Blueberry Scorch Virus

Origin and Distribution
Scorch is a serious disease of blueberries (Vaccinium corymbosum) caused by blueberry scorch virus. It is common in British Columbia, Canada, and occurs in a few fields in Washington and Oregon. The disease was first observed in a highbush blueberry ‘Berkeley’ planting in Washington in 1980. Scorch has been reported on blueberries in Massachusetts, Connecticut, New York, Quebec, The Netherlands and Italy. In 2009, scorch was detected in several highbush blueberry fields in Michigan—the first known occurrence in the North Central Region, and was traced to infected planting material. Continued vigilance is needed to prevent scorch from becoming endemic in the North Central Region as there is no known cure.

The Pathogen
Blueberry scorch virus (BlScV) 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 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 chlorosis, 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 E. scammelli 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 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. Field observations suggest that *Illinoia pepperi*, the most common blueberry aphid in Michigan, also transmits BlScV. 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.