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THE DEVELOPMENT OF *HETERODERA SACCHARI* ON UPLAND NERICA1 RICE CULTIVAR IN SCREEN HOUSE CONDITIONS

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ABSTRACT

The development and life cycle of *Heterodera sacchari* were investigated under screenhouse conditions. Three-week old NERICA 1 rice seedlings planted in 5l pots were each inoculated with 5,000 second-stage juveniles (J_2) of *H. sacchari* in four replications. Roots were examined for the presence of the developing stages of the nematodes at 24 hour intervals for 29 days. The pots containing the rice seedlings were upturned and roots were separated from soil, rinsed and stained in acid fuchsin in lactoglycerol. Stained roots were cleared in glycerol and lactic acid for 48 hours then observed for the presence of nematode under a stereo microscope. The presence and morphometric measurements of nematodes within rice roots were taken. *Heterodera sacchari* penetrated into rice roots within 24hrs after inoculation with emergence of 3rd, 4th juvenile stages and white females occurring at 11, 17 and 21 days, respectively. Mature females with large deposits of embryonated eggs were observed 24 days after inoculation. The life cycle of the nematode from J_2 to-adult female was completed within 24 days at a minimum and maximum soil temperature range of 23.3 °C and 30.0°C, relative humidity of 50.3% and 95.0%. Female body wall changed colour from milky white to light brown at 29 days after the emergence of the adult female.

Keywords: *Life cycle, Morphometric, Embryonated eggs, Cyst nematode*

ABST/NISON2014/002

EFFICACY OF *Fusarium oxysporium* AND LEAF EXTRACT OF *Ageratum conyzoides* ALONE AND IN COMBINATION IN THE CONTROL OF ROOT-KNOT NEMATODE (*Meloidogyne incognita*) IN OKRA.

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ABSTRACT

Efficacy of *Fusarium oxysporium* and leaf extract of *Ageratum conyzoides* against a root-knot nematode (*Meloidogyne incognita)* in okra was conducted in Afugiri in Umuahia North Local Government Area and was laid out in Completely Randomized Design with five treatments and five replications. The treatments include nematode alone (control), nematode+ fungi, nematode+ leaf extract + fungi and nematode + chemical. Results on plant height and number of leaves showed no statistical damage as there was no significant difference between treatments. On the number of root galls, the control plant produced the highest number of galls (12.60) and was significantly different from the other treatments. Plants treated with chemical (furadan) showed no gall at all but was significantly different from treatments with fungi. Results also indicated significant reduction of nematode population in the soil by treatments. Effects of treated plants with fungi showed the highest nematode population in the soil while with chemical (furadan) significantly reduced the nematodes although it was not significantly different from control, leaf extract and the combination of fungi and leaf extract. The result on nematode population in the root showed that the control had the highest which was significantly different from other treatments. The least population was produced by treatment with chemical but did not differ significantly from the rest of the rest of the treatments. Generally, fungi and leaf extract compared favourably with fungi.

Keywords: *Bionematicides, Carbofuran, Fungi, Phytonematodes*

ABST/NISON2014/003

NEMATICIDAL ACTIVITIES OF FRACTIONS FROM *ALSTONIA BOONEI* AND *BRIDELIA FERRUGINEA* ON *MELOIDOGYNE INCOGNITA*

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ABSTRACT

Root-knot nematodes *Meloidogyne incognita* are widely spread nematode pests limiting crop productivity in south western Nigeria. Effective management of this pest by application

of synthetic nematicides has recorded tremendous success. However, chemical nematicides are highly toxic to human health and the environment. In view of this, the leaves of *Alstonia boonei* (de Wild) and *Bridelia ferruginea* (Benth) were investigated for nematicidal activity. Fractions tested were significantly effective in causing juvenile mortality with 75% concentration being most active. Mortality increased with increase in exposure time. Fractions from *A. boonei* were significantly ($p<0.05$) more toxic to *M. incognita* juveniles with a percentage mortality of 48.62% which was not significantly different from the reference standard carbofuran with 48.89% mortality. The fractions were also as effective as carbofuran in inhibiting egg hatch, but there was minimal inhibition with the crude extracts. Spectroscopic results revealed the presence of compounds that are nematicidal in nature and these include anhydrides, amides, mono and di substituted aromatics and fatty acid esters.

Keywords: *Alstonia boonei, Bridelia ferruginea, Nematicides, Pests*

ABST/NISON2014/004

NEMATICIDAL POTENTIALS OF EXTRACT FROM SOME SELECTED PLANTS ON EGGS AND SECOND STAGE JUVENILES OF *Meloidogyne incognita* Race 2

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ABSTRACT

The effect of water extracts of *Tagetes erecta*, *Tithonia diversifolia*, *Chromolaena odorata* and *Occimum gratissimun* leaves: each at 6.6, 10.0, 13.3, 16.6 and 20% w/v on eggs and second stage juveniles of *Meloidogyne incognita* were investigated *in vitro*. There were 21 treatments arranged in a completely randomised designed experiment with four replicates. Nematodes were incubated at an average temperature and relative humidity of 27°C and 87% respectively. Eggs hatched were counted every 24 hours for 10 days while juveniles were observed for mortality every 24 hours for 5 days. All data were analysed using ANOVA ($p=0.05$) and means were separated using Duncan Multiple Range Test (DMRT). Water extracts of *T. erecta* inhibited egg hatch by 90.5% and was significantly higher than egg hatch of *O. gratissimum* which produced the lowest egg inhibition of 70.72%. *Tagetes erecta* also caused 100% juvenile mortality within 24 hours of exposure followed by *T. diversifolia* (59%), *C. odorata* (50%) and *O. gratissimum* 26.5% at the lowest concentration. The results of this study suggest that these plants can be used as an alternative measure in the management of root-knot nematodes as against the use of chemicals.

Keywords: *Larval mortality, Plant extracts, Root-knot nematodes, Tagetes erecta, Tithonia diversifolia.*

ABST/NISON2014/005
HOST STATUS OF DIFFERENT PLANTS TO *MELOIDOGYNE INCOGNITA*.

