

# **An Annotated Bibliography of Weeds as Reservoirs for Organisms Affecting Crops in Brazil**

**Ia. Nematodes: *Meloidogyne***

**LUIZ CARLOS C. BARBOSA FERRAZ**

**ROBINSON A. PITELLI**

**LEO E. BENDIXEN**

**The Ohio State University  
Ohio Agricultural Research and Development Center  
Wooster, Ohio**

## CONTENTS

\* \*

Introduction -----	1
Bibliography -----	2
Table 1. Weed Hosts of <u>Meloidogyne arenaria</u> -----	9
Table 2. Weed Hosts of <u>Meloidogyne coffeicola</u> -----	9
Table 3. Weed Hosts of <u>Meloidogyne elegans</u> -----	10
Table 4. Weed Hosts of <u>Meloidogyne exigua</u> -----	10
Table 5. Weed Hosts of <u>Meloidogyne hapla</u> -----	10
Table 6. Weed Hosts of <u>Meloidogyne incognita</u> -----	11
Table 7. Weed Hosts of <u>Meloidogyne javanica</u> -----	14
Table 8. Weed Hosts of <u>Meloidogyne thamesi</u> -----	15
Table 9. Weed Hosts of unidentified <u>Meloidogyne</u> species -----	16

AN ANNOTATED BIBLIOGRAPHY OF WEEDS AS RESERVOIRS FOR  
ORGANISMS AFFECTING CROPS IN BRAZIL.

Ia. Nematodes: Meloidogyne

Luiz Carlos C. Barbosa Ferraz<sup>1</sup>, Robinson A. Pitelli<sup>1</sup>, and Leo E. Bendixen<sup>2</sup>

Weeds play a major role in maintaining populations of nematodes available to attack susceptible crops when planted. In this role they serve, in fact, as reservoirs for the nematode populations, providing food, shelter, and a breeding site. The impact on crop production of weed hosts as reservoirs is grossly under-estimated, in general, and is an unknown factor to many people involved with agriculture.

Among the nematodes attacking crops, Meloidogyne species, the root-knot nematodes, cause the most damage on a world-wide basis. They attack a wide range of agronomic and horticultural crops, causing considerable damage and crop loss. The damage results from impairment of the root system of infected plants and malformation of the edible portions of root crops. Furthermore, in general, nematodes predispose infected plants to secondary invasion by pathogens and they may serve as vectors of pathogens.

This role of weeds as reservoirs is in addition to their direct effect on crops as competitors for light, moisture, and mineral nutrients. Competition is the most conspicuous impact of weeds on crop yield. Weeds also hinder harvesting operations and impede the flow of irrigation water, further adversely affecting the economics of crop production.

The intent of this publication is twofold: 1) to emphasize the role of weeds as reservoirs for the world's most damaging genus of crop-infecting nematodes, Meloidogyne, and 2) to make the extensive research results from Brazil on this subject more readily available to the English-reading audience.

The annotated literature citations are listed alphabetically by senior author. That section is followed by a series of tables which list the weed species hosting specific species of nematodes. The tables are arranged according to the species of Meloidogyne; i.e., M. arenaria (Neal, 1889) Chitwood, 1949; M. coffeicola Lordello and Zamith, 1960; M. elegans da Ponte, 1977; M. exigua Goeldi, 1887; M. hapla Chitwood, 1949; M. incognita (Kofoid and White, 1919) Chitwood, 1949; M. javanica (Treub, 1885) Chitwood, 1949; and M. thamesi (Chitwood, 1952) Goodey, 1963; and a table of unidentified Meloidogyne spp. The references in the tables correspond to the literature cited in the first section.

- 
1. Professor of Plant Pathology-nematology and Professor of Agronomy-weed science, respectively, Faculdade de Ciencias Agrarias e Veterinarias, Campus de Jaboticabal, Universidade Estadual Paulista, Jaboticabal, SP, Brazil.
  2. Professor of Agronomy-weed science, Ohio State University and Ohio Agricultural Research and Development Center, Columbus, Ohio.

- 001 Antonio, Helenita and P. S. Lehman. 1978. Nota sobre a ocorrência de nematóides do gênero Meloidogyne em algumas ervas daninhas nos Estados do Paraná e do Rio Grande do Sul. Soc. Bras. Nematol. 3:29-32.

