Nematol. medit. (1995), 23: 307-314

Agricultural Research Institute, Nicosia, Cyprus

AN UP-DATED LIST OF PLANT PARASITIC NEMATODES FROM CYPRUS AND THEIR ECONOMIC IMPORTANCE

by
J. PHILIS

Summary. Soil and root samples collected over several years around Cyprus revealed the presence of 58 plant parasitic nematode species, the most economically important being *Globodera rostochiensis*, *Meloidogyne* spp., *Tylenchulus semipenetrans*, *Helicotylenchus multicinctus*, *Pratylenchus penetrans*, *Xiphinema index*, *Ditylenchus dipsaci* and *Heterodera latipons*. The crop loss caused by nematode attack to citrus, vegetables and potato is estimated at 12% of their production value.

The earliest record of plant parasitic nematodes on the island of Cyprus is that of Georgiou (1957) who recorded the presence of *Meloidogyne javanica* (Treub) Chitw., *M. arenaria* (Neal) Chitw., *Tylenchulus semipenetrans* Cobb, and *Anguina tritici* Steinbuch in association with host plants and was followed by that of Taylor (1965) who reported the occurrence of 12 nematode species. Later, Philis and Siddiqi (1976) reported 36 species and 22 genera, most of them being reported for the first time, while Antoniou (1981) reported five new species from vineyards. In each case, the nematodes listed were recovered from either soil or root samples taken from the rhizosphere of plants showing yellowing or stunted growth.

The sieving and Baermann funnel method was used for extracting nematodes from soil while endoparasitic nematodes were extracted by a combination of the Waring Blender and the Baermann funnel methods. Nematode identification was made from permanent slides while additional advice, whenever necessary, was requested from nematode taxonomists in other countries. The soil type in all samples collected ranged from heavy clay to sandy loam. The nematodes listed were associated with 51 host plants.

Presented here is an up-dated list of the plant parasitic nematode species in Cyprus and their associated hosts with remarks on their economic impact. It is hoped that the information will aid any future investigations in plant nematology on the island.

Serious crop losses are caused to all types of citrus on the island by *Tylenchulus semipenetrans* (Philis 1989). It is estimated that more than 85% of the total citrus growing area is infested with the nematode. Heavily infested trees exhibit symptoms of poor growth, small leaves, die-back of twigs and reduced fruit size. The root system is severely damaged and reduced in size, thus inhibiting the normal utilization of nutrients and water from the soil. Nematicides, either of systemic or contact action, have been used against the nematode with very good results (Philis, 1988a; Philis, 1993a; 1993b) while recent work for controlling the nematode with