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ABSTRACT

Two screen house experiments were carried out to characterize the reaction of 12 horticultural crops, 2 grains, 4 spices and 2 cover crops to *Meloidogyne incognita* and their possible adverse effect on nematode population under screen house conditions. Two-week old seedlings of each crop type were inoculated with 5,000 eggs/second-stage juveniles (J2) of *M. incognita*. The plants were arranged in a completely randomized design with four replicates. Two months after infestation the experiment was terminated and the following data were collected: galling index (GI), eggs in root and nematode population in the soil. The Reproductive factor was also calculated for each plant. The tested plants with Reproductive factor less than one (RF<1.0) and galling index less than 2 (GI<2) were rated as non-hosts or resistant were *Tagetes erecta* (marigold), *Sorghum bicolor* (sorghum), *Zea mays* (Oba super 1 maize), *Amaranthus cruentus* (Green vegetables), *Sesamum indicum* (sesame), *Allium sativum* (garlic), *Curcuma longa* (turmeric), *Moringa oleifera* (moringa), *Occimum grattissimum* (tree basil), *Mucuna pruriens* (velvet beans) and *Capsicum annuum* cv safi (hot pepper). Eight of the crops were susceptible with GI>2 and reproductive factor >1 while only one crop *Capsicum annuum* cv Yolo wonder (sweet pepper) was tolerant with GI<2 and reproductive factor≥1. The result of this study suggests that planting these resistant crops in a *Meloidogyne*-infested soil will act as an alternative way of managing root-knot nematode population below the injury level as against the use of chemicals which are detrimental to health as well as the environment.

Keywords: *Environment, Moringa, Root-knot nematodes, Sesame, Tagetes*

ABST/NISON2014/006

NEMATICIDAL POTENTIAL OF SOME PLANT EXTRACTS ON THE CONTROL OF ROOT-KNOT NEMATODE, *MELOIDOGYNE JAVANICA* (KOFOID AND WHITE, 1919) CHITWOOD, 1949

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ABSTRACT

The experiment was conducted in the laboratory of Department of Crop Protection, Modibbo Adama University of Technology Yola in 2013, to determine the effect of plant extracts on the control of root-knot nematode, *Melooidogyne javanica*. The objectives of the study were to determine the effects of different extracts in controlling *Meliodogyne javanica* juveniles and also the effects of different concentration of extracts on *M. javanica*. 5, 10, 15 ml each of the crude extract and diluted extracts of garlic, lemon grass, onion, *tridax* and distilled water were dispensed separately using 10ml syringe into sixty petri-dishes containing 1000 second stage juveniles of *M. javanica* in 5ml of water. Distilled water was used as control. Juvenile mortality was observed for a period of 72 hours. There were five treatments replicated three times using completely randomized design. The results reveal that crude extracts of garlic at 72 hours gave the best result (86.68%) followed by its diluted forms. The results also showed that with increase of time of exposure and concentration the higher the mortality of nematodes. The finding of the research showed that the extracts have nematicidal property, however field trials are recommended to determine their efficacy in the field.

Keywords: *Larval mortality, Nematicides, Root-knot nematodes*

ABST/NISON2014/007

TOXIC EFFECTS OF WILD SUNFLOWER, *TITHONIA DIVERSIFOLIA* ON ROOT-KNOT NEMATODE, *MELOIDOGYNE INCOGNITA*

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ABSTRACT

The toxic effects of wild sunflower, *Tithonia diversifolia* was evaluated against root knot nematode, *Meloidogyne incognita* on egg plant *Solanum melogena*. Screen house and laboratory experiments were conducted in the year 2010 and repeated at the same time in the

year 2011 at College of Agriculture, Ahmadu Bello University, Kabba, Kogi State, Nigeria. The aqueous extract of *T. diversifolia* was applied at 0, 25, 50, 75 and 100% concentration while Cabofuran was applied at 0, 2500, 5000, 7500 and 10000ppm in the screen house. 0, 250, 500, 750 and 1000ppm of the extract were applied in the laboratory on egg-hatch inhibition and juvenile mortality of *M. incognita*. The experiment lasted for a period of six months in the screen house and seven days in the laboratory for each year. The results from the experiment showed that *T. diversifolia* aqueous extract and Cabofuran solution brought about significant reduction in nematode multiplication rate and consequent root damage (Gall Index) with resultant growth and yield increase compared to the control. Phytochemical screening of *T. diversifolia* revealed the presence of Phytin, Tannin, Oxalate, Saponin, Flavonoid and Alkaloid as bioactive chemical components present in *T. diversifolia*. The results from the experiment showed that *T. diversifolia* is toxic to root knot nematode, *Meloidogyne incognita* and can be incorporated into the control system of nematode.

Keywords: *Furadan, Nematode control, Phytochemicals*

ABST/NISON2014/008

EFFECT OF ETHYLEACETATE EXTRACT OF *DETARIUM MICROCARPUM* GUILL AND PERR STEM BARK ON ROOT-KNOT NEMATODE (*MELOIDOGYNE JAVANICA*)

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ABSTRACT

The effect of ethyleacetate extract of *Detarium microcarpum* Guill and Perr bark on root-knot nematode (*Meloidogyne javanica*) was examined in the laboratory of the Department of Crop Protection, Modibbo Adama University of Technology, Yola in 2014. It was to determine the juvenile mortality of *M. javanica* and nematicidal properties of *Detarium microcarpum* Guill and Perr bark. Completely Randomized Design (CRD) consisting of six (6) treatments replicated four (4) times was used as the experimental design for the juvenile mortality experiment. The result obtained indicates that,.*M. javanica* juvenile mortality was significantly higher in 100% concentration of the ethyleacetate extract with 90 juvenile

mortality at 72hrs followed by 80% ethyleacetate extract concentration with 87 juvenile mortality at 72 hrs. The lowest juvenile mortality was obtained in 0% concentration of ethyleacetate extract with 1juvenile mortality at 24 hrs. The chemical analysis of the ethyleacatate extract of *D. microcarpum* Guill and Perr bark also reveals that there was high concentration of terpenoids, leadacetate, cardiac glycosides but has no saponins.

Keywords: *Ethylacetate, Detarium, Mortality, Nematode juveniles, Phytonematodes*

ABST/NISON2014/009
EFFICACY OF AQUEOUS LEAF EXTRACTS OF NEGRO COFFEE (*Cassia occidentalis*) AND LEMON GRASS (*Cymbopogon citratus*) IN THE MANAGEMENT OF NEMATODE PESTS OF OKRA (*Abelmoschus esculentus* L. Moench)

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ABSTRACT

A two-year rain-fed field trials to evaluate the efficacy of aqueous leaf extracts of *C. occidentalis* and *C. citratus* at different levels in the management of nematode pests of okra was conducted. The levels of treatments used were 25%, 50%, 75%, 100% while 0% served as control. The experimental design was a randomized complete block design (RCBD). Effects of treatments on growth, yield, soil nematode population, and root weight and root gall indices were determined. Phytochemical screening and infra-red spectrum to determine the secondary metabolites in the leaf extracts were also carried out. It was observed that the treated plants especially those that received 50% level and above performed significantly better (P= 0.05) than the control with respect to the measured parameters. The phytochemical results revealed the presence of tannin (7.4%), crude alkaloids (2.5%), saponin (0%) and crude oxalates (42.28mg/g) in cassia while lemon grass contained tannin (4.5%), crude alkaloids (0.52%), saponin (1.76%) and oxalates (0%). The infra-red spectrum revealed that the two plant extracts contained very strong and broad absorption bands ~3400-1cm region, assignable to ~NH stretching mode probably of alkaloid family. The medium absorption bands were due to ~CH bands which are common in natural products. The medium absorption bands are also strong indicators of other compounds in the leaf extracts. The use of botanically derived crude leaf extracts of cassia at 50% and lemon grass at 75% in the management of nematode pests of okra will therefore be of economic benefit, ensuring food security.

