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95/069

IPPC...List of Contracting Parties to the International Plant
Protection Convention

Below is the list of the 101 countries which are now contracting parties to the International Plant Protection Convention (IPPC), dated September 1994. Previous lists appeared in the EPPO Reporting Service n° 506/11 and 507/13 (1990). The amendments introduced in 1979 have now been accepted by 2/3 of the countries and they have therefore come into force. However, the following EPPO member countries have not yet become contracting parties to the IPPC despite the repeated recommendations of EPPO Council: Croatia, Cyprus, Estonia, Latvia, Poland, Slovak Republic, Slovenia, Switzerland, Ukraine.

Algeria	Germany	Mali
Argentina	Ghana	Malta
Australia,	Greece	Mauritius
Austria	Grenada	Mexico
Bahrain	Guatemala	Morocco
Bangladesh	Guinea	Netherlands
Barbados	Guyana	New Zealand
Belgium	Haiti	Nicaragua
Belize	Hungary	Niger
Bhutan	India	Nigeria
Bolivia	Indonesia	Norway
Brazil	Iran	Oman
Bulgaria	Iraq	Pakistan
Canada	Ireland	Panama
Cape Verde	Israel	Papua New Guinea
Chile	Italy	Paraguay
Colombia	Jamaica	Peru
Costa Rica	Japan	Philippines
Cuba	Jordan	Portugal
Czech Republic	Kampuchea Democratic	Romania
Denmark	Kenya	Russia
Dominican Republic	Korea, Rep. of	Senegal
Ecuador	Lao	Sierra Leone
Egypt	Lebanon	Solomon Islands
El Salvador	Liberia	South Africa
Equatorial Guinea	Libyan Arab Jamahiriya	Spain
Ethiopia	Luxembourg	Sri Lanka
Finland	Malawi	St. Kitts and Nevis
France	Malaysia	Sudan



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Suriname	Tunisia	Venezuela
Sweden	Turkey	Yemen
Thailand	United Kingdom	Yugoslavia
Togo	United States of America	Zambia
Trinidad and Tobago	Uruguay	

Source: FAO, Rome (1995-03).

95/070 **PHYNCL...First report of *Phyllocnistis citrella* in Sardegna (IT)**

Phyllocnistis citrella (potential EPPO A2 quarantine pest) has been reported for the first time in Sardegna (IT) in autumn 1994 and is now spreading all over the island, causing serious damage to citrus. In Sardegna, the pest attacks sweet orange (*Citrus sinensis*), lemon (*C. limon*), mandarin (*C. reticulata*), and grapefruit (*C. paradisi*). The authors noted that until 1986 this species was confined to Asia, but was reported in 1993 in Florida (US) (EPPO RS 94/163), in 1994 in Spain (EPPO RS 94/185) and then spread very rapidly in the Mediterranean Basin. According to them the pest is also present in Algeria, Israel, Morocco, Portugal and Turkey. The EPPO Secretariat will check this point, because if confirmed these would be also the first reports in Morocco, Portugal and Turkey.

Source: Ortu, S.; Delrio, G.; Lentini, A. (1995) [Citrus leafminer, *Phyllocnistis citrella* Stainton (Lep: Gracillariidae: Phyllocnistidae), in Italy]: **Informatore Fitopatologico, 3, 38-41.**

Additional key words: new record.



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95/071 **PHYTRU...** First report of *Phytophthora fragariae* var. *rubi* in Sweden

The EPPO Secretariat has recently been informed by the Swedish Board of Agriculture that *Phytophthora fragariae* var. *rubi* (EPPO A2 quarantine pest) has been discovered for the first time in Sweden in 1994. The fungus has been found in autumn 1994 in a commercial field of raspberries. The cultivars infected were: Glen Moy, Glen Prosen and Autumn Bliss. It is considered that the probable source of infection was imported plant material. The plants in the infected fields have been destroyed.

Source: Swedish Board of Agriculture, Plant Protection Service, 1995-03.

Gråberg, M. (1994) [Raspberry root rot in Sweden].
Växtskyddsnotiser, 58 (4), 116-117.

Additional key words: new record.

