating row covers.
- Hand pick adults and egg masses under leaves.
- Plant repellent plants such as catnip, tansy, radishes, nasturtiums, marigolds, beebalm, or mints.
- Clean up plant debris in the fall.

## May onwards

### Spotted and Striped Cucumber Beetles – *Diabrotica* spp.

- Feed on leaves, roots, stems and fruit of cucumbers and squashes, throughout the spring, summer, fall.
- Overwintering adults feed on young plants.
- Larvae in the soil feed on plant roots.
- Second-generation adults cause feeding damage on plant leaves, blossoms and fruits.
- Protect with floating row covers, sticky traps, and rotate crops.

## May onwards

## Aphids

- In the fall, eggs are laid into the crevices of bark and bud scales.
- The insects suck the sap from leaves, twigs, stems or roots.
- Aphid honeydew attracts ants, flies, and wasps.
- Black sooty mould and viruses move in.
- Spray with water or soap.
- Avoid high nitrogen fertilizers.
- Attract natural enemies aphids by planting a variety of flowering plants.
- Apparently aphids like yellow. Place pans of water and yellow food colouring close to infestations to attract and drown them.

## May - June

### Cedar Apple Rust – *Gymnosporangium juniperi-virginianae*

- Two alternate hosts, Eastern Red Cedar (*Juniperus virginiana*) (winter host) and Apple (*Malus*) (summer host), are needed.
- The disease can cause defoliation and loss of apples.
- Small, yellow spots appear on the upper surface of young leaves and fruit. Later small black spots appear and enlarge.
- The rust overwinters as orange galls on cedar. They become gelatinous and release spores in the spring.
- Plant rust-resistant cultivars of cedars and apples.
- Spray with sulfur or lime-sulfur.

## June Fire Blight – *Erwinia amylovora* (Bacteria)

- It infects members of the rose family – apple, pear, quince, raspberries, roses, mountain ash, serviceberry, hawthorns, and cotoneaster and is transmitted by piercing and sucking insects.
- The leaves and stem tips turn brown or black and bend over into a characteristic shape like a shepherd's crook.
- If not controlled plants ooze and appear scorched by fire.
- Trim infected branched and reduce high nitrogen fertilizers.
- Control of insects with piercing and sucking mouthparts (aphids, leafhoppers, pear psylla) can slow the spread of infections.

## June/July Milkweed Bug - *Oncopeltus fasciatus* & *Lygaeus kalmii*

- Overwinter as adults.
- Eggs are laid on the underside of *Asclepias* leaves starting in June.
- Nymphs and adults eat leaves, flowers and seeds.
- More than one generation per year.

## June/July Boxelder Bug - *Boisea trivittatis*

- Lay eggs in spring
- Feed on Acer seeds - *Acer negundo* and ash
- Aggregate and invade homes in the fall

<http://www.ext.colostate.edu/pubs/insect/05522.html>

[http://pestcontrolcanada.com/INSECTS/box\\_elder\\_bugs.htm](http://pestcontrolcanada.com/INSECTS/box_elder_bugs.htm)

<http://www1.extension.umn.edu/garden/insects/find/boxelder-bugs/>

June/July

## Squash Vine Borer - *Melitta curcurbitae*

- Adults lay eggs at the base of squash plants. Larvae bore into stems to feed and block the flow of water and nutrients to the rest of the plant.
- Watch for sudden wilting leaves.
- Cut a slit in the stem, remove the larva(e),  
and hill up soil so plant can re-root.
- Wrap the base of stems with foil or use row covers.
- Monitor for adults in late June. The moths are conspicuous and buzz.
- Clean up plant debris in the fall.



## June onwards

### Earwigs - *Forficula auricularia*

- Damage starts in late spring when leaves are developing and create places for the insects to hide during the day.
- Earwigs are beneficial in that they eat other insects but are should be controlled on Hosta, Coleus, Brunnera plants and leafy vegetables
- Trap with rolled-up newspapers or cardboard and discard each morning.
- Fill small food cans with ½ cm each of oil (preferably fish oil) and soya sauce and sink them into the ground near plants. Empty them every day.
- Sprinkle a 5 cm-wide circle of diatomaceous earth around beds or the base of plants; reapply after rains.

