CONTENTS

Influence of a mycorrhizal fungus, *Glomus fasciculatum* on the host—parasite relationship of *Rotylenchulus reniformis* in cowpea—*S. Lingaraju and B.K. Goswami* .. 137

Differential influence of potatoes on the interaction between initial and final population levels of cyst nematodes—*S.F.A. Amalraj and G.R. Rao* .. 142

Studies on the survival of *Radopholus similis* under various adverse conditions—*P.K. Koshy and S.M. Geetha* .. 146

Nematicidal principle from the funicles of *Acacia auriculiformis*—*D. Roy, S.P. Sinhababu, N.C. Sukul and Mohato* .. 152

Culturing of root-knot nematode, *Meloidogyne incognita* in excised roots and callus cultures of tomato—*N. Suguna and Sivagami Vadivelu* .. 158

Host status of some economic crops to *Pratylenchus zeae* and their influence on subsequent sugarcane crops—*P. Sundararaj and Usha K. Mehta* .. 165

Comparative efficacy of nematicides, oil cakes and plant extracts in the management of *Meloidogyne incognita*, Pratylenchus delattrei and *Rotylenchulus reniformis* on brinjal—*K. Poornima and Sivagami Vadivelu* 170

Relative performance of some root-knot nematode resistant tomato lines derived from intervarietal crosses—*Surjan Singh, R. Mahajan and D.S. Cheema* 174

Nematode management with plant products—*Rajeswari Sundarababu, C. Sankaranarayana and Sivagami Vadivelu* .. 177

Effect of temperature and soil type on penetration of *Pratylenchus zeae* in sugarcane—*Usha K. Mehta and P. Sundararaj* 179

Role of infested left-out potatoes on the overwintering and dissemination of root-knot nematode, *Meloidogyne incognita* in field—*M. Nagesh, S.S. Mishra and A.K. Singh* .. 183

Population densities of plant parasitic nematodes on different cultivars of banana—*B.N. Chaudhury and P.N. Phukan* .. 188

Evaluation of predation abilities of *Mylonchulus dentatus*—*Anwar L. Bilgrami and Rajeev Kulshreshtha* .. 191

Effect of different levels of moisture on the interaction of *Glomus fasciculatum* with *Meloidogyne incognita* on cowpea—*A. Santhi and Rajeswari Sundarababu* 199

Effect of soil composition on *in-vitro* persistence of phenamiphos in soil—*H.C. Meher and C.L. Sethi* .. 202

SHORT COMMUNICATION

Germplasm evaluation of some rabi pulses against root-knot nematode, *Meloidogyne javanica*—*K.K. Verma and D.C. Gupta* .. 209

(Continued on inner cover)

(Continued from back cover)

Distribution of seven species of *Pratylenchus* in sugarcane fields of Tamil Nadu—*Usha K. Mehta and P. Sundararaj* .. 211

Estimation of avoidable yield losses in green gram and cowpea due to root-knot nematodes —*D.J. Patel, H.V. Patel and J.K. Patel* .. 213

Twig galls incited by *Meloidogyne incognita* on *Trichosanthes dioica* R.—*A.C. Verma and Anwar Ali* .. 215

Reactions of some rice varieties to *Meloidogyne graminicola—M. Kalita and P. N. Phukan* .. 215

Effect of aldicarb on hatching of *Heterodera cajani—V.K. Singh and K.P. Singh* .. 217

On the effectiveness of "Neem" products against the cereal cyst nematode, *Heterodera avenae—K.K. Kaushal* .. 218

Indian J. Nematol. 23 (2) : 137-141 (1993)

INFLUENCE OF A MYCORRHIZAL FUNGUS *GLOMUS FASCICULATUM* ON THE HOST - PARASITE RELATIONSHIP OF *ROTYLENCHULUS RENIFORMIS* IN COWPEA

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Abstract: Interactive relationship of a vesicular-arbuscular mycorrhizal fungus, *Glomus fasciculatum* and a plant parasitic nematode, *Rotylenchulus reniformis* on cowpea was studied in greenhouse. Four levels each of these organisms were used either singly or in combinations. Mycorrhizal fungus enhanced total biomass as well as fresh root weight while the nematode reduced them. The interaction effects were significant. The final numbers of the nematode were more in the presence of fungus whereas the nematode did not influence the spore numbers though it interfered with mycorrhizal colonization. The VAM induced tolerance in cowpea to the nematode even in the presence of damaging levels of the nematode under phosphorus-deficient conditions.