95/072 **NEWPEST...** New species of *Phytophthora* infecting *Rubus*

In 1987 at the Scottish Crop Research Institute (GB), several raspberry plants (*Rubus idaeus*) showing root rot were found to be infected with a papillate *Phytophthora* species. Morphology, physiology, protein patterns and pathogenicity of this *Phytophthora* species have been compared with other *Phytophthora* species with papillate sporangia (especially *P. cactorum*) and with species that attack raspberry (*P. citricola*, *P. syringae*). The authors concluded that these papillate *Phytophthora* isolates from raspberry could be considered as a new species, and proposed to name it *Phytophthora idaei* sp. nov. This species is quite distinct from *P. fragariae* var. *rubi*.

Source: Kennedy, D.M.; Duncan, J.M. (1995) A papillate *Phytophthora* species with specificity to *Rubus*.
Mycological Research, 99 (1), 57-68.

Additional key words: new pest.



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95/073 **TMYLCX/JM...First report of tomato yellow leaf curl geminivirus in Jamaica**

In spring 1993 and 1994, symptoms similar to those of tomato yellow leaf curl geminivirus (EPPO A2 quarantine pest) have been observed in tomato fields in Jamaica (parishes of St Elizabeth and St. Catherine). High levels of *Bemisia* sp. populations were also associated with symptomatic plants. Tomato leaf samples were analyzed by using a specific probe (cloned DNA of TYLCV) and strong hybridization was observed. DNA extracts of tomato samples were amplified and the restriction pattern of a fragment obtained was identical to that of TYLCV recently found in the Dominican Republic (EPPO RS 94/199 & 94/224). This is the first report of tomato yellow leaf curl geminivirus in Jamaica.

Source: McGlashan, D.; Polston, J.E.; Bois, D.; Bradenton, E. (1994) Tomato yellow leaf curl geminivirus in Jamaica.
Plant Disease, 78 (12), p 1219

Additional key words: new record.

95/074 **BNGMXX...Bean golden mosaic geminivirus is also present in Costa Rica and Nicaragua**

The occurrence of bean golden mosaic geminivirus (EU Annex I/A1) has previously been reported in Brazil, Dominican Republic, Guatemala, Jamaica, Puerto Rico and Venezuela. Molecular studies have been carried out on samples obtained from bean plants showing symptoms of bean golden mosaic and collected in Costa Rica, Jamaica, Nicaragua and Guatemala. The results showed that these four isolates are similar to type II isolates of bean golden mosaic geminivirus from Puerto Rico, Dominican Republic and Guatemala. The authors concluded that these data extend the distribution of type II isolates of bean golden mosaic geminivirus to Jamaica, Nicaragua and Costa Rica. According to the EPPO Secretariat, records of this virus in Costa Rica and Nicaragua are new.

Source: McLaughlin, W.; Rojas, M.R.; Nakhla, M.K. Hidayat, S.H.; Maxwell, D.P. (1994) Partial molecular characterization of bean golden mosaic virus isolates from Jamaica and Central America.
Plant Disease, 78 (12), p 1220.

Additional key words: new records.



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95/075

BEMITA/TMYLCX...Studies on whitefly-transmitted geminiviruses
in Yemen

In Yemen, whitefly-transmitted viruses have caused increasing economic damage to crops. Three viruses collected in southern Yemen in 1990, on watermelon, tobacco and tomato have been studied and were shown to be transmitted by *Bemisia tabaci*. These viruses were identified as watermelon chlorotic stunt geminivirus, tobacco leaf curl geminivirus and tomato yellow leaf curl geminivirus (EPPO A2 quarantine pest). In addition, colonies of *B. tabaci* established on watermelon and cotton in Yemen have been found to induce squash silverleaf symptoms and are therefore considered as being the B biotype (*B. argentifolii*). Analysis of transmission efficiencies of the three viruses showed that tobacco leaf curl geminivirus and tomato yellow leaf curl geminivirus were transmitted more efficiently than watermelon chlorotic stunt geminivirus. The authors have found that the TYLCV isolate from Yemen presented the highest levels of homology with the Spanish isolate and showed also similarities with a Jordanian isolate. They concluded that the Yemen isolate of TYLCV could be provisionally classified within the complex of yellow leaf curl geminiviruses prevalent in the Middle East and Mediterranean region. According to the EPPO Secretariat, this is the first report of tomato yellow leaf curl geminivirus in Yemen.

