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EPPO *Reporting Service*

93/150 EPPO/EC...EPPO Efficacy guidelines taken up by EC

EC Commission Directive 93A1/EEC, amending Council Directive 91/414/EEC concerning the placing of plant protection products on the market, provides that trials for testing efficacy of plant protection products in EC Member States "must be carried out in accordance to specific EPPO guidelines, where available", and also that "the design, analysis and reporting of trials must be in accordance with EPPO Guidelines 152 and 181". In this way, the 190 EPPO efficacy evaluation guidelines appearing in Bulletin OEPP/EPPO Bulletin over the year, have acquired a much stronger position in the EC Member States. Member States may, however, require the use, on their own territories, of other guidelines satisfying at least the requirements of the corresponding EPPO guidelines.

Source : **Official Journal of the EC**



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93/151

NEW PEST...New potato virus detected in South America

A virus with bacilliform particles of different sizes (code named SB-22) was isolated from a symptomless cv. Tichuasi potato plant at the International Potato Center (CIP) in Lima, Peru. The particles of this virus were similar to those of alfalfa mosaic virus (AMV), but preliminary comparative serological studies failed to show any relationship between SB-22 and AMV.

Mechanical inoculations of test plants with crude sap of *Physalis floridiana* showing mosaic, vein banding and leaf deformation indicated that the virus is sap-transmissible, success depending on the pH of the sap extraction solution, during the summer months of the year.

SB-22 was found to have a wide host range, being symptomless in several hosts. Some hosts react with similar symptoms to both SB-22 and AMV, but AMV symptoms being more severe. The following hosts were found to react with different symptoms than those caused by AMV (Peruvian isolate): *Datura metel*, *D. stramonium*, *Lycopersicon esculentum*, *L. pimpinellifolium*, *Nicandra physalodes*, *Nicotiana benthamiana*, *N. rustica*, *Physalis floridana* and *Solanum tuberosum* (clone DTO 28 and cv. Mariva). The symptoms caused by the virus vary greatly in potato clones making it difficult to detect SB-22 solely by symptomatology. Clone DTO 28 and cv. Mariva react with a yellowing of the foliage and later with necrosis and death of the plant. Glasshouse and field observations indicated that the symptomatology depends on environmental conditions and potato cultivar.

The virus is transmitted by *Cuscuta* sp., by *Myzus persicae*, apparently in a semi-persistent manner, and through seeds of *P. floridana*, *S. tuberosum* and *Capsicum annuum*. Infection reduced germination of *P. floridana* and *S. tuberosum* seeds up to 84% and 14%, respectively. This reduction is associated with virus-induced necrosis in the seeds. The virus can be detected in non-germinated seeds by DAS-ELISA.

The particle size of SB-22 ranges from 21-368 nm with an average diameter of 25 nm. Five types of particles can be distinguished in purified preparations, the predominant sizes being 21-60 nm. Light and electron microscopy studies of infected *P. floridana* and *S. tuberosum* leaves showed that the virus induces the formation of cytoplasmic inclusion bodies in epidermal and mesophyll cells. These inclusions are amorphous, of variable size, and very stable and numerous in the host tissue.

The virus was found in field samples from different localities in Peru reaching up to 88.4% infection. In the Peruvian highlands the incidence of SB-22 was greater than at the coast. The virus was also found at the Chilean Potato Germplasm collection where 15% of 47 tested clones were infected with the virus and the Robinson Crusoe Island where it infected *S. fernandezianum* but not cultivated potatoes.

According to the authors, the results of the conducted research provided sufficient evidence to classify SB-22 as a distinct virus from AMV. It is suggested that the virus be considered as a new member of the alfalfa mosaic virus group and the name potato yellowing virus has been proposed.

The International Potato Center in Peru recognises potato yellowing virus as an important virus which should be dealt with as a quarantine problem.

- Sources:**
- Fuentes, S.; Jayasinghe, U. (1993) Identification, properties and distribution of a bacilloform virus isolated from potato. *Quartech* No. 1, 1993-07, 1-2.
 - ANON. (1993) Notes on new viruses *Quartech* No. 1, 1993-07, 7.



