

# ◆ EPPO Standards ◆

**PHYTOSANITARY PROCEDURES**

OTHER VIRUSES OF *MALUS* AND *PRUNUS*

INSPECTION AND TEST METHODS

**PM 3/33(1) English**



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## **APPROVAL**

EPPO Standards are approved by EPPO Council. The date of approval appears in each individual standard.

## **REVIEW**

EPPO Standards are subject to periodic review and amendment. The next review date for this set of EPPO Standards is decided by the EPPO Working Party on Phytosanitary Regulations.

## **AMENDMENT RECORD**

Amendments will be issued as necessary, numbered and dated. The dates of amendment appear in each individual standard (as appropriate).

## **DISTRIBUTION**

EPPO Standards are distributed by the EPPO Secretariat to all EPPO member governments. Copies are available to any interested person under particular conditions upon request to the EPPO Secretariat.

## **SCOPE**

EPPO Phytosanitary Procedures are intended to be used by National Plant Protection Organizations, in their capacity as bodies responsible for the inspection, testing and treatment of plants and plant products moving in trade, or for the implementation of surveys against quarantine pests.

## **REFERENCES**

OEPP/EPPO (1996) Glossary of Phytosanitary Terms. *EPPO Technical Documents* no. 1026.

CABI/EPPO (1997) Quarantine Pests for Europe, 2nd edition (Ed. by Smith, I.M.; McNamara, D.G.; Scott, P.R.; Holderness, M.), CAB International, Wallingford, UK.

OEPP/EPPO (in preparation) Specific Quarantine Requirements. Available as electronic documents from the EPPO Web Site.

## **DEFINITIONS**

Phytosanitary procedure: Any officially prescribed method for performing inspections, tests, surveys or treatments in connection with plant quarantine.

Inspection: Official visual examination of plants, plant products or other regulated articles to determine if pests are present and/or to determine compliance with phytosanitary regulations.

Survey: An official procedure conducted over a defined period of time to determine the characteristics of a pest population or to determine which species occur in an area.

Test: Official examination, other than visual, to determine if pests are present or to identify pests.

Treatment: An officially authorized procedure for the killing, removal or rendering infertile of pests.

## **OUTLINE OF REQUIREMENTS**

EPPO Phytosanitary Procedures describe the methods to be followed for performing inspections, tests, or treatments of commodities moving in trade, or surveys against quarantine pests. For many quarantine pests, a reference to the relevant EPPO Phytosanitary Procedure is made in the corresponding EPPO Specific Quarantine Requirements. The development of EPPO phytosanitary procedures started many years ago, and these methods have been published in the Bulletin OEPP/EPPO Bulletin under several titles: 'Fumigation standards', 'Quarantine Inspection Procedures' and 'Quarantine Procedures'. All of them are now appearing under the title 'EPPO Phytosanitary Procedures' and are being edited into EPPO Standard format. The numbering of these procedures will continue to follow the sequence described in the Bulletin OEPP/EPPO Bulletin 20(2), 229-233, which corresponds approximately to the chronological order of appearance of the Phytosanitary Procedures.

## Phytosanitary procedure

### OTHER VIRUSES OF *MALUS* AND *PRUNUS* INSPECTION AND TEST METHODS

#### Specific scope

This standard describes the inspection and test methods for viruses of *Malus* and *Prunus* (other than tomato ringspot nepovirus and plum pox potyvirus), to satisfy the requirements of EPPO Standards PM 2/27(2), PM 2/28(2), PM 2/127(2).

#### Specific approval and amendment

First approved in September 1990.  
Edited as EPPO Standard in 1998.

