



## Stone Fruit Commodity-Based Pest Survey

# Plum Pox Virus

## *Plum pox or Sharka*

### Introduction

Worldwide, plum pox virus (PPV) is the most destructive disease affecting stone fruit caused by a virus. Plum pox strains are capable of causing disease in peaches, plums, apricots, nectarines, almonds, sweet and sour cherries, as well as *Prunus* and non-*Prunus* ornamentals and weedy hosts. The disease, first described in Bulgaria in 1915, is present throughout much of Europe, the Mediterranean, the Middle East, India, Asia, Argentina, and Chile. In the United States, the disease was first recorded in Pennsylvania in 1999, followed by New York and Michigan in 2006. In Canada, PPV was found in Ontario and Nova Scotia in 2000. As of 2010, the disease had been eradicated in Nova Scotia, Michigan, and Pennsylvania. Eradication efforts are ongoing in New York and Ontario.

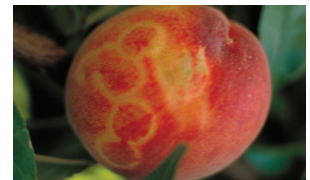
### Biology

Several aphid species can transmit plum pox within an orchard and to nearby orchards. Studies indicate that PPV can be transmitted by at least 20 aphid species. Only a few of these species, however, are considered important vectors in the northeastern United States: the black bean aphid (*Aphid fabae*), the spirea aphid (*Aphid spiraecol*), the black peach aphid (*Brachycaudus persicae*), and the green peach aphid (*Myzus persicae*). When feeding on an infected plant, aphids can pick up virus particles on their stylets (part of the aphid's mouthpart) and then transmit the virus to a healthy plant while feeding on it. In general, the virus is retained on the stylet for only minutes or up to a few hours. Long-distance spread usually occurs as a result of the movement of infected planting materials or grafting.

To date, seven strains of PPV (D, M, El-Amar, C, W, T, and Rec) have been identified worldwide based on biological, serological, and molecular properties. All occurrences of PPV in the United States have been identified as strain D (PPV-D), whereas strains D, W, and Rec have been reported from Canada. Strain D infects peach, nectarine, apricot, and plum; almond and cherry are hosts only under laboratory conditions. Epidemics of PPV-D progress slowly in peach, and this virus strain is not seed-transmitted.

### Symptoms

Symptoms of PPV can be obvious or very subtle on stone fruit leaves, fruit, flowers, and seeds. They vary in type and severity with the strain of the virus, timing of infection, *Prunus* cultivar, and environmental factors. Symptoms of PPV occur occasionally and may not be apparent until three or more years after infection. Newly infected trees rarely show symptoms.



**FIGURE 1.** Yellow rings caused by PPV on a yellow-fleshed peach cultivar. Photo courtesy of European and Mediterranean Plant Protection Organization Archive, Bugwood.org



**FIGURE 2.** Chlorotic blotches/rings on plum leaf. Photo courtesy of Laszlo Palkovics, Corvinus University of Budapest, Hungary.



**FIGURE 3.** Fruit deformation caused by PPV infection in sensitive plum. Photo courtesy of Laszlo Palkovics, Corvinus University of Budapest, Hungary.

## Hosts

The host range depends on the virus strain. PPV infects about 40 *Prunus* spp., including wild and woody species. These *Prunus* species and the wide range of weedy hosts can act as reservoirs for the virus and a source for infection.

Major hosts include: almond (*Prunus amygdalus*), apricot (*P. armeniaca*), cherry almond and dwarf flowering almond (*P. glandulosa*), Damson plum (*P. insititia*), Japanese plum (*P. salicina*), myrobalan plum (*P. cerasifera*), nectarine (*P. persica* var. *nectarina*), peach (*P. persica*), plum (*P. domestica*), sour cherry (*P. cerasus*), and sweet cherry (*P. avium*).

Minor hosts include numerous annual and perennial weed species and related and unrelated woody ornamentals.

## Distribution

As of 2010, PPV was present in: **Africa:** Egypt, South Africa, and Tunisia. **Asia:** China, India, Iran, Japan, Jordan, Kazakhstan, Pakistan, Syria, and Turkey. **Europe:** Albania, Austria, Azores, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, France, Germany, Greece, Hungary, Italy, Lithuania, Luxembourg, Moldova, Norway, Poland, Portugal, Romania, Russia, Serbia and Montenegro, Slovakia, Slovenia, Spain, Ukraine, and the United Kingdom. **North America:** Canada and the United States. **South America:** Argentina and Chile.

Diagnostic symptoms occur mainly on leaves and fruits in the United States. Leaf and fruit symptoms include chlorotic (yellowing) (Figure 1) or necrotic (browning) ring patterns and chlorotic bands, spots, or blotches during the growing season. In peach, symptoms appear as chlorotic vein-clearing (vein tissue is lighter green than that of healthy plants) and veinbanding (tissues along the veins are darker green than other lamina tissue), with twisting and distortion of the leaf lamina. Some peach cultivars may show color-breaking symptoms on the flower petals. Color-breaking appears as darker pink stripes on the flower petals.

In sweet cherry fruit, chlorotic and necrotic rings, notched marks, and premature fruit drop have been observed. The fruit of apricot and plum can be misshapen and deformed (Figure 3), or rings may be present anywhere on their fruit, leaves, and stones (Figures 2, 3, 4). An abundance of fallen fruit helps in locating suspect trees in infected orchards, especially in plum orchards.

## Identification

The approved screening protocol for the field is the PPV Enzyme-Linked ImmunoSorbent Assay (ELISA). Specific instructions to perform the PPV ELISA test are available upon request from [Renee.M.Devries@aphis.usda.gov](mailto:Renee.M.Devries@aphis.usda.gov).

## Survey

The most common method used to survey for this pest is visual survey. Survey instructions are provided at: <http://pest.ceris.purdue.edu/services/napisquery/query.php?code=cam2012>.

## What Can We Do?

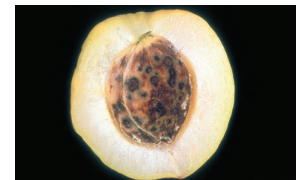
If you suspect PPV is present in your area, please contact your local extension office or State Plant Regulatory Official to have the specimen properly identified. For contact information, visit [www.aphis.usda.gov/StateOffices](http://www.aphis.usda.gov/StateOffices), [www.nationalplantboard.org/member/index.html](http://www.nationalplantboard.org/member/index.html), or [www.nifa.usda.gov/Extension/index.html](http://www.nifa.usda.gov/Extension/index.html).

References for the above information can be found on the Cooperative Agricultural Pest Survey (CAPS) Web site at <http://caps.ceris.purdue.edu/stonefruit/references>.

USDA is an equal opportunity provider and employer.  
Issued September 2011



United States Department of Agriculture  
Animal and Plant Health Inspection Service



**FIGURE 4.** Rings on the stone of apricot caused by PPV. Photo courtesy of Biologische Bundesanstalt für Land- und Forstwirtschaft Archive, Bugwood.org.