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**INTERACTION OF CARBENDAZIM WITH NEMATOCIDES ON SEED OF
WHEAT AS MEASURED BY INCIDENCE OF LOOSE SMUT
(*USTILAGO TRITICI*) AND MULTIPLICATION OF CEREAL CYST
NEMATODE (*HETERODERA AVENAE*)**

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Abstract : The efficacy of a systemic fungicide-carbendazim for control of loose smut of wheat remained unimpaired in presence of nematocides-benfuracarb and carbosulfan on the seed. The bioefficacy of these nematocides was also not affected by presence of carbendazim on seed as measured by multiplication of *Heterodera avenae* in soil. There was no effect on germination and growth of plants as observed by germination speed index, vigour index, survival, average number of tillers, height of plants and grain weight in any of the treatments.

Key words: *Heterodera avenae*, *Ustilago tritici*, seed treatment, systemic fungicide, nematocides

NEMATICIDAL EFFICACY AND PLANT GROWTH AS INFLUENCED BY PERSISTENCE OF SEBUPHOS IN SOIL AND BRINJAL PLANT

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Abstract : Under pot conditions, with 'Pusa Bheraw' brinjal, *Solanum melongena* (L.) as a test crop, the residue of sebuphos applied @ 0.5, 1.0 and 1.5 kg a.i./ha, persisted in soil and plant beyond 2 months. The chemical showed a half-life of about 7-8 days in soil. Absorption of residue by roots was rapid but further translocation into shoots was slow. The residue level was found to be always higher in roots than shoots despite a faster dissipation in roots. Both root and soil concentrations of residues significantly ($p < 0.05$) reduced invasion, development, fecundity and final population of *Meloidogyne incognita* in brinjal. Application of sebuphos @ 1.0 kg a.i./ha was found to be the best for its nematicidal action and effect on plant growth.

Key words : Sebuphos, persistence, residues, nematicidal action, *M. incognita*, *Solanum melongena*.

NEMATICIDAL PROPERTIES OF GARLIC, ALLIUM SATIVUM L.

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Abstract : Nematicidal properties of garlic against *Meloidogyne incognita* have been studied. The aqueous extract of garlic bulbs suppressed the egg hatch from 88.64 to 98.88 per cent at 0.05 to 10 per cent concentrations, respectively. Cent per cent nematode larvae were killed at 5 per cent concentration of the extract within 168h; whereas, only 61.33 per cent larval kill was observed with the leaf extract at the same concentration and after the same interval of time. The distilled oil fraction of garlic proved highly toxic against the larvae at 8 ppm concentration. The dry clove powder at 5 per cent concentration also killed cent per cent larvae after 72 h.

Key words : Garlic, nematicidal properties, *M. incognita*

SEED DRESSING WITH CARBOSULFAN FOR THE MANAGEMENT OF PARASITIC NEMATODES ON GROUNDNUT

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Abstract : Carbosulfan 25 ST seed dressing @ 1,2, 3 and 4 per cent for pot experiment while 2 and 3 per cent was used under field conditions against root-knot and parasitic nematodes respectively. Seedling emergence was not affected by the nematicidal seed dressing except at 4 per cent where the germination was suppressed upto 50 per cent in pots. Dressing with carbosulfan was found to be effective with respect to plant growth of groundnut in pots as well as under field conditions at lower doses used. 2 per cent treatment, not only increased the pod yield upto 8.7 per cent over control but also significantly lowered the nematode population of *Tylenchorhynchus vulgaris*, *T. mashhoodi* and *Pratylenchus zae* sampled at the time of harvesting. *Hoplolaimus indicus* was markedly low at harvest as compared to control treatment. Conclusively, seed dressing of groundnut with carbosulfan had improved the plant growth and significantly reduced the nematode population in pots and under field conditions.

Key words : Seed dressing, plant parasitic nematodes, control, Carbosulfan, Groundnut.