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#### Introduction

Plum pox potyvirus, the *Prunus* virus which causes most practical problems in the EPPO region, is being covered by its own EPPO Quarantine procedure (OEPP/EPPO, 1992a). The same applies to tomato ringspot nepovirus (OEPP/EPPO, 1991). Several other *Prunus* viruses, or *Prunus* diseases of virus-like origin, are included in the A1 and A2 lists since they present a plant quarantine risk for the EPPO region. On the A1 list, there are: cherry rasp leaf nepovirus (CRLV) (Data sheet no. 127; OEPP/EPPO, 1984), peach American mosaic disease (Data sheet no. 27; OEPP/EPPO, 1978a) and plum line pattern ilarvirus (PLPV) (Data sheet no. 28; OEPP/EPPO, 1978b). On the A2 list, there are cherry necrotic rusty mottle disease (Data sheet no. 91; OEPP/EPPO, 1978c). The MLOs of *Prunus* are covered by yet another Quarantine procedure (OEPP/EPPO, 1992b). CRLV also attacks apple, and is accordingly the only *Malus* virus covered by the present procedure.

According to the EPPO Specific quarantine requirements (OEPP/EPPO, 1990a) for the viruses concerned, plants for planting (except seeds) of *Malus* and *Prunus* have to come from a field inspected for all these viruses and diseases and found free from them. If they come from a country where the viruses or diseases occur, they have to be derived (not further than the second generation) from mother plants tested for the relevant viruses and diseases (except in the case of cherry necrotic rusty mottle disease), and maintained under conditions designed to prevent reinfection. The species concerned are given as: CRLV – apple, cherry, peach; American mosaic – almond, apricot, peach; PLPV – apricot, peach, plum; cherry necrotic rusty mottle – cherry only. Methods are thus needed for visual inspection in the field, and for testing mother plants (except in the case of cherry necrotic rusty mottle disease).

#### Methods

Visual inspection can detect the diseases concerned, but they are not easily distinguished from other diseases. Thus, ‘raspleaf’ can also be caused by arabis mosaic and/or raspberry ringspot nepoviruses, line pattern can also be caused by apple mosaic ilarvirus, while diseases poorly distinguishable from American mosaic have been described in North America and Japan under the names peach calico, peach blotch, and peach yellow mosaic (Desvignes, 1980).

In mother plants, the members of the nepovirus and ilarvirus groups can be detected either by sap inoculation to herbaceous indicators, or by ELISA. The former method is simple but requires 1-2 weeks for symptoms to appear. The latter is the simplest and most rapid method. See also EPPO Quarantine procedure no. 32 for tomato ringspot nepovirus in fruit trees and grapevine (OEPP/EPPO, 1991).

For peach American mosaic, and cherry necrotic rusty mottle, detection is possible by indexing on woody indicators, following the recommendations of ISHS (ISHS, 1983). Since diseases similar to American mosaic have been shown to be caused by viroids, it is possible that this will also be proved true of American mosaic, and that viroid detection techniques will become available for this disease. Indexing on woody indicators can also be

used for nepoviruses and ilarviruses, but is so slow compared with the other techniques that it would only be appropriate if such testing was in any case being done for other viruses.

Since CRLV is nematode-transmitted, maintenance under conditions designed to prevent reinfection implies absence of its nematode vector *Xiphinema americanum sensu lato*. For further details, see EPPO Quarantine procedure no. 32 for tomato ringspot nepovirus in fruit trees and grapevine (OEPP/EPPO, 1991b).

See Appendix I for details of the methods.

## APPENDIX I

### *Visual inspection*

On cherry and peach, CRLV causes large enations (leafy outgrowths or protuberances) between the lateral veins on the lower surface of narrow deformed leaves; on apple, it causes leafroll and 'flat apple'. The symptoms are striking, though, as noted above, not fully diagnostic.

The symptoms of American peach mosaic include, on peach, yellow mottling of the young foliage, deformation and late ripening of the fruits; in apricot, rings and blotches on the stones of affected fruits. These symptoms are hardly diagnostic.

PLPV causes brilliant green-yellow oak-leaf patterns on *Prunus salicina*, followed by overall yellow vein-banding. On *P. domestica*, the patterns are of much fainter oak-leaf type, or fine, irregular yellowish lines. On peach, it causes irregular wavy bands on either side of the main veins.

Cherry necrotic rusty mottle disease is characterized by the appearance of brown necrotic spots on the leaves from 3-5 weeks after petal fall. These are followed by yellowish or rust-coloured areas, the necrotic areas falling out, giving a conspicuous shot-hole effect. Only certain cultivars show symptoms.