## June Slugs and Snails -Gastropoda

- They eat leaves and tender shoots, attacking almost all crops, including grains, clovers, corn, vegetables, ornamentals, and small fruits, especially strawberries and tomatoes.
- They are hermaphrodites, lay up to 500 eggs per year, and can live 4 years.
- They feed in the evening or on dark days.
- Trim plant material and remove rubbish where they can hide.
- Trap with pieces of grapefruit skins, shingles, boards (>15 cm square) on the ground and destroy.
- Protect important plants with fly screening about 10 cm wide. Set on edge into the soil around the plant.

## June Colorado Potato Beetle – *Leptinotarsa decemlineata*

- They feed on potatoes, eggplants, tomatoes, peppers, plants in the nightshade family (Solanaceae).
- Both larvae and adults feed (multi-generations per year) and if left untreated, can completely defoliate plants.
- Potatoes are much more sensitive when tubers are beginning to bulk (soon after flowering).
- Use straw mulches.
- Watch for eggs under leaves and remove.
- Pick larvae and adults and drown them in soapy water.

## June Rose Chafers - *Macrodactylus subspinosus*

- They feed on rose, peony, white lilac, and grape flowers, fruits, trees and shrubs, particularly in areas with sandy soil.
- Females feed for a month and then lay eggs in the soil.
- The eggs hatch into C-shaped larvae which feed on the roots of grasses and weeds but do little damage.
- Rose chafers contain a toxin that can be deadly to birds, including chickens, and small animals.
- Inspect daily, hand-pick and drop in soapy water.
- Row covers (kept on until July) help protect fruits (strawberries, raspberries, grapes).

## June onwards Black Spot - *Diplocarpon rosae*

- It is one of the most common diseases found on roses.
- The disease is active during cool, moist weather.
- Spray with sulphur or baking soda as plants break dormancy and again after rains.
- Leaves less than two weeks old are the most susceptible.
- Remove diseased leaves. Ensure plants get adequate sun, ventilation, and keep foliage dry.