Root-knot nematodes (Meloidogyne arenaria, M. incognita or M. javanica) were hosted by several weeds commonly found in soybean crops in the states of Paraná and Rio Grande do Sul. The weeds were as follows:

<i>Acanthospermum australe</i>	<i>Galinsoga parviflora</i>
<i>Ageratum conyzoides</i>	<i>Ipomoea aristolochiaefolia</i>
<i>Alternanthera ficoidea</i>	<i>Ipomoea</i> sp.
<i>Amaranthus</i> spp.	<i>Leonurus sibiricus</i>
<i>Asclepias curassavica</i>	<i>Phyllanthus corcovadensis</i>
<i>Borreria verticillata</i>	<i>Polygonum punctatum</i>
<i>Eleusine indica</i>	<i>Solanum americanum</i>
<i>Emilia sonchifolia</i>	<i>Sida</i> spp.
<i>Euphorbia prunifolia</i>	<i>Talinum patens</i>

- 002 Brandão F<sup>o</sup>, J. D. 1941. Os nematóides e os meios usuais para o seu controle. Bol. Min. Agric. 30:9-15.

Elimination of weeds was recommended as an essential step in nematode control programs.

- 003 Carvalho, J. C. 1950. Nematóides das raízes encontrados em São Paulo. Arq. Inst. Biológico 20:165-172.

Solanum americanum and Sida sp. were hosts for Meloidogyne sp. in São Paulo City.

- 004 Carvalho, J. C. 1955. O nematóide das galhas no algodoeiro e outros hospedeiros. Rev. Inst. Ad. Lutz 15:173-179.

Leonurus sibiricus and Solanum sisymbriifolium were hosts for M. incognita in Campinas, São Paulo state.

- 005 Coral, F. J., N. B. Banzate, and L.G.E. Lordello. 1963. Suscetibilidade da mamoneira-anã a nematóides. Bragantia 20:115-117.

Ricinus communis was reported as a favorable host of M. incognita in the state of São Paulo.

- 006 Costa Neto, J. P. 1937. Duas doenças que atacam as partes subterrâneas dos vegetais: a galha da coroa (Bacterium tumefaciens) e as galhas por nematóides (Heterodera radiculicola). Sec. Est. Neg. Agric. Ind. Com., bol. 53:16 p.

The role of weeds as hosts of root-knot species was emphasized. Control measures were discussed.

- 007 Curi, S. M. 1973. Novas observações sobre um nematóide do cafeeiro. Biológico 39:206-207.

This is the first report of M. exigua infecting Solanum nigrum, a very common weed in coffee plantations in São Paulo state.

- 008 Ferraz, C.A.M. 1961. Contribuição para o levantamento das plantas nativas hospedeiras do nematóide causador de galhas. *Bragantia* 20:77-78.

M. incognita acrita was found infesting Ageratum conyzoides, Amaranthus sp., and Portulaca oleracea in cotton crops in São Paulo state.

- 009 Ferraz, L.C.C.B., R. A. Pitelli, and V. Furlan. 1978. Nematóides associados a plantas daninhas na região de Jaboticabal (SP): 1º Relato. *Planta Daninha*, 1:5-11.

In a field survey at the region of Jaboticabal, São Paulo state, M. arenaria, M. incognita, and Meloidogyne sp. were hosted by several important weed species, such as Acanthospermum australe, Alternanthera ficoidea, Parthenium hysterophorus, and Trichachne insularis.

- 010 Ferraz, L.C.C.B., R. A. Pitelli, and F. Soubhia. 1982. Nematóides associados a plantas daninhas na região de Jaboticabal (SP): 2º Relato. *Planta Daninha* 5:1-5.

Wissadula subpeltata was reported as a new host for M. incognita. Other weed species infected by root-knot nematodes were mentioned.

- 011 Fiuza, R. M. 1946. Inimigos e moléstias das "leguminosas comestíveis cultivadas". *Bol. SAIC* 13:335-345.

Symptoms of root-knot nematode infections in Dolichos lablab, Vigna sesquipedalis, and Vigna sinensis were described.

- 012 Freire, F.C.O. 1976. Nematóides das galhas, Meloidogyne spp., associados ao parasitismo de plantas na região amazônica. I. No Estado do Pará. *Acta Amazônica* 6:405-408.

A list of crop and weed hosts for root-knot nematodes in the state of Pará is presented for the first time. The following weeds were included:

<i>Amaranthus gracilis</i>	<i>Melochia melissaefolia</i>
<i>Bidens cynapiifolia</i>	<i>Pueraria phaseoloides</i>
<i>Borreria latifolia</i>	<i>Portulaca oleracea</i>
<i>Cassia occidentalis</i>	<i>Solanum toxicarium</i>
<i>Cleome aculeata</i>	<i>Urena lobata</i>

- 013 Freire, F.C.O. and J. J. Ponte. 1976. Nematóides das galhas, Meloidogyne spp., associados ao parasitismo de plantas no Estado da Bahia. *Bol. Cear. Agron.* 17:47-55.