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93/152 **XANTCI/NZ...Cancellation of citrus canker surveillance
standard in New Zealand**

From 1993-07-01 the Ministry of Agriculture and Fisheries of New Zealand has cancelled its surveillance standard (*NASS 157.02.01: Specifications for Surveillance for Citrus Canker*) for *Xanthomonas campestris* pv. *citri* (EPPO A1 quarantine pest).

Ongoing citrus canker surveillance is, according to the results of a pest risk assessment, considered no longer necessary. It is the intention to publish the findings of the 92/93 survey for citrus canker as the formal acknowledgement of New Zealand's freedom from *X. c.* pv. *citri*.

Source: Ministry of Agriculture and Fisheries, New Zealand
 Sentinel (1993-08-01), p. 5



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POALXX...Strain detection of Andean potato latent tymovirus

A new ELISA procedure has been described in Germany to detect the different strains of Andean potato latent tymovirus (EPPO A1 quarantine pest). The use of conventional DAS-ELISA has been limited in its use to detect the virus because of its strain specificity. Mixtures of antisera from different APLV strains used in a DAS-ELISA had overcome this strain specificity in detecting APLV. The newly developed ELISA procedure provided, according to the author, a higher sensitivity or a reduction of strain specificity and permits, therefore, the detection of APLV strains which more or less fail in DAS-ELISA. The biotin-streptavidin-alkaline phosphatase ELISA gave high extinction values also in heterologous combinations.

The biotin-streptavidin-alkaline phosphatase ELISA was carried out in the same manner as for DAS-ELISA, but instead of the AP-conjugate a biotin conjugate was used at a dilution of 1:1000 in conjugate buffer. The streptavidin-alkaline phosphatase conjugate was diluted 1:10000 in conjugate buffer and incubated for 60 min at 37° C. The enzym-substrate reaction was read after 30 minutes.

In comparison with the DAS-ELISA the biotin-ELISA gave higher absorption values from all strains and combinations of them.

Source: Weidemann, H.L. (1993) Detection of different strains of Andean potato latent tymovirus by a biotin-streptavidin-ELISA.
Quartech, No. 1, 1993-07, 3-4.



EPPO *Reporting Service*

93/154

POSTXX/CN...Mild strain of potato spindle tuber viroid in
China

It was reported from the 6th International Congress of Plant Pathology in Montreal that a mild strain of potato spindle tuber viroid (EPPO A2 quarantine pest) has been detected at the Keshan Potato Research Institute, Heilongjiang, China. The strain did not cause potato tubers to develop the typical "spindly" form. Using return-polyacrylamide gel electrophoresis (R-PAGE) the mild strain was detected in tubers as well as true potato seed. The mild strain also proved to be seed-transmitted in nine cvs. out of 22 tested. The nucleotide sequence of the strain is identical to the North American mild strain of potato spindle tuber viroid.

Source: Singh, R.P.; Singh, M.; Boucher, A.; Owens, R.A. (1993) A mild strain of potato spindle tuber viroid from Heilongjiang, China is identical to the North American-type strain.

Presentation at the 6th International Congress of Plant Pathology, Montreal, CA, 1993-07/08-27/06.



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TMYLCX/BEMITA...Control of tomato yellow leaf curl
geminivirus by symptomless mutants of the virus

Experiments were carried out in Israel to protect tomato crops from infection by tomato yellow leaf curl geminivirus (potential EPPO A2 quarantine pest) by using symptomless mutants of the virus. It was assumed that *Bemisia tabaci* (EPPO A2 quarantine pest) can be saturated with the mutated disarmed viruses and, thereby, be prevented the acquisition of virulent virions. As presented at the 6th International Congress of Plant Pathology in Montreal, in vitro mutated or plant isolated symptomless virus strains were cloned in the Agrobacterium Ti plasmid and then agroinoculated into tomato plants. Virions were produced, they replicated, spread within the plants, were acquired by whiteflies, but did not produce disease symptoms. Three weeks after the agroinoculation the plants were subjected to the infestation by *B. tabaci* populations containing various amounts of viruliferous insects. The plants pre-treated with the symptomless virus showed no or delayed symptoms.