Keywords: *Infra-red spectrum, Nematodes, Phytochemical screening, Secondary metabolites*

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Keywords: *Ethylacetate, Detarium, Mortality, Nematode juveniles, Phytonematodes*

ABST/NISON2014/009
EFFICACY OF AQUEOUS LEAF EXTRACTS OF NEGRO COFFEE (*Cassia occidentalis*) AND LEMON GRASS (*Cymbopogon citratus*) IN THE MANAGEMENT OF NEMATODE PESTS OF OKRA (*Abelmoschus esculentus* L. Moench)

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ABSTRACT

A two-year rain-fed field trials to evaluate the efficacy of aqueous leaf extracts of *C. occidentalis* and *C. citratus* at different levels in the management of nematode pests of okra was conducted. The levels of treatments used were 25%, 50%, 75%, 100% while 0% served as control. The experimental design was a randomized complete block design (RCBD). Effects of treatments on growth, yield, soil nematode population, and root weight and root gall indices were determined. Phytochemical screening and infra-red spectrum to determine the secondary metabolites in the leaf extracts were also carried out. It was observed that the treated plants especially those that received 50% level and above performed significantly better (P= 0.05) than the control with respect to the measured parameters. The phytochemical results revealed the presence of tannin (7.4%), crude alkaloids (2.5%), saponin (0%) and crude oxalates (42.28mg/g) in cassia while lemon grass contained tannin (4.5%), crude alkaloids (0.52%), saponin (1.76%) and oxalates (0%). The infra-red spectrum revealed that the two plant extracts contained very strong and broad absorption bands ~3400-1cm region, assignable to ~NH stretching mode probably of alkaloid family. The medium absorption bands were due to ~CH bands which are common in natural products. The medium absorption bands are also strong indicators of other compounds in the leaf extracts. The use of botanically derived crude leaf extracts of cassia at 50% and lemon grass at 75% in the management of nematode pests of okra will therefore be of economic benefit, ensuring food security.

Keywords: *Infra-red spectrum, Nematodes, Phytochemical screening, Secondary metabolites*

ABST/NISON2014/010
NEMATODE COMMUNITIES ASSOCIATED WITH SOME COMMON WEEDS IN SOUTHERN GUINEA SAVANNAH AGRO-ECOLOGICAL ZONE OF NIGERIA.

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ABSTRACT

The direct devastating effects of weeds on economic plants have been widely reported; either via allelopathy, interference or competition. Nonetheless their indirect effects may perhaps be even more damaging given the existence of mycobiota, nematode assemblages in soils and long term surviving inoculums on weeds. This study was conducted to provide baseline information on nematodes associated with prevalent weed species in the Southern Guinea Savannah agro-ecological zone of Nigeria. 30 common weed species belonging to 28 genera representing 15 weed families were collected from four different locations in Makurdi and examined for the presence of nematodes in their root and rhizosphere. A total of 43 nematode genera representing 22 families were detected in 93.33% of rhizosphere samples. 100% occurrence of free-living nematodes, 75% occurrence of plant-parasitic nematodes and 1% occurrence of entomopathogenic nematodes were recovered. Nematode Species Richness and Shannon-Weiner Biodiversity indices were both highest in Oil Plantation (30, 3.02) and least in Farmers' Fields (11, 2.11). Based on the absolute frequencies and prominent values of all extracted nematodes, *Pratylenchus* was highest (104, 3.49) and the least was Basiria (1.00, 0.02). Cluster dendogram clearly separated the weed species into three main clusters based on nematode community composition. The first and third clusters comprised *Acroceras zizaniodes* and *Cleome viscosa* respectively while the remaining 28 weed species formed a separate cluster. Furthermore, analysis of similarity (ANOSIM) showed a significant difference between weed species from these three clusters based on nematode composition (Global $R = 0.694, p \leq 0.05$).

Keywords: *Biodiversity, Nematode, Southern Guinea Savannah, Weed*

ABST/NISON2014/011
EVALUATION OF ANIMAL DUNGS AND ORGANOMINERAL FERTILIZER FOR CONTROL OF *MELOIDOGYNE INCOGNITA* ON SWEETPOTATO

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ABSTRACT

Root-knot nematode, *Meloidogyne incognita*, is an important animate pathogen causing

major damage and severe reductions in the growth, yield and quality of sweet potato. Nematicides are expensive and their application also causes environmental pollution. A field experiment was therefore conducted to evaluate the effectiveness of poultry dung (10 or 20t/ha), cow dung (10 or 20t/ha), horse dung (10 or 20t/ha), goat dung (10 or 20t/ha); organomineral fertilizer (2 or 4t/ha) and carbofuran (3kg a.i/ha) in the management of *M. incognita* on sweet potato using a randomized complete block design. Data were analysed using ANOVA ($p \leq 0.05$). All organic materials and carbofuran significantly ($p \leq 0.05$) reduced nematode reproduction and root damage compared with control. Poultry dung (20t/ha) and carbofuran were, however, more efficient in nematode control than other organic materials. Sweet potato plants that were grown on soil treated with organomineral fertilizer had the highest mean number of vines and fresh shoot weight, while poultry dung (20t/ha) increased sweet potato yield by 109%, followed by goat dung (20t/ha) (77.6%). It is therefore recommended that that the use of poultry dung is employed in combination with other nematode control strategies to achieve a sustainable, economic and environment-friendly nematode management.

Keywords: *Animal manures, Management, Organic materials, Root-knot nematode, Sweet potato*

ABST/NISON2014/012
MANAGEMENT OF *MELOIDOGYNE INCOGNITA* AND SALINITY ON PEPPER WITH DIFFERENT ARBUSCULAR MYCORRHIZAL FUNGI SPECIES.