Source: Bedford, I.D.; Briddon, R.W.; Jones, P.; Alkaff, N.; Markham, P.G. (1994) Differentiation of three whitefly-transmitted geminiviruses from the Republic of Yemen.
European Journal of Plant Pathology, 100 (3-4), 243-257.

Additional key words: new record.



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95/076

BEMITA...Biological control of *Bemisia argentifolii* on poinsettia

The efficacy of biological control with releases of *Encarsia luteola* (parasitoid) and *Delphastus pusillus* (predator) against *Bemisia argentifolii* (*B. tabaci* biotype B - EPPO A2 quarantine pest) has been evaluated in a greenhouse of poinsettias (*Euphorbia pulcherrima*). *Encarsia luteola* was released weekly after the plants entered the greenhouse and in addition three releases of *Delphastus pusillus* were carried out (at one week interval) when populations of the pest increased. Release rates were one insect per plant per week for the two natural enemies. Damage to harvested plants within the areas of the greenhouse where biological control was applied, was not significantly different from damage level observed in a separated area treated with pesticides. The cost of biological control was approximately five times greater than the chemical treatments. However, the authors felt that the cost of biological control could probably be reduced by defining more precisely the timing and rates of release of natural enemies, and by an increase of commercial availability of these two species.

Source: Heinz, K.M.; Parrella, M.P. (1994) Biological control of *Bemisia argentifolii* (Homoptera: Aleyrodidae) infesting *Euphorbia pulcherrima*: evaluation of releases of *Encarsia luteola* (Hymenoptera: Aphelinidae) and *Delphastus pusillus* (Coleoptera: Coccinellidae). *Environmental Entomology*, 23 (5), 1346-1353.

95/077

TMRSXX/PR...Tomato ringspot nepovirus reported in Puerto Rico on orchids

Tomato ringspot nepovirus (EPPO A2 quarantine pest) has been isolated from a terrestrial orchid plant, *Ponthieva racemosa*, collected in Puerto Rico. The authors believed that this is the first report of tomato ringspot nepovirus in *P. racemosa* and the second report in orchids (previously found on *Cymbidium*).

Source: Yao, J.M.; Tainter, F.H. (1994) The occurrence of tomato ringspot virus in *Ponthieva racemosa*. *Plant Disease*, 78 (9), p 925.

Additional key words: new hosts plants.



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95/078 IMNSXX...First report of impatiens necrotic spot tospovirus on ferns

In May 1991, in a greenhouse in Spain, fern plants (*Asplenium nidus-avis*) showed symptoms of ring spot and numerous necrotic lesions on the leaves. No fungal or bacterial pathogen could be isolated. However, by using DAS-ELISA and polyclonal antisera, it was possible to detect the presence of impatiens necrotic spot tospovirus (potential EPPO A2 quarantine pest). The authors believed that this is the first report of the virus from a pteridophyte.

Source: Laviña, A.; Batlle, A. (1994) First report of impatiens necrotic spot virus in *Asplenium nidus-avis* in Spain.
Plant Disease, 78 (3), 316.

Additional key words: new host plant.

95/079 ANSTLU...Quarantine treatment for grapefruit against *Anastrepha ludens*

A forced hot-air quarantine treatment has been developed in USA to eliminate *Anastrepha ludens* (EPPO A1 quarantine pest) from grapefruit (*Citrus paradisi*). Experiments carried out on artificially infested fruits with third instars (the most heat-tolerant stage) of *A. ludens* have shown that a forced hot-air treatment applied until the temperature of the centre of the fruit reached 48 °C is sufficient to ensure quarantine security (fulfilling probit 9 mortality = 99.9968 %). This treatment does not significantly affect the quality of the fruits.

It can be recalled that similar treatments have been proposed for *A. suspensa* (EPPO A1 quarantine pest) infesting grapefruit (EPPO RS 94/117), carambolas (EPPO RS 523/09, 1992), mangoes (Sharp, 1992) and for *A. obliqua* (EPPO A1 quarantine pest) on mangoes (EPPO RS 93/005).

