

CONE AND SEED INSECT PEST LEAFLET NO. 8

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

DOUGLAS-FIR CONE MOTH (*Barbara colfaxiana*)



Barbara colfaxiana moth don't want to use this image



Douglas-fir cone moth pupa and destroyed seeds in damaged cone.

TAXONOMY:

Order (Family): Lepidoptera (Tortricidae)

HOST: Douglas-fir

DISTRIBUTION: Found throughout the range of Douglas-fir from British Columbia south to northern California, Arizona, and into northwestern Mexico. Usually more prevalent in drier, interior locations.

DAMAGE: Cone moth is a serious pest of Douglas-fir seed production. Larvae tunnel through cones in a meandering fashion around the cone axis feeding on scales and seeds. One to several larvae may be present in a single cone. Damage to smaller cones is usually indicated by misshapen appearance, small bore holes, and frass on cone surfaces; larger cones may exhibit no exterior signs of damage.

IMPORTANCE: Although a serious pest throughout the range of Douglas-fir, coastal populations of Douglas-fir in areas with relatively cool summer climates are usually less at risk to damage than are interior populations in areas with hotter, drier summers. One larva can destroy 60% of the seeds in a cone. Three larvae will likely destroy 100% of the seeds. **Talk more about the importance. Important mostly in the interior.**

DESCRIPTION

Life History: One generation per year. Adults emerge from pupae in old cones in early spring during the Douglas-fir pollination period when new female conelets are upright, open, and pollen receptive. Adults fly in the evening and lay eggs singly on cone bracts.

Egg: The eggs are oval, about 0.7 x 0.8 mm, and pearl coloured.

Larva: Yellow-white becoming pinkish with maturity, head capsule initially black, maturing to brown. Young larvae feed on cone scales, then move to seeds as the cone matures. Larvae feed for about two months and complete their development by mid to late July.

Need a photo of a Barbara larva in a cone

B. colfaxiana larva exposed in a dissected Douglas-fir cone

Pupa: Pupation occurs within the cone, usually in late July. Pupae are reddish, about 15 mm long, within a tough, papery, pitch-coated cocoon, and overwinter in cones.



B. colfaxiana pupa dissected from its cocoon

Adult: Medium-sized (wingspan 15-20 mm), greyish- or reddish-brown with wings banded with grey, silver, and brown.

Need a photo of a Barbara moth in situ

B. colfaxiana adult on Douglas-fir cone

DETECTION AND MONITORING

I don't know what to write for this section. What is the protocol for monitoring for Barbara? We haven't done much active monitoring for Bcol for two reasons – interior D-fir seed orchards are a relatively new thing for us and population levels appear to have been generally low in natural stands for the last while. We can probably use a modification of the *Cydia*

strobilella blurb but definitely need to have it polished by Ward and Jim.—e.g.:

In Douglas-fir seed orchards, cone moth populations should be monitored on an annual basis during the spring pollination period. In British Columbia, cone moth monitoring should be carried out in Interior Douglas-fir seed orchards following the protocols established for cone maggot and seed worm monitoring in spruce. Action thresholds ??? The sex pheromone of the Douglas-fir cone moth has been identified and synthesized but this knowledge has not yet been incorporated into monitoring or control programmes for this insect.

Insect stage calendar to be added by me

CONTROL

For seed orchards in close proximity to natural stands of Douglas-fir, overhead application of cold water misting in early spring may hold back budburst sufficiently to put orchard trees out of synchrony with natural stand trees and perhaps reduce infestation. Otherwise, conelets should be monitored and if expected seed loss is unacceptable, a foliar spray of systemic insecticides applied when the majority of Douglas-fir cones are horizontal should provide good control. Currently, dimethoate is the only active ingredient registered in Canada that seems to be effective. **(Talking out of my hat here—help me please)**

In seed orchards, destruction of non-crop cones in late summer or early fall my help to reduce local cone moth populations. **(More information.....)**

KEY REFERENCES

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.

Jon Sweeney may be a good resource for other publications – he did a lot of work with Bcol in the 80s.

PHOTOGRAPHS: Dion Manastyrski and Ward Strong.