About 20 weed species commonly found in the state of Bahia are mentioned as suitable hosts for root-knot nematodes.

<i>Ageratum conyzoides</i>	<i>Leonurus sibiricus</i>
<i>Amaranthus caudatus</i>	<i>Melochia pyramidata</i>
<i>Amaranthus cruentus</i>	<i>Mimosa sensitiva</i>
<i>Amaranthus viridis</i>	<i>Momordica charantia</i>
<i>Celosia argentea</i>	<i>Portulaca oleracea</i>
<i>Cordia alliodora</i>	<i>Pueraria phaseoloides</i>
<i>Digitaria decumbens</i>	<i>Sida rhomboidea</i>

*Dolichos lablab*  
*Erechtites valerianaefolia*  
*Indigofera suffruticosa*  
*Leonotis nepetaefolia*

*Solanum auriculatum*  
*Urena lobata*  
*Verbena* sp.

- 014 Freire, F.C.O., A. M. Diógenes, and J. J. Ponte. 1972. Nematóides das galhas, Meloidogyne javanica e M. incognita, parasitando leguminosas forrageiras. Rev. Soc. Bras. Fitopatol. 5:27-32.

Cassia alata, Desmodium discolor, D. molle, Dolichos lablab, Glycine javanica, and Indigofera hirsuta were included in a list of leguminous hosts for M. incognita and M. javanica.

- 015 Huang, C. S. and F. P. Cupertino. 1976. Nematóides fitoparasitos em áreas cultivadas do Distrito Federal e Goiás. Rev. Soc. Bras. Fitopatol. 9:29-30.

A list of crop and weed hosts for root-knot species in central Brazil was presented. The weeds included were Amaranthus sp. and Solanum nigrum.

- 016 Lordello, L.G.E. 1964. Contribuição ao conhecimento dos nematóides que causam galhas em raízes de plantas cultivadas em São Paulo e Estados vizinhos. Anais E.S.A. 'Luiz de Queiroz' 21:181-218.

Information related to identification, host range, symptomatology and damage caused by root-knot nematodes in the state of São Paulo was given. Weeds (not specified) commonly found in coffee plantations from São Paulo state were considered as non-hosts of M. exigua, the galls observed in their roots being caused by M. javanica or other root-knot species."

- 017 Lordello, L.G.E. 1969. O capim gordura pode abrigar nematóide. Rev. Agric. 44:51-52.

Melinis minutiflora was reported as a new host for M. javanica.

- 018 Lordello, L.G.E. 1970. Plantas hospedeiras do nematóide Meloidogyne thamesi na Bahia. O Solo 62:19.

Leonurus sibiricus and Momordica charantia were included in a list of hosts for M. thamesi in the state of Bahia.

- 019 Lordello, L.G.E. 1981. Nematóides das plantas cultivadas. Liv. Ed. Nobel, São Paulo, 6<sup>o</sup> ed., 314 p.

The important role displayed by weeds as reservoirs for several groups of nematodes in Brazil is briefly discussed.

- 020 Lordello, L.G.E. and V.P.L. Brito. 1971. Também em Pernambuco, o capim pangola difunde nematóides. O Solo 63:21-22.

Digitaria decumbens hosted M. incognita and M. javanica in the state of Pernambuco.

- 021 Lordello, L.G.E., A. R. Monteiro, R.R.A. Lordello, and G. Bufarah. 1977. Alguns nematóides de forrageiras. Fitopatol. Brasileira 2:88.

Meloidogyne sp. was reported on Brachiaria decumbens.

- 022 Mendes, B. V. and O. F. Oliveira. 1973. Plantas suscetíveis às meloidoginoses no município de Mossoró. Bol. SCREAM, 2:17-21.

Celosia argentea, Momordica charantia, Physalis angulata, Scoparia dulcis, and Vigna sinensis were reported, for the first time, as hosts for root-knot nematodes in the state of Rio Grande do Norte.

- 023 Menezes, Maria and J.A.A. Lima. 1974. Constatação de Murcha de Sclerotium e Meloidoginose em Dichondra repens Forst., no estado do Ceará. Fitossanidade 1:18-19.

Dichondra repens was reported as a new host for M. incognita in the state of Ceará.

- 024 Moraes, M. V. 1974. Pesquisas sobre os nematóides do cafeeiro. Soc. Bras. Nematol. 1:81-90.

Dolichos lablab, Luffa cylindrica, and Ricinus communis are listed as hosts for M. arenaria.

