

Blueberry scorch, caused by *Blueberry scorch virus* (BIScV), was first found in British Columbia (B.C.) in 2000, and now it is widespread in all blueberry growing regions of the province. It is spread by aphids or infected planting stock. Severity of the disease depends on the blueberry varieties and strains of BIScV, but all highbush blueberry varieties grown in B.C. are susceptible to BIScV. It can cause severe blossom and leaf blighting, and reduction in yield. Once infected, blueberry plants do not recover from the disease and serve as a source of inoculum of virus for aphid transmission. With over 11,500 hectares (28,500 acres) of blueberry production in B.C., management and control of BIScV requires region-wide cooperation of all growers to control aphid populations and remove infected plants in order to slow the spread of blueberry scorch within fields, between fields, and between farms.

## Symptoms

Symptoms on blueberry plants usually develop 1-2 years after the initial infection by BIScV. This period is called the latent period (the length of time it takes for the virus to build up to detectible levels in the plant following infection).

The best time to look for early symptoms on blueberry plants is during bloom. Blossoms and leaves rapidly blight and dry up following early bloom (Figure 1). Sometimes only blossoms are blighted, or only a few infected shoots may be observed (Figure 1A-D). Blighted blossoms and leaves remain attached to green stems (Figure 1D). Symptomless plants are often found next to symptomatic ones (Figure 1F).

Virus infected plants never regain normal productivity and they decline and die-back over a period of years. As the season progresses, plants may produce new growth that appears to be healthy but remain infected with the virus. All parts of the plant become infected, even the roots. If an infected plant is mowed down, the new shoots will still be infected with the virus.

Other signs of infection can include red line patterns on leaves (oak leaf patterning) in the fall, yellowing of leaf margins, leaf mottling, overall pale color, low number of blossoms, or even a 'twiggy' appearance.

In some cases, infected plants may show subtle or no symptoms, but all varieties are susceptible to infection. 'Bluecrop' plants may show only mild symptoms or show no symptoms at all. Infected 'Bluecrop' foliage may be a paler green than that of healthy plants. They do not usually show the blighting and dieback symptoms that are more common on other varieties. Although symptoms on 'Bluecrop' may be subtle, the infected bushes have lower yields. They produce fewer blossoms and smaller fruit.

Blueberry scorch symptoms can resemble other diseases and disorders of blueberry such as blueberry shock, mummy berry, bacterial blight, spanworm damage or frost damage. Therefore, confirmation of the causal agent associated with the symptoms by a plant diagnostic laboratory is necessary.



Figure 1. Symptoms on blueberry plants infected with *Blueberry scorch virus*. Early to late symptoms of blighting of blossoms (A-D), blighting of leaves (E), and a symptomatic plant is amongst asymptomatic plants in a *Blueberry scorch virus* infected field (F). Photo Credit: Lisa Wegener, Kwantlen Polytechnical University, British Columbia.

**Management Strategies**

**Clean plants:** Start with clean plants. Do not propagate infected plants. All mother plants should be tested for BISCv prior to propagating. Aphid control is critical throughout all phases of propagation to prevent virus

introduction and spread. *Only purchase planting stock from reputable nurseries that follow an accepted propagation protocol, including virus testing.*

**Monitoring:** Blueberry fields should be carefully monitored starting at bloom time for blossom and shoot blighting and other scorch-like symptoms.

**Testing of plants with symptoms:** Send leaves from symptomatic or suspected plants to the [Ministry of Agriculture, Food and Fisheries - Plant Health Laboratory](#) or to a qualified laboratory, as directed by the BC Blueberry Council to test and confirm whether the virus is present. Collect at least 10 fresh leaves per bush, as close to the symptomatic region as possible. BISCv samples submitted to the laboratory must be accompanied by a BISCv laboratory submission form.

**Removal of infected plants:** Infected plants should be removed as soon as possible and destroyed. Infected plants should be removed entirely including roots. Infected plants that are left in the field will act as a source of virus infection for surrounding, healthy plants. In the absence of plant removal and/or aphid control, the virus can spread through a field at a rate of 5% per year. Whole fields will eventually become infected and non-productive.

