Raspberry Insect Pest Management

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Insect pests of raspberries are sporadic and few occur in every field or every year. Scouting on a regular basis is very helpful, however, monitoring techniques and thresholds have not been scientifically developed in many cases. Because few insecticides are registered for raspberry pests, sanitation and management practices in raspberries are very important. Another challenge is timing insecticides for important pests around bloom, because raspberry bloom is very attractive to bees and other beneficial pollinators. As growers switch from broad-spectrum insecticides to more specific products with shorter residuals, expect flare-ups of pests that were not previously a problem.

Primocane fruiting raspberries, if grown only for the fall crop, present a different set of pest problems compared to summer–fruiting types. Flat-headed borers, two-spotted spider mite, potato leafhopper, tarnished plant bug, sap-beetles and wasps can be major pests of primocane fruiting raspberries. Clipper weevil, raspberry fruitworm and rose chafer are not as important, because buds are not present when these pests are active. Loopers and spanworms are not common on fruit in late summer or fall. Raspberry crown borer, snowy tree cricket and raspberry caneborer can be kept in check by regular mowing and destruction of canes each year.

Following is a list and brief description of the most important raspberry insect pests and how to scout for them. Because insecticide registrations vary between the USA and Canada and also from state to state, they are not specified here.

Insects That Attack Canes and Crowns

Raspberry crown borer. Of the cane and crown borers, raspberry crown borer is the most common and devastating. The adult is a clear winged moth that is rarely seen. It is active during late July, August and September when it lays eggs on raspberry leaves. The larva hatches and travels to the base of the cane to overwinter. The following spring the larva enters the crown and tunnels around in the lower cane and crown for a year and a half. It pupates and emerges as an adult late in the second summer. During the first year, larvae are not obvious unless the crown is dug up and carefully examined for larvae, tunnelling and frass. In the second summer, canes pull away easily from the crown with a firm tug. The frass and larvae, much bigger by now, can be seen in the base of the cane. Prominent swellings from crown borer larvae are sometimes seen a few inches above the base of the cane. Damage from this pest is often confused with disease symptoms or winter injury. Canes are weak and often die back just before harvest. Primocane numbers decline over time.

Insecticides for this pest do a great job *if* they are applied at the correct timing. The window for control is short, as larvae must be controlled before they tunnel into the crown. Sprays are

usually applied in October, or very early spring. Research is focussed on developing a pheromone for the adult. If this work is successful, pheromone traps could be used to monitor adult activity and perhaps spray for this stage. Mating disruption may be possible in larger, more uniformly sized blocks.

Raspberry cane borer. This is a slender, small (1/2 inch), long-horned beetle, black with a bright orange thorax. The beetle is seldom seen, but easily recognized by antennae that are longer than the body. It is active in June and may be present for several months.

The adult lays an egg in the primocane tip, then makes two rings of puncture marks in a ring around the cane, above and below the egg. The primocane wilts immediately, but damage to the entire cane is rare into the first year. The larva travels down the cane however, to overwinter, and remains a second year at the base of the cane. These canes usually die in the winter.

Growers usually control this pest by removing wilting primocane tips in July and August, before the larvae travel down the cane to the crown. Pruning out fruiting canes before the next growing season is also important. Be sure to cut canes close to the ground. Insecticides can be applied to control beetles. Apply controls when damage is first evident, generally before or after bloom.

Red-necked cane borer and bronze cane borer are more common pests of blackberries and raspberries in the southern USA. Adults are very small beetles (1/4 inch) and black in colour with a reddish thorax. In Ontario, beetles are present in July, and can sometimes be seen on foliage in the lower canopy, especially on sunny days. Adult beetles lay their eggs on primocanes, about 1-4 feet above the ground. Larvae hatch and tunnel in a spiral up and down the cane, which can be seen by scraping the bark away in the damaged area. Long swellings with cracked bark develop where the larvae have tunnelled. Canes often break off at the swelling before harvest; however these broken canes are sometimes attributed to rabbit feeding or wind damage. Damaged canes should be removed and destroyed during the dormant season. Insecticides can be applied to control adult beetles (in July) but nothing will control larvae inside the cane.

Tree crickets. These pale green delicate looking insects have long antennae and long legs. Both nymphs and adults can be found on raspberry foliage during the summer. Adults lay a series of eggs in a row along the primocane, leaving several to many puncture marks in a tight row lengthwise along the cane. Long cylindrical eggs can be found inserted into the cane. The egg laying wound can weaken the cane and provide an entry point for cane blight. Although a little tree cricket damage does not seem to be harmful, severely affected canes could die over winter, or might collapse above the point of injury just before harvest. Workers should be trained to identify the damage caused by this pest. Pruning out damaged primocanes in the winter is an important part of controlling this pest.

Insects That Attack Fruit and Leaves

Raspberry fruitworm. Adults are small (1/8 inch), brown, hairy beetles with clubbed antennae. Adults are active in May, as flower buds develop, and shred foliage and bite holes in fruit buds. Larvae may be present in fruit cup at harvest. To monitor for this pest, watch for shredding on

new foliage of fruiting canes and for holes in developing buds. Shake buds clusters over a small tray or dish to look for beetles. Quiet observers may also see beetles feeding on buds. Control beetles with pre-bloom application of registered insecticide.

