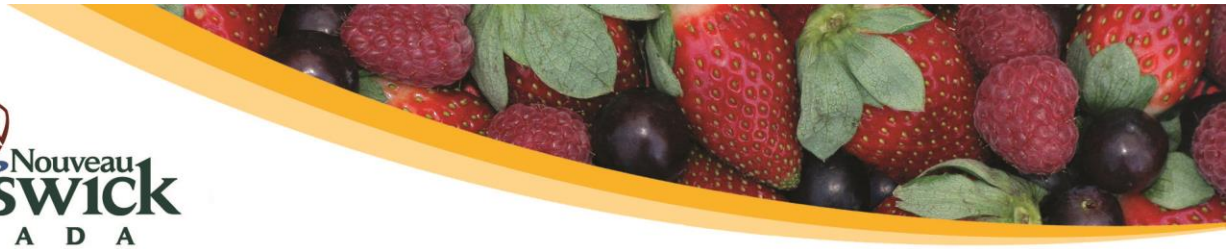

ISBN 978-1-4605-1665-2

Best Management Practices for Strawberry Viruses

Strawberry decline disease (SDD) is caused when two or more viruses infect a strawberry plant. The disease results in reduced plant health and yield loss. The plant may develop symptoms such as stunted, twisted or deformed leaves, yellowing of the leaves and reduced plant vigour (Fig. 1). Strawberry plants infected with only one virus do not exhibit visual symptoms of SDD. Symptoms of SDD are similar to those caused by other factors including cyclamen mites (Fig. 2), herbicide injury and nutritional deficiencies. Thus, laboratory tests should be conducted on strawberry plants samples to confirm incidence of strawberry viruses during the growing season.

Figure 1. Strawberry plants infected with SMYEV and SMoV.

Figure 2. Strawberry plants showing similar mottling damage caused by cyclamen mites.

There are over fifteen strawberry viruses worldwide. Of these, the most common and economically important strawberry viruses in North American major production areas are, strawberry mild yellow edge virus (SMYEV), strawberry mottle virus (SMoV), strawberry crinkle virus (SCV) and strawberry vein banding virus (SVBV). These are transmitted by strawberry aphids. Two other important viruses are strawberry pallidosis-associated virus (SPaV) and beet pseudo-yellows virus (BSYV). Both of these are transmitted by whiteflies. The most common viruses identified in New Brunswick (NB) strawberry fields are SMYEV and SMoV. A relatively newly discovered strawberry virus, strawberry polerovirus-1 (SPV-1) was found in nursery stock samples and from strawberry field samples in the 2016 NB survey.

The New Brunswick Department of Agriculture, Aquaculture and Fisheries (NBDAAF) conducted a strawberry virus survey from 2013 to 2016. The objectives were to determine if strawberry viruses were present in NB strawberry fields, to determine if strawberry viruses were present in nursery stocks and to evaluate on-farm spread of strawberry viruses. Results of the surveys demonstrated that strawberry viruses were present in NB strawberry fields, that some of the nursery stock tested was infected with virus and that there was on-farm spread of strawberry viruses on some farms. Results were used to develop best management practices for SDD management in New Brunswick.

The NBDAAF recommends the following best management practices as a strategy to manage strawberry virus levels:

1) Plant only virus-free nursery stock. Contact your strawberry nursery stock suppliers (nurseries) to inquire about their virus management practices.

2) Monitor fields for the presence of the strawberry aphid, *Chaetosiphon fragaefolii*, in strawberry fields and implement management practices for aphid control as required. For more information check the strawberry aphid fact sheet "Simplified Monitoring Procedure for Strawberry Aphids in New Brunswick Strawberry Fields" available on the NBDAAF web site (small fruit section).

3) Do not keep fields in production for longer than two fruiting years. Keeping strawberry plants for only two fruiting years will reduce the level of strawberry virus inoculum and consequently reduce the spread of the strawberry viruses.

4) Growers with fields in close proximity to each other (about 2 km) should work together to manage the aphid populations in order to prevent the movement of aphids from infected fields to non-infected ones and prevent the spread of viruses.

5) Remove weeds, such as wild strawberry and common lamb's quarters, which may be sources of strawberry virus inoculum in your field.

6) Monitor all strawberry fields in the spring and throughout the growing season to identify unhealthy plants. Fields should be scouted for dead or diseased plants and these plants should be removed and disposed of. Visual symptoms of virus infection are widely variable, depending on cultivar, virus complex, environmental conditions and other sources of plant stress. The presence of virus cannot be confirmed without testing the plants in your field using laboratory testing.

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