Source: Mangan, R.L.; Ingle, S.J. (1994) Forced hot-air quarantine treatment for grapefruit infested with Mexican fruit fly (Diptera: Tephritidae).
Journal of Economic Entomology, 87 (6), 1574-1579.

Sharp, J.L. (1992) Hot-air quarantine treatment for mango infested with Caribbean fruit fly (Diptera: Tephritidae).
Journal of Economic Entomology, 85 (6), 2302-2304.



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95/080

ANSTSU...Effect of rearing temperatures on mortality of *Anastrepha suspensa* exposed to hot-water immersion or cold storage

In quarantine treatments against *Anastrepha suspensa* (EPPO A1 quarantine pest) cold temperatures of 0-5 °C or hot temperatures of 43-48 °C can be used. The author has studied the effects of rearing temperatures (20, 25 or 30 °C) on the mortality of third instars exposed to such treatments. *A. suspensa* was reared from egg to third instar in a semi-artificial diet, carambolas and guavas and then submitted to hot-water immersion (43-46 °C) or cold storage (1 °C). The results showed that rearing temperatures did not affect tolerance to 1 °C cold storage. However, for hot-water immersion treatments the rearing temperature has an effect on mortality. For example, third instars reared on semi-artificial diet at 30 °C showed significantly less mortality (49.0 %) than those at 20 °C (94.2 %) when exposed to a hot-water immersion (43 °C for 21 min). The same results were observed for hot-water treatments at 46 °C and for insects reared on carambolas or guavas. The author concluded that immature stages of *A. suspensa* are more tolerant to hot temperatures (43-46 °C) when reared at higher temperatures between 20-30 °C. Therefore, it might be more difficult to eliminate *A. suspensa* in fruit harvested during the warmest seasons and this aspect should be taken into account when designing quarantine treatments against *A. suspensa*.

Source: Hallman, G. (1994) Mortality of third-instar Caribbean fruit fly (Diptera: Tephritidae) reared at three temperatures and exposed to hot water immersion or cold storage.
Journal of Economic Entomology, 87 (2), 405-408.



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95/081 PALYXX...PCR detection of palm lethal yellowing phytoplasma

Studies have been carried out in Florida (US) in order to develop suitable PCR primers for specific detection of palm lethal yellowing phytoplasma (EPPO A1 quarantine pest). With these primers it has been possible to achieve reliable and reproducible detection of palm lethal yellowing phytoplasma in palm inflorescence spikelets and in leaflets of the least mature leaves. However, it was difficult to detect the pathogen in mature leaves, probably because of an uneven distribution. However, this study confirms the effectiveness of PCR as a detection method. In practice, sampling and PCR analysis of leaflets of the least mature palm leaves could provide a diagnostic of the disease. The authors concluded that PCR will be a useful tool for a better understanding of the disease epidemiology, e.g. for studies on its putative vector biology (*Myndus crudus*), host resistance and identification of alternative host plants.

Source: Harrison, N.A.; Richardson, P.A.; Kramer, J.B.; Tsai, J.H. (1994) Detection of the mycoplasma-like organism associated with lethal yellowing disease of palms in Florida by polymerase chain reaction. *Plant Pathology*, 43 (6), 998-1008.

Additional key words: new diagnostic method.

95/082 APPXXX...Rapid detection of apple proliferation phytoplasma using PCR

In Italy, a one-step PCR method based on the amplification of 16S rRNA of apple proliferation phytoplasma (EPPO A2 quarantine pest) has been developed. With this rapid method, it is possible to detect the pathogen in plant tissue (in as little as 0.3 g of diseased tissue). This method appears to be specific of a group of related 'decline phytoplasmas', such as: apple proliferation, pear decline and plum leptonecrosis phytoplasma. Other phytoplasmas were not detected (Western X disease, grapevine yellows, peach rosette). The authors felt that this method could be useful for indexing plant material.

Source: Firrao, G.; Gobbi, E.; Locci, R. (1994) Rapid diagnosis of apple proliferation mycoplasma-like organism using a polymerase chain reaction procedure. *Plant Pathology*, 43 (4), 669-674.