Key words : Vesicular-arbuscular mycorrhiza, reniform nematode, interaction, cowpea.

Back to Contents

Indian J. Nematol. 23 (2) : 142-145 (1993)

DIFFERENTIAL INFLUENCE OF POTATOES ON THE INTERACTION BETWEEN INITIAL AND FINAL POPULATION LEVELS OF CYST NEMATODES*

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Abstract: The relation between initial and final soil population densities caused by two potato cyst nematode species was studied using four differential potato clones for conditions prevailing over Tamil Nadu hills.

The response curve-fits denoted that the final densities of *Globodera rostochiensis* stablized at high P_i values to all of the four clones. Two kinds of patterns were discernible with *G.pallida*. One was that the susceptible and tolerant clones showed pattern similar to the observations made with *G. rostochiensis*, while the two VTn^2 resistant clones had a different pattern. At higher values of P_i these two resistant clones showed stabilization around the equilibrium density line.

The study further indicated that *G. rostochiensis* was mild and *G. pallida* was virulent under Tamil Nadu hills conditions.

Key words : *Globodera rostochiensis, G. pallida*, populations, potatoes.

Back to Contents

STUDIES ON THE SURVIVAL OF *RADOPHOLUS SIMILIS* UNDER VARIOUS ADVERSE CONDITIONS

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Abstract : *Radopholus similis* survived under adverse conditions as adult females during summer months in infested coconut roots under field conditions. The hatching of the nematode is triggered only with sufficient soil moisture. Under green house conditions at 0.4 per cent moisture level (wilting point), none of the stages of the nematode could be recovered alive. Under moisture stress different stages of the nematode became dormant. In mesocarp, 20 per cent moisture prevented survival of all stages. In culture, on carrot discs, the depletion of food was withstood maximum by adult females followed by fourth stage female juveniles compared to second, third and fourth stage male juveniles and gravid females. Adult females and fourth stage females survived for maximum days in water compared to other stages. However, the capacity of different stages to survive in water was not different between isolates from arecanut, banana, coconut and black pepper.

Key words : Survival, adverse conditions, Radopholus similis

Back to Contents

Indian J. Nematol. 23 (2) : 152-157 (1993)

NEMATICIDAL PRINCIPLE FROM THE FUNICLES OF *ACACIA AURICULIFORMIS*

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Abstract: The crude alcoholic extract of the funicles of *Acacia auriculiformis* killed 55% *Meloidogyne incognita* juveniles in 80 min at 4 mg/ml concentration. The nematicidal principle isolated from the funicles consisted of two saponins, acaciaside A and B which killed 62.5% juveniles in 80 min at 4 mg/ml concentration. Both the crude extract and the saponins, when applied by soil drench as well as foliar spray at 10 mg/ml and 4 mg/ml concentrations, respectively, reduced root galling and nematode population in the roots of cowpea (*Vigna catjang*). The treatments increased plant growth and *Rhizobium* nodule formation which were affected by nematode infestation of the roots. The test substances were water-soluble and systemic in action.

Key words : *Acacia auriculiformis*, nematicidal, saponins, acaciasides, *Meloidogyne incognita*

Back to Contents

Indian J. Nematol. 23 (2) : 158-164 (1993)

CULTURING OF ROOT-KNOT NEMATODE, *MELOIDOGYNE INCOGNITA* IN EXCISED ROOTS AND CALLUS CULTURES OF TOMATO.

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Abstract : Studies were undertaken to find out the *in vitro* response of various explants viz., seed, leafdisc, excised roots of tomato cv. Co3 on Murashige and Skoog medium with growth regulators for callus induction and rhizogenesis respectively. The root-knot nematode, *Meloidogyne incognita* was inoculated on tomato leaf, root call and on root culture to study their multiplication rate under *in vitro* conditions. The explant leaf disc showed a profuse growth of callus on MS media supplemented with 0.5 mg l^{-1} 2, 4-D and 3.0 mg l^{-1} BAP. Tomato seed germinated on MS media containing 1.0 mg l^{-1} NAA and 0.5 mg l^{-1} BAP registered high frequency of rooting and more number of roots. Optimal root callus induction was found to be on the MS media at 1.0 mg l^{-1} NAA and 1.5 mg l^{-1} BAP. Tomato leaf calli of 32 days old did not seem to favour *Meloidogyne incognita* multiplication. Inspite of permitting feeding of *M. incognita* the tomato root callus did not support its development or multiplication, as only 45.33 percent larvae penetrated the callus and 27.94 per cent reached the adult female stage. But, in *in vitro* root culture, increased nematode reproduction was observed as out of the 66.0 per cent of the larvae penetrated, 75.76 per cent reached the adult female stage.

