

# SPRUCE SEEDWORM (*Cydia strobilella*)

*Cydia strobilella* adult on interior spruce foliage

## TAXONOMY:

Order (Family): Lepidoptera (Tortricidae)

**HOST:** All spruces in North America.

**DISTRIBUTION:** Widespread throughout range of spruce in Canada and the western and northeastern United States.

**DAMAGE:** Seedworm larvae can cause major damage to spruce seed crops. Young larvae tunnel through cone tissue and bore into individual seeds, consuming the contents. Seeds are partially to completely consumed and often become fused to cone scales. Larvae leave no external evidence of their presence.

**Importance:** In British Columbia, spruce seedworm is primarily an issue for spruce crops in the interior. To date, coastal spruce crops have not been impacted by spruce seedworm **Are there any stats about seed loss due to this insect?**

The only good image of *Cydia*-consumed seed that I know of is the old (Doug Ruth?) image posted at [http://www.for.gov.bc.ca/hti/iig/pests/images/cydiastrobilella\\_damage.jpg](http://www.for.gov.bc.ca/hti/iig/pests/images/cydiastrobilella_damage.jpg) (damaged seeds on top, healthy seeds on bottom)

## DESCRIPTION

**Life History:** One generation per year with adult emergence synchronized with the spruce pollination period. Overwintering larvae may enter extended diapause and remain inside cones for one or more years. **Any idea of the number of eggs laid?**

**Egg:** Eggs are pale to dark orange, spherical, flattened, about 0.5 mm in diameter, and are deposited singly on or between conelet scales during or shortly after cone pollination.

Spruce seedworm egg in a dissected cone scale **Which photo? Or would you like both I think BOTH**

**Larva:** Larvae are creamy white with a brown head capsule and thoracic shield and are about 10 mm long at maturity. There are 4 larval instars. Early instars consume seeds; in late summer, mature larvae tunnel into the central cone axis to overwinter. One larva may destroy from 10-20 seeds.

Spruce coneworm (early instar) on cone tissue **Do you think this is a *Cydia*? HMM – fairly sketchy!**

Late instar *C. strobilella* larva in cone axis

**Pupa:** Light amber, later darkening to black, about 4.0 mm to 6.5 mm long, within the cone axis. Pupation occurs in the spring just prior to budburst. **It says in Hedlin, that if there is more than one larva present in the axis, they may separate themselves using frass plugs. Cool....**

**Adult:** Small moth (wingspan 8mm – 11 mm), greyish-brown wings with distinctive silvery crossbands on the forewings. Adults are only present for a short time during the spruce pollination period.

*C. strobilella* adult on a spruce cone

## **DETECTION AND MONITORING**

In spruce seed orchards, spruce seedworm populations should be monitored on an annual, ongoing basis in seed orchards. In British Columbia, spruce seedworm monitoring is carried out in Interior seed orchards at the same time as spruce cone maggot monitoring and following the same protocols. However, no action thresholds have been established for this insect in British Columbia as, generally, cone maggots are a more substantial problem and maggot control tactics are usually also effective against seedworm populations. In part because of this, although various aspects of the chemical ecology of the spruce seedworm are understood (including its sex pheromone and its response to some other environmental stimuli) this knowledge has not yet been incorporated into monitoring or control programmes for this insect.

**Is it enough of an issue for there to be a pheromone program for this wee beastie?**

**Does one sample the conelets for eggs and young larvae after pollination? Does one dissect cones to estimate population levels and percent seed loss? I think I have answered these 3 questions with text above**

**Insect stage calendar to be added by me**

## **CONTROL**

If predicted seed loss is unacceptable, a foliar spray of systemic insecticides applied when the majority of spruce cones are horizontal should provide good control. Currently, dimethoate is the only active ingredient registered in Canada that seems to be effective. **(This needs more information)**

**Biocontrol options?**

In spruce seed orchards, non-crop cones should be picked and destroyed before the following spring to kill overwintering larvae. This will help to reduce the numbers of seedworms that survive to adulthood in the local population. In natural stands, prior to harvest, examine samples of mature cone for the presence of seedworm larvae in cone axes as well as to estimate the numbers of filled seeds remaining in cones.

## **KEY REFERENCES**

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**PHOTOGRAPHS:** Dion Manastyrski unless otherwise noted.