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## MULTIPLICATION OF *MELOIDOGYNE JAVANICA* AS AFFECTED BY *FUSARIUM SOLANI* AND *RHIZOCTONIA BATATICOLA* ON GROUNDNUT<sup>1</sup>

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**Abstract :** Multiplication of *Meloidogyne javanica* and the galling on groundnut was found to be adversely affected by *Rhizoctonia bataticola* and *Fusarium solani*. Reduction in multiplication was maximum wherever one or both the fungi were inoculated simultaneously with the nematode. Introduction of *F. solani* one week after the nematode did not reduce galling and the nematode population in soil and roots significantly. *R. bataticola* proved more antagonistic to *M. javanica* than *F. solani*.

**Key words :** *Meloidogyne javanica*, *Rhizoctonia bataticola*, *Fusarium solani*, interaction, groundnut, antagonism

CONTROL OF *RADOPHOLUS SIMILIS* ON ARECANUT SEEDLINGS  
WITH ALDICARB, ALDICARB SULFONE, CARBOFURAN  
AND FENSULFOTHION

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*Abstract* : Efficacy of 4 systemic nematicides (aldicarb, aldicarb sulfone, carbofuran and fensulfothion @ 1 g a.i./ plant) applied 3 times in a year for 3 years, were tested against *Radopholus similis* on arecanut seedlings. All the chemicals were effective in reducing the numbers of *R. similis* significantly and increasing plant growth in comparison to control plants. Aldicarb and fensulfothion were most effective while aldicarb sulfone and carbofuran were less effective in controlling nematodes. None of the chemicals was phytotoxic on arecanut seedlings.

**Key words** : *Radopholus similis*, arecanut seedlings, control, aldicarb sulfone, carbofuran, aldicarb and fensulfothion

DETERMINATION OF EFFECTIVE DOSES AND TIME OF  
APPLICATION OF NEMATICIDES AND CASTOR LEAVES  
FOR CONTROLLING *MELOIDOGYNE JAVANICA* IN TOMATO

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*Abstract* : Proper dose and time of application of aldicarb, carbofuran and chopped castor leaves were determined to control *Meloidogyne javanica* in tomato. Both the nematicides, at the rate of 2 kg a.i./ha, applied at transplanting, and chopped castor leaves, @ 40 and 60 g/kg soil, 7 days before transplanting, were effective. Application of aldicarb and carbofuran at transplanting and chopped castor leaves, one or two weeks before transplanting, significantly reduced number of galls and enhanced plant growth.

**Key words** : *Meloidogyne javanica*, nematicide, castor leaves, doses, application time

TOXICITY EVALUATION OF THREE NEMATOCIDES (WITH  
OR WITHOUT AMMONIUM SULPHATE) ON ROOT-KNOT  
NEMATODES ATTACKING TOMATO

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*Abstract* : Three systemic nematicides at two treatment levels, with or without extra ammonical fertilization, were evaluated against root-knot nematodes attacking tomato. Addition of ammonium sulphate to temik at 2 and 4 kg a.i./ha, carbofuran at 2 kg a.i./ha and miral at 2 kg a.i./ha resulted in improved yields of tomato fruit. Addition of ammonium sulphate to carbofuran, and miral at 4 kg a.i./ha led to a depression in yield of tomato. All treatments were superior to the control except miral applied at 4 kg a.i./ha + ammonium sulphate.

The results of the galling indices show that all treatments were superior to the control. Treatments involving carbofuran 4 kg a.i. + ammonium sulphate, miral alone at 2 and 4 kg a.i./ha, miral at 4 kg a.i./ha + ammonium sulphate were significantly superior to the control ( $P = 0.05$ ).

Residues of miral in fruits were negligible and addition of ammonium sulphate did not affect the amount of residues detected significantly ( $P = 0.05$ ). Residues of miral in soil samples, however, did show some discrepancies and were high in some of the samples.