- 025 Moraes, M. V., L.G.E. Lordello, O. A. Piccinin, and R.R.A. Lordello. 1972. Pesquisas sobre plantas hospedeiras do nematóide do cafeeiro Meloidogyne exigua Goeldi, 1887. Ciência e Cultura 24:658-660.

The following weeds were considered as non-hosts for M. exigua:

<i>Amaranthus retroflexus</i>	<i>Leonurus sibiricus</i>
<i>Asclepias curassavica</i>	<i>Luffa cylindrica</i>
<i>Cassia obtusifolia</i>	<i>Portulaca oleracea</i>
<i>Commelina</i> sp.	<i>Ricinus communis</i>
<i>Dolichos lablab</i>	<i>Solanum nigrum</i>
<i>Erechtites hieracifolia</i>	<i>Solanum sisymbriifolium</i>
<i>Indigofera hirsuta</i>	

- 026 Moraes, M. V., L.G.E. Lordello, R.R.A. Lordello, and O. A. Piccinin. 1973. Novas pesquisas sobre as plantas hospedeiras do nematóide do cafeeiro Meloidogyne exigua Goeldi, 1887. Anais E.S.A. 'Luiz de Queiroz' 30:71-75.

A comparative discussion on the host range of root-knot species is presented. M. incognita and M. javanica were considered polyphagous, attacking numerous weeds. M. exigua was only reported infesting coffee and a restricted group of cultivated plants.

- 027 Ponte, J. J. 1968. Subsídios ao conhecimento de plantas hospedeiras e ao controle dos nematóides das galhas, Meloidogyne spp., no Estado do Ceará. Bol. Cear. Agron. 9:1-26.

An extensive list of crop and weed hosts for root-knot nematodes in the state of Ceará is presented. The following weeds were included:

<i>Ageratum conyzoides</i>	<i>Mimosa sensitiva</i>
<i>Alternanthera puberula</i>	<i>Molugo verticillata</i>
<i>Amaranthus spinosus</i>	<i>Momordica charantia</i>
<i>Amaranthus viridis</i>	<i>Pavonia sassifolia</i>
<i>Asclepias curassavica</i>	<i>Physalis angulata</i>

<i>Bidens riparia</i>	<i>Portulaca grandiflora</i>
<i>Borreria verticillata</i>	<i>Portulaca oleracea</i>
<i>Calotropis gigantea</i>	<i>Portulaca sativa</i>
<i>Cassia sericea</i>	<i>Quamoclit rochae</i>
<i>Cassia tora</i>	<i>Ricinus communis</i>
<i>Celosia argentea</i>	<i>Schrankia leptocarpa</i>
<i>Cleome spinosa</i>	<i>Scoparia dulcis</i>
<i>Crotalaria incana</i>	<i>Sesbania exasperata</i>
<i>Desmodium discolor</i>	<i>Sida cordifolia</i>
<i>Eclipta alba</i>	<i>Sida linifolia</i>
<i>Emilia sonchifolia</i>	<i>Sida rhombifolia</i>
<i>Heliotropium indicum</i>	<i>Solanum nigrum</i>
<i>Hyptis suaveolens</i>	<i>Solanum paniculatum</i>
<i>Indigofera hirsuta</i>	<i>Stachytarpheta cayennensis</i>
<i>Indigofera suffruticosa</i>	<i>Thunbergia coccinea</i>
<i>Ipomoea glabra</i>	<i>Turnera ulmifolia</i>
<i>Jatropha urens</i>	<i>Urena lobata</i>
<i>Leonotis nepetaefolia</i>	<i>Vigna sinensis</i>
<i>Luffa cylindrica</i>	<i>Wedelia scaberrima</i>

- 028 Ponte, J. J. 1972. Uma forma distinta de nematóide do gênero Meloidogyne Goeldi, 1887 (nota prévia). Rev. Soc. Bras. Fitopatol. 5:33-36.

Meloidogyne females with an unusual perineal pattern were extracted from Schrankia leptocarpa roots in the state of Ceará.

- 029 Ponte, J. J. 1977. Nematóides das galhas: espécies ocorrentes no Brasil e seus hospedeiros. Bol. Cear. Agron. 18:1-99.

Root-knot species are catalogued under their hosts in Brazil. Meloidogyne elegans sp. n., found in Schrankia leptocarpa and Momordica charantia roots, is described.

- 030 Ponte, J. J. and F. E. Castro. 1975. Lista adicional de plantas hospedeiras de nematóides das galhas, Meloidogyne spp., no Estado de Ceará, referente a 1969/74. Fitossanidade 1:29-30.