Additional key words: new diagnostic procedure.



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95/083 PRDXXX...Pear decline phytoplasma can affect cultivars of Japanese pear

During preliminary surveys carried out in 1991-92, in Emilia-Romagna (IT), symptoms similar to the slow form of pear decline phytoplasma (EPPO A2 quarantine pest) were observed in trees of *Pyrus pyrifolia* cvs Hosui and Kosui grafted on *P. communis* seedling rootstocks. The main symptoms were a downward curling of the distal part of the leaves with an upward rolling along the midribs of the margins. The leaves then turned red and became abnormally thick with swollen and brown major veins. The incidence of this decline was particularly high in one orchard adjacent to a pear orchard strongly affected by the slow form of pear decline. In affected trees, phytoplasmas were consistently detected by using DAPI technique and RFLP analysis of PCR-amplified DNA. The authors concluded that although Japanese pears are well-known hosts of pear decline phytoplasma when used as rootstocks of French cultivars, this is the first report of pear decline in *P. pyrifolia* as the scion cultivar.

Source: Poggi Pollini, C.; Giunchedi, L.; Seemüller, E.; Lorenz, K.H. (1994) Association of the decline of Nashi pears with an MLO. *Journal of Phytopathology*, 142 (2), 115-121.

Additional key words: new host plant.

95/084 CA/US/MX...Situation of forest pests in North America in 1994

The 1994 situation of forest pests in North America was reviewed during the annual meeting (Winnipeg, CA, 1994-10-04/06) of the Insect and Disease Study Group of the North American Forestry Commission and can be summarized as follow.

• **Canada**

In eastern Canada, the most serious pests were: *Choristoneura fumiferana*, *Malacosoma disstria* and *Lymantria dispar*. However, there were significant decreases in areas defoliated by *Malacosoma disstria*, *Lymantria dispar* and *C. fumiferana*, significant increases of *Choristoneura pinus* and decreases of *Lambdina fiscellaria* in Newfoundland and in other areas.



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In western Canada: *Dendroctonus ponderosae*, *Choristoneura occidentalis* and *C. fumiferana* were the most important pests.

Forest diseases of concern were: *Elytroderma deformans* and *Lophodermella concolor* (pine needle diseases), *Gremmeniella abietina* and maple decline (unknown etiology). Dwarf mistletoes (*Arceuthobium* spp.), root and stem rots continued to be a forest management problem. *Bursaphelenchus xylophilus* has also been reported but is not considered to be a significant forest pest according to this report.

• United States

In eastern US, *Lymantria dispar* and *Dendroctonus frontalis* were the most serious pests. Defoliation by *C. fumiferana* was extremely low, area defoliated by *L. dispar* decreased to only 360,000 ha, the Asian form of *L. dispar* has been again introduced from Germany; southern pine beetle (*Dendroctonus frontalis*) epidemic continued in parts of the South; the area infested by *Tomicus piniperda* continued to increase.

In western US, *C. occidentalis* defoliation and mountain pine beetle (*Dendroctonus ponderosae*) were at historically low levels.

Forest diseases of concern were: *Cronartium quercuum*, *C. fusiforme*, root and stem decays, tree decline (especially on ash, oak, fir, larch, maple, and red spruce), *Arceuthobium* spp., *Scleroderris* canker, *Lachnellula wilkommii* (European larch canker), and *B. xylophilus*. Pine pitch canker (*Fusarium subglutinans*) a disease common in the Southeastern United States, is now found in 11 counties in California.

• Mexico

In 1994, 14,800 ha were affected by pests, mainly in temperate forests. The main problem is due to bark beetles (*Dendroctonus* spp.) of conifers which affected an area of 2,600 ha in central and southern Mexico. *Arceuthobium* spp. and other parasitic plants (*Psittacanthus*) affected 9,700 ha.

Some serious insects and diseases exist in conifer and urban areas, i.e. pine pitch canker (*Fusarium subglutinans*), oak decline (unknown agent), *Heterobasidion annosum* and *Paranthrene dolli* (poplar borer).

Source: Anonymous (1995) North America's forest pest conditions
NAPPO Newsletter 15 (1), pp 6 & 9.



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95/085

LYMADI...Survey on the Asian form of *Lymantria dispar* in the USA

In order to differentiate the Asian form of *Lymantria dispar* from the common form, two genetic markers have been used: a nuclear marker FS1, probably located on an autosomal chromosome (two alleles have been identified: North American and Asian); mitochondrial DNA (three mitochondrial haplotypes have also been found: North American, Siberian, Russian). However, neither of these genetic markers is strictly limited to only one population and their presence makes no implication about the Asian behaviour (females which fly more freely and wider host range). The presence of "Asian genes" represents only the 'potential' of flight behavior and/or a broader host range capability.

Analysis have been carried out by the AHIS Otis Methods Center in Massachusetts (US) on gypsy moth specimens collected in US Ports for the presence of the Asian genotype. Up till now 2760 port specimens from 27 States have been analysed by using the two genetic markers. As a result, the "Asian" genotype has been found in 15 States: California, Connecticut, Delaware, Massachusets, Maryland, Maine, Michigan, North Carolina, New Jersey, New York, Ohio, Rhode Island, South Carolina, Virginia, West Virginia.

Source: Anonymous (1995) Asian gypsy moth genotype survey.
NAPPO Newsletter 15 (1), p 9.



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95/086 RADOSI...Control measures against *Radopholus similis*

In Côte d'Ivoire, field studies have been carried out to assess the potential for using nematode-free micropropagated banana plants after the implementation of cultural (weed fallow and flooding) and chemical control methods against *Radopholus similis* (EPPO A2 quarantine pest) and other nematodes pathogenic to banana (*Helicotylenchus multicinctus* and *Hoplolaimus pararobustus*). The results have shown that all nematode species declined but were not eliminated after a soil treatment with 1,3 dichloropropene, that *R. similis* did not persist after a weed fallow of two years (dominated by the weeds: *Chromolaena odorata* or *Asystasia gangetica*) or 10-week flooding. Other pathogenic nematodes (*H. multicinctus* and *H. pararobustus* which are able to parasitize the two weed species) were still present after these two cultural operations but in lower numbers. The authors concluded that fallowing and flooding (when possible) are two interesting control measures against nematodes in bananas.

Source: Mateille, T.; Quénéhervé, P.; Hugon, R. (1994) The development of plant parasitic nematode infestations on micro-propagated banana plants following field control measures in Côte d'Ivoire.
Annals of Applied Biology, 125 (1), 147-159.

Additional key words: control methods.



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95/087 **HYROBO...Biological control of *Listronotus bonariensis* in New Zealand**

In New Zealand, *Listronotus bonariensis* (EPPO A1 quarantine pest) is a serious pest of grasslands. Although losses have been estimated between 78-251 million NZD per year, for economic reasons pesticides have not given a satisfactory solution to this problem. Therefore, studies are currently being carried out on the introduction and establishment of natural enemies. Seven ecotypes of a parasitoid *Microctonus hyperodae* from South America (Brazil, Uruguay, Argentina and Chile) have been reared and released in three regions of New Zealand (northern & central North Island, central South Island and southern South Island) from April to October 1991. First recoveries of *M. hyperodae* parasitized weevils were found from October 1991 to October 1992. In general, in all regions there has been a rapid establishment, especially in the warmer northern areas, and at all sites after initial establishment, parasitism has continued to build up, reaching 80 % in some areas.

Source: Goldson, S.L.; McNeill, M.R., Proffitt, J.R.; Barker, G.M.; Addison, P.J.; Barratt, B.I.P.; Ferguson, C.M. (1993) Systematic mass rearing and release of *Microctonus hyperodae* (Hym: Braconidae, Euphorinae), a parasitoid of the argentine stem weevil *Listronotus bonariensis* (Col: Curculionidae) and records of its establishment in New Zealand. *Entomophaga*, 38 (4), 527-536.

95/088 **HELIZE...*Lonicera japonica* is a host plant for *Helicoverpa zea***

It has been observed in southwestern Georgia and northern Florida (US) that flowers of *Lonicera japonica* could support populations of *Heliothis virescens* and *Helicoverpa zea* (EPPO A1 quarantine pest). Studies conducted at different sites indicate that wild *L. japonica* is an important early and late-season host for *H. virescens* and *H. zea* in southern Georgia and northern Florida. This is the first record of *L. japonica* as a host plant for *Heliothis virescens* and *Helicoverpa zea*.

Source: Pair, S.D. (1994) Japanese honeysuckle (Caprifoliaceae): newly discovered host of *Heliothis virescens* and *Helicoverpa zea* (Lepidoptera: Noctuidae). *Environmental Entomology*, 23 (4), 906-911.

Additional key words: new host plant.



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95/089

LEPTDE...Effects of cyromazine on *Leptinotarsa decemlineata*

The effects of cyromazine (insect growth regulator) have been tested against *Leptinotarsa decemlineata* (EPPO A2 quarantine pest) in the laboratory and in the field, in Michigan (US). In the laboratory, results obtained showed that second instar larvae fed upon treated foliage died within 10 days. Fourth larval instars were less affected but showed decreased feeding and some symptoms of poisoning. Mortality of pre-pupae and pupae was high.

In the field, cyromazine sprays reduced the number of first and second instars and affected third and fourth instars by inhibiting feeding and lowering rates of pupation. Compared with the untreated control plots, cyromazine treatment reduced adult emergence from 63 fold and increased potato yield of 2 to 4.5 fold. The authors concluded that the disruption of pupation and the decrease of adult emergence make cyromazine a useful tool for control of the summer generation of Colorado beetle and that this compound could be an appropriate alternative insecticide in resistance management programmes. However, they noted that further information on its mode of action would be useful to prevent the development of resistance.

Source: Sirota, H.M.; Grafius, E. (1994) Effects of cyromazine on larval survival, pupation, and adult emergence of Colorado potato beetle (Coleoptera: Chrysomelidae).
Journal of Economic Entomology, 87 (3), 577-582.

Additional key words: control method.



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95/090 PHYTCN...Specific detection of *Phytophthora cinnamomi* in soil

A rapid, sensitive and specific detection method for *Phytophthora cinnamomi* (EU Annexe II/B) in soil, has been developed in Australia. The method is based on the phenomenon of chemotaxis and electrotaxis to attract zoospores of this soil-borne pathogen, placed in solution, to a membrane attached to a plastic dipstick and to detect them with monoclonal antibodies. This dipstick immunoassay has been used successfully to detect *P. cinnamomi* from a wide range of soil samples (laterites, clays, loams, sands etc.) collected from beneath a diverse range of host plants (avocados, eucalyptus, chestnuts, walnut etc.). The assay is as sensitive as a bait plant test and is quantitative. The authors concluded that this method, which does not require expert knowledge of *Phytophthora* taxonomy nor infected plant tissue, could be used as a detection kit in the field.

Source: Cahill, D.M.; Hardham, A.R. (1994) A dipstick immunoassay for the specific detection of *Phytophthora cinnamomi* in soils.
Phytopathology, 84 (11), 1284-1292.

Additional key words: new diagnostic method.

95/091 ERWICH...*Erwinia chrysanthemi* found on maize in Portugal

In summer 1991, serious stalk rot infection of maize was observed in south-eastern Portugal. Affected plants showed yellow-green water-soaked spots delimited by a dark margin on stalk and leaves, wilting of the upper leaves and soft rot at the base of the whorl. A putrid odour was emitted by the plants. In the final stage, affected stalks collapsed. Similar symptoms had been observed in summer 1987 but the causal agent was not identified. On the basis of morphological, cultural, biochemical, physiological and pathological properties, the pathogen was identified as *Erwinia chrysanthemi* (EPPO A2 quarantine pest) biovars 2 and 3. This bacteria had previously been found in Portugal on tomato plants grown under greenhouse conditions but not in maize fields.

Source: Ferreira-Pinto, M.M.; Cruz, M.L.; Oliveira, H. (1994) The occurrence in Portugal of the bacterial disease of maize crops caused by *Erwinia chrysanthemi*.
Plant Pathology, 43 (6), 1050-1054

Additional key words: new record.