**Key words** : Root-knot nematode, nematicides, control.

SEASONAL POPULATION FLUCTUATIONS OF *HETERODERA ZEAЕ*,  
*ROTYLENCHULUS RENIFORMIS* AND *TYLENCHORHYNCHUS*  
*VULGARIS* IN MAIZE-COWPEA-WHEAT ROTATION

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**Abstract :** Studies on population fluctuation of the maize cyst nematode, *Heterodera zae*, under field conditions, with maize-cowpea-wheat rotation, revealed one high peak coinciding with crop maturity, indicating host specificity. The reniform nematode, *Rotylenchulus reniformis* and the stunt nematode, *Tylenchorhynchus vulgaris*, maintained their populations without major fluctuations. *T. vulgaris* did not show any host preference while *R. reniformis* multiplied well on cowpea and maize.

**Key words :** Population dynamics, *Heterodera zae* *Tylenchorhynchus vulgaris*, *Rotylenchulus reniformis*, *Zea mays*, crop rotation.

EFFECT OF CHEMICALS AND A PHYTOTHERAPEUTIC SUBSTANCE  
ON BIOLOGICAL PHENOMENA OF *MELOIDOGYNE*  
*JAVANICA* INFESTING TOMATO

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*Abstract* : Effect of two granular nematicides (aldicarb and carbofuran, each @ 1 mg a.i./kg soil) and castor leaf extract (@ 40 g/kg soil) was studied on hatching, penetration, life-cycle development and oviposition of *Meloidogyne javanica*. *In vitro* studies on hatching revealed that maximum reduction in population over control occurred with castor leaf extract. With regard to larval penetration in tomato roots, chemicals were more effective at all intervals (24, 48, 72 and 96 hrs after inoculation) as compared to castor leaves. Studies on life-cycle development indicated that in both treated and untreated tomato plants, the time required for its completion was 27 days (from larva to larva). Oviposition in treated plants was markedly reduced as compared to control.

**Key words** : *Meloidogyne javanica*, biological phenomena, chemicals, castor leaf extract

## EFFECT OF SOME SYSTEMIC NEMATOCIDES ON GROUNDNUT AND MULTIPLICATION OF *MELOIDOGYNE JAVANICA*<sup>1</sup>

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*Abstract* : Soil application of oxamyl, aldicarb, carbofuran and phenamiphos retarded galling and reproduction of *Meloidogyne javanica* and improved growth of groundnut plants. Seed soaking in 1000 µg/ml of phenamiphos solution delayed germination by 2-5 days but improved root growth. Soil treatment with oxamyl and aldicarb, preceded by seed soaking, was more effective while seed soaking in phenamiphos was not compatible with carbofuran. Seed soaking and soil treatment with phenamiphos resulted in phytotoxicity.

**Key words** : *Meloidogyne javanica*, groundnut, systemic nematicides, nematode control, seed soaking.

EVALUATION OF GREENGRAM AND BLACKGRAM VARIETIES  
AGAINST RENIFORM NEMATODE, *ROTYLENCHULUS RENIFORMIS*

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*Abstract* : Relative susceptibility of seventeen greengram as well as blackgram varieties against *Rotylenchulus reniformis* were tested in replicated pot culture experiments. The greengram varieties, ML-80, ML-62, TT-8E, Pusa-103, PDM-14 and blackgram cultivars, Ratnapur-1, UG-201, UG-135 showed resistant reaction to the best nematode species. Reaction of other varieties were moderately resistant to highly susceptible.