Several weed species were included in the host range of the root-knot nematodes known to occur in the state of Ceará, namely Boerhavia coccinea, Indigofera suffruticosa, Luffa operculata, Melochia pyramidata, Ricinus communis, and Waltheria indica.

- 031 Ponte, J. J., C. Mendes, and A. A. Santos. 1974. Pragas e doenças de plantas nos perímetros irrigados do DNOCS, nos Estados da Bahia e Minas Gerais. Bol. Tec. DNOCS 55:70.

Vigna sinensis is considered a host for M. hapla.

- 032 Ponte, J. J., E. R. Fernandes, and A. T. Silva. 1976. Plantas hospedeiras de Meloidogyne no Estado do Rio Grande do Norte. Soc. Bras. Nematol. 2:67-70.

A list of crop and weed hosts for Meloidogyne spp. in the state of Rio Grande do Norte is presented. The weeds included were:



<i>Amaranthus viridis</i>	<i>Momordica charantia</i>
<i>Borreria verticillata</i>	<i>Physalis angulata</i>
<i>Celosia argentea</i>	<i>Scoparia dulcis</i>
<i>Chenopodium ambrosioides</i>	<i>Spigelia anthelmia</i>
<i>Indigofera suffruticosa</i>	<i>Vigna sinensis</i>
<i>Mirabilis jalapa</i>	

- 033 Ponte, J. J., A. Franco, and O. B. Leal. 1982. Novos hospedeiros silvestres de nematóides das galhas. Soc. Bras. Nematol. 5:21-23.

Alternanthera polygonoides, Crotalaria striata, and Waltheria indica are reported as new hosts for M. javanica, M. incognita, and M. arenaria, respectively.

- 034 Ponte, J. J., J.K.A. Matos, R.C.V. Tenente, and L. Maria. 1975. Primeira lista de hospedeiros de Meloidogyne do Distrito Federal. Rev. Soc. Bras. Fitopatol. 6/8:29-34.

A survey to determine host plants of root-knot nematodes in the Federal District area was performed. Weed species such as Portulaca oleracea, Solanum nigrum, and Vigna sinensis were included in the list.

- 035 Ponte, J. J., J.K.A. Matos, R.C.V. Tenente, J.W.V. Lemos, and R. L. Guilherme. 1976. Segunda lista de hospedeiros de Meloidogyne no Distrito Federal. Fitopatol. Brasileira 1:105-109.

A new list of host plants of root-knot nematodes in the Federal District area is presented. The following weeds were included:

<i>Ageratum conyzoides</i>	<i>Portulaca oleracea</i>
<i>Alternanthera ficoidea</i>	<i>Solanum nigrum</i>
<i>Bidens pilosa</i>	<i>Sonchus oleraceus</i>
<i>Cardiospermum halicacabum</i>	

- 036 Ponte, J. J., O. J. Viana, F. S. Cavalcante, C. M. Bispo, F. V. Matos, and A. Franco. 1982. Indicação de plantas imunes à Meloidoginose. I) Primeira triagem entre gramíneas forrageiras. Soc. Bras. Nematol. 5:51-55.

In greenhouse studies, Brachiaria decumbens, Melinis minutiflora, Panicum maximum, Paspalum maritimum, Paspalum notatum, and Tricholaena rosea were immune to M. incognita and M. javanica. Light infection was caused by M. incognita on Axonopus compressus, Cynodon dactylon, and Digitaria sp.

- 037 Rebel, E. K., L.G.E. Lordello, and M. V. Moraes. 1974. Plantas hospedeiras de um nematóide nocivo ao cafeeiro. Anais E.S.A. 'Luiz de Queiroz' 31:431-435.

Several common weeds found in the state of Paraná, such as species of Acanthospermum, Bidens, Cassia, Ipomoea, and Portulaca, are reported as hosts of M. incognita and M. javanica.

- 038 Sharma, R. D. and P.A.A. Loof. 1972. Nematodes associated with different plants at the Centro de Pesquisas do Cacau, Bahia. Revista Theobroma 2:38-43.

Meloidogyne sp. was found attacking Portulaca grandiflora in the state of Bahia.

- 039 Zem, A. C. 1977. Informações preliminares sobre os nematóides que se hospedam em plantas invasoras. Soc. Bras. Nematol. 2:45-48.

Common weeds from cultivated areas of Brazil are designated as hosts of root-knot species, namely Alternanthera brasiliana, Amaranthus hybridus, Brachiaria plantaginea, Momordica charantia, Portulaca oleracea, Solanum nigrum, and Solanum sp.

