

IPM Fact Sheet Series

UMass Extension Fruit Team

Fact Sheet #SD-006

Strawberry – Virus Diseases

Strawberry Mottle Virus (SMoV) & Strawberry Mild Yellow Edge Virus (SMYEV)

ID/Disease Cycle: Strawberry viruses can cause significant crop loss, particularly in areas where strawberries are grown as perennial crops. Recently, Strawberry mottle virus (SMoV) and Strawberry mild yellow edge virus (SMYEV) have become pathogens of special concern for growers in the northeastern US. In a recent survey of 11 viruses in field-grown strawberries from throughout the US and Canada, SMoV and SMYEV were the viruses most frequently detected in plants from the Northeast and they often occur together causing synergistic damage.

Symptoms can be severe when plants are infected with both viruses, or in multiple infections with other viruses. These symptoms may include stunting, chlorosis and/or necrosis on newer leaves, reddening of older leaves, leaf distortion, and diminished yield.



Fig. 1) Left to Right – Various examples of Strawberry infected with both SMoV and SMYEV
Photo Credit: C. S. Johnson, Virginia Tech.

The strawberry aphid, *Chaetosiphon fragaefolii*, is the major vector for both SMoV and SMYEV. *Chaetosiphon jacobi* and *C. minor* may also transmit both viruses; in addition, *C. gossypii* can transmit SMoV. Strawberry aphids overwinter as black, oval eggs up to 0.5 mm in length on the undersides of leaves close to the ground. Once hatched, nymphs will move to younger leaves. Nymphs will mature and begin giving birth to live young within about two weeks. As the population increases, adult aphids will grow wings and become more mobile, enabling them to spread viruses further.

Although they are both transmitted by aphids, these viruses have different relationships with their vector. SMoV is transmitted in a semi-persistent manner. The virus enters the aphid's foregut, but not the hindgut. It does not reproduce inside the vector. Aphids acquire the virus within minutes of beginning to feed on an infected plant and can transmit the virus for 2-3 hours. SMYEV is transmitted in a persistent manner. The virus enters the aphid's hindgut and can reproduce there; the aphid therefore remains infective for the span of its life. Aphids pick up the virus from infected plants in about 2 hours and can transmit it to uninfected plants after 8 hours.

In addition to aphids, both viruses may also be spread through propagation and dissemination of infected plant material. All species of *Fragaria* are believed to be susceptible to both viruses.

Damage: Virus infection can result in subtle damage at first that is difficult to measure. SMoV alone can cause up to 30% reduction in yield and runner production; however, strawberry plants infected with a single virus seldom display visible disease symptoms. Some virus symptom can be confused with damage from other causes, such as Potato Leafhopper, Cyclamen Mite, Nutrient Deficiency, Herbicide Damage or Verticillium Wilt. Check with a diagnostic lab to get help in confirming if virus infection is the cause of symptoms. The UMass Diagnostic Lab sample submission instructions can be found at: <http://ag.umass.edu/services/plant-diagnostics-laboratory/tree-fruit-small-fruit-diagnostics>.

Management: Purchase plant material that is certified as virus-free from a reputable nursery. See <http://nationalcleanplantnetwork.org> for more information. Propagating your own plant material with runners may risk the introduction of viruses into your planting. Once strawberry plants are infected with a virus, they cannot be cured. The infection is passed on to all daughter plants via runners. Most viruses are spread from plant to plant via aphids. Chemical insecticides may not kill aphids before they are able to transmit viruses. The most reliable control is to avoid introducing viruses by purchasing certified virus free plant material. If a virus infection is suspected, have the plants tested before plowing down the field since virus symptoms can be similar to herbicide injury and other causes.

Monitoring: Monitor strawberry fields for aphids during regular scouting using yellow sticky traps beginning in late-April. Ten (10) traps per average field placed at just above canopy height is recommended. No firm treatment threshold has been determined, but 1 winged adult per 10 traps is suggested as a reasonable indication for treatment where virus infections are feared. Virus testing is the only definitive way to confirm virus infection. Consult UMass Extension Specialists for recommendations on virus testing.

Control strategies:

Cultural/Biological:

- Plant only certified virus-tested planting stock purchased from a reputable nursery.
- Do not set out new plants next to old, virus-infected fields.
- Control known insect vectors. Aphid flights peak in late April to early May and again in September - the most critical periods for controlling aphid vectors.

Chemical:

- No chemical control of viruses is available.
- See [New England Small Fruit Management Guide](#) for currently recommended spray materials for aphids.
- Where repeat applications are needed, rotate insecticide materials from different IRAC groups to avoid promoting the development of resistant aphids.

Date: March 2020

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This work was supported in part by funding provided by USDA NIFA Extension Implementation Program, Award No. 2017-70006-27137



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