### *Mechanical transmission*

ISHS recommends to use *Chenopodium quinoa* or *Cucumis sativus* for ilarviruses and nepoviruses generally. However, it only specifically recommends these indicators for CRLV and specifically advises that PLPV cannot be transmitted to *C. sativus*. Data sheet no. 127 also recommends *C. murale* for CRLV, while Data sheet no. 28 recommends *Nicotiana megalosiphon* and *Vigna cylindrica* for PLPV (chlorotic or necrotic local lesions and ringspots, followed by a systemic chlorotic mottle with necrosis on new growth) (OEPP/EPPO, 1978b, 1984). The ISHS recommendations specify 5 replicates, at 20°C for 20 days. For further details on the method of inoculation, see Quarantine procedure no. 28 for tomato ringspot nepovirus in pelargonium (OEPP/EPPO, 1990b).

### *Woody indicators*

ISHS recommends the following woody indicators to detect the *Malus* and *Prunus* viruses and diseases concerned:

#### *CRLV in apple*

*Malus pumila* cv. Golden Delicious, in the field, with 3 replicates, for 3 crops.

#### *CRLV, PLPV and American mosaic in Prunus*

*Prunus persica* cvs GF305 or Elberta, in the glasshouse, with 5 replicates, at 20°C, for 12 weeks.

ISHS specifically recommends this for American mosaic in almond, apricot and peach; for CRLV in cherry and for PLPV in plum. It may be assumed that it is also suitable for CRLV in peach, and for PLPV in apricot and peach, though these combinations are not specifically mentioned by ISHS. ISHS also recommends that the same indicators can be used in the field for peach, with 3 replicates for 4 years.

#### *CRLV in cherry*

*Prunus avium* cv. Bing, in the field, with 3 replicates, for 3 years.

#### *Cherry necrotic rusty mottle disease in cherry (Test recommended by ISHS but not required by EPPO)*

*Prunus avium* cv. Sam, in the field, with 3 replicates, for 3 years.

#### **ELISA**

ELISA may be used for CRLV or PLPV. For further details, see Quarantine procedure no. 32 for tomato ringspot nepovirus in fruit trees and grapevine (OEPP/EPPO, 1991).

#### **References**

- Desvignes, J.C. (1980) Different symptoms of peach latent mosaic. *Acta Phytopathologica Academiae Scientiarum Hungaricae* **15**, 183-190.
- ISHS (1983) Detection of virus and virus-like diseases of fruit trees. *Acta Horticulturae* no. 130, 319-326.
- OEPP/EPPO (1978a) Data sheet on quarantine organisms no. 27: peach American mosaic. *Bulletin OEPP/EPPO Bulletin* **8** (2).
- OEPP/EPPO (1978b) Data sheet on quarantine organisms no. 28: plum line pattern virus (American). *Bulletin OEPP/EPPO Bulletin* **8** (2).
- OEPP/EPPO (1978c) Data sheet on quarantine organisms no. 91: cherry necrotic rusty mottle disease. *Bulletin OEPP/EPPO Bulletin* **8** (2).
- OEPP/EPPO (1984) Data sheet on quarantine organisms no. 127: cherry rasp leaf virus. *Bulletin OEPP/EPPO Bulletin* **14**, 5-10.
- OEPP/EPPO (1990a) Specific quarantine requirements. *EPPO Technical Documents* no. 1008.
- OEPP/EPPO (1990b) Quarantine procedure no. 28: tomato ringspot nepovirus in pelargonium. *Bulletin OEPP/EPPO Bulletin* **20**, 273-276.
- OEPP/EPPO (1991) Quarantine procedure no. 32: tomato ringspot nepovirus in fruit trees and grapevine. *Bulletin OEPP/EPPO Bulletin* **21**, 245-250.
- OEPP/EPPO (1992a) Quarantine procedure: plum pox potyvirus. *Bulletin OEPP/EPPO Bulletin* (in press).
- OEPP/EPPO (1992b) Quarantine procedure: MLOs of fruit trees and grapevine. *Bulletin OEPP/EPPO Bulletin* (in press).

#### **Enquiries**

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