MORPHOMETRIC VARIABILITY IN *RADOPHOLUS SIMILIS*

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Abstract : Morphometric studies were carried out to determine differences, if any, among the 12 populations of *Radopholus similis* collected from different localities of South India. Most of the measurements and ratios recorded in these studies fall within the range of measurements of *R. similis* reported previously. Out of the 39 characters/ratios examined, stylet length (C.V. 3.91%) and ratio 'V' (C. V. 3.10%) were the most stable characters in *R. similis*. The populations developed from a single adult female on carrot discs recorded minimum variations. Comparisons of adult and gravid females of a coconut population (C₁₇,H) from host root showed that most of the measurements were higher in gravid females, indicating the need for recording the measurements of gravid females separately in all morphological studies. D² analysis of 39 characters of males and females grouped the 10 populations into three clusters and 12 populations fell into 4 clusters with population cultured on host root alone forming a separate cluster. Significant correlation was found between the pairs of characters constituting the ratio 'c' and body length of females and males and ratio V of females. Body length (BL) has been found to be a good descriptive ratio in *R. similis* where the correlations was highly significant between the constituting characters.

Key words : *Radopholus similis*, morphometrics, variability

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HOST PREFERENCE OF THE BURROWING NEMATODE, *RADOPHOLUS SIMILIS* POPULATIONS FROM INDIA*

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Abstract : Host specificity study of 28 populations of *Radopholus similis* was done. Designated 17 host differentials to identify races of *R. similis*. The host differentials are coconut (Cv. Laccadive Micro), arecanut (Var. Mangala), banana (Cv. Njalipooan and Var. Robusta), black pepper (Var. Panniyur-1), nutmeg (Cv. Local), clove (Cv. Local), cardamom (Cv. Vazhukka), tea (Var. Ca-150), coffee (Cv. San Ramon), avocado (Cv. Furte), citrus (Cv. Musambi), pineapple (Cvs. Mauritius and Kew), sweet potato (Var. H-268) and sugarcane (Vars. Co. 449 and Co. 997). Ten races of *R. similis* in south India were identified among the 28 populations on the basis of their multiplication on the 17 identified host differentials. Citrus, clove, pineapple and sugarcane var. Co. 997 were immune to all the 28 populations. Race I multiplied on all the 11 susceptible differentials. Nutmeg was immune to race II and nutmeg and tea were immune to race III. Race IV did not multiply on avocado and nutmeg. Black pepper was immune to race V. Race VI did not multiply on banana Cv. Njalipooan but it multiplied on tissue cultured banana Var. Robusta and nutmeg. In addition to banana Cv. Njalipooan, race VII did not multiply on sugarcane Var. Co. 449, avocado, coffee and tea. Race VIII did not multiply on 4 differentials viz. black pepper, sugarcane, tea and nutmeg. Arecanut, tea and nutmeg were immune to race IX. In addition to arecanut and nutmeg, race X did not multiply on black pepper.

Key words : *Radopholus similis*, host specificity, races, differentials

PATHOGENICITY AND AVOIDABLE LEAF YIELD LOSS DUE TO *MELOIDOGYNE INCOGNITA* IN MULBERRY (*MORUS ALBA* L.)

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Abstract : The effect of different inoculum levels of *Meloidogyne incognita* viz., 0, 10, 100, 1000 and 10,000 second stage larvae/plant and the extent of avoidable leaf yield loss were estimated in pot culture and field conditions respectively. *M. incognita* was found to be highly pathogenic to mulberry and caused significant reduction in plant growth leaf yield and moisture per cent as well as shoot and root weight observed at 10,000 larvae/plant. The avoidable leaf yield loss in field conditions was 11.8 percent.

Key words : Inoculum level, yield loss, *Meloidogyne incognita*, carbofuran, mulberry.

EFFECT OF ANTIBIOTIC KT-199 ON HISTOLOGICAL CHANGES IN MELOIDOGYNE INCOGNITA - INDUCED GALLS ON TOMATO*

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Abstract : The nematode galls on tomato plants treated with antibiotic KT-199 were studied by adopting histochemical techniques in comparison with the untreated control. The treatment with antibiotic markedly decreased the number of nematodes, the number and volume of giant cells and the nuclei in them as compared to untreated control plants. The giant cells of treated plants contained less of insoluble polysaccharides, nucleic acids and proteins than those in untreated plants. The effect was more pronounced in the foliar spray treated plants than in those with soil drench. As the giant cells nurse the nematodes, the reduction in their metabolic activity, perhaps adversely affected the growth and development of the nematodes. The present study revealed that the antibiotic KT-199 has a potential to check the root-knot nematode damage in tomato plants.

