

National Pest Alert

Blueberry Scorch Virus

Origin and Distribution

Scorch is a serious disease of blueberries (*Vaccinium corymbosum*) caused by blueberry scorch virus. Blueberry scorch virus has been detected in blueberry plants in northern blueberry growing states on the east and west coasts and in the midwest. Blueberry scorch virus was initially described from plants in New Jersey in 1970, but was not identified as a viral disease until 1980 from studies on infected plants in Washington.



courtesy P. Oudemans, Rutgers, The State University of New Jersey

Blighted flowers in BISCv-infected 'Duke' blueberry plant.

The virus also infects several wild *Vaccinium* species, some of which show symptoms similar to highbush blueberries. Infected cranberry and black huckleberry (*V. membranaceum*) are symptomless.

Symptoms

While all highbush blueberry cultivars are susceptible, symptom expression depends on the cultivar and virus strain. In most cultivars, infection results in blighting of flowers and leaves during the bloom period. Symptoms may be present on a few branches or the whole bush, and infected bushes may be scattered throughout the field. Blighted tissues often remain attached for a long time and turn a silvery gray if retained through the winter. Scorch may resemble frost injury, blueberry shock, Botrytis, Phomopsis or Pseudomonas twig blights. Some cultivars show mild symptoms such as chloro-

The Pathogen

Blueberry scorch virus (BISCv) is a single-stranded, positive-sense RNA virus in the genus *Carlavirus* and family *Flexiviridae*. Virions are flexuous rods ca. 690 nm long and 14 nm wide. Different strains of the virus exist with the greatest virus diversity identified in British Columbia. The virus can infect highbush and rabbiteye blueberries, but has not been detected in lowbush blueberry. The virus also infects several wild *Vaccinium*



courtesy P. Bristow, formerly Washington State University.

Blighted flowers remain attached for a long time on BISCv-infected plants.

sis, yellow margins or red line patterns on leaves in the fall. Others remain symptomless but can still serve as virus reservoirs. Plants with necrosis symptoms have greatly reduced fruit production and shoot growth; yield losses as high as 80% have been reported. Symptoms return every year but the severity may vary. Plants with severe scorch symptoms continue to decline and may die after 3 to 6 years. No observable yield loss occurs in symptomless infected plants. Since visual symptoms are not reliable, laboratory testing is required for a proper disease diagnosis.

Biology

Infected planting material is the primary source for long-distance spread of blueberry scorch virus. The aphids *Ericaphis fimbriata* and *Illinoia pepperi* are known to spread the virus from plant to plant in a non-persistent manner. This occurs over relatively short distances, typically less than 1 mile. While feeding on infected plants, aphids pick up virus particles on their mouthparts and can transmit

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Necrotic leaves and flowers on BlScV-infected blueberry bush.



Pale green leaves of 'Bluecrop' plant infected with blueberry scorch virus.

them for about 15 minutes. *Ericaphis* species are relatively inefficient vectors, but high aphid populations increase the risk of virus transmission. The rate of spread is about 4% per year in the absence of aphid control. The virus is not transmitted by contact between plants or mechanical means. Once a plant is infected, symptoms take 1 to 2 years to develop. The disease usually starts on one or two branches but eventually the entire bush becomes infected, including the roots.

Management

The introduction of the virus can be prevented by using certified virus-tested nursery stock. Visual inspection in nurseries is not sufficient as many cultivars do not show symptoms. Monitor plants closely for symptom development during bloom and mark suspicious plants. If scorch is suspected, send fresh, symptomatic plant samples to a reputable laboratory for diagnosis. Due to uneven distribution of the virus in the plant, it is advisable to take several samples from different branches.

If the percentage of infected plants in a field is high, all plants should be removed and burned. If the percentage is low, removal of infected plants combined with virus testing and aphid control can be implemented. Virus testing and aphid control should continue for at least 2 years following bush removal to ensure that the virus has been eradicated. Before bush removal, apply an insecticide to prevent dispersal of infective aphids, and a herbicide to prevent emergence of infected suckers from any roots that are left behind.

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Yellow leaf margins in BlScV-infected 'Stanley' blueberry.



Red line patterns on blueberry leaves in the fall due to infection by blueberry scorch virus.



Red lines and yellowed leaves on 'Legacy' plant infected with blueberry scorch virus.

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