CONE AND SEED INSECT PEST LEAFLET NO. 4

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

WESTERN CONIFER SEED BUG (*Leptoglossus occidentalis*)

Leptoglossus occidentalis adult on cone

TAXONOMY:

Order (Family): Hemiptera (Coreidae)

HOST: All Pinaceae (i.e. Douglas-fir, pine, spruce, larch, hemlock) in British Columbia.

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 western Europe.

L. occidentalis nymph with needle-like mouthparts extended

DAMAGE: Adult and immature conifer seed bugs feed on individual seeds in developing and mature cones. Needle-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. Feeding activity does not damage the cones and damage to seeds is only made apparent through seed dissection or x-ray radiography.

Damage is difficult to quantify because environmental factors can cause visually similar damage to seeds.

Need a good x-ray radiograph of damaged seeds

IMPORTANCE: It is generally felt that large populations can cause severe damage to seed crops especially in Douglas-fir and pines. No economic thresholds have been established. **How important is this insect here?**

DESCRIPTION

Life History: One generation per year. Adults overwinter in aggregations under bark or in other natural habitats. As well, they may overwinter in homes and buildings, often becoming household pests. Adults emerge in spring, but eggs are not usually laid until July or early August.

Egg: Somewhat barrel-shaped, approximately 2 mm by 1 mm. Light brown at first, changing to reddish brown. Laid in rows along host foliage. Eggs hatch within 2 weeks.

Conifer seed bug eggs on a pine needle

Nymph: Similar to the adult, but smaller and wingless. There are five nymphal instars. Generally found on the cone surface initially feeding on foliage before moving onto seeds in cones. Nymphs mature in about 5 weeks.

Nymphal stage of the conifer seed bug on Douglas fir cone

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

First instar conifer seed bug nymphs

DETECTION AND MONITORING

Seed bugs are monitored by visually searching cones on trees; no effective sampling scheme has been devised. It is thought that even very low populations may significantly affect seedset. It has been estimated that a single adult female per tree can reduce seedset in Interior lodgepole pine seed orchards by 3.5%. Researchers at Simon Fraser University and the BC 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. Progress is also being made toward quantifying the damage caused by seed bugs and providing a simple diagnostic tool for identifying seed bug damage to seeds. **Will need input from Ward and Jim here.**

Insect stage calendar to be added by me

CONTROL

Chemical control can protect seed crops. No pesticides are currently registered against this pest in BC. However, applications of dimethoate or carbaryl to control other insects may provide effective control of conifer seed bugs. A control option utilizing infrared light wavelengths may be available in the near future. **Again, need input from Ward and Jim here.**

Need a nice photo of wretched seed set here

KEY REFERENCES

Ward will be able to supply some key refs other than the ones below that I have just copied from my cv.

Bates, S.L., J.H. Borden, A.R. Kermode, and R.G. Bennett. 2000. Impact of *Leptoglossus occidentalis* (Hemiptera: Coreidae) on Douglas-fir seed production. *Journal of Economic Entomology* 93(5): 1444-1451.

Bates, S.L., J.H. Borden, A. Savoie, S.E. Blatt, C.G. Lait, A.R. Kermode, and R.G. Bennett. 2000. Impact of feeding by *Leptoglossus occidentalis* (Hemiptera: Coreidae) on the major storage reserves of mature Douglas-fir (Pinaceae) seeds. *The Canadian Entomologist* 132(1): 91-102.

Hedlin, A.F. 1974. Cone and seed insects of British Columbia. Canadian Forestry Service, Pac. For. Res. Cen., Victoria, BC. BC-X-90. 63 pp.

Takács, S., K. Hardin, G. Gries, W. Strong, and R.G. Bennett. 2008. Vibratory communication signal produced by male western conifer seed bugs (Hemiptera: Coreidae). *The Canadian Entomologist* 140(2): 174-183.

PHOTOGRAPHS: Dion Manastyrski unless otherwise noted. (Some are Ward Strong!)