FGC Forest Genetics Council of British Columbia

Cone and Seed Insect Pest Leaflet No. 4

British Columbia Ministry of Forests and Range,
Tree Improvement Branch, Saanichton, BC

BRITISH COLUMBIA
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WESTERN CONIFER SEED BUG
(Leptoglossus occidentalis)

Leptoglossus occidentalis adult (D. Manastyrski)

TAXONOMY:

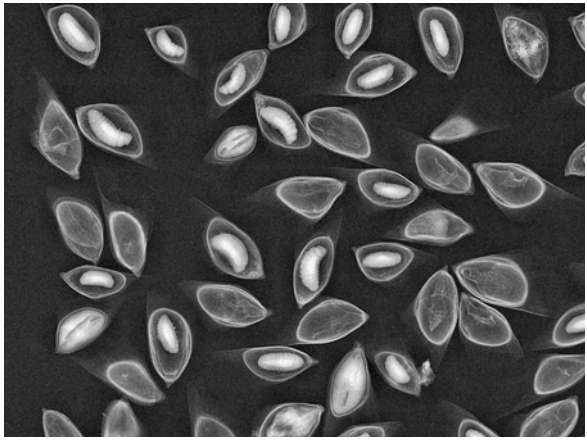
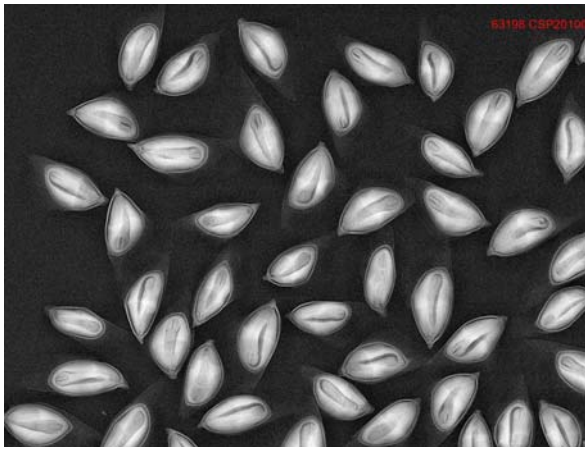
Order: Hemiptera (true bugs)

Family: Coreidae (leaf-footed bugs)

HOSTS: All Pinaceae in western British Columbia: Douglas-fir (*Pseudotsuga menziesii),* pine (*Pinus* spp.), spruce (*Picea* spp.), larch (*Larix occidentalis*), and hemlock (*Tsuga heterophylla*).

DISTRIBUTION: Currently found from British Columbia to New Brunswick in Canada and along the Pacific Coast to Mexico. It has been steadily expanding its range eastward in Canada from BC, probably because of its association with human habitations for overwintering sites. Populations are now also established in Europe.

DAMAGE: Adult and immature conifer seed bugs feed on individual seeds in developing and mature cones. Syringe-like mouthparts are inserted through cone scales and into individual seeds. Seed contents are dissolved by bug salivary enzymes and sucked up out of the seeds. Cones are not damaged by feeding activities. Damage to seeds early in development causes seed abortion and an apparent decline in seedset; and damage later in development causes empty and partially filled seeds that are only detected through seed dissection or x-ray radiography. However, such damage is difficult to quantify because environmental factors can cause similar damage to seeds.

	X-rayed seeds: empty, partially filled and infested with *Megastigmus* spp. (seed wasps) *Leptoglossus* feeding damage later in seed development causes empty and partially filled seeds, but such damage is difficult to quantify because environmental factors can cause similar damage. (D. Kolotelo)
	X ray of healthy, filled Douglas-fir seeds (D. Kolotelo)

Leptoglossus occidentalis adult on cone (D. Manastyrski)

IMPORTANCE: It is generally felt that large populations can cause severe damage to seed crops, especially in Douglas-fir and pines. Bagging studies in British Columbia have shown lodgepole pine seed losses to seed orchard populations of *Leptoglossus* can be as high as 83%.

Description

LIFE HISTORY: One generation per year.

EGG: Somewhat barrel-shaped, approximately 2 mm by 1 mm. Light brown at first, changing to reddish brown. Eggs are laid in rows along host foliage. They are laid between mid June and early August, and hatch in about 2 weeks.

Leptoglossus occidentalis eggs on a pine needle (W. Strong)

NYMPH: Similar appearance to the adult, but smaller and wingless. There are five nymphal instars. Generally found on or near cones, and initially feeding on foliage before switching to seeds in cones. Early instars usually found in small aggregations; older individuals are more dispersed. Nymphs mature in about 5 weeks.

First instar *Leptoglossus occidentalis* nymphs on conifer needle; hatched and hatching eggs on underside of needle (W. Strong)

Leptoglossus occidentalis nymph on Douglas-fir cone (D. Manastyrski)

ADULT: 15-18 mm with long antennae and legs (hind legs conspicuously flattened). Dark reddish to greyish–brown with distinctive white markings on exposed sides of abdomen. Mouthparts in form of a long needle-like proboscis bent backwards between the insect's legs when not feeding. When disturbed, adults may release a strong, almond-like odour.

Adults overwinter in aggregations under bark or in other natural habitats, as well as in homes and buildings, where they often become household pests. Adults emerge in spring to mate, feed, and lay eggs. The overwintered generation lives until late July or early August; adults in late summer are the progeny of the overwintered generation.

Detection and Monitoring

Seed bugs are monitored by visually searching cones on trees. Walk at a sedate pace throughout the orchard for a period of 30 minutes, scanning cones at eye-level, and counting any seed bugs observed. Monitor only between 9:30 am and 8:00 pm, when the temperature is between 15 and 32°C, and the wind less than 15 km/hr, and not during or within an hour of rainfall. The currently recommended threshold in lodgepole pine is 1 to 2 seed bugs per 30 minute search. It has been estimated that one adult female can destroy up to 310 seeds in an Interior lodgepole pine orchard.

Researchers at Simon Fraser University and the British Columbia Ministry of Forests and Range have recently discovered that conifer seed bugs can perceive and are attracted to infrared light wavelengths. A monitoring program utilizing this information is currently under development. University of Northern British Columbia researchers have found a strong clonal preference in seed bug feeding. Knowing preferred clones could improve the efficiency of monitoring and control programs.

Mating *Leptoglossus occidentalis* on spruce (W. Strong)

Insect Stages and Monitoring Calendar

Oct-May	May-June	Mid June- early August	July-Sept
Adults overwinter in aggregations under bark or in other habitats	Adults emerge to mate	Eggs are laid Overwintered generation lives until August	Nymphs actively feeding in orchards New adults emerging
Monitoring for *Leptoglossus occidentalis*			
	Monitor for adults in seed orchards following sampling protocol		
	Monitoring and control using infrared-emitting coloured traps currently being tested (2010)	Chemical sprays applied to control other pests may be effective for *Leptoglossus*	

Control

Chemical control can protect seed crops. No pesticides are currently registered against this pest in Canada. However, applications of dimethoate or carbaryl to control other insects may provide effective control of conifer seed bugs. A control option utilizing traps emitting visible and infrared light wavelengths) may be available in the near future.

Key References

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