- 040 Zem, A. C. and L.G.E. Lordello. 1976. Nematóides associados a plantas invasoras. Anais E.S.A. 'Luiz de Queiroz' 33:597-615.

The authors present an extensive list of weeds as hosts of important plant-parasitic nematodes found in different regions of Brazil.

Eupatorium pauciflorum was considered a new host for M. coffeicola.

Other weed species listed as hosts for root-knot nematodes were:

<i>Ageratum conyzoides</i>	<i>Momordica charantia</i>
<i>Alternanthera brasiliana</i>	<i>Ophiopogon japonicus</i>
<i>Amaranthus hybridus</i>	<i>Phytolacca thyrsiflora</i>
<i>Amaranthus</i> sp.	<i>Portulaca grandiflora</i>
<i>Ambrosia artemisiifolia</i>	<i>Portulaca oleracea</i>
<i>Asclepias curassavica</i>	<i>Ricinus communis</i>
<i>Brachiaria plantaginea</i>	<i>Sida</i> sp.
<i>Celosia tuberosa</i>	<i>Solanum nigrum</i>
<i>Ipomoea</i> sp.	<i>Solanum sisymbriifolium</i>
<i>Leonotis nepetaefolia</i>	<i>Solanum</i> sp.
<i>Leonurus sibiricus</i>	<i>Talinum patens</i>
<i>Luffa cylindrica</i>	

\*\*\*\*\*

Table 1. Weed hosts of Meloidogyne arenaria

Family	Weed Species	Reference
Compositae	<i>Acanthospermum australe</i>	9
	<i>Ageratum conyzoides</i>	40
Convolvulaceae	<i>Ipomoea</i> sp.	1
Cucurbitaceae	<i>Luffa cylindrica</i>	24,25
	<i>Momordica charantia</i>	13,27,40
Euphorbiaceae	<i>Ricinus communis</i>	24,25
Leguminosae	<i>Cassia patellaria</i>	9
	<i>Dolichos lablab</i>	24,25
	<i>Indigofera suffruticosa</i>	30
	<i>Mimosa sensitiva</i>	13
	<i>Vigna sinensis</i>	27
Malvaceae	<i>Sida</i> sp.	1
	<i>Urena lobata</i>	12
Polygonaceae	<i>Polygonum punctatum</i>	1
Portulacaceae	<i>Portulaca grandiflora</i>	40
	<i>Portulaca oleracea</i>	9
Sterculiaceae	<i>Waltheria indica</i>	33
Turneraceae	<i>Turnera ulmifolia</i>	27

Table 2. Weed hosts of Meloidogyne coffeicola

Family	Weed Species	Reference
Compositae	<i>Eupatorium pauciflorum</i>	40

Table 3. Weed hosts of Meloidogyne elegans

Family	Weed Species	Reference
Cucurbitaceae	<i>Momordica charantia</i>	29
Leguminosae	<i>Schrankia leptocarpa</i>	29

Table 4. Weed hosts of Meloidogyne exigua

Family	Weed Species	Reference
Solanaceae	<i>Solanum nigrum</i>	7

Table 5. Weed hosts of Meloidogyne hapla

Family	Weed Species	Reference
Chenopodiaceae	<i>Chenopodium ambrosioides</i>	32
Compositae	<i>Bidens cynapiifolia</i>	35
Leguminosae	<i>Mimosa sensitiva</i>	13
	<i>Vigna sinensis</i>	27
Portulacaceae	<i>Portulaca oleracea</i>	35

Table 6. Weed hosts of Meloidogyne incognita

Family	Weed Species	Reference
Acanthaceae	<i>Thunbergia coccinea</i>	27
Amaranthaceae	<i>Alternanthera ficoidea</i>	1,9,10
	<i>Alternanthera puberula</i>	27
	<i>Amaranthus caudatus</i>	13
	<i>Amaranthus cruentus</i>	13
	<i>Amaranthus gracilis</i>	12
	<i>Amaranthus hybridus</i>	10,39,40
	<i>Amaranthus</i> spp.	8,15,40
	<i>Amaranthus viridis</i>	13,27,32
	<i>Celosia argentea</i>	13,27,32
Asclepiadaceae	<i>Asclepias curassavica</i>	27
Ceparidaceae	<i>Cleome aculeata</i>	12
	<i>Cleome spinosa</i>	27
Compositae	<i>Ageratum conyzoides</i>	1,8,10,13
	<i>Ambrosia artemisiifolia</i>	40
	<i>Bidens pilosa</i>	10,35
	<i>Bidens riparia</i>	27
	<i>Eclipta alba</i>	27
	<i>Emilia sonchifolia</i>	1
	<i>Erechtites valerianaefolia</i>	13
	<i>Parthenium hysterophorus</i>	9
	<i>Wedelia scaberrima</i>	27
Convolvulaceae	<i>Dichondra repens</i>	23
	<i>Ipomoea acuminata</i>	10
	<i>Ipomoea aristolochiaefolia</i>	10
	<i>Ipomoea glabra</i>	27
	<i>Ipomoea</i> sp.	40
	<i>Quamoclit rochae</i>	27
Cucurbitaceae	<i>Luffa cylindrica</i>	27,40
	<i>Luffa operculata</i>	30
	<i>Momordica charantia</i>	13,27,32
Cyperaceae	<i>Cyperus rotundus</i>	13
Euphorbiaceae	<i>Jatropha urens</i>	27
	<i>Ricinus communis</i>	5,27,40