**Key words** : Greengram, blackgram, *Rotylenchulus reniformis*

## PATHOGENICITY OF PIGEON-PEA CYST NEMATODE, *HETERODERA CAJANI* KOSHY, 1967 ON SOME PULSE CROPS

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*Abstract* : Experiments on pathogenicity of *Heterodera cajani* Koshy, 1967 on cowpea [*Vigna unguiculata* (L.) Walp.], black gram [*V. mungo* (L.) Hepper], moth bean [*V. acontifolia* (Jacq.) Marechal], and pigeon pea [*Cajanus cajan* (L.) Millsp.] were conducted in screenhouse. Highly significant reductions in growth parameters of cowpea, pigeon pea and moth bean (except plant height in the latter) were recorded at 100 larvae and above level per kg of soil. Significant reduction in root length, fresh and dry root weights of moth bean was observed at 10 inoculum level. No significant reduction in shoot growth parameters of black gram was recorded even at the highest inoculum (1,000 larvae/pot). However, significant reduction in root growth parameters occurred at 100 larvae and above levels.

**Key words** : *Heterodera cajani*, pathogenicity, cowpea, black gram, moth bean, pigeon-pea.

EFFECT OF CARBOFURAN ON THE MACRONUTRIENTS OF SOIL  
AND GROWTH OF TOMATO PLANTS IN PRESENCE OF  
*MELOIDOGYNE INCOGNITA*

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*Abstract* : The effect of carbofuran, on plant growth population and development of root-knot nematode *Meloidogyne incognita* and availability of N, P and K in soil, amended with different fertilizers, was studied. Plant growth was better at 10 ppm carbofuran than other treatments in fertilizer treated soils. A significant reduction in the population and development of root-knot nematode was observed in fertilized soil treated with nematicide. The availability of N, P and K increased with an increase in concentration of carbofuran up to 10 ppm after 30 days which decreased further at 60 days.

**Key words** : Carbofuran, macronutrients, tomato, *Meloidogyne incognita*

ANTAGONISM BETWEEN *HETERODERA CAJANI* AND *RHIZOCTONIA SOLANI* ON COWPEA [*VIGNA UNGUICULATA* (L) WALP]

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*Abstract* : *Rhizoctonia solani* adversely affected *Heterodera cajani* population when inoculated one week prior to nematode. The number of cysts and larvae were significantly reduced over nematode alone. The fungus, when inoculated 2 weeks after nematode, reduced the top growth of plants significantly compared to check or any other treatment.

**Key words** : *Heterodera cajani*, *Rhizoctonia salani*, interaction, cowpea.

EFFECT OF DIFFERENT NEMATICIDES AND NEEM OIL CAKE  
IN THE CONTROL OF *RADOPHOLUS SIMILIS* IN YELLOW  
LEAF DISEASE AFFECTED ARECANUT PALMS

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*Abstract* : Investigations were carried out to study the effect of three nematicides viz., fensulfothion @ 50 g ai/palm, aldicarb @ 10 g a.i./palm, DBCP @ 10 ml a.i./palm and neem oil cake @ 1.5 kg/palm for the control of *Radopholus similis* in yellow leaf disease affected arecanut palms. All chemicals were effective in reducing the population of *R. similis* significantly compared to the control plants. Fensulfothion yielded maximum number of nuts (347.9) and total nut weight (7958 g) per palm, closely followed by aldicarb against untreated plants which yielded maximum number of 36.5 nuts with a total nut weight of 1066 g per palm.

**Key words** : *Radopholus similis*, arecanut, systemic nematicides, neem oil cake

## EVALUATION OF NEMACUR AGAINST *MELOIDOGYNE INCOGNITA* IN A CARDAMOM NURSERY\*

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*Abstract* : Nematicur 400 E.C. @ 5, 10 and 15 kg a.i./ha when used as soil drench as well as foliar spray, on 2 months—old cardamom seedlings against *Meloidogyne incognita*, in an infested nursery significantly reduced the nematode population. There was no difference between the two methods of application. With an increase in nematicur dosage, the vigour of the seedlings increased. In general, soil drench treatment yielded better plant growth than foliar spray.

