

Aphids on Cereals



Host Crops

Small grain cereals (wheat, oats, barley, rye).

Most abundant species

In Manitoba, the English grain aphid (*Sitobion avenae*) and the oat-birdcherry aphid (*Rhopalosiphum padi*) can commonly be found on cereal grains, and the greenbug (*Schizaphis graminum*) occurs sporadically. The corn leaf aphid (*Rhopalosiphum maidis*) may at times be present on corn or small grain cereals. None of these aphids are known to overwinter in Manitoba; they move up from the South in late spring. Other less numerous species of aphids are also found on cereals in Manitoba. The term cereal aphid is sometimes used as a generic term to describe the complex of aphids commonly found on cereal crops.

Identification of Common Species

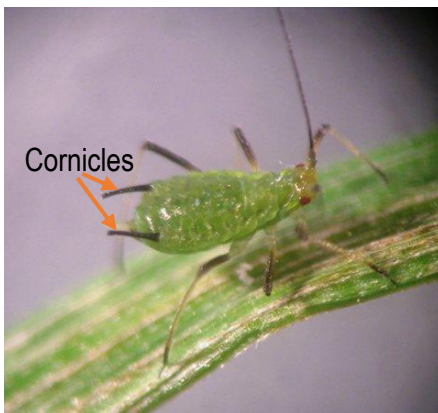


Figure 1. English grain aphid

English grain aphid

- Bright green with black antennae. A red colour morph can also occur.
- Long black cornicles (a pair of tubes at the back of the aphids abdomen).
- Legs are banded with areas of green and black.
- Eyes typically red.
- Small nymphs may have a green line down the middle of the back, similar to the greenbug.



Figure 2. Oat-birdcherry aphid

Oat-birdcherry aphid

- Dull olive-green with black antennae.
- Legs and cornicles are pale green with black tips.
- There is a reddish-orange patch between and at the base of the cornicles.



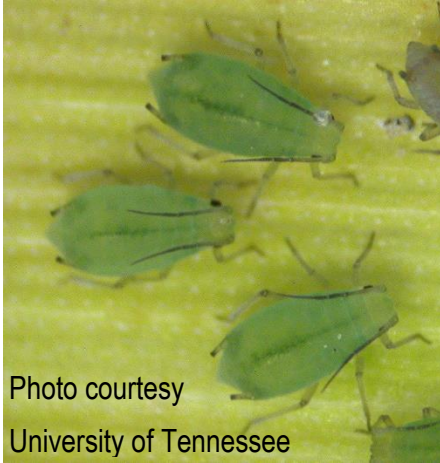


Photo courtesy
University of Tennessee

Greenbug

- Pale to bright green with a dark green stripe down the middle of the abdomen.
- Antennae are black, and more than half the body length.
- Legs and cornicles are pale green with black tips

Feeding behaviour

English grain aphids can often be found on the heads, feeding on the ripening kernels of cereal crops. Once green heads emerge, English grain aphids are typically found feeding head down at the base of the glumes. When sufficiently large populations develop, their feeding can reduce seed number, seed weight and grain protein content. The greatest potential for injury is during flowering and early grain formation. After flowering, seed number is not affected. Research on English grain aphid feeding on winter wheat found that there was a greater yield reduction for a given aphid density when plants were grown under severe water stress than nonstress conditions.

On wheat, the oat-birdcherry aphid prefers the stems and lower leaves, whereas the English grain aphid is found mostly on the head and upper leaves of the plant. The oat-birdcherry aphid is the main vector of barley yellow dwarf virus on the prairies. English grain aphids can also vector barley yellow dwarf virus, but are not as efficient a vector as the oat-birdcherry aphid.

The greenbug has a saliva which is toxic to the plant and causes discoloration and brown spotting on the leaves it is feeding on. Highest concentrations of greenbugs are usually found on the lower surface of lower leaves.

Aphids also produce large amounts of honeydew that can promote the growth of saprophytic and pathogenic fungi on the plant. A positive aspect of honeydew is that many beneficial insects including parasitic wasps, some predaceous insects and bees will feed on honeydew. Honeydew from aphids has been shown to increase the longevity of some parasitic wasps. Thus low levels of aphids can have a positive role in the ecology of beneficial insects in crops.

Scouting Techniques

Monitor from June until the soft-dough stage in small grain cereals. Check 20 stems in each of five areas. Counts should be at least 50 paces apart, and observations should be made well into the center of the field. Too frequently farmers become alarmed after checking a few plants along the margins, especially near shelterbelts, where populations are high. Record the total number of aphids and calculate the average per stem.

Look for symptoms of damage, including leaf discoloration in host plants. Severe infestation may appear as large, bronzy or brown patches in the field, often visible from the road. Later in the season, these patches may appear as thin stands.

Agronomists routinely take stem samples for aphid counts. Cut the stem close to the ground and then hit it sharply against a stiff piece of white paper or into a white pan. This dislodges the aphids so they can be counted.

When counting aphids, note the presence or absence of predators, parasitized aphid mummies, or aphids killed by fungi.

Economic Thresholds

The economic threshold for aphids on cereals is an average of 12 to 15 aphids per stem prior to the soft dough stage. After the early dough stage insecticide treatments would not be cost-effective.

Control Tips

Planting date: Early seeded crops may develop past the susceptible stage before aphid populations reach damaging levels. Early planted spring cereals may be at less risk of damage from barley yellow dwarf than cereals planted later.

Biological controls: Natural predators (such as lady beetles, hover fly larvae and lacewings) and parasites usually keep populations of aphids under control. For more information on predators and parasitoids of crop feeding insects, see the factsheet <http://www.gov.mb.ca/agriculture/crops/insects/pubs/predatorsofinsectsfactsheet.pdf>



Figure 4. Aphid "mummies" - swollen, dead aphids that have been tanned and hardened due to parasites. Note the holes where the parasites emerged from some of the aphids.



Figure 5. Hover fly larva.

Heavy rain and strong wind may knock aphids from the plants, decreasing populations of aphids on cereal crops.

Insecticides: Malathion and dimethoate (Cygon/ Diamante 4) are registered for the control of aphids in small grain cereals in Canada. Dimethoate has a 35-day preharvest interval in small grain cereals, and can't be used within 35 days of the crop being swathed or harvested. Both of these insecticide options are quite general in the spectrum of insects they control and would also kill many of the natural enemies of aphids.

If natural enemy populations are sufficiently high they can keep a population of aphids below the economic threshold and may result in the population of aphids declining rather than increasing.

Before deciding to apply insecticides for aphids, consider:

- the aphid population (is it near or above the economic threshold),
- the stage of the crop,
- evidence of natural enemies (predators, parasitoids, and pathogens),
- the pathogen vectoring potential of the species of aphid,
- are any heavy rain events forecast for the near future,
- additional stresses (such as drought) that the crop may be under.

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