

Plum Pox (PPV) / Sharka Potyvirus

EPMS 004

Quick Facts

- Plum Pox was found in a Pennsylvania orchard in October 1999, but has not been reported elsewhere in the U.S.
- Plum Pox belongs to the Potyviridae family and the Potyvirus genus.
- Long distance spread of Plum Pox is usually through propagative material. Plum Pox is spread locally via aphids, mechanical inoculation.
- The Plum Pox strain present in the US is PPV-D. Three other strains (groups) are identified as PPV-C, M and EA.
- Plum Pox host plants include all major stone fruits grown commercially in Utah (Apricot, Peach, Nectarine and Plum).

In 2000 it was found in Canada in the Province of Ontario.

There are two related concerns for this disease that qualify it as an exotic pest: first, infection results in severe deformation of fruit and reduced yields and second, multiple quarantines have been placed on infected fruit and propagative material ranging from interstate to international non-transport quarantines. Both of these concerns result in a significant economic impact to growers. The economic affect coupled with the government issued eradication requirement for infected material provides adequate incentive to monitor for this virus in hopes of lessening its impact on Utah stone fruit orchardists.

Symptoms:

Symptoms for this disease vary widely depending on the crop, cultivar and even trees within the same cultivar. Symptoms on peach blossoms appear as color differentiation. Infected blossoms are similar in size and shape to healthy blossoms, but the solid light pink color of petals is interspersed with darker pink colored speckles (Figure 1).



Figure 1. Peach blossoms showing typical speckling of Plum Pox infected trees.

Original reports describing Plum Pox symptomology and host susceptibility surfaced early in the 1900's from Bulgaria, where it was named Sharka. Since these early reports Sharka has been given the common name of Plum Pox. Throughout the mid and late 1900's Plum Pox spread throughout Europe and in 1999 it was discovered in Pennsylvania, USA.

Foliar symptoms of infected stone fruit trees include either chlorotic (yellow) rings interspersed on the leaf surface or chlorotic blotches and vein clearing (Figure 2). Stone fruit that exhibit symptoms will have chlorotic or necrotic rings that in plum and apricot can severely deform the fruit. Infected apricot fruit may have ring lesions evident on their pits (Figure 3) in addition to foliar and fruit ring lesions.

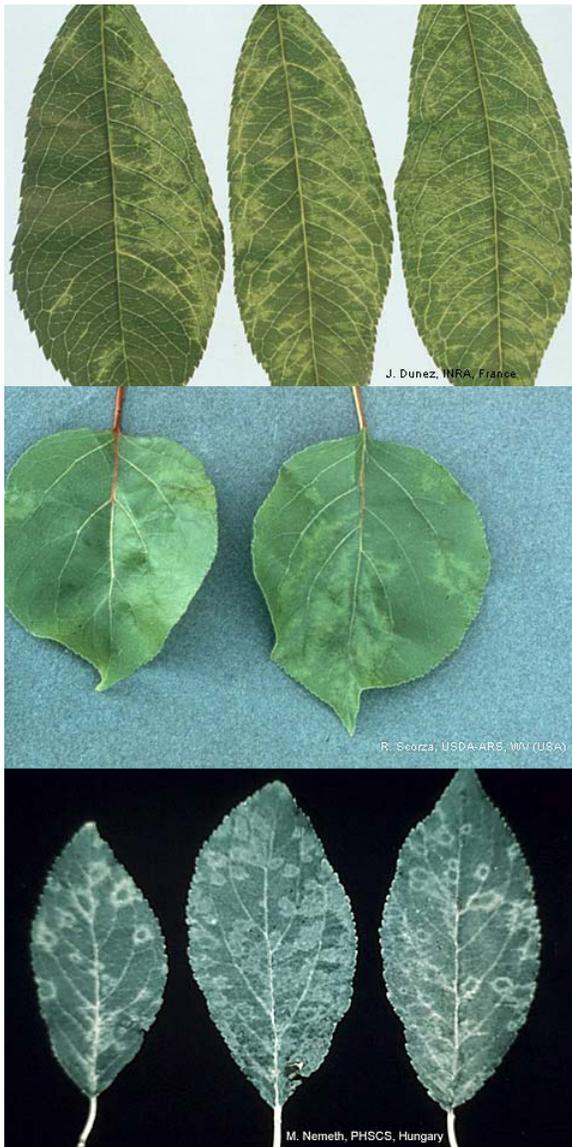


Figure 2. Characteristic chlorotic blotches and vein clearing on foliage of peach (top) and apricot (middle). Obvious chlorotic ring symptom on peach leaves (bottom).

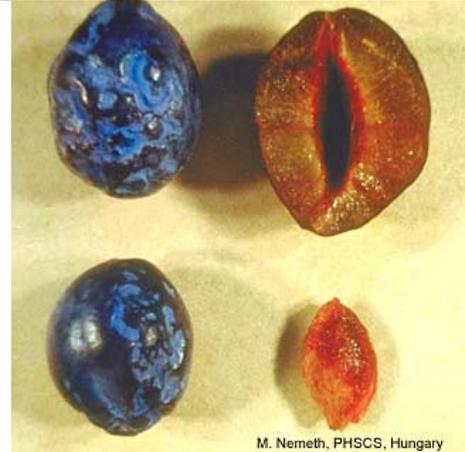


Figure 3. Necrotic ring symptom on apricot fruit and pit (top). Chlorotic rings induced by PPV infection on peach fruit (middle). Necrotic rings and severely deformed fruit caused by PPV infection on plum (bottom).

Causal Agent:

Plum Pox is classified in the family Potyviridae and the genus Potyvirus. Members of this genus are known to be aphid vectored by passing recently extracted plant sap harbored in the aphid stylet. The result of this vectoring process is a reduced time in which the aphid is able to transmit the virus without feeding on another infected plant. Viral particles in certain

genera are integrated into the salivary glands of the vectors or other organs, which results in the ability to transmit the virus throughout the life of the insect. In some cases the insects may pass the virus on to their offspring. Of the twenty known aphids that vector Plum Pox, the four most important are found in Utah: Green Peach aphid, Thistle aphid, Leaf Curling Plum aphid and the Hop aphid. There are four distinct strains of Plum Pox: PPV-D, M, C and EA. PPV-D is the only strain present in the U.S. and Canada and is moderately aggressive compared to the other strains. It is not known to be seed transmitted. Identification of the virus is based on Enzyme linked immunosorbant assays (ELISA) or Polymerase Chain Reaction (PCR) amplification of PPV-D specific RNA base sequence.

Control:

There are no known controls short of complete eradication of Plum Pox infected trees and adjacent trees, therefore preventing introduction of the virus is paramount.

Suggested preventative measures include:

- Purchase propagative material from a certified nursery.
- Educate field personnel on disease symptoms and integrate into scouting program.
- Maintain control of aphid populations.
- Resistant cultivars are not readily available for peach or apricot.
- Immediately report all suspected infections to the USU Plant Pest Clinic for identification:
Plant Pest Clinic
Logan, Utah 84322-5305
(435) 797-2435

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Questions for Plum Pox Virus samples and survey

Grower Information

Name:

Address:

Farm Location:

Crop Information:

Origin of propagative material (transplants, rootstock, scion tissue, budwood):

Plant and Variety:

Soil type:

Fertilization and pesticide applications:

Fertilizer (units applied):

Insecticide applications:

Insecticide Name:

Target Pest(s):

Fungicide applications:

Fungicide Name:

Target Pest(s):

Neighboring farms with host plants: yes/no

Are neighboring farms experiencing same disease: yes/no

Percent crop loss:

Recent environmental conditions experienced at affected location: