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97/024 Situation of *Ralstonia solanacearum* in the Netherlands - harvest 1996

A preliminary report of the situation of *Ralstonia* (*Pseudomonas*) *solanacearum* (EPPO A2 quarantine pest) concerning the 1996 potato harvest in the Netherlands appeared in the EPPO RS 96/182. An update of the situation has recently been sent to the EPPO Secretariat. In the Netherlands, during the 1996 season, all seed potato lots from one place of production have been tested for the bacterium before a plant passport or a phytosanitary certificate was issued and marketing allowed. Sampling and testing was carried out from mid-August to the end of November. Approximately 58,000 samples were tested from 3,100 seed potato growing farms. Infections with *R. solanacearum* were found on nine farms. On each farm, only one potato cultivar was infected. Seven of these farms were growing seed potatoes. Measures have been taken to prevent spread of the bacterium from all infected farms. Concerning the farms found infected during the 1995 season, which were allowed to grow ware potatoes, all potato lots of the 1996 season were tested and no infection was detected.
To determine the extent of contaminated surface water and infected *Solanum dulcamara* plants, studies were started all over the Netherlands with emphasis on potato-growing regions in spring 1996. In several of the potato-growing regions, contaminations of surface water and/or *S. dulcamara* were detected. Areas with contaminated surface water have been demarcated. For potato lots from these demarcated areas posing a risk (use of surface water), only a controlled distribution as ware potatoes was allowed.

In addition, an infection of *R. solanacearum* was found in one tomato glasshouse. The infection was due to the contamination of the surface water used for irrigation. However, irrigation of tomato crops with surface water is not a common practice in the Netherlands. This single glasshouse infestation has been eradicated by destroying all plant material and rockwool, and disinfecting the irrigation system, tools and premises.

Source: **Plant Protection Service of the Netherlands, 1997-01.**

Additional key words: detailed record **Computer codes:** PSDMSO, NL

97/025 Update on the situation of *Ralstonia solanacearum* in the UK

The EPPO Secretariat has been informed that a sample of ware potatoes from the 1995 harvest was found contaminated by *Ralstonia* (*Pseudomonas*) *solanacearum* (EPPO A2 quarantine pest) in United Kingdom. This sample was taken from a farm store situated near Slough (within the Thames basin), in the same area where the previous outbreak had been found (EPPO RS 93/031). Investigations were carried out on seed from the same origin, as well as on sister stocks to the contaminated potatoes, and gave negative results. However, the bacterium was isolated from *Solanum dulcamara* growing in the water system from which the infected potatoes were irrigated. These weeds appear as the most likely source of infection. The following measures have been applied: potato growing is prohibited on the infected field, no seed potatoes are grown on the farm and monitoring of potato crops in other fields is performed.

Source: Plant Protection Service of United Kingdom, 1996-11.

Additional key words: detailed record **Computer codes:** PSDMSO, GB

97/026 Update on the situation of *Thrips palmi* in the Netherlands

In the EPPO RS 96/193, it was reported that two infestations of *Thrips palmi* (EPPO A1 quarantine pest) had been found and eradicated in the Netherlands during the course of 1996. The EPPO Secretariat has recently been informed that a third outbreak of *T. palmi* has been found on *Ficus benjamina* during the regular inspections necessary for the issuance a plant passport. The plants were grown as consumer products. The eradication programme used in previous outbreaks has been applied and completed. The source of the infestation is under investigation.

Source: Plant Protection Service of the Netherlands, 1997-01.

Additional key words: eradication **Computer codes:** THRIPL, NL

97/027 Surveys carried out in France on *Thrips palmi*

In 1996, surveys have been carried out by the French Plant Protection Service on *Thrips palmi* (EPPO A1 quarantine pest), both within the country and at points of entry.

At the national level, two types of surveys have been done: on *Ficus* plants originating from the Netherlands sold on markets, shops and garden centres, and on host plants of *T. palmi* grown in France with emphasis given to tomato, cucumber, melon and chrysanthemum. In total, 521 checks have been made in 38 départments, using plant beating or extraction funnels (Berlèse); the thrips found were then identified in the laboratory. This extraction technique is the most effective to detect thrips on plant material. The results of these surveys have confirmed that *T. palmi* is absent from France, no single specimen having been found either on *Ficus* or on other crops. Among thrips species identified on the inspected plants, *Frankliniella occidentalis* (EPPO A2 quarantine pest) was dominant on most crops, *T. tabaci* was also present but to a much lower extent, and other species were found sporadically.

Further studies have been made to try to identify the main pathways of entry for *T. palmi*. Data were gathered from the literature on its potential host plants and on interception records, but also from practical experience of phytosanitary checks made on imports at the airports of Paris. Consignments were visually inspected, samples were taken to be analysed by using extraction funnels (Berlèse) and thrips species were identified in the laboratory (infested consignments were of course intercepted). Three main pathways have been identified: 1) cut flowers of orchids from Thailand and Singapore, 2) fruits of *Solanum melongena*, leaves of *Cucurbita maxima* and *Sechium edule* from Mauritius, 3) fruits of *S. melongena*, *Momordica charantia* from Dominican Republic. Other vegetables like *Basella rubra* from Viet Nam; *Capsicum frutescens* and aubergines from Mauritius, aubergines and cucumbers from Dominican Republic, aubergines from Thailand are also considered as presenting a risk. Vegetables imported from the French overseas departments Guadeloupe and Martinique (in both of which *T. palmi* is present) have not presented any problems. Concerning orchids, inspections have also been made on rooted orchids, and one *Dendrobium* plant from Thailand was found infested. It is suggested that the import of rooted orchids with flowers from countries where *T. palmi* occurs should be prohibited. In addition, checks were done on cut flower orchids carried by passengers and infestations were also found.

Source: **French Plant Protection Service, Paris, 1997-01.**

Additional key words: survey, absence, interceptions **Computer codes:** THRIPL, FR

97/028 New data on pests of quarantine importance

By browsing through the literature, the EPPO Secretariat has extracted the following new data concerning pests of quarantine importance.

New geographical records

Hyphantria cunea (EPPO A2 quarantine pest) is reported as new to Denmark. Review of Agricultural Entomology, 84(12), p 1366 (11260).

Detailed records

Liriomyza trifolii (EPPO A2 quarantine pest) is present in Gujarat (India). Review of Agricultural Entomology, 84(12), p 1415 (11678).

An outbreak of *Liriomyza trifolii* was observed throughout the cotton-growing area of northern Karnataka (India), in August 1991. Review of Agricultural Entomology, 84(12), p 1435 (11849).

Eutetranychus orientalis (EU Annex II/A1) is present in West Bengal, India. Review of Agricultural Entomology, 84(12), p 1424 (11750).

In Russia, *Frankliniella occidentalis* (EPPO A2 quarantine pest) has been reported for the first time in the Pyatigorsk area (Stavropol territory, just north of the Caucasus), from 2 glasshouses in 1991-92. It was felt that the pest was introduced from the St Petersburg region on planting material. The outbreak was brought under control by the end of 1994. Review of Agricultural Entomology, 84(12), p 1445 (11913).

Parasaissetia nigra (EU Annex II/A1) was found in most rubber plantations in Assam and Tripura (India) and caused severe damage in some cases. Review of Agricultural Entomology, 85(1), p 101 (838).

New host plants

Antirrhinum majus is reported as a new host plant for *Helicoverpa armigera* (EPPO A2 quarantine pest). Review of Agricultural Entomology, 84(12), p 1446 (11931).

Source: EPPO Secretariat, 1997-01.

Additional key words: new records, detailed records, new host plants

Computer codes: EUTEOR, FRANOC, HELIAR, HYPHCU, LIRITR, SAISNI, DK, IN, RU

97/029 News from the Diagnostic Centre of the Dutch Plant Protection Service

The Diagnostic Centre of the Plant Protection Service of the Netherlands has published its Annual Report for 1995, and the EPPO Secretariat has noted the following items:

1) After the discovery of two outbreaks of *Cacoecimorpha pronubana* (EPPO A2 quarantine pest) in a garden of the Zeeland province (EPPO RS 94/193), surveys were carried out by using pheromone traps. In 1994, it became clear that the species had actually established in public and private gardens in different places in the Netherlands (Zeeland, Zuid-Holland, Utrecht, Noord-Brabant and Limburg). In 1995, surveys were continued to establish possible host plant preferences. It was found that *C. pronubana* could develop on at least 22 different plant species belonging to 9 families (Asteraceae, Berberidaceae, Caprifoliaceae, Eleagnaceae, Euphorbiaceae, Lamiaceae, Oleaceae, Rosaceae, Saxifragaceae).

2) *Cryphonectria parasitica* (EPPO A2 quarantine pest) was found in the southern part of the Netherlands near Belgium. However, it is felt that the infection was most probably carried by plant material from southern Europe. The Dutch Plant Protection Service has destroyed the infected plants and since then *C. parasitica* has not been found again in the Netherlands.

3) *Discula destructiva*, the causal agent of dogwood anthracnose, has been isolated from leaves on an ornamental dogwood bush (*Cornus kousa* var. *chinensis*). So far, this fungus has not been reported from Europe, but is known to cause serious damage in USA on *Cornus nuttallii* (Pacific dogwood) and *C. florida* (flowering dogwood). A review on this disease has recently been made by Daughtrey *et al*. (1996) on the situation in North America. Dogwood anthracnose was first observed in US in the mid-1970s, in the areas of New York city and Seattle. It then spread rapidly and its impact is rated as considerable. *D. destructiva* caused dieback and disfigurement of landscape specimens as well as mortality of trees in forests. The authors noted that considering its first appearance near ports of entry, its rapid spread, and its lethal nature, *D. destructiva* could be an introduced pathogen. However, its origin remains unknown. Very little information is available on the susceptibility of European dogwoods (*C. mas* and *C. sanguinea*) and on *C. stolonifera* (North American species grown in Europe), but the Dutch report stressed that as *C. florida* and *C. nuttallii* are extensively grown in Europe, the establishment of this fungus could pose serious problems.

4) Tomato spotted wilt tospovirus (EU Annexes I/B and II/A2) has been detected 31 times in 17 different plant species. Among these, 7 ornamentals were not recorded before as host plants of the virus: *Bromelia achmea*, *Cestrum rubrum*, *Eucharis* sp., *Lobelia valida*, *Oxypetalum* sp., *Pachypodium lamerei* and *Ranunculus* sp.

Source: **Annual Report 1995, Diagnostic Centre, Plant Protection Service, Wageningen, Netherlands, 125 pp.**

Daughtrey, M.L.; Hibben, C.R.; Britton, K.O.; Windham, M.T.; Redlin, S.R. (1996) Dogwood anthracnose. Understanding a disease new to North America.
Plant Disease, 80(4), 349-357.

Additional key words: new records, detailed records, new host plants, new pest

Computer codes: ENDOPA, TORTPR, TMSWXX, NL

97/030 News from Caribbean Plant Protection Commission (CPPC)

Toxoptera citricida (EPPO A1 quarantine pest) has recently been reported in Belize. Adults and nymphs were collected from sweet orange on the 1996-10-25 at Mullins River in the Stann Creek District. The Caribbean Plant Protection Commission also mentions that *T. citricida* is present in Honduras. These are two new records according to the EPPO Secretariat.

Maconellicoccus hirsutus continues to spread within the Caribbean region. The pest is now present in Grenada, St Kitts, Trinidad (EPPO RS 96/028), and more recently it has been reported from St Martin (Netherlands Antilles - EPPO RS 96/207) and St Lucia in October 1996. The record for St Lucia is new.

Source: Pollard, G.V. (1996) CPPC Circular Letter no. 1/96, 1 December 1996, FAO Sub-Regional Office for the Caribbean, Barbados.

Additional key words: new records

Computer codes: TOXOCI, PHENHI, BZ, HN, LC

97/031 Introduction of *Claviceps africana* in South America

In mid-1995, the sugary disease of sorghum due to *Claviceps africana* was found in commercial forage and hybrid seed production fields in Brazil (Sao Paulo, Minas Gerais, Goias). The disease reached rapidly all the central and southern part of the country. This was the first report of *C. africana* in the Americas. Ergot fungi causing sugary disease (it now seems that *C. africana* is considered as distinct from *C. sorghi*) were previously only reported from Africa and Asia. The rapid dissemination of sugary disease in Brazil is of major concern to other countries of the region. The disease affects individual florets in a panicle, causing poor development of grain or preventing it. Symptoms are characterized by the presence of sticky, pinkish to brownish liquid drops, which exude from infected ovaries. A saprophytic fungus may then overgrow the honeydew and convert it into a sticky black mat. The sugary disease can cause severe losses especially in seed production fields, particularly if pollination of male-sterile lines is delayed due to lack of viable pollen. Sclerotia of the sugary disease fungus have not been reported to be toxic to humans or animals unlike the European ergot pathogen *C. purpurea*.

Source: Reis, E.M.; Mantle, P.G.; Hassan, H.A.G. (1996) First report in the Americas of Sorghum ergot disease, caused by a pathogen diagnosed as *Claviceps africana*. **Plant Disease, 80(4), 463.**

Vasconcellos,J.H. (1996) Ergot of sorghum. **ISPP International Newsletter on Plant Pathology, 26 (6), December 1996, p 1.**

Additional key words: new record

97/032 Rhizomania in Serbia (YU)

The EPPO Secretariat had previously a general record of beet necrotic yellow vein furovirus (EPPO A2 quarantine pest) in Yugoslavia. Later, data were obtained on the occurrence of rhizomania in Croatia and Slovenia. A CABI abstract (Review of Plant Pathology, 75(12), p 1107, (8283)) gives the indication that beet necrotic yellow vein furovirus is also present near Sremska Mitrovica (region of Belgrade), Serbia (YU).

Source: Skrbic, K. (1995) Influence of additional crop space and nitrogen on yields and quality of sugar beet cultivars under conditions of rhizomania infection.
Review of Research Work at the Faculty of Agriculture, Belgrade, 40(2), 7-23.

Additional key words: detailed record **Computer codes:** BTNYVX, YU

97/033 Situation of *Diabrotica virgifera* in Central Europe

During the 1st Meeting of the EPPO *ad hoc* Panel on *Diabrotica virgifera* (EPPO A2 quarantine pest) held jointly with IWGO in Zabreb (1996-10-15/16), the current situation in Central Europe was presented. Extracts from the Panel meeting report are presented below.

- **Austria**

D. virgifera has not been found.

- **Bosnia-Herzegovina**

No participant from Bosnia-Herzegovina could attend the meeting but Croatian scientists reported that a trapping programme was carried out in 1996. Traps were placed in northern Bosnia and some captures were made in areas not far from he areas in eastern Croatia where catches were made in 1996.

- **Croatia**

In 1996, 788 adult *D. virgifera* were trapped in the eastern part of the country (714 in Vukovarsko-srijemska country (adjoining Serbia), 66 in Osjecko-baranjska country (adjoining Hungary), 8 in Brodkso-posavska country (adjoining Bosnia-Herzegovina). No active infestations of maize were found, though a few flying adults were seen.

- **Federal Republic of Yugoslavia**

Adults of *D. virgifera* are only trapped in the northern part of Serbia. No catches have been made in southern Serbia and Montenegro. The zone in which active damage is observed remains restricted and an E-W oval around Belgrade. In this area, yield losses are up to 20 % (but up to 80 % lodging has been seen locally).

- **Germany**

D. virgifera has not been found.

- **Hungary**

In 1996, monitoring was extended to the whole country. Adults were caught only in the southern part, in an area about 100 km along the Serbian border and 40 km in depth. The numbers of adult caught were much greater than in 1995 (19 times more, for the same type of trap) and catches were made at 35 sites in 1996, instead of 5 in 1995. However, maize crops did not show any active infestations.

- **Poland**

In 1996, five monitoring points were established in the south of the country (near Czech and Slovak borders), in maize fields and in a maize-breeding station. *D. virgifera* was not found.

- **Romania**

Trapping results were negative in 1995 but the first adults were caught in 1996. Three adults were caught at Nadlac (see EPPO RS 96/165). Maize fields were monitored throughout the country for signs of damage, but nothing was found.

- **Slovakia**

Slovakia was not present at the meeting but the Plant Protection Service of Slovakia has recently informed that EPPO Secretariat that a survey was carried out in 1996. 20 yellow sticky traps were installed in a maize field in July 1996, in Iza (Komarno district). This locality is situated near the Hungarian border (3 km) in a warm area of the country, and the chosen maize field is near a road leading to Hungary. Traps were inspected twice or three times a week and renewed every two weeks, from 4th of July until 19th September 1996. *D. virgifera* was not found during this survey.

- **Slovenia**

In 1996, no adults were caught in traps placed along the Croatian and Hungarian borders.

- **Ukraine**

A trapping programme was started in the extreme south-west of the country (adjoining Romania) and the insect was not found.

No information was available on the situation of *D. virgifera* in other countries surrounding the area of the outbreak (Albania, Bulgaria, Macedonia, Moldova).

Source: **Report of the 1st Meeting of the EPPO ad hoc Panel on *Diabrotica virgifera* held jointly with the 3rd international IWGO Workshop on *Diabrotica virgifera*, Zagreb, 1996-10-15/16.**

Plant Protection Service of Slovakia, 1997-01.

Additional key words: detailed records, absence **Computer codes:** DIABVI, AT, BA, DE, HR, HU, PL, RO, SK, SI, UA, YU

97/034 *Lispothrips crassipes*: a new pest of poplar in Croatia and Italy

In Croatia (Hrašovec & Lovas, 1996), recent research on poplar pests revealed the presence of a new pest: *Lispothrips crassipes*. First signs of dieback of poplars with no evident cause were observed in 1986, in the northeastern part of the country. Approximately 17 ha of poplars showed a reduced growth and in three years time 12 ha were completely destroyed. The cause of this decline was identified in 1989, as being the thrips *L. crassipes* and treatments were applied. From 1987 to 1990, population densities fluctuated in most places but remained at constant high levels in some locations and resulted in further tree mortality (7 ha). In 1994 and 1995, infestation levels were low. In Italy, *L. crassipes* has been reported in 1985 as a new pest of poplars, but was considered as a secondary pest attacking stressed trees. In his book, Dyadechko (1964) describes this thrips species as being usually found on aspen and poplar, and present in Hungary, Romania, Russia and Sweden.

Source: Dyadechko, N.P. (1964) Thrips or fringe-winged insects (Thysanoptera) of the European part of the USSR, translated and published for ARS-USDA, 276-277

HraŠovec, B.; Lovas, O. (1996) *Lispothrips crassipes* Jabl., poplar pest in northeastern Croatia.
Proceedings of the 20th Session of the International Poplar Commission, FAO, Budapest (HU), 1996-10-01/04, 236-241.

Lapietra-G; Allegro-G (1985) [*Lispothrips crassipes* Jabl. (Thysanoptera, Phloeothripidae), a new pest of poplar in northern Italy.]
Atti XIV Congresso Nazionale Italiano di Entomologia, Palermo-Erice-Bagheria (IT), 1985-05-28/06-01, 95-101.

Additional key words: new pest

97/035 New virus of tomato transmitted by *Trialeurodes vaporariorum*

Since 1993, a new virus disease has been observed in several places in California (US), on tomato grown in the field and under glasshouse. Affected tomato plants showed interveinal yellowing, necrosis and severe yield losses. The causal agent has been identified as a new clostero-like virus transmitted by *Trialeurodes vaporariorum* (but not by *Bemisia tabaci*) and has been designated as tomato infectious chlorosis virus. In addition to tomato, it can also infect tomatillo (*Physalis ixocarpa*), potato (*Solanum tuberosum*), artichoke (*Cynara scolymus*), lettuce (*Lactuca sativa*) and petunia (*Petunia* hybrida).

Source: Duffus, J.E.; Liu, H.Y.; Wisler, G.C. (1996) Tomato infectious chlorosis virus - a new clostero-like virus transmitted by *Trialeurodes vaporariorum*. **European Journal of Plant Pathology, 102(3), 219-226.**

Additional key words: new pest **Computer codes:** TICV, US

97/036 Phytosanitary controls on fruit flies in France

Since 1993, the French Plant Protection Service has made a large number of interceptions of fruits infested by fruit flies of quarantine importance. Although, these have been regularly reported by EPPO in the Reporting Service, it was felt useful to give the conclusions of four years of work. Most of these interceptions have been made at the two airports of Paris and at the national market of Rungis (Ile de France region), mainly on consignments of citrus and tropical fruits from various origins and generally on small quantities. Species were identified by the entomological laboratory of the Regional Plant Protection Service of Poitou-Charentes. The interceptions made during 1995 and the first 8 months of 1996 are given in the table below. Details are not given for 1993 and 1994, but the authors mentioned three interceptions corresponding to pathways which do not appear in the table: mangoes from Guinea (*Ceratitis*), guavas from Philippines (*Bactrocera*) and *Citrus paradisi* from Mexico (*Anastrepha*). Interceptions made during these four years have revealed the existence of pathways for the introduction of non-European Tephritidae on citrus and tropical fruits into Europe. So far, no interception has been made on temperate fruits. It is also pointed out that the list of fruit species intercepted is wider than the one appearing in the EU Annex V, since Cucurbitaceae such as *Luffa aegyptiaca* and *Trichosanthes cucumerina* can be infested by cucurbit specific species such as *Bactrocera cucurbitae* and *Dacus ciliatus*. The authors felt that special attention should be given to fruits of Cucurbitaceae during inspections (and Solanaceae, though there were in fact no interceptions on these during the survey). They also

noted that the introduction of *Rhagoletis* species on fruits of *Malus*, *Pyrus*, *Prunus* and *Ribes* appears unlikely for the moment, as these fruits are imported out of season from South America and South Africa where *Rhagoletis* spp. have not been reported. But imports of blueberries and cranberries from North America where *R. mendax* is present must be carefully checked. These phytosanitary checks will continue in 1997 and it is also planned to install traps in the airports and the Rungis market.

Interceptions made in 1995 and 1996 (first 8 months of the year) in Ile de France (Bayart *et al*., 1997)

Fruit species	**Country of origin**	**nb of interceptions**	**Tephritidae**
Annona squamosa	Vietnam	1	*Bactrocera* sp.
	Thailand	4	*Bactrocera* sp.
Citrus nobilis	Australia	2	*Bactrocera* sp.
Diospyros kaki	Brazil	1	*Anastrepha* sp.
Luffa aegyptiaca	Côte d'Ivoire	1	*Dacus ciliatus*
Mangifera indica	Cameroon	5	*Ceratitis* sp. (probably *C. anonae*)
	Côte d'Ivoire	1	*Ceratitis* sp.
	Egypt	1	*Ceratitis* (probably *C. capitata*)
	India	1	*Tephritidae*
	Indonesia	1	*Bactrocera* sp.
	Kenya	3	*Ceratitis cosyra*
		2	*Ceratitis rosa*
		2	*Ceratitis* sp.
		1	*Tephritidae*
	Mali	9	*Ceratitis* sp. (probably *C. cosyra* or *C. rosa*)
	Mauritius	2	*Bactrocera zonata*
		1	*Ceratitis capitata*
		1	*Ceratitis rosa*
	Senegal	1	*Ceratitis cosyra*
		2	*Ceratitis* sp
	Thailand	2	*Bactrocera dorsalis* complex
		2	*Bactrocera* sp.
	Venezuela	1	*Ceratitis* sp. (probably *C. capitata*)
Psidium spp.	Brazil	3	*Anastrepha* sp.
	Egypt	1	*Ceratitis capitata*
	India	1	*Tephritidae*
	Indonesia	1	*Bactrocera* sp.
	Thailand	2	*Bactrocera correcta*
		1	*Bactrocera* sp.
	Vietnam	3	*Bactrocera* sp.
Syzygium spp.	Vietnam	1	*Bactrocera dorsalis* complex
Trichosanthes cucumerina	Mauritius	5	*Bactrocera cucurbitae*
		1	*Bactrocera* (probably *B. cucurbitae*)
		2	*Dacus ciliatus*
		1	*Dacus* (probably *D. ciliatus*)
Fruit non found	Thailand	1	*Bactrocera latifrons*

Source: Bayart, J.D.; Phalip, M.; Lemonnier, R.; Gueudré, F. (1997) Mouches des fruits. Bilan de quatre années de contrôle des fruits à l'importation en Ile de France. **Phytoma - La Défense des Végétaux, n° 490, 20-25**

Additional key words: interceptions **Computer codes:** ANSTSP, CERASP, DACUSP

97/037 Update on the situation of *Rhagoletis completa* in Italy

In 1991, *Rhagoletis completa* (EU Annex I/A1) was found for the first time in Europe in Ticino (Switzerland) and simultaneously in northern Italy (EPPO RS 516/15, 1991, 93/210). Within two years, *R. completa* had become very common and injurious to walnut crops in Trentino, Veneto and Friuli-Venezia Giulia. In August and September 1994, the pest is reported as damaging walnut in Viterbo (Lazio). The authors felt that due to the wide distribution of this pest in Italy, its introduction may not be recent.

Source: Trematerra, P.; Paparatti, B.; Girgenti, P. (1995) [Attention to the presence of walnut moth.] Informatore Agrario, 51(47), 74-76. **Review of Agricultural Entomology, 85(1), p 93 (769).**

Additional key words: trapping, detailed record **Computer codes:** ANSTOB, IT

97/038 Attractants for *Anastrepha obliqua*

Several yeasts were tested as attractants for *Anastrepha obliqua* (EPPO A1 quarantine pest) in a mango orchard, in Venezuela. The following aqueous suspensions of yeasts: *Cryptococcus luteolus*, *Piccha farinosa*, *C. luteolus* + *P. farinosa*, *Saccharomyces cerevisiae*, *S. calsbergensis* and Torula yeast pellets were studied. All 6 suspensions were attractive to *A. obliqua*. The greatest numbers of captures were obtained in traps baited with Torula yeast pellets and a mixture of *C. luteolus* and *P. farinosa*.

Source: Frágenas, N.N.; González, E.; T. Hernández, J. de la; Cásares, R.; Lander, E. (1996) [Production and evaluation of attractants for the mango fly *Anastrepha obliqua* (Macquart) (Diptera: Tephritidae).] Boletín de Entomología Venezolana 11(1), 19-25. **Review of Agricultural Entomology, 85(1), p 92 (760).**

Additional key words: trapping **Computer codes:** ANSTOB

97/039 Attractiveness of methyl eugenol to *Bactrocera carambolae*

In Indonesia, the attractiveness of methyl eugenol to *Bactrocera carambolae* (EPPO A1 quarantine pest) was studied. Approximately 600 newly emerged males and females were released in an outdoor screen cage which contained a potted carambola fruit tree, adult food and a methyl eugenol trap (Steiner-type trap). The male annihilation technique, using this type of trap (fiber blocks baited with methyl eugenol and insecticide, e.g. malathion) has been successfully applied to eradicate for example *B. dorsalis* in Japan and California. Immediately after release, males of *B. carambolae* were attracted by methyl eugenol, and more than 99 % of the males were considered dead by trapping or other factors, but at least two males mated with females during the exposure to methyl eugenol. The authors felt that the male annihilation technique with this type of trap could be effective against *B. carambolae*. With the Steiner-type trap only a small number of females were killed, but when changing to a plastic-board trap with glue and methyl eugenol, many females were caught. The authors suggested that the development of suitable traps for females could accelerate the control of *B. carambolae*.

Source: Iwahashi, O.; Syamusdin-Subahar, T.S.; Sastrodihardjo, S. (1996) Attractiveness of methyl eugenol to the fruit fly *Bactrocera carambolae* (Diptera: Tephritidae) in Indonesia.
Annals of the Entomological Society of America, 89(5), 653-660.

Additional key words: trapping **Computer codes:** BCTRCB

97/040 PCR method to differentiate immature stages of *Ceratitis capitata* and *Anastrepha fraterculus*

A PCR method has been developed to differentiate between the immature stages of *Ceratitis capitata* (EPPO A2 quarantine pest) and *Anastrepha fraterculus* (EPPO A1 quarantine pest), in Argentina where the two fruit fly species are present. It is recalled that the current status of tephritid taxonomy relies almost exclusively on adult characters, and therefore there is a need to develop methods to identify larval and pupal stages. More than thirty different primers (10-base long commercial random primers) were tested on wild populations of the two fruit flies and on laboratory strains of *C. capitata*. The results showed that with a single primer or a combination of two, it is possible to differentiate rapidly and reliably between the two fruit fly species, and also between populations of the same species. With this method, as few as 1 insect per assay (mature or immature stage) is needed. The authors concluded that their method could be useful when identification of immature individuals, or of the origin of fruit fly populations is required; e.g. for quarantine purposes or within eradication programs.

Source: Sonvico, A.; Manso, F.; Quesada-Allue, L.A. (1996) Discrimination between the immature stages of *Ceratitis capitata* and *Anastrepha fraterculus* (Diptera: Tephritidae) populations by random amplified polymorphic DNA polymerase chain reaction.
Journal of Economic Entomology, 89(5), 1208-1212.

Additional key words: identification method **Computer codes:** CERTCA, ANSTFR

97/041 Forced hot-air as a quarantine treatment against *Anastrepha suspensa*

Studies were carried out in Florida (US) on the efficacy of forced hot-air as a quarantine treatment against third instars of *Anastrepha suspensa* (EPPO A1 quarantine pest) in navel orange (*Citrus sinensis*). A hot-air treatment with 48±0.3 °C was studied at different durations. It was found that to obtain the quarantine security, a duration of 108.6 min with a final mean temperature in the centre of the fruit $\geq$ 44 °C was necessary. In a large scale experiment with 113,676 larvae in 1200 manually infested oranges, no larvae survived after a treatment of 48±0.3 °C (0.75 m^3 air flow) until the centre fruit temperatures

were ≥ 44 °C. Such a treatment required a duration of 100.2±3 min, when initial centre temperatures of the fruits were 23.2±0.4 °C. The authors proposed that a hot-air treatment at 48±0.3 °C during 105 min could be a suitable quarantine treatment and could offer a good alternative to other treatments (cold storage, vapour heat and methyl bromide fumigation). In addition, they have observed that such treatment followed by a month storage at 5°C had no significant consequences on the fruit quality.

Source: Sharp, J.L.; McGuire, R.G. (1996) Control of Caribbean fruit fly (Diptera: Tephritidae) in navel orange by forced hot air.
Journal of Economic Entomology, 89(5), 1181-1185.

Additional key words: quarantine treatment **Computer codes:** ANSTSU

97/042 Irradiation as a quarantine treatment against *Ceratitis capitata*

As a quarantine treatment against *Ceratitis capitata* (EPPO A2 quarantine pest), gamma irradiation with a dose of 150 Gy has previously been proposed. Further studies have been carried out on eggs and larvae exposed at different ages to a series of gamma radiation doses ranging from 5 to 1280 Gy, in order to define the minimum doses required to prevent egg hatch, pupation and adult emergence. Results showed that relatively low doses could prevent development beyond the pupal stage. None of the eggs exposed to 20 Gy or larvae treated with 40 Gy survived to the adult stage. Tests in which more than 100000 mature larvae were treated in air with a dose of 40 Gy resulted in no adult emergence. In a small scale experiment, similar results were obtained when 3rd instars were irradiated inside natural host fruits (orange and peach). Previous studies took as an efficacy criteria the lack of egg hatch or pupation and proposed the dose of 150 Gy to ensure quarantine security. The authors felt that this dose may be injurious to many fruit species, and they consider that a more appropriate criterion for efficacy, such as lack of adult emergence, should be envisaged; and when this criterion is chosen, a minimum dose of 40 Gy is sufficient.

Source: Mansour, M.; Franz, G. (1996) Gamma radiation as a quarantine treatment for the Mediterranean fruit fly (Diptera: Tephritidae)
Journal of Economic Entomology, 89(5), 1175-1180.

Additional key words: quarantine treatment **Computer codes:** CERTCA

97/043 Identification method for *Liriomyza* species

Within the genus *Liriomyza* (Diptera: Agromyzidae), species identification by classical morphological methods can only be done at the adult stage, as larvae and puparia possess few distinguishing characters. A diagnostic assay has been developed in United Kingdom using protein electrophoresis on a cellulose acetate membrane and staining for two enzymes (G6PDH, PEP). The aim is to distinguish between *L. huidobrensis* (EPPO A2 quarantine pest) from related indigenous and non-indigenous species, either on intercepted plant material or on plants grown under glass. With this method, it is possible to distinguish between the introduced *L. huidobrensis* and its close relatives: *L. bryoniae* (EU Annex I/A2) and *L. strigata*. In addition, *L. huidobrensis* can be clearly separated from *Chromatomyia syngenesiae*, *C. horticola*, *L. trifolii* (EPPO A2 quarantine pest) and *L. sativae* (EPPO A1 quarantine pest). The effect of parasitism of *L. huidobrensis* by *Dacnusa sibirica* has been studied and results showed that parasitism is unlikely to cause misidentification of the leaf miner host. A simple biochemical key to separate between these agromyzid leaf miners of economic importance is presented. It can be recalled that the EPPO phytosanitary procedure was based on the same principles but the biochemical key was given only for species of quarantine importance: *L. bryoniae*, *L. trifolii*, *L. huidobrensis* and *L. sativae* (EPPO, 1992).

Source: Collins, D.W. (1996) The separation of *Liriomyza huidobrensis* (Diptera: Agromyzidae) from related indigenous and non-indigenous species encountered in the United Kingdom using cellulose acetate electrophoresis.
Annals of Applied Biology, 128(3), 387-398.

EPPO (1992) Quarantine Procedure - Identification of *Liriomyza* spp**.**
Bulletin OEPP/EPPO Bulletin, 22(2), 235-238.

Additional key words: identification method **Computer codes:** LIRIBO**,** LIRIHU, LIRITR, LIRISA

97/044 Methyl bromide fumigation against *Liriomyza huidobrensis*

Fumigation of plant material with methyl bromide can be used against *Liriomyza trifolii* (EPPO A2 quarantine pest). An EPPO Phytosanitary Procedure had been proposed for chrysanthemum cuttings (EPPO, 1993) as a quarantine treatment to prevent spread of this pest in trade. Experiments have been carried out in United Kingdom on the effectiveness of such treatment against *L. huidobrensis* (EPPO A2 quarantine pest). Eggs, larvae and pupae were tested separately. Results obtained were similar to those obtained for *L. trifolii* and it is concluded that the treatment which is already recommended for *L. trifolii* (with a concentration time product of 54 $mg.l^{-1}h$) is equally effective against *L. huidobrensis*. However, the absence of phytotoxicity should be verified when plants other than chrysanthemum are treated.

Source: EPPO (1993) Quarantine Procedure - Combined methyl bromide fumigation and cold storage treatment of chrysanthemum cuttings. **Bulletin OEPP/EPPO Bulletin, 23(2), 210-211.**

Macdonald, O.C.; Mitchell, R.J. (1996) Evaluation of methyl bromide as a fumigant against *Liriomyza huidobrensis*. **Tests of Agrochemicals and Cultivars, 17. Annals of Applied Biology, 128 (Supplement), 2-3.**

Additional key words: quarantine treatment **Computer codes:** LIRIHU

97/045 Sampling techniques for *Liriomyza huidobrensis* in potato fields

Studies have been carried out in Israel in order to define the optimum monitoring and sampling techniques of *Liriomyza huidobrensis* (EPPO A2 quarantine pest) in potato fields. It was found that yellow sticky traps placed at plant height caught significantly more adult flies. No difference were observed between traps placed horizontally and traps placed vertically. Activity of the pest during the day was also studied, and peak activity was observed in May and June just after sunrise and then decline. The authors concluded that this type of study provides useful information for pest management programmes, and could help for a better timing of chemical treatments.

Source: Weintraub, P.G.; Horowitz, A.R.; (1996) Spatial and diel activity of the pea leafminer (Diptera: Agromyzidae) in potatoes, *Solanum tuberosum*. **Environmental Entomology, 25(4), 722-726.**

Additional key words: sampling method **Computer codes:** LIRIHU