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ABSTRACT

A screenhouse experiment was conducted to evaluate the efficacy of three arbuscular mycorrhizal fungi (AMF) in alleviating the adverse effects of salinity and root-knot nematode on sweet pepper (*Capsicum annum.L*) plants. The experiment was a 2x3x4 factorial laid out in a completely randomized design (CRD) with three replications. The treatments involved 24 combinations of three mycorrhizal fungi (*Glomus mosseeae, Glomus deserticola, Gigaspora gigantea*), plus an uninoculated control, different salinity levels (0.08, 2.00 and 4.00 ds/m) and inoculation with or without 5,000 eggs of *M. incognita*. The pepper seedlings were inoculated with AMF at the nursery stage. Data were collected on number of galls per root system, gall index (0-5 scale), number of egg masses, plant height, fresh root weight and shoot dry weight per plant. The results obtained indicated that the pepper variety "Tatese" was highly susceptible to *M. incognita* infection with heavy galls on non-mycorrhizal plants.Nematode inoculation significantly ($P \leq 0.05$) inhibited growth and dry matter production in pepper relative to the uninoculated plants. Increase in salinity level significantly ($P \leq 0.05$) significantly ($p < 0.05$) inhibited root galling, growth and dry matter accumulation in

pepper .AMF inoculation significantly ($p<0.05$) reduced root galling compared with the nonmycorrhizal plants. Arbuscular mycorrhizal fungi inoculation significantly ($P\leq0.05$) enhanced growth and dry matter yield of pepper in the presence or absence of nematode infection at all salinity levels relative to the non-mycorrhizal plants. Among the AMF species, *G. deserticola* was the most efficient in ameliorating the injurious effects of salt and *M. incognita* followed by *G. mosseae*.

Keywords: *Biological control, Plant-parasitic nematodes, Root galling*

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PHYTOCHEMICAL CONSTITUENTS OF SIAM WEED (CHROMOLAENA ODORATA) AND AFRICAN CUSTARD APPLE (ANNONA SENEGALENSIS).

By

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ABSTRACT

Siam weed (Chromolaena odorata) and closely related species of Annona senegalensis such as A. Muricata, A. Squamosa had been investigated for nematicidal activity for the control of nematodes on crops. This study was carried out to provide some information on the phytochemical constituents in these plants.

Chromolaena odorata leaves and roots, Annona senegalensis leaves and bark collected, air-dried and ground into powder, were taken to The Central Laboratory, University of Ibadan for Infrared (IR) Analysis. Phytochemical analysis was carried out in the Department of Pharmacognosy, University of Ibadan. The concentrations of some phytochemicals were determined.

Results of IR revealed the functional groups were alcohols, amides, alkenes, carbonyl, unsaturated/aromatic, double bonds, carboxyl, metals and phenols. The chemical constituents were alkaloids, phenols, flavonoids, saponins, cardenolides, anthraquinones and tannins. Chromolaena odorata leaf contained total phenols 38.6 mg/g, tannins 41.0 mg/g, flavonoids 7.7 mg/g, saponins 331.7 mg/g, alkaloids 12.2mg/g; C odorata root contained total phenols 14.3 mg/g, tannins 14.5 mg/g, flavonoids 1.5 mg/g, saponins 34.8 mg/g, alkaloids 11.5 mg/g. Annona senegalensis leaf contained total phenols 31.0 mg/g, tannis 31.7 mg/g, flavonoids 11.5 mg/g, saponins 103.3 mg/g, alkaloids 12.0 mg/g, and A. Senegalensis bark contained total phenols 91.2mg/g, tan

nins 97.6mg/g, flavonoids 0.5mg/g, saponins 156.2mg/g, alkaloids 14.7mg/g.

Key words: Siam weed, African Custard Apple, Infrared (IR), Functional groups, phytochemicals.

ABST/NISON2014/014
COMPARATIVE PROFITABILITY OF MANAGING *MELOIDOGYNE INCOGNITA* ON COWPEA USING CARBOFURAN AND *ALOE KEAYI* LEAVES

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ABSTRACT

The cost-benefit of managing *Meloidogyne incognita* on cowpea using leaves of *Aloe keayi* (AKY) and carbofuran was evaluated in a field experiment with a view to selecting the more profitable management option. The experiment was laid out in randomized complete block design and the treatments were; *A. keayi* at 80 kg/ha, carbofuran at 2 kg a.i./ha, untreated and uninfected control. Two-week old Ife Brown cowpea seedlings were inoculated with 10,000 eggs of *M. incognita* (except uninfected control). Milled leaves of AKY and carbofuran were applied one week after inoculation (WAI). Data were collected at 10 WAI on growth, yield, gall index (root damage), nematode population, costs and benefits of treatments. Treatment of *M. incognita*-infected cowpea with AKY and carbofuran improved vegetative growth by 201.6.3% and 183.5%, respectively compared to untreated. Root damage was reduced by 62.5% and 68.8% by AKY and carbofuran, respectively. Milled leaves of AKY compared effectively with carbofuran in reduction of nematode population. Treated cowpea with AKY improved grain yield by 219.9% that translated to a gross margin (GM) of US$ 798.1 per hectare; whereas carbofuran gave a yield increase of 204.5% that translated into a GM of US$ 692.3 per hectare. Cost:benefit (CB) analysis showed positive return per hectare when cowpea was treated with AKY and carbofuran. Management of *M. incognita* on cowpea with AKY (CB=0.61) is more profitable than carbofuran (CB=0.74).

Keywords: *Aloe keayi, Carbofuran, Cowpea, Meloidogyne incognita, Profitability*

ABST/NISON2014/015
REACTION OF SOME VARIETIES OF CASSAVA (*Manihot esculenta* Crantz) TO ROOT-KNOT NEMATODES

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ABSTRACT

Rapid screening was carried out to determine the reaction of sixty cassava varieties to *Meloidogyne incognita* (Kofoid& White) Chitwood. Stem cuttings (25cm) of the cassava

varieties were planted in black polythene bags containing 5 litres of steam-sterilized soil. Inoculated plants (one 3- week old seedling per pot) received the standard inoculum of 5,000 eggs of *M. incognita*. The un-inoculated plants served as control. There were 120 experimental units replicated four times and arranged in a completely randomized design in the screenhouse. Sixteen weeks after inoculation, the plants were carefully uprooted. The plants were assessed for root galls, nematode population in the soil and roots were estimated and nematode reproductive factor (RF) was determined. Data were taken on fresh shoot weight, fresh feeder root weight and effect of *M.incognita* on growth parameters of the cassava varieties was determined. On the basis of three parameters namely: growth parameters, gall index and reproductive factor, seven varieties TMS 30001, 93/0078, 93/0241, 95/0058, 97/04580 and 99/0240 were found to be resistant, twenty varieties were tolerant while thirty-three varieties out of the sixty varieties were susceptible to the nematode.
Keywords: *Feeder root Manihot esculenta, Meloidogyne incognita*