Key words: Culturing, *Meloidogyne incognita*, callus, tomato.

Back to Contents

Indian J. Nematol. 23 (2) : 165-169 (1993)

HOST STATUS OF SOME ECONOMIC CROPS TO *PRATYLENCHUS ZEAE* AND THEIR INFLUENCE ON SUBSEQUENT SUGARCANE CROPS*

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Abstract : The study on host status of different crops showed that brinjal, cabbage, foxtail millet and soybean are most favourable hosts for *P. zeae*. Turmip, red gram, opra, pearl millet were moderately fabourable whereas sunhump, sesame, groundnut, green gram, fennel, corriander, mustard and tomato were poor hosts.

Key words : *Pratylenchus zeae*, sugarcane

Back to Contents

Indian J. Nematol. 23 (2) : 170-173 (1993)

COMPARATIVE EFFICACY OF NEMATICIDES, OIL CAKES AND PLANT EXTRACTS IN THE MANAGEMENT OF *MELOIDOGYNE INCOGNITA, PRATYLENCHUS DELATTREI* AND *ROTYLENCHULUS RENIFORMIS* ON BRINJAL

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Abstract: Pot culture studies were conducted to find out the effect of nematicides (carbofuran, phenamiphos, phorate, margocide EC and nimbicidin EC), oil cakes (neem, castor, mahua) and plant extracts (*Crotalaria juncea, Andrographis paniculata, Medicago media* and *Anona squamosa*) on populations of *Meloidogyne incognita, Pratylenchus delattrei* and *Rotylenchulus reniformis* in brinjal cultivar Co. 2. Chemicals proved most effective in reducing the nematode population, phenamiphos 5G being the best followed by carbofuran 3G and phorate 10G. Oil cakes ranked next to chemicals. Plant extracts were least in their effect. Oilcakes boosted the growth of the plants and root weight was increased by chemicals.

Key words: ***Meloidogyne incognita, Pratylenchus delattrei, Rotylenchulus reniformis,*** **control, brinjal.**

Back to Contents

Indian J. Nematol. 23 (2) : 174-176 (1993)

RELATIVE PERFORMANCE OF SOME ROOT-KNOT NEMATODE RESISTANT TOMATO LINES DERIVED FROM INTERVARIETAL CROSSES

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Abstract : Five root-knot nematode resistant tomato breeding lines derived from five different crosses through pedigree method were evaluated in replicated yield trial for four years. The highest performing line 1-6-1-4 was also tested in multilocation trials. This line gave an average yield of 574 Q/ha which is 40% higher than the checks and has determinate plant habit, bearing medium sized pear shaped fruits. It exhibited resistance to root-knot nematodes at all the sixteen centres where it was tested.

Key words: Tomato, root-knot nematode, *M. incognita*, resistance, varietal improvement

Back to Contents

Indian J. Nematol. 23 (2) : 177-178 (1993)

NEMATODE MANAGEMENT WITH PLANT PRODUCTS

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Abstract: The effect of chopped leaves of bougainvillea, ocimum, onion, prosopis, calotropis and subabul @ 5 g/kg soil was studied against the root-knot nematode on tomato and reniform nematode on greengram. All the leaf products tested were able to enhance the plant growth and suppress the final nematode population in the soil. Among them prosopis was superior followed by subabul, calotropis and bougainvillea.

Key words: *Meloidogyne incognita, tomato, Rotylenchulus reniformis*, greengram, control.

Back to Contents

Indian J. Nematol. 23 (2) : 179-182 (1993)

EFFECT OF TEMPERATURE AND SOIL TYPE ON PENETRATION OF *PRATYLENCHUS ZEAE* IN SUGARCANE

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Abstract: Influence of temperature (15-29°C) on penetration of *Pratylenchus zeae* in roots of sugarcane varieties (Co 6304, Co 8021, CoC 671, and CoC 85061) cultivated in 3 soil types (clay, sandy and clay loamy) were investigated. Temperatures between 26 and 28°C induced greatest penetration of *P. zeae* irrespective of soil type. Among all varieties CoC 671 was highly susceptible to *P. zeae* whereas in the varieties Co 6304, CoC 85061 and Co 8021 the rate of penetration reduced in the descending order. Among the soil types rate of penetration in descending order occurred in clay, sandy, clay loamy respectively.