**Key words** : *Meloidogyne incognita*, nematicur, cardamom

STUDIES ON EFFECT OF NPK FERTILIZERS SINGLY AND IN COMBINATION WITH PESTICIDES ON COWPEA [*VIGNA UNGUICULATA* (L.) WALP] INFECTED WITH *MELOIDOGYNE JAVANICA*

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*Abstract* : Effect of aldicarb and carbofuran at different dosages, individually and in combination, with different NPK fertilizers on population development of *Meloidogyne javanica* and also on extent of damage to cowpea variety, Pusa dofasali was investigated. Plants, inoculated one week after germination, with 1,000 second stage larvae of *M. javanica* alongwith 20 kg K/ha resulted in significant increase in plant growth, maximum number of galls, minimum number of egg masses. Aldicarb at 1 kg a.i./ha recorded minimum number of eggs/egg mass.

**Key words** : Fertilizers, *Vigna unguiculata*, nematocides-fertilizers interaction

RESPONSE OF SOME NEMATODE RESISTANT TOMATO CULTIVARS  
TO MIXED INOCULATIONS OF *MELOIDOGYNE INCOGNITA* AND  
*PSEUDOMONAS SOLANACEARUM*

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*Abstract* : Inoculation of *Meloidogyne incognita* 7 days prior and *Pseudomonas solanacearum* at planting caused maximum wilt (75 per cent) followed by simultaneous inoculations of both the pathogens (45 per cent) at 60 days of observation. Least wilt percentage (8.3) was noticed in root-knot nematode resistant tomato variety, Ronita. No wilt was noticed in plants inoculated with nematode alone and control but nematode inoculated plants showed very poor growth and chlorotic appearance.

**Key words** : *Lycopersicon esculentum*, *Meloidogyne incognita*, *Pseudomonas solanacearum*, wilt

EFFECT OF DIFFERENT PLANTS, SINGLY AND IN COMBINATIONS,  
ON THE ATTRACTION OF ADULT *XIPHINEMA BASIRI*

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**Abstract :** Observations on the effect of different plants, singly and in combinations of two plants, were made on the attraction of adult *Xiphinema basiri* in agar plates. Cabbage and tomato were most attractive, carrot and brinjal moderately attractive, chilli and radish least attractive while onion and mustard failed to attract nematodes significantly when tested alone, or together in one combination. The differential attraction behaviour of *X. basiri* is attributed to the plant root attractants and the intensity of the attractants.

**Key words :** *Xiphinema basiri*, behaviour, attraction

NEMATICIDAL PROPERTIES OF SOME INDIGENOUS PLANT  
MATERIALS AGAINST ROOT-KNOT NEMATODES,  
*MELOIDOGYNE INCOGNITA* ON TOMATO

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*Abstract* : Pot culture and in-vitro studies were conducted simultaneously for testing nematicidal properties of *Andrographis paniculata*, *Calendula officinalis*, *Enhydra fluctuans* and *Solanum khasianum* against root-knot nematode, *Meloidogyne incognita*. Pot trial was done on tomato. For in-vitro studies, for one trial the percentage mortality of larvae of *M. incognita* was recorded while for the other, larval-hatch from egg masses was observed. All the plant materials reduced galls and nematode populations in pot trial, *C. officinalis* and *E. fluctuans* being more effective. In in-vitro test also the same materials were more effective in killing larvae (larval mortality) and inhibiting hatching.

**Key words** : *Meloidogyne incognita*, tomato, plant material

VULNERABILITY OF LARVAE AND EGGS OF *MELOIDOGYNE*  
*INCOGNITA* TO SOME OILCAKES AND FUNGICIDES

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*Abstract* : Larvicidal and ovicidal properties of aqueous extracts of *neem*, *karanj*, *mahua*, groundnut, cotton, linseed, sesamum and *kokam* oilcakes and two fungicides, *ceresan-wet* and *aureofungin-sol* are reported. Eggs of *Meloidogyne incognita* were found more vulnerable to oilcakes and fungicides than larvae.

