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Data Sheets on Quarantine Pests

Potato yellow vein disease

IDENTITY

Name: Potato yellow vein disease
Synonyms: Potato yellow vein 'virus'
Taxonomic position: Uncertain
EPPO computer code: POYVXX
EPPO A1 list: No. 30
EU Annex designation: I/A1

HOSTS

The only crop affected by the disease is potatoes (*Solanum tuberosum*) (OEPP/EPPO, 1979).

GEOGRAPHICAL DISTRIBUTION

EPPO region: Absent.
South America: Very common in the highlands of Ecuador and southern Colombia; also reported from some areas of Venezuela.
EU: Absent.

BIOLOGY

Little is known about the agent of potato yellow vein, which seems most probably to be a virus. It is transmitted semi-persistently by the whitefly *Trialeurodes vaporariorum* (CIP, 1988; Diaz *et al*., 1990, 1991) from infected to healthy potato plants. Spread is increased by intercropping beans (*Phaseolus* spp.) and potatoes. It is believed that beans serve as a vector-increasing host (Saldarriaga *et al*., 1988). Tuber transmission is not regular.

DETECTION AND IDENTIFICATION

Symptoms

Newly developed symptoms are bright yellow veins and, in some cultivars, interveinal yellowing. Later the leaves become yellow and the veins may turn green. Some rugosity and necrotic spotting may also develop. Tubers may be deformed, with large protruding eyes.

Morphology

Isometric particles 26 nm in diameter have been seen (personal communication to Hooker, 1983), but there seems to have been no critical study of the identity of the virus or its morphology.

Detection and inspection methods

The causal agent can be mechanically transmitted to *Datura stramonium*, but only with difficulty. Reliable detection methods are not available (Vega, 1970).

MEANS OF MOVEMENT AND DISPERSAL

The agent of potato yellow vein disease is transmitted locally by *T. vaporariorum*. It is not transmitted by true seed, and only irregularly by tubers. In principle, potato tubers could carry potato yellow vein in international trade.

PEST SIGNIFICANCE

Economic impact

Potato yellow vein disease is widespread and damaging at its centre of diversity. It has spread in recent years, becoming a severe problem to all cultivars growing in these regions and reducing yields by up to 50% (Hooker, 1983). Saldarriaga *et al*. (1988) observed yield reductions of 41.8% in potato cv. Diacol Capiro and of 53.8% in cv. Picacho.

Control

As with all potato viruses, control depends on the production of high-quality seed potatoes from virus-free nuclear stock.

Phytosanitary risk

Potato yellow vein disease is included among the non-European potato viruses of the EPPO A1 quarantine list (OEPP/EPPO, 1984a). In general, all regional plant protection organizations outside South America recommend very strict measures for potato material from that continent. The principal perceived risk is the introduction of new viruses into seed potato production schemes, increasing the cost and difficulty of operating these schemes, and opening up new possibilities for yield losses from single or mixed virus infections. Any seed potato-exporting country in which potato yellow vein disease was reported would immediately find itself in difficulties with respect to the phytosanitary certification of its exports. The risk is particularly important because of the simple pathway which exists from useful germplasm material (local potato cultivars, wild tuber-forming *Solanum* spp.) in the potato's centre of diversity in South America through to nuclear stock material of new cultivars in seed potato-producing countries. Thus there is a great risk of introduction due to the increased international exchange of breeding material and germplasm, whether in the form of tubers, rooted cuttings, *in vitro* cultures or true seeds.

Individually, potato yellow vein disease could be regarded, among the group of South American potato pathogens, as of medium importance for the EPPO region. It is distinguished by being a relatively widespread and damaging disease, but further research is needed to clarify its etiology and biology. It can relatively easily be excluded by prohibition of commercial trade in potato tubers. The risk of introduction with breeding material is minor, since it is not carried by true seed, and besides would probably cause obvious symptoms on material held in quarantine.

PHYTOSANITARY MEASURES

Importation of potato tubers from countries where potato yellow vein disease occurs should be prohibited. Potato yellow vein disease is one of the group of South American pests of potato which justify strict post-entry quarantine procedures in the EPPO region, together with equivalent checks before export. Only material for scientific purposes, in quantities limited to what is strictly necessary and subject to import permit, should normally be imported from countries where the disease occurs. Because of the probability that any material of wild tuber-forming *Solanum* spp. originates ultimately from South America, the same tests should be applied whatever the origin. EPPO's specific quarantine requirements (OEPP/EPPO, 1990) outline suitable quarantine measures, while EPPO's phytosanitary

procedures lay down the test procedures to be followed both before export and in post-entry quarantine after import (OEPP/EPPO, 1984b).

BIBLIOGRAPHY

CIP (1988) *Annual Report, International Potato Center (CIP), Lima, Peru*, p. 79.

Diaz, M.C.; Pulgarin, J.M.; Saldarriaga, V.A. (1990) [Insect-pathogen relationship in the problem of potato yellow vein]. *Revista Colombiana de Entomologia* **16**, 3-14.

Diaz, M.C.; Pulgarin, M.; Saldarriaga, V.A. (1991) [Method for testing transovarian transmission of pathogens by *Trialeurodes vaporariorum* and results with the causal agent of potato yellow vein disease]. *Revista Colombiana de Entomologia* **17**, 3-7.

Hooker, W.J. (1983) *Compendium of potato diseases*. American Phytopathological Society, St. Paul, USA.

OEPP/EPPO (1979) Data sheets on quarantine organisms No. 29, Potato vein-yellowing virus. *Bulletin OEPP/EPPO Bulletin* **9** (2).

OEPP/EPPO (1984a) Data sheets on quarantine organisms No. 128, Potato viruses (non-European). *Bulletin OEPP/EPPO Bulletin* **14**, 11-22.

OEPP/EPPO (1984b) Quarantine procedures No. 21, Potato viruses (non-European) and potato spindle tuber viroid. *Bulletin OEPP/EPPO Bulletin* **14**, 73-76.

OEPP/EPPO (1990) Specific quarantine requirements. *EPPO Technical Documents* No. 1008.

Saldarriaga, V.A.; Alvarez, A.M; Jaramillo, J.E. (1988) [Effect of the potato yellow vein transmitted by *Trialeurodes vaporariorum* in potato]. *Revista Colombiana de Entomologia* **14**, 3-8.

Vega, J.G. (1970) [Transmission, purification and characterization of the causal agent of potato yellow vein]. *M.Sc. Thesis, Universidad Nacional Instituto Colombiano Agropecuario Bogota, Colombia*, 47 pp.