Key words: *Pratylenchus zeae*, sugarcane, temperature, soil type, penetration

Back to Contents

Indian J. Nematol. 23 (2) : 183-187 (1993)

ROLE OF INFESTED LEFT OUT POTATOES ON THE OVERWINTERING AND DISSEMINATION OF ROOT-KNOT NEMATODE, *MELOIDOGYNE INCOGNITA* IN FIELD

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Abstract : The study conducted during 1991-92 and 1992-93 at Shimla showed that the left out tubers aided *M. incognita* in overwintering upto six months in the fields. The average total potential inoculum/g infested tubers was 207.11 eggs and juveniles which is considered to be significantly higher than the economic threshold level. Further, the actual inoculum developed/g of infested tubers after 30 days of planting of such infested tubers declined to 96.03 and to 52.34 after sixty days of planting.

Key words: *Meloidogyne incognita*, potatoes, dissemination

Back to Contents

Indian J. Nematol. 23 (2) : 188-190 (1993)

POPULATION DENSITIES OF PLANT PARASITIC NEMATODES ON DIFFERENT CULTIVARS OF BANANA

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Abstract: A field experiment was conducted to study changes in densities of nematode population associated with 15 cultivars of banana. Dwarf jahaji, Robusta, Malbhog and Chenichampa were favourable for *Helicotylenchus dihystera*. Athia was least favourable.

Key words: Banana, cultivar, Dwarf jahaji, *Helicotylenchus dihystera*.

Back to Contents

Indian J. Nematol. 23 (2) : 191-198 (1993)

EVALUATION OF PREDATION ABILITIES OF *MYLONCHULUS DENTATUS*

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Abstract: Observation on *Mylonchulus dentatus* revealed that it is predaceous in nature. The prey catching and feeding mechanisms are comparable to other mononchs. Predation by *M. dentatus* depended on chance encounters with the prey. Predators fed by cutting the cuticle and shredding the prey into pieces. There was no set predatory pattern, Females were most active predators than the juveniles. *M. dentatus* prefered second-stage juveniles of *Meloidogyne incognita, Tylenchulus semipenetrans. Heterodera mothi* and *Anguina tritici* most. All factors viz., number of prey, temperature, agar concentration, pH of the medium, test arena, starvation of predators and thickness of agar influenced predation by *M. dentatus.*

Key words: Predation, predator, prey, *Mylonchulus dentatus*

Back to Contents

Indian J. Nematol. 23 (2) : 199-201 (1993)

EFFECT OF DIFFERENT LEVELS OF MOISTURE ON THE INTERACTION OF *GLOMUS FASCICULATUM WITH MELOIDOGYNE INCOGNITA* ON COWPEA

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Abstract: The pot culture experiment was conducted with different levels of moisture (ranged from 20 to 100%) to study its effect on the interaction of *Glomus fasciculatum* with *Meloidogyne incognita* on cowpea and found that maximum growth of the plant was observed at 70% moisture level and increasing level declined the growth of the plant whereas reverse trend was noticed in the root weight character. The nematode population was positively correlated with the moisture level whereas VAM spore population and colonization was negatively correlated with the moisture levels.

Key words: *G. fasciculatum. M. incognita,* cowpea, interaction, moisture.

Back to Contents

Indian J. Nematol. 23 (2) : 202-208 (1993)

EFFECT OF SOIL COMPOSITION ON *IN-VITRO* PERSISTENCE OF PHENAMIPHOS IN SOIL

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Abstract : Persistence of phenamiphos in soil at 31 ± 1°C was enhanced by increasing clay content resulting in longer half- life. Addition of organic matter initially enhanced its persistence but further increase resulted in faster dissipation. Sand had negligible effect on overall elution of the chemical into soil water; but clay and organic matter adversely affected elution and sorption coefficient. Adsorption of phenamiphos was of higher order onto clay than organic matter.

Key words: Phenamiphos, dissipation, adsorption, clay, sand, organic matter.

Back to Contents