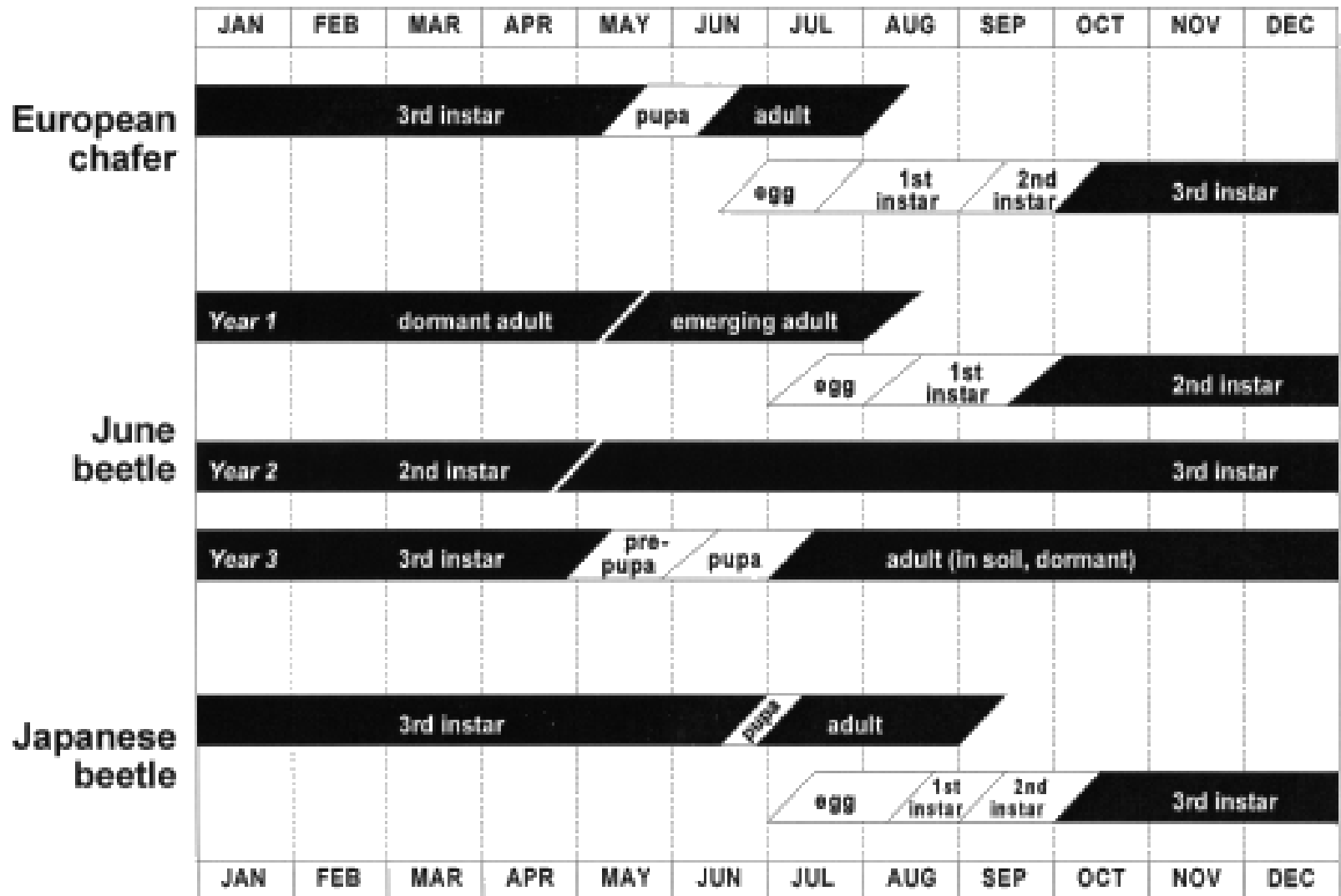
# June onwards Powdery Mildew –Erysiphales

- Almost no type of plant is immune.
- White or gray powdery spots appear, which can cover the entire leaf surface. It is also found on plant stems, flowers and even fruit. Leaves infected with powdery mildew turn yellow, die, and fall off.
- Provide adequate air circulation and light (>6 hours) and avoid high nitrogen fertilization.
- Apply baking soda/oil solution every two weeks.
- Or apply milk solution weekly (1 part milk to 4-9 parts water).

## July Japanese Beetles - *Popillia japonica*

- Adults emerge in early July (about the time Chickory, Queen Anne's Lace, and Elderberries flower) and feed on foliage and fruit of about 300 species of plants.
- They tend to feed first on shorter plants and then move to taller ones (elm, linden trees) as the season progresses.
- In early morning, knock off the adults into a jar of soapy water and discard.





<http://www.omafra.gov.on.ca/english/crops/facts/08-023w.htm>



# July Tomato Hornworm - *Manduca quinquemaculata*

- They quickly defoliate tomatoes, potatoes, eggplants, and peppers.
- They tend to feed on the interior of the plant during the day and are more easily spotted when they move to the outside of the plant at dawn and dusk.
- They have eight V-shaped marks on each side and their horn is straighter and blue-black in color (below).
- Hornworms overwinter as pupae. Adults emerge in June or July. They are the larvae of hawk or sphinx moths.

## July Chinch Bugs - *Blissus leucopterus hirtus*

- They suck the sap from the crown and stems of turf grass. They overwinter as adults.
- Damage is localized. Severe damage is not noticed until August when Bird's Foot Trefoil is in bloom.
- Chinch bugs thrive in hot, dry, sunny areas, so irrigated lawns are better able to tolerate eating.
- Turf cultivars (fescues) containing endophytic fungi may show some resistance to chinch bug feeding.
- Spray edges of infected area with soap solution.
- Cover edges of infected areas with a sheet. Bugs will take cover and can be destroyed.