Source:

Czosnek, H.; Zeidan, M.; Gronenborn, B. (1993) Protection of tomato crops from the tomato yellow leaf curl virus with virus symptomless mutants.

Presentation at the 6th International Congress of Plant Pathology, Montreal, CA, 1993-07/08-27/06.



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93/156 CORBMI/IR...*Clavibacter michiganensis* subsp. *michiganensis* found in Iran

Clavibacter michiganensis subsp. *michiganensis* (EPPO A2 quarantine pest) has been found in Iran for the first time in 1988. The bacterium was found to infect tomatoes which showed the typical symptoms of the disease. Diseased plants were found in fields located in the Oroumieh region (West Azarbaijan).

Source: Oroumchi, S. (1992) Bacterial canker of tomato in Iran.
FAO Plant Protection Bulletin 40, 166-167.

93/157 CORBML..EPPO distribution list of *Clavibacter michiganensis* subsp. *michiganensis*

Due to the new record of *Clavibacter michiganensis* subsp. *michiganensis* in Iran the distribution of this pest is as follows. Note also that the record for Finland, published in the 1992 data sheet, was erroneous and was consequently been removed and that Ecuador and Uruguay have been added to the list.

EPPO Distribution List: *Clavibacter michiganensis* subsp. *michiganensis*

C. michiganensis subsp. *michiganensis* was first described in North America and presumably originated there.

EPPO region: Austria, Belgium, Bulgaria, France, Germany, Greece, Hungary, Ireland, Israel, Italy, Lebanon (potential EPPO country), Morocco, Netherlands, Norway (eradicated), Poland (unconfirmed), Portugal (eradicated), Romania, Switzerland, Tunisia, Turkey, UK (found but not established), USSR, Yugoslavia.

Asia: China, India, Iran, Israel, Japan, Lebanon, Turkey, USSR (former).

Africa: Kenya, Madagascar, Morocco, South Africa, Tunisia, Uganda, Zambia, Zimbabwe.

North America: Widespread in Canada (Alberta, British Columbia, Manitoba, Ontario, Québec, Saskatchewan), Mexico, USA (including Hawaii).

Central America and Caribbean: Costa Rica, Cuba, Dominica, Dominican Republic, Grenada, Guadeloupe, Martinique, Panama.

South America: Argentina, Brazil, Chile, Colombia, Ecuador, Peru, Uruguay.

Oceania: Australia (New South Wales, Queensland, South Australia, Victoria, Western Australia), New Zealand, Tonga.

EC: Present.

*This distribution list replaces all previous published EPPO Distribution Lists on *Clavibacter michiganensis* subsp. *michiganensis*!*

Source: EPPO Secretariat, Paris (1993-08)



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93/158 **GVFDXX/CH...Grapevine flavescence dorée MLO not present in Switzerland**

For several years symptoms of a yellows disease of grapevine have been observed on vines in Switzerland. An investigation was initiated to determine if the yellows disease is identical with grapevine flavescence dorée MLO (EPPO A2 quarantine pest). Diseased grapevine samples were collected in West Switzerland and in the Tessin and were subjected to an ELISA test specific to grapevine flavescence dorée MLO. All samples reacted negatively with the ELISA. The authors, therefore, concluded that grapevine flavescence dorée MLO is not present in Switzerland. They stressed, however, the danger presented by unknown yellows diseases.

Source: Cazelles, O.; Kuszala, C. (1993) Prospection des jaunisses de la vigne en Suisse romande et au Tessin et comparaison avec la flavescence dorée par le test ELISA.
 Revue Suisse de Viticulture, Arboriculture, Horticulture 25, 257-259.



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93/159

XANTOR...Detection of *Xanthomonas oryzae* pv. *oryzae*

In Japan, investigations were carried out to detect through specific antibodies extracellular polysaccharides from *Xanthomonas oryzae* pv. *oryzae* (EPPO A1 quarantine pest) by immunofluorescent and immunoelectron microscopy and ELISA.