ABST/NISON2014/016
SUSCEPTIBILITY OF SELECTED ORNAMENTAL PLANTS TO THE ROOT-KNOT NEMATODE *Meloidogyne* ***species.***

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ABSTRACT

Meloidogyne incognita (the root-knot nematode) is a serious pathogen of ornamental plants. It directly attacks plants limiting their growth and vigor and diminishing the aesthetic value of many of the affected plants. The susceptibility of 42 common ornamental plants to *Meloidogyne* species infection was studied using the standard quantitative scheme of assigning host suitability designations. The experiment was arranged in completely randomized design with 42 treatments (ornamental plants) and four replicates. Thirty-eight of the plants were resistant while the following were susceptible to the root-knot nematode: *Bryophyllum pinnatum, Codiaeum variegatum* (Croton), *Codiaeum variegatum* (Gold Dust) and *Portulaca olliacea.* It is suggested that these susceptible plants are not used in *Meloidogyne incognita* infested soils.
Keywords: *Host resistance, Ornamental Plants, Plant-parasitic nematodes*

ABST/NISON2014/017

REACTION OF WHITE YAM (DIOSCOREA *ROTUNDATA*) TO *MELOIDOGYNE SPP., SCUTELLONEMA BRADYS* AND *PRATYLENCHUS COFFEAE* USING VINE CUTTINGS.

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ABSTRACT

Nematodes have been reported as one of the actual biological constraints for yam production in West Africa. Efforts in research have been oriented to identify reactions to this pest; however these efforts have been focussed on few accessions. A screen house experiment was conducted to evaluate yam (*Dioscorea rotundata*) accessions for resistance to *Meloidogyne spp., Scutellonema bradys* and *Pratylenchus coffeae*. Forty accessions of yam were planted on the field from which vines were cut 100DAP and planted in a 2:1 steam- sterilized topsoil and river sand substratum, loaded in vertical sacs (80 x 30cm). The experiment was laid out in split-plot design with three replications. Four weeks after planting, each vine in a bag was inoculated with 200 juveniles of *Scutellonema bradys, Pratylenchus coffeae* and 500 eggs of *Meloidogyne spp.* Sixteen weeks after inoculation, tubers were harvested. Yield and resistance on tuber reaction were evaluated based on nematode reproductive factor and damage scoring. Nine out of the 40 accessions were found to be tolerant to dry – rot damage caused by *Scutellonema bradys* while the rest were susceptible,18 out of 40 accessions were resistant to galling damage caused by *Meloidogyne spp.*, four accessions were tolerant while the rest were susceptible. 13 out of 40 accessions were tolerant to dry rot damage caused by *Pratylenchus coffeae* while the rest were susceptible. The clone Tdr 03/00058 had the highest tuber weight and was also susceptible to *Meloidogyne spp., P. coffeae* and S. *bradys making it a tolerant yam accession. Based on the accessions used, the work supports the report (IITA, 2004) that identification of resistance, to nematode constraints is highly desirable, but yet remains to be realized yams since none of the accessions were resistant Pratylenchus coffeae and Scutellonema bradys. From this study it was concluded that* vine cutting is an effective tool in evaluating reactions of *D. rotundata* to nematodes; there is a moderate level of resistance to *S. bradys* which can be exploited to increase yam resistance to this soil-borne pathogens.

Keywords: *Dioscorea rotundata, Meloidogyne spp., Pratylenchus coffeae, Resistance, Scutellonema bradys, Tolerance.*

ABST/NISON2014/018

SURVEY OF PLANT-PARASITIC NEMATODES ASSOCIATED WITH SELECTED CASH CROPS IN SOUTH WESTERN NIGERIA.

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ABSTRACT

Plant-parasitic nematodes are known to cause yield losses of about 45% to various crops including cash crops. Various authors have established the fact that yield losses as much as

45% of the total production as a result of nematodes infection have been reported on various crops including cash crops in Nigeria and other parts of the world. This research was conducted to survey the plant-parasitic nematodes associated with cocoa (*Theobroma cacao*), coffee (*Coffea* spp.) and cashew (*Anarcadium occidentale*) in South Western Nigeria. Five States: Ekiti, Ondo, Osun, Ogun and Oyo were selected among the South Western States. Three Local Government Areas were visited in each State for sample collection. Soil and root samples were collected from three locations from each Local Government Area (LGA). The samples were processed and the extracted nematodes were identified to generic level. Six genera of plant-parasitic nematodes were found associated with the three crops; namely *Paratylenchus* spp., *Pratylenchus* spp., *Helicotylenchus* spp., *Tylenchus* spp., *Meloidogyne* spp. and *Aphelenchus* spp. *Helicotylenchus* spp. was found to be the most abundant and frequently encountered nematode; occurring in 88.2%, 71.1% and 8.9%, respectively, on cocoa, cashew and coffee root samples across Western Nigeria. The same nematode, *Helicotylenchus* spp. occurred most abundantly at 83.8%, 82.4% and 13.2% of the soil samples for cocoa, cashew and coffee, respectively. Further studies to determine the severity of infection of the identified nematodes on each of the crops is being proposed.

ABST/NISON2014/019
PLANT-PARASITIC NEMATODES ASSOCIATED WITH CASSAVA (*Manihot esculenta*) IN THREE LOCAL GOVERNMENT AREAS OF RIVERS STATE IN NIGERIA.