**Key words** : *Meloidogyne incognita*, vulnerability, oilcakes, fungicides

## SURVIVAL OF *RADOPHOLUS SIMILIS* IN HOST FREE SOIL

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*Abstract* : The burrowing nematode, *Radopholus similis*, population survived in air dried soil (moisture range 0.1 to 1.0 per cent) for a period of 3 months. Under moist conditions (irrigated regularly), active nematode population could be recovered up to 15 months. The nematode infested coconut roots did not harbour active population after a period of one month in dry soil and two months in moist soil, but the population that had come out from the severed roots survived under field conditions, for 6 months in moist soil and only one month in dry soil.

**Key words** : *Radopholus similis*, coconut, survival

## PERSISTENCE OF 1,2 DIBROMO-3-CHLOROPROPANE AS INFLUENCED BY SOIL TYPE

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*Abstract* : Persistence and movement of 1,2 dibromo-3-chloropropane (DBCP), as detected by GLC, indicated rapid degradation in red and sandy loam soils during the first 7 days and thereafter it became slow and almost constant. Degradation in black soil was slow during the first 30 days and then it was rapid. At 60 days, total degradation was 83, 97 and 78 per cent in red, black and sandy loam soils respectively. Movement of DBCP was quicker from upper to lower profile in sandy loam as compared to red and black soils. Mortality of *Meloidogyne incognita* larvae was directly proportional to the concentrations of DBCP residue in each soil, as tested by bioassay technique, LC<sub>50</sub> values in respect to biotoxicity to root knot larvae in red, black and sandy loam soils were 0.39, 0.68 and 0.92 ppm respectively.

**Key words** : DBCP, persistence, residue, soil types, bioefficacy, *Meloidogyne incognita*.

## MANAGEMENT OF *HETERODERA ZEA* ON MAIZE THROUGH PESTICIDAL SEED DRESSING

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**Abstract :** Aldicarb, aldoxycarb and carbofuran @ 0.75 and 1.5 per cent and fensulfothion @ 0.25 and 0.5 per cent, both under pot and field conditions, were evaluated as seed dressers against *Heterodera zea*. Seedling emergence was not hampered by chemicals both under pot and field conditions except to some extent in field by aldicarb at 1.5 per cent. Larval emergence in soil increased by application of nematicides, but their penetration into maize roots was inhibited. Aldicarb and fensulfothion, at both the doses, were effective in reducing population of *H. zea*.

**Key words :** *Heterodera zea*, control, seed treatment, management, seedling emergence, larval emergence, penetration, plant growth, nematode population; crop yield.

**NEOLOBOCRICONEMA REGULARIS SP. N. (CRICONEMATINA :  
TYLENCHIDA) FROM INDIA WITH ADDITIONAL DATA ON  
N. ABERRANS**

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*Abstract* : A new species of the genus, *Neolobocriconema* Mehta & Raski, 1971, collected from Saharanpur (U.P.) is described and illustrated. Additional data on *N. aberrans* (Jairajpuri & Siddiqi, 1963) Andrassy, 1969, collected from several localities of U.P., is also provided.

**Key words** : *Neolobocriconema regularis* sp. n.

EFFECT OF NEMATODE POPULATION AND HOST TYPES ON  
EMERGENCE, PENETRATION AND DEVELOPMENT  
OF *HETERODERA AVENAE*<sup>1</sup>

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*Abstract* : Increased emergence of larvae from *Heterodera avenae* cysts was observed when barley variety resistant to Ludhiana but susceptible to Narnaul populations was planted in soil infested with Narnaul population. Higher penetrations of larvae was observed in barley resistant to both the populations and barley variety resistant to Narnaul but susceptible to Ludhiana populations and planted in soil infested with Narnaul population and also in the latter case when soil was infested with Ludhiana population.

**Key words** : *Heterodera avenae*, host type, larval emergence