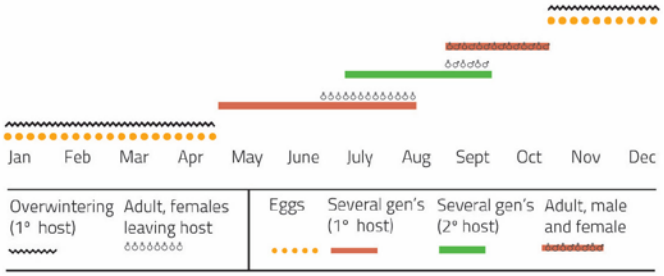
Sugar beet root aphid - adult
Erik J. Wenninger, University of Idaho

Aphid, sugar beet root

Pemphigus betae Doane



Hosts

Primary hosts are trees in the poplar (*Populus*) genus (e.g. balsam poplar, black poplar, and cottonwood); secondary hosts include sugar beet and the weeds lamb's-quarters, kochia and pigweed. Also reported infesting roots of red beets, Swiss chard, spinach, quinoa, and alfalfa.

Identification

ADULTS: Wingless adults are 1.9-2.4 mm long with oval-shaped, pale yellowish-white bodies coated with a fine white powder. Root-infesting forms have reduced appendages compared to leaf-infesting forms. Winged spring- and fall-adults are same size as wingless forms but have a black head and thorax and green abdomen.
MATURE NYMPHS: Similar appearance to wingless adults but smaller.

Life Cycle

Overwinter as eggs in bark crevices of primary hosts. The eggs hatch in spring into wingless females ("stem mothers"). These give rise to colonies of winged females that develop within galls along the leaf midrib created by their feeding action. The winged females disperse to secondary hosts during early to mid-summer where they form wingless colonies on the host roots. The aphids secrete a waxy material that covers the individual colonies. After several generations, winged females are produced in late summer and early fall that then migrate back to winter (primary) hosts. Some root colonies may overwinter in the soil without producing fall migrants. The fall migrant females give birth to wingless males and females. After mating, females each lay a single white egg that overwinters under a white waxy secretion.

Feeding Damage

ADULTS AND NYMPHS: Feeding action can destroy rootlets and cause the tap root to become rubbery and flaccid, especially under drought conditions. Heavy infestations can kill sugar beet plants under extreme stress as well as reduce yields, sugar content and recoverable sugar. Leaves appear chlorotic and wilt easily under moisture stress. Heavily infested sugar beets are also pre-disposed to greater damage by early frost.

Similar Species

Co-occurring *Pemphigus* species on sugar beet roots can include *P. populitransversus* Riley and *P. populivenae* Fitch. The three species are difficult to distinguish without the aid of a microscope.

Monitoring/Scouting

No scouting methods have been developed. Dig up wilted plants and examine for root-infesting colonies to confirm presence. The presence of leaf midrib galls on primary hosts in the spring indicate the presence of this pest and a risk to sugar beet and other food crop hosts in the area.

Economic Threshold

None established.

Sugar beet root aphid - colony
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Management Options

BIOLOGICAL: Leaf-gall colonies are attacked by an anthocorid bug (*Anthocoris antevolens* White), larvae of a hover fly (*Syrphus bigelowi* Curran (p. 132)), larvae of an aphid fly (*Leucopis pemphigae* Malloch), a ladybird beetle (*Scymus* spp. (p. 116), green lacewings (p. 139), snakeflies (p. 140) and parasitoids (*Aphidius smithi* Sharma et Subba Rao (p. 129)). A small frit fly (*Thaumatomyia glabra* (Meigen)) attacks root-infesting colonies and the pathogenic fungus, *Entomophthora aphidis* Hoffman occasionally destroys field populations.

CULTURAL: Grow sugar beet root aphid tolerant or resistant varieties. However, since sugar beet root aphid infestations are sporadic, it may make more economic sense over the long-term to choose varieties based on other agronomic considerations. More realistic strategies include:

- Plant sugar beets early and maintain adequate soil moisture and nutrients to encourage rapid and vigorous growth especially during drought conditions.
- Control weed hosts within and adjacent to crops.
- Do not replant fields to a host crop for a minimum of 3 years and maintain control of weed hosts every year.
- Clean all equipment thoroughly before moving from an infested to non-infested field.

CHEMICAL: None registered.

Sugar beet root aphid gall on eastern cottonwood
(Populus deltoides)
Kevin Floate, AAFC

Sugar beet root aphid infestation on sugar beet
Erik J. Wenninger, University of Idaho

Field Crop and Forage Pests and their Natural Enemies in Western Canada:

Identification and Management



Agriculture and Agri-Food Canada
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1. Pea leaf weavil (*Sitona lineatus*) and leaf damage - Jonathon Williams, AAFC
2. *Pteromalus puparum* parasitizing an imported cabbage worm cocoon (*Pieris rapae*) - T. Haye, CABI
3. Lacewing (*Chrysopa* sp.) adult - John Gavloski, Manitoba Ministry of Agriculture
4. Grasshopper - Jesse MacDonald, AAFC

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