Insects That Attack Fruit and Buds

Clipper weevil. The adult is a small weevil with long snout and reddish brown mottling on back. Adult weevils clip buds from the flower truss before bloom. Look for this pest in May, as flower buds develop. Tap flower clusters over tray or dish to look for weevils and clipped buds. Observe buds clusters for hanging or missing buds. Expect more problems where strawberries are also grown. Control beetles with pre-bloom application of registered insecticide.

Japanese Beetle. These are large, blocky beetles (1/2 inch), metallic brown-green colour with long legs. They feed extensively on foliage between the veins, and also on ripe fruit. Adults are active in late June and early July, just as fruit begins to ripen, and continuing for many weeks. To scout for this pest, look for leaf shredding and beetles, which will be obvious.
Control first beetles to reduce aggregation (they attract one another). Remove first beetles by hand. Japanese beetle adults are relatively susceptible to registered insecticides, but be aware of the preharvest interval. Control larvae in soil with soil drench of different registered products.

Rose chafer. Adults are oblong, beige beetles about ½ inch, with long spiny legs. They feed extensively on foliage and flower buds in the pre-bloom through bloom stage, typically when peonies are in bloom. Look where problems occurred in the past. Adults are relatively easy to control with insecticides. Identify the source of the infestation, which is usually an area of permanent sod or turf on sandy soil. Consider control of larvae on these sites, either by removing sod in the late summer or fall, or controlling with registered insecticides for white grubs in soil.

Tarnished plant bug. Adults are fast-moving brown insects, oval, with a yellow triangle behind the head. Nymphs are green, soft bodied similar in size to aphids. Damage from this pest is not well documented, or consistently a problem. Adults and nymphs feeding on blossoms and developing fruit may cause uneven fruit formation. Feeding by adults on ripe fruit can cause desiccation of drupelets and provide wounds for Botrytis grey mould infection. Tap blossom and fruit clusters over a tray or dish to look for fast-moving nymphs. Watch for adults feeding on ripe fruit in late summer and fall. Thresholds and control strategies have not been developed for this pest. To keep populations low, control weeds, which are attractive to adults. Timing weed control is important however. Do not mow weeds or adjacent alfalfa crops when raspberry flowers and fruit are present, because plant bugs will move from these favoured hosts to your raspberry crop.

Inchworms, loopers, spanworms. These are small, slender caterpillars, usually with brown or reddish angular markings. Caterpillars are found mostly on fruit, and may feed on individual drupelets. Most damage is caused by the presence of larvae in harvested fruit.

Monitor just before harvest by shaking fruit clusters over a tray or dish. Expect problems to be worse near woods and hedgerows and deciduous trees. Prebloom insecticides for caterpillars will provide control.

Paper wasps and yellow jackets. These pests are easily identified. Adults are attracted to ripe fruit as a source of moisture and sugar, especially in late summer and early fall when populations are at their peak. They are a nuisance and danger to people picking the fruit. harvest all ripe fruit on a regular schedule to reduce problems with these pests. Bait traps placed around the perimeter to the field may help

Insects That Feed on Foliage

Two spotted spider mite (TSSM). Overwintering females TSSM are bright orange. Otherwise these small 8-legged creatures are greenish white with two distinct black spots. Early damage appears as fine white speckling or stippling on upper leaf surface and fine webbing on the lower leaf surface. Leaves eventually develop brown dry patches and appear to be "sand-blasted". Severely damaged leaves eventually fall off the plant. Lower leaves are affected first. To scout for TSSM check foliage often for early signs of stippling. Check the underside of leaves with handlens for mites, webbing, and predators. Two spotted spider mites are worse in greenhouse and high tunnels than they are in the field. The cultivar Autumn Britten seems to be especially susceptible. Commercial sources of predator mites can be released for biological control. Take time to learn how pesticide use and climatic conditions affect the success of this method of control.

Raspberry sawfly. Adults are small (1/4 inch), black fly-like insects with four wings and rarely noticed. Larvae are bristly green up to ½ inch long. Larvae feed on the lower leaf surface, eating, chewing through most leaf tissue, except the veins. Watch for leaf feeding and green larvae , mostly on primocanes. Check routinely from the prebloom to green fruit stage. Control larvae with pre-bloom application of registered insecticide.

Potato leafhopper. Adults and nymphs are bright green, narrow wedge shaped insects. Adults are winged and quickly fly away when disturbed. Nymphs are soft-bodied and in the same size range as aphids. Leafhopper nymphs are found on the leaf underside and have the unique ability to move sideways when prodded. Adults and larvae feed on plant juices and inject a toxin that causes "hopper burn". Leaves turn yellow along the edges and curl downwards. New growth may be stunted. There are several generations each year from June through to September. Remember to check new plantings for this pest. Check new growth for yellowing and leaf curl and check the leaf underside for small green nymphs.

Control when damage is evident and leafhopper nymphs are easy to find. However, bloom, especially on primocane fruiting varieties, can interfere with timing these insecticides.

Suggested references

Berry Diagnostic Tool http://www.hort.cornell.edu/diagnostic/
Bramble Production Guide
Compendium of Raspberry and Blackberry Diseases
Midwest Small Fruit Pest Management Handbook