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ABSTRACT

Many plant-parasitic nematodes (PPNs) have been reportedly associated with cassava in different geographical areas, but they vary in types and population over time and space. There is the need for extensive and current investigation of PPNs on cassava in most cassava-growing areas in Nigeria to ensure their proper management. The study identified and determined recent occurrence of plant-parasitic nematodes associated with cassava in three Local Government Areas (LGAs) of Rivers State in Nigeria in the growing season of 2013. Soil and root samples of cassava were collected from 27 cassava-growing farms across the three LGAs. Plant-parasitic nematodes were extracted, identified and their population determined using standard procedures. Five PPNs genera were found associated with cassava: *Helicotylenchus*, *Meloidogyne*, *Pratylenchus*, *Scutellonema*, and *Gracilacus*. *Gracilacus* spp. and *Pratylenchus* spp. were the predominant PPNs ($P \leq 0.05$) in the soils and roots of cassava, respectively. The significant occurrence and abundance of *Gracilacus* species might indicate it as one of the emerging key nematode pests of cassava in Rivers State.
Keywords: *Manihot esculenta*, Plant-parasitic nematodes, *Gracilacus* species, *Pratylenchus* species, *Helicotylenchus* species

ABST/NISON2014/020

PLANT-PARASITIC NEMATODES ASSOCIATED WITH OLD CACAO PLANTATIONS IN OYO AND ONDO STATE OF NIGERIA

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ABSTRACT

A study was conducted to determine the types, frequency and population of plant-parasitic nematodes associated with old cacao plantation in Cocoa Research Institute of Nigeria, Ibadan and Owena in Ondo State of Nigeria using random sampling along the four cardinal direction around the base of the root using the tray modification of Baerman technique for plant-parasitic nematodes extraction. Ten genera of plant-parasitic nematodes were encountered in Ibadan. Plant-parasitic nematodes recovered included *Meloidogyne* spp., *Pratylenchus* spp., *Helicotylenchus* spp. *Paralongidorus* spp., *Eutylenchus* spp., *Scutellonema* spp., *Hemicyclophora* spp., *Xiphinema* spp., *Longidorus* spp. and *Anguillulina* spp., and the most widely distributed was *Meloidogyne* spp with the frequency rating of 67%, followed by *Anguillulina* spp and *Paralongidorus* spp. with a frequency rating of 50% and 33% respectively. Thirteen genera of plant-parasitic nematodes were encountered in Owena, these include *Meloidogyne* spp., *Pratylenchus* spp., *Helicotylenchus* spp. *Paralongidorus* spp., *Eutylenchus* spp., *Scutellonema* spp., *Hemicyclophora* spp., *Xiphinema* spp., *Longidorus* spp., *Anguillulina* spp., *Psilenchus* spp., *Tetylenchus* spp. and *Heterodera* spp. *Meloidognye* spp. was the most predominant in Owena soil with a frequency rating of 75%, this was followed by *Hemicyclophora* spp. and *Eutylenchus* spp. having a frequency rating of 33 and 25% respectively.

Keywords: *Cacao, types, frequency, population of plant-parasitic nematodes*

ABST/NISON2014/021

HOST PLANT RESISTANCE IN THE MANAGEMENT OF *MELOIDOGYNE INCOGNITA* ON MAIZE

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ABSTRACT

Meloidogne incognita is a cosmopolitan pest of crops causing galling in infected roots. Above-ground symptoms include stunting, leaf cholorosis and patchy growth. Root galls may be small, large or further back along the root. Typical gall symptom may be totally absent in some cases. This made some people to consider maize as a poor host or immune to root-knot nematodes. This study was embarked upon to know the *M. incognita* status of some selected maize genotypes that are of economic importance to farmers and researchers and the possibility of using such maize genotype in *M. incognita* management. Fifteen selected maize genotypes, based on resistance to Downy mildew, maize streak virus and striga, were screened in a screenhouse experiment for susceptibility to *M. incognita*. Out of these, six genotypes were selected for field work based on resistance to *M. incognita*. Five thousand juveniles and adults of *M. incognita* were used for the inoculation of the maize genotypes; both in screenhouse and on the field. Parameters on *M. incognita* density, reproductive factor (RF), grain yield, galling pattern and galling index were assessed at harvest. The RF ranged from 0.04 to 1.18 and mean *M. incognita* density was between 22.1 and 591.0 per plant. In this study, maize genotypes: Western Yellow, 9450, Oba Super 2 and Oba Super 1 were rated moderately resistant. Gandajika was tolerant, while Saint Mazoca larga and 5057 were moderately susceptible to *M. incognita* infection. Some unusual galling patterns such as: multiple terminal globose galls, tumour-like galls, hyper galls (galling of the galls) and degenerative massive galls, were observed in this study. This study established that the moderately resistant genotypes prevented a significant grain yield loss of 15.0% in the field studies. It was also observed that most of the genotypes that were resistant to Downy mildew, maize streak virus and striga were also resistant to root-knot nematode. Perhaps maize resistance to Downy mildew, maize streak virus and striga resistance could be an indicator to *M. incognita resistance in maize*. The use of host plant resistance to manage root-knot nematode of maize, without the use of nematicide, is cheap, readily accessible, eco-friendly and sustainable for peasant maize farmers in Africa.

Keywords: Root-knot nematode, resistant genotypes, grain yield loss, galling

ABST/NISON2014/022

COMPARATIVE EVALUATION OF PREMIUM LANDRACES AND ELITE LINES OF *Vigna unguiculata* (L.) Walp FOR REACTION TO *Meloidogyne incognita*

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ABSTRACT

Cowpea yield is greatly reduced by infection of *Meloidogyne incognita*. There is dearth of information about the reaction of 'Oloyin' and Bornu Brown cowpea landraces to nematode infection. Two premium landraces ('Oloyin' and Bornu Brown) and five elite cowpea lines (IT98k-491-1, IT03K-351-1, IT90K-76, IT97K-568-18 and IT97K-499-35) from IITA were evaluated for their resistance to root-knot. The study was carried out in the screenhouse of Plant Quarantine Services, Ibadan. Seedlings of each cowpea variety was inoculated with 0 and 5000 eggs of *M. incognita* per plant, seven days after emergence in a 7x2 factorial experiment fitted into a Randomized Complete Block Design (RCBD) with six replicates. Resistance to root-knot nematodes was studied using standard methods. Three replicates of the experiment were randomly selected at the sixth week for root-gall index (GI) assessment, nematode reproduction factor (R) and plant vegetative reaction to the root-knot nematode. Nematode effect on yield parameters were obtained from the other three replicates of the experiment at harvest. Results showed that **'Oloyin' and Bornu brown were susceptible to *M. incognita* with a percentage grain yield loss of 43.60% and 41.63% respectively (P<0.05, GI>2 and R>1). IT90K-76 and IT97K-568-18 exhibited resistance with no significant difference (P>0.05) in grain yield of inoculated plants and control (R<1 and GI<2). IT98K-491-4 and IT03K-351-1 were tolerant to the root-knot nematode. There was no loss in grain yield despite heavy root galling (GI>3.0) and high nematode reproduction (R=1.21 and 1.47 respectively). It was concluded that root-knot nematodes should be controlled for optimum yield, when 'Oloyin' and Bornu brown varieties of cowpea are grown in root-knot nematode-infested soil.**