Table 6. (Continued) Weed hosts of *M. incognita*

Family	Weed Species	Reference
Gramineae	<i>Axonopus compressus</i>	36
	<i>Brachiaria plantaginea</i>	39,40
	<i>Cynodon dactylon</i>	36
	<i>Digitaria decumbens</i>	13,20
	<i>Digitaria</i> sp.	36
	<i>Eleusine indica</i>	1
	Labiatae	<i>Hyptis suaveolens</i>
<i>Leonotis nepetaefolia</i>		13,27,40
<i>Leonurus sibiricus</i>		4,40
Leguminosae	<i>Cassia occidentalis</i>	12
	<i>Cassia sericea</i>	27
	<i>Cassia tora</i>	27
	<i>Crotalaria incana</i>	28
	<i>Crotalaria striata</i>	33
	<i>Dolichos lablab</i>	14,25
	<i>Indigofera hirsuta</i>	10,27
	<i>Indigofera suffruticosa</i>	13,30,32
	<i>Mimosa sensitiva</i>	13
	<i>Pueraria phaseoloides</i>	12,13
	<i>Sesbania exasperata</i>	27
	<i>Vigna sinensis</i>	27,32
Malvaceae	<i>Sida linifolia</i>	27
	<i>Sida rhomboidea</i>	13,27
	<i>Sida</i> sp.	1,40
	<i>Urena lobata</i>	12,13,27
	<i>Wissadula subpeltata</i>	10
Molluginaceae	<i>Mollugo verticillata</i>	27
Nyctaginaceae	<i>Boerhavia coccinea</i>	30
	<i>Mirabilis jalapa</i>	32
Portulacaceae	<i>Portulaca grandiflora</i>	27
	<i>Portulaca oleracea</i>	8,10,12 13,39,40
Rubiaceae	<i>Borreria latifolia</i>	12
	<i>Borreria verticillata</i>	32
Scrophulariaceae	<i>Scoparia dulcis</i>	27,32

Table 6. (Continued) Weed hosts of *M. incognita*

Family	Weed Species	Reference
Solanaceae	<i>Physalis angulata</i>	32
	<i>Solanum americanum</i>	1
	<i>Solanum auriculatum</i>	13
	<i>Solanum nigrum</i>	15,27,35 39,40
	<i>Solanum paniculatum</i>	27
	<i>Solanum sisymbriifolium</i>	4
	<i>Solanum</i> sp.	40
	<i>Solanum toxicarium</i>	12
	Sterculiaceae	<i>Melochia melissaefolia</i>
<i>Melochia pyramidata</i>		13,30
<i>Waltheria indica</i>		30
Turneraceae	<i>Turnera ulmifolia</i>	27
Verbenaceae	<i>Stachytarpheta cayennensis</i>	27