Key words : Tomato, root-knot nematode, antibiotic KT-199, giant cell, foliar spray, soil drench.

EFFICACY OF *PASTEURIA PENETRANS* ALONE AND IN COMBINATION WITH CARBOFURAN IN CONTROLLING *MELOIDOGYNE INCOGNITA*

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Abstract : Application of *Pasteuria penetrans* and carbofuran individually and in combination (at half of their individual doses) significantly reduced the gall formation by *Meloidogyne incognita* and improved the plant growth characteristics of tomato Cv. Pusa ruby seedlings. Maximum reduction in galling and improvement in plant growth characteristics was recorded where *P. penetrans* alone was applied followed by combined application of *P. penetrans* and carbofuran, and carbofuran alone.

Key words : *Pasteuria penetrans*, carbofuran, control, *Meloidogyne incognita*, tomato

STUDIES ON COMPARATIVE EFFICACY OF MUSTARD AND KARANJ OIL SEED CAKES WITH A NEMATICIDE, CARBOFURAN AGAINST ROOT-KNOT NEMATODE, *MELOIDOGYNE INCOGNITA* IN TOMATO

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Abstract : Efficacy of two of the commonly used oil-cakes viz., mustard and karanj in relation to a standard nematicide, carbofuran on the penetration of nematode juveniles in tomato roots and also the effect of the cakes on plant growth and nematode multiplication was studied. Both the cakes of mustard and karanj significantly reduced penetration of juveniles of *Meloidogyne incognita* in tomato roots. In comparison to non-amended/untreated soil, there was almost 50% reduction in root penetration by the nematode juveniles in amended soil. The cakes were as effective as the carbofuran treatment. Tomato plants grew remarkably well in mustard and karanj amended soil as compared with that obtained in carbofuran treatment. The shoot length was better in karanj than in mustard amended soil. All the three treatments (karanj, mustard and carbofuran) suppressed the effect of nematode in comparison to nematode alone treatment with regard to shoot weight. Same treatments also suppressed nematode infestation as indicated by root-knot index and number of galls per plant. The same trend was reflected in the case of nematode population in the soil

Key words: *Meloidogyne incognita*, karanj, mustard, tomato

DENSITY AND FREQUENCY OF THE LESION NEMATODE, *PRATYLENCHUS* IN SUGARCANE BELT OF TAMIL NADU¹

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Abstract : Survey for plant parasitic nematodes was conducted in the 11 districts in state of Tamil Nadu where sugarcane is cultivated as a major crop. Assay of nematode showed that *Pratylenchus* spp. is the predominant nematode found in varied numbers all over the state. Absolute density and frequency were calculated and from these data relative density and frequency were also calculated. Reasons for the differences in population level are outlined. A distinct picture of the distribution pattern of the nematode in and around the sugar factory zones of the state is apparent.

Key words : Nematode, *Pratylenchus*, density, frequency, sugarcane, Tamil Nadu

EFFECT OF *PRATYLENCHUS ZEA* GRAHAM, 1951 ON THE ENZYMES AND AMINO ACID CONTENT OF SUGARCANE ROOTS

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Abstract : Changes in enzymes and free amino acids of sugarcane roots infected by lesion nematode, *Pratylenchus zae*, were investigated. It was found that polyphenol oxidase, peroxidase, ascorbic acid oxidase, glucose-6-phosphate dehydrogenase, cellulase, protease and acid phosphatase increased in the *P. zae* inoculated roots as compared to the control. However glutamate dehydrogenase and malate dehydrogenase remained unchanged while ribonuclease decreased in the inoculated roots. In the control plant roots, seven amino acids were identified while the inoculated roots contained nine amino acids.

NEMATOTOXICITY OF 2-CHLOROETHYL O-ARYL O-METHYL PHOSPHONATES⁺

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Abstract: Twenty two, 2 chloro-ethyl O-aryl.-methyl phosphonates were tested against root knot nematode (*Meloidogyne incognita*). Six phosphonates showed good activity *in vitro*, were further evaluated under pot experiment on soybean CV SE 1140. These six compounds reduced the number of galls on the root system without altering the plant growth characters of soybean. O-methyl 2-chloroethyl 0-4 thiomethyl phenyl phosphonate is considered to be most potent .

Key words: Phosphonates, *Meloidogyne incognita*, soybean, *in vitro*,