

# CONE AND SEED INSECT PEST LEAFLET No. 11

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

## WHITE <sup>[RB1]</sup>PINE CONE BEETLE (*Conophthorus ponderosae*)



*Conophthorus ponderosae* adult

### TAXONOMY:

Order (Family): Coleoptera (Curculionidae: Scolytinae)

**HOST:** Pines. In British Columbia, particularly western white pine but also ponderosa pine, and to a lesser extent, lodgepole pine.

**DISTRIBUTION:** Western North America from southern Yukon Territory south through British Columbia and the western United States to the Sierra Madre Range in Mexico.

**DAMAGE:** *Conophthorus ponderosae* can be a serious pest of western white pine cones. Adult female beetles tunnel into the base of second year cones in early spring, severing the conductive tissue, and killing the cones. Larval beetles tunnel within the killed cones and destroy any developing seeds. Attacked cones may remain on the tree but usually fall to the ground in early summer.



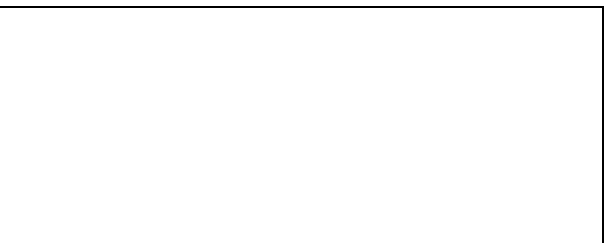
Pitch tube created by beetle boring into cone

Pitch tubes and boring dust are often evident at the attack site on cone bases.

**IMPORTANCE:** Up to 90% of a cone crop can be destroyed; seed mortality is 100% within each cone. One female may kill as many as **xx** cones. (*Do we have a number?*) <sup>[RB2]</sup> This insect has not yet become an issue in British Columbia seed orchards. However it causes considerable damage in natural stands, for example in the naturally blister-rust-resistant white pine stands on Texada Island.

### DESCRIPTION

**Life History:** Cone beetles have a single generation per year. Adults fly to second year cones early in the spring, where they tunnel into cone bases, killing the cones. Eggs are laid in galleries excavated along cone axes. Larvae hatch and feed partially developed seeds and other internal cone tissues, completing their development in approximately one month. (*Do we know how many eggs are laid?*) <sup>[RB3]</sup>



*Healthy and cone beetle damaged western white pine cones*

Infested cones normally drop to the ground. Adults mature within cones during the summer and usually overwinter there. At least in coastal BC populations, new adults may leave the cones in summer and fall to overwinter elsewhere.

**Egg:** Oval, whitish, approximately 0.6-1.0 mm long.

**Larva:** “C” – shaped, white, legless, with amber to light brown head. 1.0-3.0 mm long. (Do we know how many instars?) [RB4]



*C. ponderosae* larva exposed in a dissected western white pine cone

**Pupa:** Pupation occurs during summer within the dead cone. Pupae are white when they are first formed. After a period of 4-5 days, they transform to teneral adults, which gradually darken and harden over several weeks.



*C. ponderosae* pupa dissected from its cocoon

**Adult:** A small beetle (2.4-4.0 mm-Peter's book says 2.4-3.0 mm), dark brown to black, covered with moderately long hairs; head concealed when viewed from above.



*C. ponderosae* adult on damaged cone

## DETECTION AND MONITORING

This section needs to be written by someone other than myself. I don't know if anything is done in any of the orchards for cone beetle.

Do you want to talk about cone beetle pheromones and monitoring populations with them? Timing?? [RB5]

**Insect stage calendar to be added - only necessary if there is monitoring to be done.**

## CONTROL

Chemical insecticidal control measures have not proven effective against this insect. (Peter's book talks about soil application and stem implants....Is that anything you want in this factsheet?) [RB6]

Where populations occur in pine seed orchards, they can be kept in check through careful collection and destruction (e.g. raking and burning) of all infested cones during the summer months. However, this tactic is not feasible in natural stands. In the blister-rust-resistant white pines of Texada Island, cone crops are protected by annual spring climbing of seed production trees and bagging of all second year cones to exclude beetles.

## KEY REFERENCES

Hedlin AF, Yates III HO, Tovar DC, Ebel BH, Koerver TW, Merkel EP. 1980. Cone and seed insects of North American conifers. Environment Canada, Canadian Forest Service; USDA Forest Service; Subsecretaria Forestal y de la Fauna, Secretaria de Agricultura y Recursos Hidraulicos, Mexico.

Miller DR, Pierce HD, De Groot P, Jeans-Williams N, Bennett R, Borden JH. 2000. Sex pheromone of *Conophthorus ponderosae* (Coleoptera: Scolytidae) in a coastal stand of western white pine (Pinaceae). *The Canadian Entomologist* 132: 243-245.

Rappaport NG, Stein JD, Del Rio Mora AA, DeBarr G, De Groot P, Mori S. 2000. Responses of *Conophthorus* spp. (Coleoptera: Scolytidae) to behavioural chemicals in field trials: A transcontinental perspective. *The Canadian Entomologist* 132: 925-937.

**PHOTOGRAPHS:** Dion Manastyrski and Robb Bennett.