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Data Sheets on Quarantine Pests

Cherry leafroll nepovirus in *Rubus*

IDENTITY

Name: Cherry leaf roll nepovirus
Taxonomic position: Viruses: Comoviridae: *Nepovirus*
Common names: CLRV (acronym)
No specific disease name is used for infections in *Rubus*
EPPO computer code: CRLRRX
EPPO A2 list: No. 148
EU Annex designation: II/A1

HOSTS

CLRV occurs commonly in woody species throughout Europe, Russia and North America (Jones, 1985), but not in *Rubus* in the EPPO region.

GEOGRAPHICAL DISTRIBUTION

EPPO region: Widespread, but found in *Rubus* in only a few *R. procerus* plants in southern England (UK) (Cropley & Tomlinson, 1971; Ormerod, 1972, 1975). Also recently recorded in wild *Rubus* in Czech Republic (EPPO Reporting Service, 512/14; FAO, 1991). Recorded in Slovakia. Not found in *R. idaeus*.
Oceania: Found in *Rubus* only in *R. idaeus* in New Zealand (Jones & Wood, 1978). Although few comparative tests have been done, the raspberry isolate seems to differ in *in vitro* properties from others that have been described.
EU: Present.

BIOLOGY

Many strains in hosts other than *Rubus* are known (Jones, 1985); most of those from different natural host species are serologically distinguishable from each other (Jones & Murant, 1971; Jones, 1976). CLRV from *R. procerus* is serologically distinguishable from most other strains (Jones, 1976) but no tests have been made with an isolate from *R. idaeus*.

Unlike many nepoviruses, CLRV appears not to be transmitted by soil-inhabiting nematodes (Jones *et al*., 1981) despite earlier claims (Fritzsche & Kegler, 1964; Flegg, 1969), nor is it common in naturally infected herbaceous species. It is seed-borne in many natural and experimental hosts, often to a high frequency (Murant, 1983; Jones, 1985) but no tests have been made with *Rubus*. There is evidence that strains in walnut (*Juglans regia*) and birch (*Betula*) are pollen-transmitted to the plant pollinated (Mircetich *et al*., 1980; Cooper *et al*., 1984); no tests have been made to see if this mode of transmission occurs in *Rubus*. The virus is readily transmitted by mechanical inoculation of sap to a wide range of herbaceous species (Jones, 1985).

DETECTION AND IDENTIFICATION

Symptoms

Naturally infected *Rubus procerus* shows chlorotic mottling and line-pattern symptoms, stunting and plant death (Cropley & Tomlinson, 1971; Ormerod, 1972, 1975). In *R. idaeus*, plants are often stunted but only leaves of fruiting canes show any obvious symptoms; many of these leaves are small and distorted, and a few show line-pattern symptoms, severe chlorotic mottling or ringspots (Jones & Wood, 1978).

Morphology

The isometric particles of several CLRV strains have been well studied and their properties shown to be those of nepoviruses (Jones, 1985).

Detection and inspection methods

The symptoms induced by CLRV in *Rubus* and in many herbaceous test plants resemble those induced by several nematode-borne viruses, so that CLVR can only be identified unequivocally by serological tests. As CLVR has a wide range of serological variants, antisera to several virus strains should be used. Inspection and test methods are also presented in OEPP/EPPO (1991).

MEANS OF MOVEMENT AND DISPERSAL

Lacking a natural vector, CLRV is in practice dispersed by human movement of infected seeds or plants, or by pollen. Transmission by pollen from imported *Rubus* to local plants, or propagation of imported *Rubus*, would be the practical means of establishment of CLRV in this crop in the EPPO region.

PEST SIGNIFICANCE

Economic impact

CLRV is widespread in raspberry in New Zealand, where it is associated with severe disease in some areas (Jones & Wood, 1978). If the raspberry isolate is pollen-borne to mature plants, as appears to be the case with some other CLRV strains, it has the potential to spread rapidly.

Control

The pollen-borne mode of transmission of CLRV makes its spread in crops difficult to control except by growing plants immune or resistant to infection. Healthy planting material should be used, based for example on the virus-free certification scheme for *Rubus* developed by OEPP/EPPO (1994).

Phytosanitary risk

The EPPO A2 quarantine list includes three pollen-borne viruses of *Rubus* (OEPP/EPPO, 1986). Of these, CLRV, like apple mosaic ilarvirus (EPPO/CABI, 1996a) is widespread in Europe but hardly found in *Rubus* there. So European *Rubus* can probably only become infected by CLRV by pollen transmission from infected *Rubus* from non-EPPO regions. Black raspberry latent ilarvirus, the third virus concerned, does not occur in the EPPO region at all (EPPO/CABI, 1996b).

CLRV, unlike the other two viruses, causes significant damage to *Rubus.* However, the decision to consider it as a quarantine pest was mainly based on the wish of certain EPPO countries to produce and maintain virus-free *Rubus*. This could probably be achieved as successfully by using normal certification, following for example an adaptation of the scheme proposed by OEPP/EPPO (1994). The fact that CLRV is occasionally found in

Rubus in Europe tends to diminish the justification for treating it as an A2 quarantine pest. It may also be noted that the pollen transmissibility of CLRV in *Rubus* is conjectural, based on the analogy with other strains of the virus (see Biology).

PHYTOSANITARY MEASURES

Plants of *Rubus* from countries where CLRV occurs in *Rubus* should come from a reliable certification scheme, in which particular attention has been paid to preventing pollen-transmitted reinfection. Standard methods for eliminating viruses can be used for CLRV in nuclear stock of *Rubus*.

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