2020 Apple Virus Survey Report

Project Leaders

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Objective

Survey for virus complex in apples in 12 apple orchards located in 10 counties: Cayuga (1 orchard), Clinton (1 orchard), Niagara (1 orchard), Onondaga (1 orchard), Orleans (1 orchard), Saratoga (1 orchard), Schuyler (2 orchard2), Tompkins (1 orchard), Wayne (2 orchards), and Yates (1 orchard).

Methods

The decision was made to survey for the apple viruses in May of 2020 to improve detection over samples collected in the fall. Due to COVID-19 delaying laboratory start-up, samples were collected in June to coincide with availability of the laboratory for testing. The apple viruses included were:

- apple stem pitting virus (ASPV)
- apple stem grooving virus (ASGV)

- apple mosaic virus (ApMV)
- apple chlorotic leaf spot virus (ACLSV)
- tomato ringspot virus (ToRSV)
- tobacco ringspot virus (TRSV)

For the apple virus survey, orchard blocks were selected that had relatively recently planted trees, and, where possible, on rootstock G.935. Quadrat sampling was done wherein six leaves were collected from four contiguous trees in the row, five quadrats were collected in each row, and every fifth row was sampled in the block. Leaf samples were collected from 12 orchards. Leaves from 416 trees were included in the 104 quadrat samples. Tissue samples were analyzed by Fuchs' lab using enzyme-linked immunosorbent assays (ELISA).

Results and Discussion

Only ACLSV and ASPV were found in the quadrat samples. Interestingly, ASPV was only found in combination with ACLSV, and in only 4 out of 104 quadrats (4%). ACLSV was found in 18 quadrat samples (17%) and 82 (79%) of quadrats tested negative for all viruses. Of the samples from trees on G.935, 10 of the 59 quadrats (17%) tested positive for ACLSV and zero tested positive for ASPV. 'NY1' ('SnapDragon') samples had 1 (2%) with both viruses and 12 (20%) with ACLSV in 59 quadrats collected of that variety. Almost half (5 of 12) of the orchards tested negative for all samples. In one orchard ('NY1' on M.26), all five quadrat samples tested positive, four with ACLSV and one with both viruses. Another orchard ('Sweet Cheeks' on G.41) had four of the five quadrats test positive, one with ACLSV and three with both viruses. In the five other orchards, 40% in two, 20%, 16%, and 10% of samples contained ACLSV.

Both of these viruses are transmitted via vegetative propagation practices. Therefore, the use of apple virus certification programs and clean stock programs will, over time, decrease their prevalence in apple orchards in New York State, which will significantly improve the health, longevity and productivity of apple orchards.

Publications

Cieniewicz, E. and Fuchs, M. 2016. Apple chlorotic leaf spot virus. Tree Fruit IPM Fact Sheet, NYS IPM Program, Cornell University. 2pp. https://hdl.handle.net/1813/43944

Cieniewicz, E. and Fuchs, M. 2016. Apple stem pitting virus. Tree Fruit IPM Fact Sheet, NYS IPM Program, Cornell University. 2pp. https://hdl.handle.net/1813/43945