

Blueberry Scorch Virus

Blueberry Scorch Virus (BIScV) was first detected in BC in 2000, but it is likely that it was present in BC several years earlier. It is now widespread in all blueberry growing areas of the province. Severity of the symptoms depends on the cultivar and viral strain, but all highbush blueberry varieties grown in BC appear to be susceptible. BIScV can cause severe blossom and leaf blighting, and decreased yields. Once infected, plants do not recover. Infected plants show symptoms each year, and should be removed. BIScV is spread by aphids or by planting infected stock.



Figure 1. Blighted blossoms



Figure 2. BIScV infected bush next to healthy plants

Blueberry Scorch Virus strains

- 7 strains of BIScV have been found in BC. These are thought to be distinct from the Northwest strain (found in Oregon and southern Washington) and the East Coast strain (first identified in New Jersey over 25 years ago).
- Symptomology and susceptibility of blueberry varieties to individual strains is not well understood. Further research is being conducted to understand how individual strains affect different blueberry varieties.

Where has the virus been found?

- BIScV virus is present in all blueberry production regions, including all areas of the Lower Mainland/Fraser Valley, the Saanich Peninsula of Vancouver Island, and the Okanagan and Kootenay valleys.
- BIScV has been found in both young fields and in older fields.
- BIScV has been detected in cranberry (*Vaccinium macrocarpon*), red huckleberry (*Vaccinium parvifolium*), and oval-leaf (wild) blueberry (*Vaccinium ovalifolium*) but does not appear to cause symptoms in any of these hosts.

Symptoms



Figure 3. Blossom Blighting



Figure 4. Leaf blighting on 'Northland' variety

- The best time to look for symptoms of BISCv is during bloom. Monitor your fields carefully at this time.
- In the most severe cases, blossoms and leaves rapidly blight and dry up following early bloom. Sometimes only blossoms are blighted, or only a few infected shoots may be observed.
- Blighted blossoms and leaves remain attached to green stems.
- BISCv symptoms can resemble Blueberry Shock Virus, Mummyberry, frost damage, bacterial blight, spanworm damage, or other diseases. Laboratory testing is required for a proper diagnosis.
- BISCv symptoms usually develop 1-2 years after infection. This period is called the latent period (the length of time it takes for the virus to build up to detectable levels in the plant following infection).
- Symptomless plants are often found next to diseased ones.
- BISCv infected plants decline and die-back over a period of years.
- Infected plants never regain normal productivity.
- As the season progresses, plants may put on new growth that appears to be healthy, but remain infected with the virus.
- In some cases, infected plants may show few or no symptoms, but all varieties are susceptible to infection.
- 'Bluecrop' plants may show only subtle signs of infection, or show no symptoms at all. BISCv infected 'Bluecrop' may be more 'yellow' in color than healthy 'Bluecrop'. They do not always show the dieback symptoms that are more common with other varieties. Although symptoms on these bushes may be subtle, the 'yellowed' bushes have lower yields. They produce fewer blossoms and smaller fruit.
- 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. **If anything looks suspicious, have it tested.**
- All parts of the plant become infected, even the roots. If an infected plant is chopped down, the new shoots will still be infected with the virus.



Figures 5 and 6. Healthy 'Bluecrop' (left) versus Scorch Virus infected 'Bluecrop' (right). Note the lack of fruit and pale leaf colour on the infected bush.

Management Strategies

- 1. Monitoring.** All blueberry fields should be carefully monitored during bloom for blossom and shoot blighting and other scorch-like symptoms.
- 2. Test plants with suspicious symptoms.** Send leaves from suspicious plants to the BCMAL Plant Diagnostic Lab (or other qualified lab) for testing to confirm whether the virus is present. Collect at least 10 fresh, fully opened, **green** leaves per sample, from as close to the affected (symptomatic) region as possible. B1ScV samples submitted to the lab must be accompanied by a B1ScV laboratory submission form. Growers can submit up to 10 samples per field, free of charge.
- 3. Remove infected plants.** Infected plants should be removed from the field as soon as possible and destroyed. Infected plants need to be removed entirely, including the roots. Infected plants that are left in the field will act as a source of new 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.



Figure 7. Regrowth on mowed B1ScV infected plants. The new shoots will act as a source of infection as long as these plants remain in the field.



Figure 8. Infected 'Bluecrop' plants that are slightly yellower than surrounding, healthy plants.

- 4. Aphid control.** B1ScV is transmitted by aphids. An effective aphid control program should be used by all growers, in all growing regions. All fields should be treated before bloom with a registered aphicide to control over-wintering aphids before they reproduce and disperse. After bloom, monitor fields for aphids and, if necessary, apply sprays before populations increase. Scout several locations in each field, especially around field borders. Do not spray until after bees have been removed from the field, and be sure to follow the pre-harvest intervals on product labels.

Information on registered aphicides and rates can be found in the BCMAL Berry Production Guide. An emergency registration for Fulfill 50WG (pymetrozine) has been requested for 2008. Full registration is expected for 2009. Admire 240F (imidacloprid) can be used post-bloom, after bees have been removed from the field, and up to 14 days before harvest. Contact the BCMAL or your chemical supplier for up-to-date information on chemical registrations and use restrictions. Full registration of additional effective aphicides is being pursued.

- 5. Start with clean plants. Do not propagate infected plants. All mother plants should be tested for B1ScV 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.**

Blueberry Scorch Virus is a very serious disease that is widespread in all blueberry production regions of BC. With over 18,000 acres of blueberries now planted in BC, management and control of B1ScV requires region-wide cooperation of all growers to control their aphid populations and remove infected plants in order to slow the spread of Blueberry Scorch within fields, between fields, and between farms.

Remember:

1. Monitor fields for scorch virus symptoms, especially during bloom
2. Sample and test any plants with suspicious symptoms
3. Remove all infected plants
4. Maintain an effective aphid control program
5. Only purchase planting stock that has been grown according to an accepted propagation protocol that includes virus testing.

Further research is being conducted in order to gain a better understanding of the virus, to develop better testing methods for virus detection, and to improve management strategies.

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For more information on the BCMAL Plant Diagnostic Lab and their submission procedures, go to www.al.gov.bc.ca/croplive/cropprot/lab.htm or call (604) 556-3001.