TABLE I - *Plant parasitic nematodes in Cyprus and their associated hosts.*

Host association		Nematode species
Almond	*Prunus amygdalus* Batsch	*Geocenamus brevidens* (Allen) Brzeski, 1991
		Helicotylenchus digonicus Perry, 1959
		Longidorus pisi Edward, Misra *et* Singh, 1964
		Meloidogyne javanica (Treub.) Chit., 1949
		Mesocriconema antipolitanum (de Guiran) Loof *et* de Grisse, 1989
		Pratylenchus sp.
Annual mercury	*Mercurialis annua* L.	*Meloidogyne* sp.
Apple	*Malus domestica* Borkh	*Helicotylenchus* sp.
		Pratylenchus brachyurus (Godfrey) Filipjev *et* Schuurmans Stekhoven, 1941
		Tylenchorhynchus sp.
Apricot	*Prunus armeniaca* L.	*Geocenamus brevidens* (Allen) Brzeski, 1991
		Paratylenchus neoamblycephalus Geraert, 1965
		Paratylenchus sp.
		Pratylenchus sp.
Artichoke	*Cynara scolymus* L.	*Meloidogyne* sp.
		Paratylenchus cf. *italiensis* Raski, 1975
		Paratylenchus vexans Thorne *et* Malek, 1968
Banana	*Musa cavendishii* Lambert	*Helicotylenchus multicinctus* (Cobb) Golden, 1956
		Meloidogyne javanica (Treub) Chitw., 1949
		Meloidogyne sp.
		Pratylenchus sp.
Barley	*Hordeum vulgare* L.	*Anguina tritici* (Steinbuch) Filipjev, 1936
		Ditylenchus dipsaci (Kuehn) Filipjev, 1936
		Geocenamus brevidens (Allen) Brzeski, 1991
		Geocenamus microdorus (Geraert) Brzeski, 1991
		Heterodera latipons Franklin, 1969
		Meloidogyne sp.
		Paratylenchus neoamblycephalus Geraert, 1965
		Paratylenchus cf. *microdorus* Andrassy, 1959
		Pratylenchus mediterraneus Corbett, 1983
		Pratylenchus thornei Sher *et* Allen, 1953
		Tylenchorhynchus sp. Allen, 1955
Black nightshade	*Solanum nigrum* L.	*Meloidogyne javanica* (Treub) Chitw., 1949
Blue wattle	*Acacia cyanophylla* Lindl.	*Meloidogyne javanica* (Treub) Chitw., 1949
Broad bean	*Vicia faba* L.	*Ditylenchus dipsaci* (Kuehn) Filipjev, 1936
Cantaloupe	*Cucurbita melo* L.	*Meloidogyne javanica* (Treub) Chitw., 1949
Carrot	*Daucus carota* L.	*Aphelenchoides blastophthorus* Franklin, 1952
		Aphelenchoides hamatus Thorne *et* Malek, 1968
		Aphelenchoides nonveilleri Andrassy, 1959
		Ditylenchus destructor Thorne, 1945
		Geocenamus brevidens (Allen) Brzeski, 1991
		Ditylenchus sp.
		Heterodera carotae Jones, 1950
		Meloidogyne javanica (Treub) Chitw., 1949
		Paratylenchus neoamblycephalus Geraert, 1965
		Pratylenchus pseudopratensis Seinhorst, 1968
		Pratylenchus thornei Sher *et* Allen, 1953

TABLE I - *(continuation)*

Host association		Nematode species
		Tylenchorhynchus clarus Allen, 1955
		Tylenchorhynchus sp.
Celery	*Apium graveolens* L.	*Meloidogyne javanica* (Treub) Chitw., 1949
Cherry	*Prunus cerasus* L.	*Meloidogyne* sp.
Citrus	*Citrus aurantium* L.	*Boleodorus thylactus* Thorne, 1941
		Geocenamus brevidens (Allen) Brzeski, 1991
		Pratylenchus penetrans (Cobb) Filipjev *et* Schuurmans Stekhoven, 1941
		Pratylenchus crenatus Loof, 1960
		Pratylenchus mediterraneus Corbett, 1983
		Pratylenchoides cf. *alkani* Yueksel, 1977
		Rotylenchulus parvus (Williams) Sher, 1961
		Tylenchulus semipenetrans Cobb, 1913
		Tylenchorhynchus sp.
		Xiphinema pachtaicum (Tulaganov) Kirjanova, 1951
Coriander	*Coriandrum sativum* L.	*Meloidogyne javanica* (Treub) Chitw., 1949
Cow pea	*Vigna unguiculata* L.	*Meloidogyne javanica* (Treub) Chitw., 1949
		Meloidogyne arenaria (Neal) Chitw., 1949
Cucumber	*Cucumis sativus* L.	*Meloidogyne javanica* (Treub) Chitw., 1949
Egg plant	*Abelmoschus esculentus* L.	*Meloidogyne javanica* (Treub) Chitw., 1949
Fig	*Ficus carica* L.	*Mesocriconema xenoplax* (Raski) Loof *et* de Grisse, 1989
		Meloidogyne javanica (Treub) Chitw., 1949
		Xiphinema index Thorne *et* Allen, 1950
Fumitory	*Fumaria officinalis* L.	*Meloidogyne javanica* (Treub) Chitw., 1949
Goosefoot	*Chenopodium* sp.	*Meloidogyne javanica* (Treub) Chitw., 1949
Grapevine	*Vitis vinifera* L.	*Boleodorus thylactus* Thorne, 1941
		Criconemoides amorphus de Grisse, 1967
		Geocenamus brevidens (Allen) Brzeski, 1991
		Helicotylenchus vulgaris Yuen, 1964
		Helicotylenchus digonicus Perry, 1959
		Helicotylenchus cf. *microcephalus* Sher, 1966
		Helicotylenchus tunisiensis Siddiqi, 1964
		Meloidogyne javanica (Treub) Chitw., 1949
		Mesocriconema xenoplax (Raski) Loof *et* de Grisse, 1989
		Mesocriconema sp.
		Paratylenchus nainianus Edward *et* Misra, 1962
		Paratylenchus sp.
		Pratylenchus mediterraneus Corbett, 1983
		Pratylenchus thornei Sher *et* Allen, 1953
		Rotylenchus cypriensis Antoniou, 1981
		Rotylenchus sp.
		Trichodorus sp.
		Tylenchorhynchus capitatus Allen, 1955
		Tylenchorhynchus clarus Allen, 1955
		Tylenchorhynchus latus Allen, 1955
		Xiphinema index Thorne *et* Allen, 1950
		Xiphinema italiae Meyl, 1953
		Xiphinema ingens Luc *et* Dalmasso, 1964
		Xiphinema pachtaicum (Tulaganov) Kirjanova, 1951

TABLE I - *(continuation)*

Host association		Nematode species
Haricot bean	*Phaseolus vulgaris* L.	*Apratylenchoides* sp.
		Boleodorus thylactus Thorne, 1941
		Coslenchus costatus (de Man) Siddiqi, 1978
		Ditylenchus dipsaci (Kuehn) Filipjev, 1936
		Filenchus thornei (Andrassy) Andrassy, 1980
		Geocenamus brevidens (Allen) Brzeski, 1991
		Geocenamus microdorus (Geraert) Brzeski, 1991
		Meloidogyne javanica (Treub) Chitw., 1949
		Pratylenchus pseudopratensis Seinhorst, 1968
		Pratylenchus thornei Sher *et* Allen, 1953
		Pratylenchus neglectus (Rensch) Filipjev *et* Schuurmans Stekhoven, 1941
		Pratylenchus penetrans (Cobb) Filipjev *et* Schuurmans Stekhoven, 1941
		Pratylenchus mediterraneus Corbett, 1983
		Rotylenchulus sp.
		Xiphinema pachtaicum (Tulaganov) Kirjanova, 1951
Kiwi	*Actinidia deliciosa* Chev.	*Meloidogyne hapla* Chitw., 1949
Kohlrabi	*Brassica oleracea* L. var. *Botrytis*	*Meloidogyne javanica* (Treub) Chitw., 1949
Lady's fingers	*Hibiscus esculentum* L.	*Meloidogyne arenaria* (Neal) Chitw., 1949
Lettuce	*Lactuca sativa* L.	*Aphelenchoides* sp.
		Meloidogyne sp.
		Paratylenchus sp.
		Rotylenchus sp.
		Tylenchorhynchus parvus Allen, 1955
Lucerne	*Medicago sativa* L.	*Aphelenchoides* sp.
		Ditylenchus dipsaci (Kuehn) Filipjev, 1936
		Geocenamus brevidens (Allen) Brzeski, 1991
		Geocenamus microdorus (Geraert) Brzeski, 1991
		Geocenamus nanus (Allen) Brzeski, 1991
		Helicotylenchus cf. *microcephalus* Sher, 1966
		Meloidogyne sp.
		Mesocriconema sp.
		Paratylenchus sp.
		Pratylenchus neglectus (Rensch) Filipjev *et* Schuurmans Stekhoven, 1941
		Pratylenchus pseudopratensis Seinhorst, 1968
		Pratylenchus thornei Sher *et* Allen, 1953
		Pratylenchus mediterraneus Corbett, 1983
		Pratylenchoides sp.
		Pratylenchus sp.
		Tylenchorhynchus clarus Allen, 1955
		Tylenchorhynchus latus Allen, 1955
		Tylenchorhynchus parvus Allen, 1955
Loquat	*Eriobotrya japonica* (Thunb.) Lindley	*Meloidogyne* sp.
Mallow	*Malva* sp.	*Meloidogyne javanica* (Treub) Chitw., 1949
Marrow	*Cucurbita pepo* L.	*Ditylenchus dipsaci* (Kuehn) Filipjev, 1936
Olive	*Olea europaea* L.	*Geocenamus brevidens* (Allen) Brzeski, 1991
		Helicotylenchus dihystera (Cobb) Sher, 1961

TABLE I - *(continuation)*

Host association		Nematode species
		Helicotylenchus digonicus Perry, 1959
		Rotylenchus sp.
Passion fruit	*Passiflora* sp.	*Meloidogyne* sp. (Treub) Chitw., 1949
		Rotylenchulus macrosoma Dasgupta, Raski *et* Sher, 1968
Peach	*Prunus persica* Batsch	*Helicotylenchus digonicus* Perry, 1959
		Helicotylenchus vulgaris Yuen, 1964
		Meloidogyne arenaria (Neal) Chitw., 1949
		Meloidogyne javanica (Treub) Chitw., 1949
		Meloidogyne incognita (Kofoid *et* White) Chitw., 1949
		Mesocriconema xenoplax (Raski) Loof *et* de Grisse, 1989
		Pratylenchus neglectus (Rensch) Filipjev *et* Schuurmans Stekhoven, 1941
		Trichodorus sp.
		Tylenchorhynchus goffarti Sturhan, 1966
		Xiphinema brevicolle Lordello *et* da Costa, 1961
		Xiphinema sp.
Peanut	*Arachis hypogaea* L.	*Ditylenchus* sp.
		Geocenamus brevidens (Allen) Brzeski, 1991
		Helicotylenchus sp.
		Meloidogyne sp.
		Paratylenchus sp.
		Pratylenchus sp.
		Pratylenchoides sp.
Pear	*Pyrus communis* L.	*Trichodorus* sp.
		Tylenchorhynchus sp.
Pepper	*Capsicum* sp.	*Meloidogyne* sp.
Pine	*Pinus pinea* L.	*Bursaphelenchus leoni* Baujard, 1980
Plum	*Prunus domestica* L.	*Longidorus pisi* Edward, Misra *et* Singh, 1964
Potato	*Solanum tuberosum* L.	*Meloidogyne* sp.
		Geocenamus brevidens (Allen) Brzeski, 1991
		Geocenamus microdorus (Geraert) Brzeski, 1991
		Geocenamus nanus (Allen) Brzeski, 1991
		Globodera rostochiensis (Woll.) Skarbilovich, 1959
		Globodera pallida Stone, 1973
		Meloidogyne javanica (Treub) Chitw., 1949
		Meloidogyne incognita (Kofoid *et* White) Chitw., 1949
		Meloidogyne arenaria (Neal) Chitw., 1949
		Paratylenchus microdorus Andrassy, 1959
		Pratylenchus penetrans (Cobb) Filipjev *et* Schuurmans Stekhoven, 1941
		Pratylenchus neglectus (Rensch) Filipjev *et* Schuurmans Stekhoven, 1941
		Pratylenchus crenatus Loof, 1960
		Pratylenchoides cf. *alkani* Yueksel, 1977
Sesame	*Sesamum indicum* L.	*Meloidogyne* sp.
Snapdragon	*Antirrhinum majus* L.	*Meloidogyne* sp.
Strawberry	*Fragaria vesca* L.	*Aphelenchoides longiurus* Das, 1960
		Meloidogyne sp.
		Pratylenchus sp.
Sugar beet	*Beta vulgaris* L.	*Meloidogyne javanica* (Treub) Chitw., 1949

TABLE I - *(continuation)*

Host association		Nematode species
Tobacco	*Nicotiana tabaccum* L.	*Geocenamus* sp.
		Meloidogyne sp.
		Paratylenchus sp.
		Pratylenchus sp.
		Tylenchorhynchus sp.
Tomato	*Lycopersicon esculentum* Mill.	*Meloidogyne javanica* (Treub) Chitw., 1949
Vetch	*Vicia sativa* L.	*Aphelenchoides* sp.
		Ditylenchus dipsaci (Kuehn) Filipjev, 1936
		Geocenamus sp.
		Paratylenchus microdorus Andrassy, 1959
		Pratylenchus sp.
Water melon	*Citrulus lanatus* (Thunb.) Mansf.	*Meloidogyne javanica* (Treub) Chitw., 1949
White mulberry	*Morus alba* L.	*Meloidogyne* sp.

new nematicides resulted in a 26% increase of exportable cartons of fruits compared with untreated trees (unpublished). This was exclusively due to the better quality (size) of fruit produced.

Most damage by *Meloidogyne* ssp. occurs from spring to autumn when soil temperatures are well above 10 °C. To-date, four species have been identified, namely: *Meloidogyne javanica*, *M. incognita*, *M. arenaria* and *M. hapla*. The last species is found in the mountainous region, usually up to 1,000 m high, while the most common species are *M. javanica* and *M. incognita* race 2 (Philis, 1983). Crop losses caused by these nematodes can be extremely high depending mainly on the level of nematode infestation in the soil at planting and on plant susceptibility. Cultivars resistant to root-knot nematode have been successfully tested (Philis, 1990, 1995a) and several nematicides are used effectively for the control of these nematodes (Philis, 1994b).

Globodera rostochiensis causes serious damage to potato and may also attack tomato and egg plant. It is mainly spread in the south east part of the island (Kokkinochoria) while infested fields can also be found at other areas (Agros). A small portion of the local populations consists of the white potato cyst nematode, *G. pallida* (Philis, 1981a). Both species cause severe damage to potato, yields being reduced by approximately 2.2 tons per hectare for every 20 eggs and first stage juveniles per gram of soil at planting (Philis, 1991). Nematode-resistant cultivars are used by farmers from time to time in an attempt to reduce crop losses caused by the Ro_1, pathotype. Unfortunately, to-date, no commercial cultivars are available for use against the other pathotypes of the nematode while nematicides, mostly of systemic action, are applied by farmers every year with good results as far as nematode control and increase in yields are concerned (Philis 1981b). By choosing the correct time of planting, where possible, plants can entirely escape nematode attack (Philis 1986). Such an opportunity exists for the early crop in the spring cropping season where no frost damage occurs after plant emergence (coastal zone).

Helicotylenchus multicinctus attacks bananas (*Musa cavendishii*) which are grown mainly in the frost-free west coastal area of the island. It invades the feeder roots forming necrotic lesions. Seriously infested roots become necrotic

and plants are unable to absorb enough nutrients and water from the soil so that yields are considerably reduced. To control the nematode in established plantations nematicides are distributed through the irrigation system during spring and late summer. When old banana plantations are to be replanted with banana suckers, it is important that the soil is fumigated to prevent re-infestation of the new plants (Philis 1971). The nematodes may be introduced into new fields in suckers taken from heavily infested, long-standing plantations.

Among *Pratylenchus*, the most important species in Cyprus is *Pratylenchus penetrans* which causes considerable damage to potato and haricot bean. Other lesion nematodes found to cause crop damage are *P. neglectus* on potato, *P. thornei* on cereals and *P. mediterraneus* on citrus while the role of other species, which were found associated with several plants, needs to be investigated. Trials on the chemical control of *P. Penetrans* have been very successful (Philis, 1995b).

Five species of *Xiphinema* have been identified from vineyards and peach groves. *Xiphinema pachtaicum*, *X. index*, *X. italiae* and *X. ingens* have been found associated with grapevine while *X. brevicolle* has been found near the rhizosphere of peach. *Xiphinema index* and *X. italiae* are of importance as vectors of grape fanleaf virus of vines (Hewitt *et al.* 1958; Cohn *et al.* 1970). *Xiphinema pachtaicum*, whose role on grape vine is still unknown, can be found nearly in almost every vineyard while *X. index* was found to be present in 22% of the samples examined during a systematic survey on the island (Philis, 1993c). Experiments have confirmed the results obtained elsewhere (Raski *et al.* 1965) that a minimum of four years must elapse from up-rooting the old vineyard until the nematode is eradicated (Philis, 1994a).

Recent examination of soil and leaf samples has shown that the stem nematode, *Ditylenchus dipsaci*, is widespread in fields where lucerne (*Medicago sativa*) is intensively grown. Infected plants are stunted and their life span greatly shortened.

Crop failure, due to *Paratylenchus* spp. depends mainly on their population density in the soil. *Paratylenchus neoamblycephalus* causes serious damage to carrots (Philis 1976) while recently, pin nematodes have also been found associated with potato.

The Mediterranean Cereal Cyst Nematode (*Heterodera latipons*), has been found to be wide spread in cereals (Philis, 1988b), while the ring nematodes (*Mesocriconema xenoplax* and other related species) and other genera (*Geonanamus*, *Rotylenchulus*, *Tylenchorhynchus*) should be investigated thoroughly to establish their pathogenicity to several crops. Recent findings (Orion and Shlevin, 1989) suggest that seed coating of cereals with nematicides can effectively control nematodes causing damage to cereals with a resultant increase in yield.

Estimates of losses caused by parasitic nematodes in agricultural production is not an easy task. In most subtropical countries, however, where environmental conditions favourable to nematodes usually exist, the overall loss can easily exceed 8% of the total national agricultural production value. It is logical, however, to assume that the damage caused locally by root-knot nematodes (*Meloidogyne* spp.) on vegetables, citrus nematode (*Tylenchulus semipenetrans*) on citrus and potato cyst nematode (*Globodera rostochiensis*) on potato, can reach around U.S.A. $ 20 million or 12% of the production value from these three important groups of crops. Additional losses occur also on vines and cereals caused by *Xiphinema index* and *Heterodera latipons*, respectively, not to mention other groups of nematodes whose role is still unknown.

Acknowledgements. Many thanks are due to Dr M. R. Siddiqi (U. K.), Dr P. A. A. Loof (Netherlands), Dr J. Nobbs (U. K.) and Dr D. Sturhan (Germany) for assisting with nematode identification.

Literature cited

ANTONIOU M., 1981. A nematological survey of vineyards in Cyprus. *Nematol. medit., 9*: 133-137.

COHN E., TANNE E. and NITZANY F. F., 1970. *Xiphinema italiae* a new vector of grapevine fanleaf virus. *Phytopathology, 60*: 181-182.

GEORGIOU G. P., 1957. Records and notes on the plant parasitic nematodes of Cyprus. Department of Agriculture, Tech. Bul. TB-3, Cyprus, 5 pp.

HEWITT W. B., RASKI D. J. and GOHEEN A. C., 1958. Nematode vector of soil borne fanleaf virus of grapevines. *Phytopathology, 48*: 586-595.

ORION D. and SHLEVIN E., 1989. Nematicide seed dressing for cyst and lesion nematode control in wheat. *J. Nematol., 21*: 629-631.

PHILIS J., 1971. Control of root-knot and spiral nematodes on bananas in Cyprus. *Plant Dis. Reprt., 55*: 707-710.

PHILIS J., 1976. Occurrence and control of nematodes affecting carrot crops in Cyprus. *Nematol. medit., 4*: 7-12.

PHILIS J., 1981a. Species of potato cyst nematode from the Xylophagou area in Cyprus. *Nematol. medit., 9*: 56-61.

PHILIS J., 1981b. Chemical control of the potato cyst nematode, *Globodera rostochiensis* (Woll.), in Cyprus. Technical paper, 21, 6 pp. Agricultural Research Institute, Ministry of Agriculture and Natural Resources, Nicosia, Cyprus.

PHILIS J., 1983. Occurrence of *Meloidogyne* spp. and races on the island of Cyprus. *Nematol. medit., 11*: 13-19.

PHILIS J., 1986. Phenological control of the potato cyst nematode. Technical Bulletin, 81, Agricultural Research Institute, Ministry of Agriculture and Natural Resources, Nicosia, Cyprus, 5 pp.

PHILIS J., 1988a. Control of the citrus nematode (*Tylenchulus semipenetrans*) in valencia orange groves in Cyprus. *Nematol. medit., 16*: 159-161.

PHILIS J., 1988b. Occurrence of *Heterodera latipons* on barley in Cyprus. *Nematol. medit., 16*: 223.

PHILIS J., 1989. Yield loss assessment caused by the citrus nematode *Tylenchulus semipenetrans* on valencia oranges in Cyprus. *Nematol. medit., 17*: 5-6.

PHILIS J., 1990. The efficacy of nematode resistant tomato cultivars to *Meloidogyne javanica* under greenhouse conditions. *Nematol. medit., 18*: 209-211.

PHILIS J., 1991. Assessment of potato yield loss caused by the potato cyst nematode, *Globodera rostochiensis*. *Nematol. medit., 19*: 191-194.

PHILIS J., 1993a. Control of the citrus nematode, *Tylenchulus semipenetrans*, in established grapefruit orchards of Cyprus. *Nematol. medit., 21*: 63-66.

PHILIS J., 1993b. Use of nematicides through sprinkler irrigation to control the citrus nematode in established lemon trees. *Misc. reports, 59*: 5 pp.

PHILIS J., 1993c. Distribution and ecoogy of *Xiphinema index* in Cyprus. *Nematol. medit., 21*: 139-142.

PHILIS J., 1994a. Cultural practices for the control of *Xiphinema index* in Cyprus. *Nematol. medit.*, 22: 125-126.

PHILIS J., 1994b. Use of dazomet and oxamyl for controlling the root-knot nematode, *Meloidogyne javanica*, in glasshouses. *Nematol. medit.*, 22: 241-243.

PHILIS J., 1995a. Performance of resistant peach rootstocks against *Meloidogyne javanica* in Cyprus. *Nematol. medit., 23*: 101-104.

PHILIS J., 1995b. Presence and control of *Pratylenchus penetrans* on potato in Cyprus. *Nematol. medit., 23*: 235-238.

PHILIS J. and SIDDIQI M. R., 1976. A list of plant parasitic nematodes in Cyprus. *Nematol. medit., 4*: 171-174.

RASKI D. J., HEWITT W. B., GOHEEN A. C., TAYLOR C. E. and TAYLOR R. H., 1965. Survival of *Xiphinema index* and reservoirs of fanleaf virus in fallowed vineyard soil. *Nematologica, 11*: 349-352.

TAYLOR A. L., 1965. Final report (cyclostyled). United Nations Special Fund Project. Agricultural Research Institute, Ministry of Agriculture and Natural Resources, 37 pp.

Accepted for publication on 2 August 1995.