Table 7. Weed hosts of *Meloidogyne javanica*

Family	Weed Species	Reference
Amaranthaceae	<i>Alternanthera brasiliana</i>	39,40
	<i>Alternanthera ficoidea</i>	1,35
	<i>Alternanthera polygonoides</i>	33
	<i>Amaranthus hybridus</i>	39,40
	<i>Amaranthus retroflexus</i>	25
	<i>Amaranthus</i> spp.	15
	<i>Celosia argentea</i>	32,40
Asclepiadaceae	<i>Asclepias curassavica</i>	1,25,40
	<i>Calotropis gigantea</i>	27
Commelinaceae	<i>Commelina tuberosa</i>	40
Compositae	<i>Acanthospermum australe</i>	1
	<i>Ageratum conyzoides</i>	1
	<i>Bidens cynapiifolia</i>	12
	<i>Bidens pilosa</i>	35
	<i>Emilia sonchifolia</i>	1,27
	<i>Pavonia sessifolia</i>	27
	<i>Spigelia anthelmia</i>	32
Convolvulaceae	<i>Quamoclit rochae</i>	27
Cucurbitaceae	<i>Luffa cylindrica</i>	27
	<i>Momordica charantia</i>	27,39,40
Euphorbiaceae	<i>Euphorbia prunifolia</i>	1
	<i>Ricinus communis</i>	25,30,40
Gramineae	<i>Brachiaria plantaginea</i>	39,40
	<i>Digitaria decumbens</i>	20
	<i>Eleusine indica</i>	1
	<i>Melinis minutiflora</i>	17
Labiatae	<i>Leonurus sibiricus</i>	1,25,40
Leguminosae	<i>Cassia alata</i>	14
	<i>Cassia obtusifolia</i>	25
	<i>Cassia occidentalis</i>	12
	<i>Cassia tora</i>	27
	<i>Desmodium discolor</i>	14,27
	<i>Desmodium molle</i>	14
	<i>Dolichos lablab</i>	13,25



Table 7. (Continued) Weed hosts of *M. javanica*

Family	Weed Species	Reference
Leguminosae	<i>Glycine javanica</i>	14,25
	<i>Indigofera hirsuta</i>	14,25,27
	<i>Indigofera suffruticosa</i>	27
	<i>Mimosa sensitiva</i>	27
	<i>Pueraria phaseoloides</i>	13
	<i>Schrankia leptocarpa</i>	27
	<i>Vigna sinensis</i>	27,32
Malvaceae	<i>Sida cordifolia</i>	27
Phytolacaceae	<i>Phytolacca thyrsoiflora</i>	40
Portulacaceae	<i>Portulaca oleracea</i>	25,27,39,40
	<i>Portulaca sativa</i>	27
	<i>Talinum patens</i>	1,40
Rubiaceae	<i>Borreria verticillata</i>	1,27
Sapindaceae	<i>Cardiospermum halicacabum</i>	35
Scrophulariaceae	<i>Scoparia dulcis</i>	32
Solanaceae	<i>Physalis angulata</i>	27,32
	<i>Solanum auriculatum</i>	13
	<i>Solanum nigrum</i>	15
	<i>Solanum paniculatum</i>	40
	<i>Solanum sisymbriifolium</i>	40
	<i>Solanum</i> sp.	39,40
	<i>Solanum toxicarium</i>	12
Turneraceae	<i>Turnera ulmifolia</i>	27

Table 8. Weed hosts of *Meloidogyne thamesi*

Family	Weed Species	Reference
Cucurbitaceae	<i>Momordica charantia</i>	18
Labiatae	<i>Leonurus sibiricus</i>	13,18
Turneraceae	<i>Turnera ulmifolia</i>	27

Table 9. Weed hosts of unidentified Meloidogyne species

Family	Weed Species	Reference
Amaranthaceae	<i>Celosia argentea</i>	22
Borraginaceae	<i>Cordia alliodora</i>	13
	<i>Heliotropium indicum</i>	27
Commelinaceae	<i>Commelina</i> sp.	25
Compositae	<i>Erechtites hieracifolia</i>	25
	<i>Galinsoga parviflora</i>	1
	<i>Sonchus oleraceus</i>	35
Convolvulaceae	<i>Ipomoea aristolochiaefolia</i>	1
Cucurbitaceae	<i>Luffa cylindrica</i>	25
	<i>Momordica charantia</i>	22
Euphorbiaceae	<i>Phyllanthus corcovadensis</i>	1
Gramineae	<i>Brachiaria decumbens</i>	21
	<i>Trichachne insularis</i>	9
Leguminosae	<i>Dolichos lablab</i>	11,25
	<i>Indigofera hirsuta</i>	9
	<i>Schrankia leptocarpa</i>	28
	<i>Vigna sesquipedalis</i>	11
	<i>Vigna sinensis</i>	11,22,34
Liliaceae	<i>Ophiopogon japonicus</i>	40
Malvaceae	<i>Sida</i> sp.	3
Portulacaceae	<i>Portulaca grandiflora</i>	38
	<i>Portulaca oleracea</i>	34
Scrophulariaceae	<i>Scoparia dulcis</i>	22
Solanaceae	<i>Physalis angulata</i>	22
	<i>Solanum americanum</i>	3
	<i>Solanum nigrum</i>	25,34
	<i>Solanum sisymbriifolium</i>	25
Verbenaceae	<i>Verbena</i> sp.	13



**The Ohio State University**

**Ohio Agricultural Research and Development Center**