## July/August Sunflower Moth - *Homoeosoma ellectellum*

- The most serious pest of commercial sunflowers but it also infects wild sunflowers and coneflowers.
- Eggs are laid in flowers during the early stages of bloom. Larvae feed on pollen and seeds and produce webbing.
- The damage from caterpillar feeding also leaves the coneflower more susceptible to *Rhizopus* rot, which may lead to plant death.
- Control – *Bacillus thuringiensis*, soap solution, Tachinid flies

# August

## Viruses

- Hosta virus x , Tobacco rattle virus, as examples.
- Symptoms include irregular blotchy patches of lighter or darker tissue, circular spots with rings, or small lighter flecks.
- They are spread by the sap of an infected plant contacting an open wound of another plant:
  - from tools not scrubbed and disinfected between use, or
  - from an animal or insect feeding on an infected plant, then feeding on another plant.
- Infected plants should be destroyed.

# August

## Tar Spot - *Rhytisma spp.*

- Tar spot infects the leaves of maples species (some more than others) by producing raised black spots on upper leaf surfaces that resemble drops of tar.
- Rake and destroy leaves when they have fallen.
- This reduces the number of overwintering tar spots, which produce spores the following spring.

## September Black Knot - *Apiosporina morbosa*

- A common fungal disease of plum, prune, and cherry trees (*Prunus* spp.).
- It appears as black swellings or knots on first on small twigs, then branches, and trunks.
- Prune out all knot-bearing branches to at least 15-20 cm below the knot. Disinfect cutting blades.
- Pruning is more easily done in late fall when leaves are gone.
- Diseased material should be destroyed because spores can be released.
- If the infections are high in the tree, it is advisable to hire a professional arborist to perform the trimming.

## Winter

### Moles - usually *Parascalops breweri*

- Moles eat earthworms, insects, and aerate soil, but they tunnel through lawns and gardens and thus destroy roots.
- A mole can consume ~20kg of worms and insects each year.
- Moles can dig surface tunnels at approximately 5-6 m/hour. They travel through existing tunnels at about 25m/minute.
- Over-watering your lawn can bring soil invertebrates and moles closer to the ground surface, making tunnels more visible.
- Trapping is the most effective way of controlling.

## Winter Voles (Meadow Mice) - *Microtus*

- Voles eat plant material. They chew bark and grasses down to the crown.
- They construct elaborate runway systems within the turf canopy and where they make many short forays from the nest to seek food .
- Damage can be dramatic when snow melts.
- Protect trees and shrubs with tree wrap set into the ground.
- They can be caught with mouse traps baited with peanut butter (along with other 'non-target' critters), but does not often reduce numbers .
- Low-snow winters can reduce populations.



# Take Away

- Flowering Plants
- Beneficial Insects
- Bird Baths and Feeders
- Daily garden walks and observation
- Benches
- Take notes



# Reference Links

- <http://www.omafra.gov.on.ca/english/crops/>
- <http://ottawa.ca/en/residents/water-and-environment/lawn-and-garden/pests>
- [http://www.creditvalleyca.ca/wp-content/uploads/2011/03/stel02\\_179223.pdf](http://www.creditvalleyca.ca/wp-content/uploads/2011/03/stel02_179223.pdf)
- <http://www.colostate.edu/Dept/CoopExt/4DMG/Pests/pests.htm>
- <http://idl.entomology.cornell.edu/factsheets/>
- <http://www.ipm.ucdavis.edu/PMG/menu.homegarden.html>
- <http://www.extension.umn.edu/garden/insects/>
- <http://www.epa.gov/region1/eco/uep/pdfs/BugBook.pdf>
- <http://umaine.edu/home-and-garden-ipm/pest-id/>
- <http://www.pestcontrolcanada.com/INSECTS/insects%202.htm>