The developed antibody detected extracellular polysaccharide of the pathogen at concentrations above 0.1 µg/ml using ELISA and did not react with extracellular polysaccharides from *X. campestris* pv. *campestris* and *X. citri* pv. *citri*. Immunofluorescent antibody staining of infected rice leaves showed that extracellular polysaccharide produced by *X.o.* pv. *oryzae* was distributed in both xylem vessels and transverse veins, but not in either sieve tubes or mesophyll tissues. The distribution of extracellular polysaccharide coincided with that of bacteria in the infected tissues. Immunoelectron microscopic observations showed that the localization of extracellular polysaccharide was restricted in the area close to bacterial cells.

Source:

Watabe, M.; Kitamura, S.; Horino, O. (1993) Immunohistochemical studies on extracellular polysaccharide from *Xanthomonas campestris* pv. *oryzae* in infected rice leaves.

Presentation at the 6th International Congress of Plant Pathology, Montreal, CA, 1993-07/08-27/06.



EPPO *Reporting Service*

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XANTVE...New tomato race of *Xanthomonas campestris* pv. *vesicatoria* found in Florida

It was reported at the 6th International Congress of Plant Pathology in Montreal that a new race of *Xanthomonas campestris* pv. *vesicatoria* (EPPO A2 quarantine pest) has been detected infecting tomatoes in Florida, US. The new race, pectolytic and amylolytic, was distinguished from races 1 and 2 of the pathogen by genomic fingerprinting. Strains of the new race did not react with monoclonal antibodies specific to race 1 and race 2 of the pathogen.

Source:

Jones, J.B.; Stall, R.E.; Bouzar, H.; Minsavage, G.V.; Wang, J.F.; Somodi, G.C.; Hodge, N.C.; Scott, J.W. (1993) A new tomato race of *Xanthomonas campestris* pv. *vesicatoria* in Florida.
Presentation at the 6th International Congress of Plant Pathology, Montreal, CA, 1993-07/08-27/06.



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93/161 PUCCHN...Outbreak of *Puccinia horiana* in California, US

Puccinia horiana (EPPO A2 quarantine pest) had been thought to be eradicated from the USA since its outbreak in 1991. In 1993-03, however, chrysanthemum white rust had been detected again at 17 residential properties in the Santa Cruz County in California. Previous findings of *P. horiana* were always confined to nurseries. Plant protection authorities in the USA have removed and destroyed all chrysanthemums from the affected residential properties.

Source: NAPPO Newsletter 1993-07, Vol. 13 (3), p. 10



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PHYTMS...Occurrence of *Phytophthora megasperma* f.sp. *glycinea* races in Argentina

A survey for the identification of races of *Phytophthora megasperma* f.sp. *glycinea* (EPPO A2 quarantine organism) has been carried out in the province of Buenos Aires, Argentina. According to a presentation at the 6th International Congress of Plant Pathology in Montreal, 46 isolates of the pathogen were analysed. Only race one of the pathogen was identified in the survey.

Source: Barreto, D.; de Gurfinkel, B.S.; Fortugno, C. (1993) Reaction of soybean cultivars and races of *Phytophthora sojae* in the province of Buenos Aires (Argentina).
Presentation at the 6th International Congress of Plant Pathology, Montreal, CA, 1993-07/08-27/06.



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BEMITA...*Bemisia tabaci* association with silverleaf of *Cucurbita pepo*

Silverleaf squash *Cucurbita pepo* has been several times associated with the presence of *Bemisia tabaci* (EPPO A2 quarantine pest). The causal agent of this disease, however, had not been conclusively determined. Studies carried out in Florida, US, revealed that an uncapsidated viral-like double stranded RNA (dsRNA) was consistently detected in plants showing silverleaf and in *B. tabaci* adults capable of mediating the disease. As reported at the 6th International Congress of Plant Pathology in Montreal, dsRNA quantities in *B. tabaci* adults are only limited and, therefore, the whitefly density is positively correlated with silverleaf rating. An average of 15-20 whiteflies per plant is necessary to induce the disease. Transmission experiments revealed the obligate requirement of whitefly for continued silverleaf development and the detection of dsRNA in the leaf tissues.