ABST/NISON2014/023
POPULATION CHANGES OF PLANT-PARASITIC NEMATODES IN YAM CROPPING SYSTEMS IN NIGERIA

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ABSTRACT

An assessment to determine the population changes of plant parasitic nematodes in yam (*Dioscorea* spp.) cropping systems was undertaken at IITA, Ibadan, Nigeria. The influence of tillage (Ridged and Flat), cropping system (maize intercrop and yam monocrop), planting densities (10025, 13333, 14815, 16667, 19048, 22222, 26667, and 33333 ha^{-1}) and fertilizer application (NPK fertilizer 200 kg ha^{-1} plus Urea 65 kg ha^{-1} plus KCl 100 kg ha^{-1}) on population changes of nematodes was monitored in four yam fields between October and December. Eleven genera of plant-parasitic nematodes were identified. Populations of *Meloidogyne* spp., *S.bradys, Pratylenchus* spp., *Aphelenchus* spp., were significantly higher in November than October and December. Populations of some nematodes were generally low throughout the three months. The application of fertilizer appeared not to have any significant effect on nematode populations in soil though populations were low. *Pratylenchus* spp *and Helicotylenchus* spp had the highest population in yam plots intercropped with maize. *S. bradys* and *Aphelenchus* spp also had the highest population in flat compared with ridged plots. *Pratylenchus* spp was significantly lower at 19048 ha^{-1} and 33333 ha^{-1} compared with other planting densities. *Helicotylenchus* spp also had the highest population at 22222 ha^{-1} compared with other planting densities. At plant population density of 10025 ha^{-1} nematode population were generally low. Low population densities of yam plants, such as 10025 ha^{-1} supported lowest nematode population.

Keywords: *Cropping system, Fertilizer, Plant density, Tillage system, Yam* (*Dioscorea* spp.)

ABST/NISON2014/024
EVALUATION OF TOMATO (Solanum lycopersicum L.) LINES FOR RESISTANCE TO ROOT KNOT NEMATODES (*Meloidogyne incognita* and *M. enterolobii*).

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ABSTRACT

Root knot nematodes (*Meloidogyne* spp.) are important group of plant parasitic nematodes which poses threat to tomato (*Solanum lycopersicum* L.) production. The study evaluated

seven lines of tomato collected from the World Vegetable Centre, AVRDC, Taiwan, (AVT0 1080, AVTO 09802, V1045743, AVTO 1122, AVTO 0922, AVTO 1141, AVTO 1143,) in comparison to Roma VFN, Ibadan local, Celebrity and Beske) for resistance to *M. incognita* and the newly identified *Meloidogyne* species, *M. enterolobii.* The experiment was a 3 × 11 factorial laid out in Randomized Complete Block Design. All the pots were inoculated with 2000 eggs except the control pots. Data taken were stem girth, plant height, days to flowering, fresh shoot weight, fresh root weight, galling index and reproductive factor. Both *Meloidogyne* spp. had a significant effect (p= 0.05) on days to flowering but did not significantly reduce the stem girth, plant height and fresh shoot weight of the tomato lines 8 weeks after inoculation. However, *M.enterolobii* had similar galling index with *M. incognita* with indices of 4.6 and 4.7, but, *M. incognita* reproduced significantly more than *M. enterolobii* with values of 95.3 and 26.0 respectively. All the varieties were found to be susceptible to both *Meloidogyne* spp.

***Keywords**: Resistance, Reproduction, Root-knot nematodes, Solanum lycopersicum*

ABST/NISON2014/025
VARIABILITY OF NEMATODE COMMUNITY STRUCTURE AS INFLUENCED BY ORGANIC FERTILISER AMENDMENTS IN SOYBEAN FIELDS

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ABSTRACT

Effects of the application of gateway, sunshine and neem organic fertilisers on population changes during the growing season on nematode communities were evaluated in two soybean fields in Ogun State, Nigeria. The organic fertilisers were manually incorporated into the soil two weeks before planting while basal application of NPK 15:15:15 was done two weeks after planting on the check plots. Nematodes were extracted prior to organic fertilizer incorporation and at harvest and identified to genus level. The nematodes recovered were grouped into bacterivores, fungivores, predators, omnivores and plant-parasitic types. Numbers of plant-parasitic nematodes were suppressed while bacterivorous and fungivorous nematodes increased in plots treated with organic fertilisers which resulted in the reduction of the Fungi-to-Bacteria ratio at both sites. Incorporation of the three organic fertilisers also resulted in an increase in the Bacteria-to-Plant-Parasitic ratio and this corresponded with increase in soybean seed yield in the treated plots. The Plant Parasitic Index and Maturity Index were lowered consistently in the organic plots with the exception of Gateway organic fertilizer-treated plots in Ayetoro which had the highest initial population of plant parasitic nematodes and total nematodes

***Keywords**: Bacterivores, Fungivores, Nematode community, Predators, Organic fertilisers*

ABST/NISON2014/026
RESPONSE OF SEVEN ELITE CASSAVA (*MANIHOT ESCULENTA* CRANTZ) VARIETIES TO ROOT-KNOT NEMATODE (*MELOIDOGYNE* SPP.) INFESTATION

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ABSTRACT

Cassava (*Manihot esculenta* Crantz) is attacked by numerous species of plant-parasitic nematodes, among which, *Meloidogyne* spp. are the most damaging. Screening for resistance against these nematodes would be prudent to minimize yield loss and the high costs of alternative control measures. This study was initiated with the major objective of establishing a reproducible and rapid screening protocol for cassava against *Meloidogyne* spp. Therefore, seven elite cassava varieties from the International Institute of Tropical Agriculture (IITA) were evaluated for their responses to early screening at the Federal University of Abeokuta, Ogun State, Nigeria. In the screen house trial, individual plants were inoculated with 30,000 eggs of the nematode species in 30-litre plastic pots. Un-inoculated plants served as the control in a 7x2 factorial experiment fitted into a Randomized Complete Block Design (RCBD) with three replicates. Infected plants were scored for galling on a 1-5 rating scale. Data were collected on growth, yield and nematode infection parameters. At harvest, galls were observed on feeder roots and also on the tubers. All the cassava varieties reacted to *Meloidogyne* spp. infection with varying intensity ranging from an index of 3-5. Variety (TME EB419) had the least number of galls and was rated tolerant with Gall index (GI) of 3, Reproduction Factor of 2.6 and tuber yield of 425.56 g/plant. The other varieties (98/0505, 01/1368, 98/0510, TMS 30572, 95/0289, 98/0581) were rated susceptible with Gall index (GI) of 4-5, Reproduction Factor (RF) >1 and tuber yield varying between 93.61-378.67 g/plant. The nematode infection significantly ($P \leq 0.05$) reduced plant height and fresh tuber weight in all the cassava varieties except for TME EB419. Fresh storage tuber weight reduction ranges from 0.10 % (95/0289) to 63.61 % (TMS 30572). One cassava variety (TME EB419) was rated tolerant with root galling but insignificant storage tuber weight decrease. These results indicate that promising source materials are not available for improving cassava varieties against root-knot nematodes.