**Aphid control:** BISCv is transmitted by aphids (vector). In blueberry producing regions where scorch is present, all growers should follow an effective aphid control program. All fields should be treated before bloom with registered aphicides (Table 1) to control the over-wintering aphids before they reproduce and disperse. After bloom, monitor fields for aphids and, if necessary, apply aphicide before populations increase. Scout several locations in each field, especially around the edges of fields. Do not spray until after bees have been removed from the field and be sure to follow pre-harvest intervals as indicated on the aphicide labels. Refer to the BC Berry Production Guide for information on pesticide recommendations and management of aphids.

Table 1. A summary of registered aphicides and label information. Please refer to Health Canada’s [Pest Management Regulatory Agency](#) website for labels and information on registered pesticides.

Timing of application	Product	Application guidelines (see label)
Pre- or post-bloom application	Fulfill	(50% pymetrozine) at 193 g/ha (77g/acre) for control of overwintering aphids prior to bloom. Do not apply when bees are present. Can be used as post-harvest if aphid population increases. Do not exceed 2 applications per season. Do not apply within 85 days of harvest.
	Exirel	(100 g/L cyantraniliprole) at 750 - 1500 mL/ha (i.e. 300 - 600 mL/acre). Use the high rate at high insect pressure. Toxic to bees; therefore, do not apply at bloom when bees are present. Do not exceed 4 applications per season. Do not apply within 3 days of harvest.
	Sivanto Prime	(200 g/L flupyradifurone) at 500 - 750 mL/ha (i.e. 196 - 295 mL/acre). Use the high rate at high insect pressure. Toxic to bees; therefore, do not apply at bloom when bees are present. Do not exceed 2000 ml/ha (787 ml/acre) per season. Do not apply within 3 days of harvest.
	PyGanic ECI.4	(1.4% pyrethrins) at 2.32 - 4.65 L/ha (i.e. 0.93 - 1.86 L/acre). Do not exceed 8 applications per season. Toxic to bees; therefore, do not apply when bees are present. Can be used in organic production. Can be applied up to the day of harvest.

Post-bloom application	Admire 240F or Alias 240SC	(240 g/L imidacloprid) at 175 mL/ha (i.e. 70 mL/acre). Toxic to bees; therefore, do not apply at pollination when bees are present. Do not apply more than two times per season. Do not apply Admire within 3 days and Alias within 14 days of harvest. Removal of woody growth (stumping of plants) must occur after harvest and before the next season's bloom. In producing fields, consider alternative aphicide products.
	Assail 70WP	(70% acetamiprid) at 56 to 86 g/ha (22 to 34 g/acre). Do not exceed 4 applications per season. Toxic to bees; therefore, do not apply during bloom when bees are present. Do not apply within 1 day of harvest.
	Closer	(240 g/L sulfoxaflor) at 100 to 200 mL/ha (40 to 80 mL/acre). Use the high rate at high insect pressure. Toxic to bees; therefore, do not apply at bloom when bees are present. Do not exceed 3 applications per season. Do not apply within 1 day of harvest.
	Concept Liquid	(75 g/L imidacloprid, 10 g/L deltamethrin) at 560 mL/ha (224 mL/acre). Do not exceed 3 applications per season. Toxic to bees; therefore, do not apply at bloom when bees are present. Concept is not acceptable to certain markets; check with your processor before using. Removal of woody growth (stumping of plants) must occur after harvest and before the next season's bloom. In producing fields, consider alternative aphicide products. Do not apply within 14 days of harvest.
	Cormoran	(80 g/L acetamiprid, 100 g/L novaluron) at 750 mL/ha (300 mL/acre). Toxic to bees; therefore, do not apply at bloom when bees are present. Do not exceed 3 applications per season. Avoid applying under high temperatures. Do not apply within 8 days of harvest.
	Movento 240SC	(240 g/L spirotetramat) at 220 - 365 mL/ha (i.e. 88 - 146 mL/acre). Toxic to bees; therefore, do not apply at bloom when bees are present. Do not apply more than 1.8 L/ha (i.e. 0.72 L/acre) per season. Do not apply within 7 days of harvest.

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