

Management of Raspberry Borers

Hannah Fraser, Entomologist – Horticulture, OMAFA and Erica Pate, Fruit Crop Specialist, OMAFA

Published September 2022

If borers are hobbling the health of your raspberry canes, take action this fall (and again next year) to help reduce pest pressure going forward.

There are two types of borers attacking raspberries and other *Rubus* species in Ontario: raspberry crown borers (moths) and cane borers (beetles). In both cases, it is the larval stage that causes economic injury by killing canes and entire plants. Management strategies vary by pest, so the first step involves identification.

Red-neckedcane borer, one of two beetle pests, is a small (6-7 mm long), slender metallic insect with a copper-coloured area behind the head. As a point of reference, they are buprestid or metallic wood borers, closely related to the emerald ash borer, an introduced pest that has changed the Ontario landscape since its accidental introduction over 15 years ago. You might find adult red-necked cane borers feeding on the leaf margins, leaving their droppings behind as additional evidence of their presence. The females lay their eggs under the bark in the lower portion of primocanes. Larvae are white, legless, with a flattened and enlarged head region. They tunnel in a spiral fashion, damaging the tissues, with a resulting swelling or gall. Bark covering the galled areas will often split. Canes become dried and brittle above the swellings and are easily blown over. Injury is most frequently observed in late summer, fall or winter when infested canes break off.

Infested canes are fairly obvious during scouting, and one of the most effective management strategies is to remove and destroy them before the new adults emerge in the spring. There is one generation per year. There are no insecticides labeled for red-necked cane borer in Canada, but the adults are likely knocked back by products used to manage other pests.

Did you find canes with wilted tips this summer? And did these have two rows of zipper-like punctures below the wilting point (Figure 1)?



Figure 1 Damage from raspberry cane borer

Or perhaps your fall scouting has revealed dead or broken tips. It was probably injury caused by another beetle, the raspberry cane borer. The adults are slender, black, with a yellow-orange thorax (area behind the head) and relatively long antennae. Females lay their eggs in the top 15 cm of new canes. They chew two rows of punctures around cane, below and above egg-laying point. Why do they take this extra step? Because it helps ensure successful egg hatch and facilitates downward movement of the larva. The larvae hatch mid-summer and burrow down into the cane, making their way to the base, near the roots. The feeding tunnel should be obvious if you cut into the cane slightly below the puncture holes and slice the cane vertically.

Although Altacor (chlorantraniliprole, a group 28 diamide) is registered for use as a foliar spray to target the adults, raspberry cane borer management usually doesn't require insecticides. Save your money, use the product where it's really needed, and focus on physical removal of infested canes – which you need to do anyway. During the summer, identify wilting tips and cut canes about 10 cm below the punctures to remove any larvae. It's still possible to remove infested canes in the fall, but you will have to remove the entire cane before the larva makes its way to the base to overwinter and where it will cause even more injury next year. This is very rarely an economic pest of raspberry if caught early.

Now onto a much more challenging pest.

Raspberry crown borers are members of the clear-winged moth family, many of which are excellent bee or wasp mimics. Not just in terms of looks either. Even their flight patterns are more bee-like (hover and dart) than moth-like (flutter like a butterfly). These features are important as a survival tactic, because the adults are active during the day, and resembling a stinging insect likely helps them from predation. It also makes them easier to identify. Raspberry crown borer moths have a wingspan of 25-30 mm and look like a big furry yellowjacket, with alternating black and yellow stripes on the abdomen and thorax.

Females lay reddish-brown eggs singly on the underside of leaves (she will lay about 200 in her short lifetime). The egg hatches several weeks later, and the larva migrates to the base of the canes, where it either excavates a small cavity or finds a protected place in the bark to overwinter. Early the following spring, the larva moves through the cambium and into the crown, where it continues to feed through another entire year. The larva spends most of its two-year life cycle protected within the plant, feeding on the crown, at the base of the canes and larger roots. In other words, raspberry crown borer has a two-year life cycle and is protected from insecticides over most of that period. The longer a field is in production, the higher the risk, especially if the pest is left unmanaged. High tunnel, soilless production are unlikely to be at risk for infestation.

The first step in control is to recognize raspberry crown borer before it causes significant damage. Watch for wilting or dying primocanes and areas of weak growth in the spring.



Figure 2 Decline from raspberry crown borer

By early summer, infested canes will pull out easily from the crown with a sharp tug. Dig up the crown, clip off the canes and cut through the crown to look for frass, larvae, and tunnelling.



Figure 3 Raspberry crown borer pupa found in the crown.

Destroy infested canes and crowns in the late summer and fall.

Timing really is everything in terms of managing raspberry crown borer. And we're in one of two windows of opportunity right now, in the early fall. You'll have another opportunity again in the spring, and we recommend targeting this pest again then. New adults emerge in the late summer to early fall, with females laying eggs into late September. If we had a reliable pheromone trapping system and a degree day model, it would be easier to track their emergence and activity, helping us to time insecticide applications targeting hatching eggs. Unfortunately, published research from British Columbia indicates the pheromone is unstable under field conditions.

Management involves identifying infested plants and the timely application of insecticides. Since raspberry crown borer has a two-year life cycle and the larvae are at different stages of development at any given time, you need to target the pest over multiple years. This means applications in the fall to intercept newly hatched larvae as they move down the cane to the base of the crown and again in the following spring before they burrow into the crown. You will need to repeat this process over two consecutive years for effective control.

There are few remaining insecticides labelled for raspberry crown borer in Canada. Altacor (max 3 applications per year depending on rate) will control hatching eggs and young larvae. Research by McKern *et al.* (2006) in Arkansas indicated excellent control (100%) using Altacor drenches with early November timing. We recommend applying the first spray in late August or early September when eggs are hatching, ensuring good coverage of the whole plant. Follow this with a second application in early to mid-October, using a high-volume spray to the base of the cane to target overwintering larvae. Spring applications (April) target the larvae before they move into the crown. Diazinon 50 EC / 500 E (1 application per year) applied at a high volume of water drench to the crown area) should be applied using a high volume of water to drench the crown area when the new canes reach about 10 cm in height. Summer applications of entomopathogenic nematodes such as *Steinernema feltiae* that actively hunt raspberry crown borer (even once in the crown) may help to reduce numbers (Capinera, 1986); soils are too cold in the spring for these predators to be effective (McKern *et al.*, 2006). Nematodes have not been evaluated in Ontario for management of raspberry crown borer.

For more information and pictures of these pests, visit

<https://cropipm.omafra.gov.on.ca/en-ca/crops/raspberries/insects-and-mites>