Source: Bharathan, N. (1993) Uncapsidated viral-like double stranded RNA in whitefly-mediated silverleaf squash.
Presentation at the 6th International Congress of Plant Pathology, Montreal, CA, 1993-07/08-27/06.

93/164

BEMITA...Insecticide resistance of *Bemisia tabaci*

Investigations have been carried out in the UK to assess the resistance of *Bemisia tabaci* (EPPO A2 quarantine pest) from different geographical areas to organophosphates and pyrethroids. Whitefly populations from Sudan, Israel, Cyprus, Pakistan, UK, Netherlands, Belize and the USA were assessed and compared. It was found that no strain was fully susceptible to the organophosphates and pyrethroids tested and that most appear remarkably homogeneous in response, with no or little evidence for the presence of susceptible individuals.

Source: Cahill, M.; Byrne, F.; Birnie, L.; Denholm, I.; Devonshire, A. (1993) Insecticide resistance in *Bemisia tabaci*: An International Perspective.
Resistant Pest Management Vol. 5(1), p. 16-18

93/165

BEMITA...Resistance of *Bemisia tabaci* to buprofezin detected

Studies in the UK revealed that *Bemisia tabaci* (EPPO A2 quarantine pest) can develop resistance against buprofezin, an insect growth regulator introduced in the 1980s for the control of whiteflies. A glasshouse-collected population of *B. tabaci* which underwent intensive buprofezin treatments (22 times in the previous 18 months) was assessed regarding its susceptibility to the insecticide. It was found that the population exhibited a high-(75 fold) tolerance to buprofezin.

The authors concluded that *B. tabaci* is a highly adaptable species and that chemical control measures have to be applied in moderation and under the full use of all novel control agents to avoid exacerbating resistance problems.

Source: Cahill, M.; Denholm, I. (1993) Detection of resistance to buprofezin in the whitefly *Bemisia tabaci*.
Resistant Pest Management Vol. 5 (1), p. 42



EPPO *Reporting Service*

93/166 DACUSP/DACOCR...*Bactrocera correcta* found on
grapevine

Bactrocera correcta (EPPO A1 quarantine pest as a non-European *Bactrocera* sp.) is a fruit fly which has been previously known as *Chaetodacus correctus* and *Dacus correctus*. It is recorded mainly from eastern Asia (India, Nepal, Pakistan, Sri Lanka, Thailand), but has been also found in California (US) in 1986. In general it attacks common jujube (*Ziziphus jujube*) and tropical almond (*Terminalia catappa*), but is also recorded from guava (*Psidium guajava*), mango (*Mangifera indica*), peach (*Prunus persica*), rose-apple (*Syzygium jambos*), Citrus sp., coffee (*Coffea canephora*), sandalwood (*Santalum album*), sapodilla (*Manilkara zapota*) and avocado. The pest was never before recorded to infest grapes. A survey carried out in India showed now that the pest can also infest grapes, although it has remained a minor pest of grapevine.

Source: Mani, M. (1992) *Bactrocera correcta* on grapevine in India.
 FAO Plant Protection Bulletin 40, 162-163.



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93/167 TOXOCI/CSTXXX...Spread of *Toxoptera citricidus* in the Caribbean Islands

During a survey in the Dominican Republic *Toxoptera citricidus* (EPPO A1 quarantine pest) had been discovered in Villa Altigracia and Constanza. The extent of the infestation in Altigracia as well as its detection in Constanza led the authors to assume that the pest has been present for some time in the Dominican Republic. Earlier *T. citricidus* has been also found in other parts of the Caribbean. The vector of citrus tristeza closterovirus (EPPO A2 quarantine pest) was detected in 1991 in Martinique and Guadeloupe and in 1992 in Saint Lucia. Citrus tristeza closterovirus, however, has not been detected on these islands yet.

