

## Strawberry Viruses: Why Worry?

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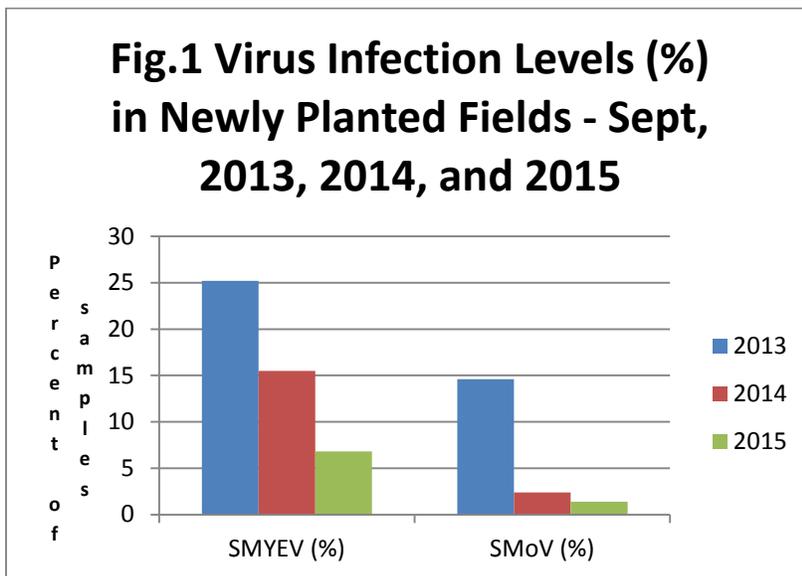
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An outbreak of two aphid vectored viruses in Nova Scotia strawberry fields in 2012-2013 caused significant losses to both nursery and commercial fruiting operations. The overall loss to the sector was nearly 50% of the combined \$19 million crop value. Recovery efforts focused on three strategies: 1) inoculum reduction facilitated by a federal/provincial disaster assistance “replant” program, 2) production of clean nursery stock facilitated by third party virus testing, and 3) optimum vector management facilitated by a province wide aphid monitoring program. More than half of the commercial fruit crop was lost in 2013 and about 25% in 2014 due to the effects of the viruses. However, the 2015 crop was a bumper one and most growers attribute this to declining virus levels (Figure 1).



The two problem viruses, strawberry mild yellow edge virus (SMYEV) and strawberry mottle virus (SMoV), are among the most common viruses to be found in strawberries and are reported around the world. Individually, they do not appear to cause problems for strawberries but in mixed infections can cause decline symptoms and severe yield reduction. A third previously unknown virus, named strawberry polerovirus 1 (SPV1), was discovered in symptomatic plants collected in 2013 and may also add to the synergistic effects of the primary viruses identified above.

SMYEV and SMoV are both spread primarily by the strawberry aphid, *Chaetosiphon fragaefolii*, so monitoring and management of this aphid is critical for controlling the spread and impact of the decline phenomena observed in Nova Scotia in 2012/2013. In Nova Scotia, this aphid species overwinters as shiny black, football shaped eggs on the underside of old leaves lying close to the ground. Monitoring should begin immediately after mulch removal in the spring with the assumption that the majority of eggs found are of the strawberry aphid. If significant numbers are found, plans should be made to apply a control shortly after hatch which will be within 2 weeks of mulch removal. Newly hatched strawberry aphid nymphs prefer young succulent leaves so monitoring is facilitated by collecting 60 random immature trifoliolate leaves on a weekly basis from each field block and examining for nymphs on the underside of the leaves. The strawberry aphid nymphs are wingless and easy to identify although growers will require either trained scouting services or magnifying equipment greater than 20x for verification. No thresholds for treatment have been established but our experience in Nova Scotia has shown that even low numbers of nymphs will increase rapidly and a treatment should be applied when monitoring counts exceed 15 nymphs per 60 leaf sample.



**Fig.2 “Wingless” strawberry aphid**

Left untreated, strawberry aphid colonies will eventually become crowded and adult aphids will quickly grow wings to allow dispersal to new areas. This marks the beginning of the high-risk flight period where winged strawberry aphids can spread viruses from infected plants throughout a field and potentially downwind to a neighbor’s fields. Monitoring for the initiation of the strawberry aphid flight period is critical for minimizing virus spread and we are using yellow

sticky traps for this purpose. Ten traps per field block are deployed at canopy height in mid to late May in Nova Scotia and examined on a weekly basis to establish the beginning of the flight period and upon first catch in a given area growers are informed by a “virus alert” email. Once again, no thresholds for treatment have been established for winged aphid catches but it is important to know that the yellow sticky traps are extremely conservative and even with zero counts in a field, there can be new infections. As such, in the midst of an epidemic such as experienced in Nova Scotia in 2012-2013, it is advisable to guide your spray decisions based on the overall monitoring report (eg. virus alert) rather than your individual field counts. In contrast, a threshold of 1 winged strawberry aphid per 10 trap set is likely a satisfactory threshold to warrant a spray in a low virus pressure situation.



**Fig.3 “Winged” strawberry aphid**

The strawberry aphid flight period lasts 6-8 weeks in Nova Scotia and upon completion growers may breathe a sigh of relief; however, fields should be monitored by leaf sampling in mid-fall to assess the need for a clean-up spray to minimize egg laying.

Strawberry viruses are a very real threat that caused a serious crop failure in Nova Scotia in 2012-2013. These viruses and others causing decline symptoms in northeastern North America in recent years have been primarily aphid vectored and effective control can be achieved by timely removal of fields, replanting with virus tested stock, and effective monitoring and management of the strawberry aphid.