Sources: Etienne, J.; Aubert, B.; Leclant, F. (1992) Premier signalement de *Toxoptera citricidus* en Guadeloupe, Martinique, République Dominicaine et à Sainte-Lucie.
FAO Plant Protection Bulletin 40,, p. 162.
Leclant, F.; Etienne, J.; Aubert, B. (1992) Alerte à la tristeza en vergers d'agrumes.
Phytoma (FR) No. 440, 32-34.

93/168 TOXOCI...EPPO Distribution List: *Toxoptera citricidus*

Due to the new records of *Toxoptera citricidus* (EPPO A1 quarantine pest) in the Caribbean the distribution of the pest is as follows:

EPPO Distribution List: Toxoptera citricidus

T. citricidus occurs predominantly in humid tropical regions and presumably originated in south-east Asia and spread on citrus plants to other tropical areas. It has also spread to areas of Mediterranean climate (Australia, South Africa, Chile).

EPPO region: Absent (supposed records from Cyprus, Italy, Malta and Spain refer to *T. aurantii*).

Asia: Widespread in south-east Asia; China, Indonesia, India, Japan, Korea Dem. Peoples Republic, Korea Republic, Malaysia, Philippines, Sri Lanka, Thailand, Taiwan.

Africa: Widespread south of the Sahara; Congo, Cameroon, Ghana, Kenya, Mauritius, Mozambique, Nigeria, Réunion, Senegal, Sierra Leone, South Africa, St. Helena, Sudan, Tanzania, Uganda, Zimbabwe.

North America: USA (Hawaii only).

Central America and Caribbean: Dominican Republic, Guadeloupe, Martinique, Saint Lucia and Trinidad and Tobago only. Note that the first edition of the EPPO data sheet on *T. citricidus* (OEPP/EPPO, 1980) erroneously gave it as widespread in the Caribbean except Trinidad.

South America: Widespread; Argentina, Brazil, Chile, Ecuador, French Guiana, Guyana, Paraguay, Peru, Suriname, Uruguay, Venezuela.

Oceania: Australia (New South Wales, South Australia, Queensland, Victoria, Western, Australia, Tasmania), Cook Islands, Fiji, New Zealand (North Island).

This distribution list replaces all previous published EPPO Distribution Lists on Toxoptera citricidus!

Source: EPPO Secretariat, Paris (1993-08)



EPPO *Reporting Service*

93/169

HETDGL...Control of *Heterodera glycines*

Crop rotation experiments for soybeans were carried out in China in order to investigate their effect on the infestations of soybeans by *Heterodera glycines* (EPPO A1 quarantine pest). As reported at the 6th International Congress of Plant Pathology in Montreal, maize, millet and castorbean (*Ricinus communis*) were grown on a heavily *H. glycines* infested field preceding a crop of susceptible soybeans. It was found that the average amount of cysts per soybean plant was markedly decreased and the soybean yield was greatly increased when castorbean had been cultivated as a preceding crop. Laboratory experiments showed that the root diffusates of castorbean induced a hatching of the eggs of *H. glycines*. The juveniles died soon after the hatching due to the absence of host plants. The authors concluded that the cultivation of castorbean as a predecessor crop of soybean can control the soybean cyst nematode effectively.

Source: Ye, L.; Weizhi, L.; Yuxi, D. (1993) Effects of castorbean and other nonhost crops on controlling *Heterodera glycines*.
Presentation at the 6th International Congress of Plant Pathology,
Montreal, CA, 1993-07/08-27/06.



EPPO *Reporting Service*

93/170 ERWIAM/RO...Fireblight in Romania

Fireblight (due to the EPPO A2 quarantine pest *Erwinia amylovora*) was first observed in Romania in 1992-08 near Braila, and then in the pear collection of the Fruit Research Institute in Pitesti-Maracineni. Numerous trees of many cultivars were affected. A detailed article will appear shortly in Bulletin OEPP/EPPO Bulletin. The disease had probably been present already for one year.

Source : **Research Institute for Plant Protection, Bucuresti.**