Keywords: *Cassava varieties, Galling, Meloidogyne* spp., *Susceptible, Tolerant.*

ABST/NISON2014/027

NEMATODES ASSOCIATED WITH WHITE GUINEA YAM (*DIOSCOREA ROTUNDATA)* UNDER FOUR COMMUNITY-BASED FARMING SCHEME LOCATIONS IN OGUN STATE

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ABSTRACT

Nematodes remain one of the pests causing devastating economic impacts on yam starting from field and proceed to storage. In a way to keep them under management control, this study was conducted to identify the types, frequency and population of nematodes associated with the soils of White Guinea Yam (*Dioscorea rotundata*) in Community-based farming Scheme of the Federal University Of Agriculture, Abeokuta using random sampling in zigzag matter for soil sample collection and Nematodes were extracted and identified. In the study, 26 nematodes genera were found in the four Locations of the community-Based Farming Scheme and the number of nematodes in one soil sample ranged from 11 to 325 individuals/250 g soil. Plant parasitic nematodes recovered and identified included *Scutellonema* spp., *Meloidogyne* spp., *Pratylenchus* spp., *Paratylenchulus* spp., *Trichodorus* spp., *Helicotylenchus* spp., *Hoplolaimus* spp., *Tylenchorhynchus* spp., *Aphelenchus* spp., *Xiphinema* spp., *Ditylenchus* spp., *Rotylenchulus* spp., *Rotylenchus* spp. and *Aphelenchoides* species while the Non-plant- parasitic recovered included *Aulolaimoides* spp., *Cephalobus* spp., *Cylindrocorpus* spp., *Lotonchus* spp., *Monhystera* spp., *Oncholaimus* spp., *Paraplectonema* spp., *Prismatolaimus* spp., *Dorylaimus* spp., *Tylencholaimellus* spp., *Tylencholaimus* spp., and *Tyleptus* spp. *Scutellonema* spp., *Pratylenchus* spp., *Rotylenchulus* spp. and *Meloidogyne* spp. were most widely distributed in soil samples and yam tuber from the four locations in Ogun State.

Keywords: *Community index, Meloidogyne* spp., *Nematode population densities*

ABST/NISON2014/028

EVALUATION OF THE POTENTIALS OF *TRICHODERMA*-ENCODED COMPOST IN THE MANAGEMENT OF NEMATODE DISEASE IN TOMATO (*LYCOPERSICUM ESCULENTUM* MILL).

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ABSTRACT

Plant-parasitic nematodes are major pest of tomato causing yield losses between 65% to 100% in heavily infected fields in Nigeria. Two tomato varieties Roma and Beske were used to test for the potentials of the effect of *Trichoderma*-encoded compost in the management of Nematode disease in tomato in two locations in Abeokuta, Ogun State in 2013. The experiment was laid out in a 2x2 factorial experiment fitted into a randomized complete block design with four replicates, with the treatment being the presence or absence of the *Trichoderma*-encoded compost. On six centrally placed plants present in each plot/experimental unit data was collected on the agronomic parameters. Soil sampling was also carried out at different stages of the growth of the crop to determine the population and types of both plant-parasitic and free living nematodes present on the fields. Data collected were subjected to analysis of variance and significant means were separated using LSD ($p<0.05$). In the FUNAAB location, *Helicotylenchus* spp, *Tylenchus* spp, *Meloidogyne* spp, *Rotylenchus* spp, *Aphelenchus* spp, *Practylenchus* spp, *Alaimus* spp and *Monochus* spp were found on the field. While for the Emere location, *Meloidogyne* spp, *Tylenchus* spp, *Helicotylenchus* spp, *Aphelenchus* spp, *Scutellonema* spp, *Longidorus* spp, *Alaimus* spp, *Monochus* spp and *Monhystera* spp were found to be present in the soil. The application of the *Trichoderma*-encoded compost has a significantly positive impact on the growth parameters as well as yield of tomato in Beske variety. There was marked reduction of observed plant-parasitic nematodes in *Trichoderma*-encoded compost application for the Beske variety.

Keywords: *Composts, Phytonematodes, Predators*

ABST/NISON2014/029

COMBINED EFFECT OF TWO COMPOSTS OF DIFFERRENT ORIGINS IN THE MANAGEMENT OF ROOT-KNOT NEMATODE IN TOMATO

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ABSTRACT

The perils associated with the use of chemical pesticides have necessitated the need for eco-friendly methods of control, particularly organic soil amendments. Therefore, this research was carried out in the screen house of the Department of Crop Protection, College of Plant Science and Crop Production, Federal University of Agriculture, Abeokuta **during the 2013/2014 planting season.. Composts used in this study consisted of Vermicompost (VC) and Trichoderma-encoded compost (TC) both in combination and in single applications at different percentage compositions of 10, 0.5. The tomato variety used was grown in each pots containing sterilized soil of 600g. The experiment was laid-out in** Completely Randomized Design (CRD). There were six treatments in which each treatment was replicated six times. Data were collected from growth parameter, dry matter content and population of juvenile nematodes in 250g of soil.From the experiment conducted, it was obvious that the VC and TC both in combination or in singly has significantly effect on plant growth parameters, dry matter content and population of nematodes control but **Trichoderma-encoded compost have more effect in controlling the *Mi* population in singly compared to when used in combination with Vermicompost on tomato plant. Based on the results obtained it** is therefore recommended that in controlling *Mi*. nematode population in tomato variety, TC and VC at 1% composition (v/v) relative to soil may be explored for improved crop growth and dry matter content.

Keywords: *Nematode, Management, Vermicompost, Trichoderma, Tomato*

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Effect of Plant Extracts on the Control of *Meloidogyne javanica* in the Laboratory.

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ABSTRACT

An Experiment was conducted in the Laboratory of the Department of Crop Protection, Modibbo Adama Universty of Technology, Yola, in 2013, to determine the effect of defferent plant extracts on the juvenile mortality of *Meloidogyne javanica* in the Laboratory. 1000 juveniles were exposed to crude and diluted extracts of *Datura stramonjum*, *Tamarin indica* and *Vitex doniana* at 5ml, 10ml and 15ml. Distilled water serves as control. A complete Rondamised design was used for the experiment. A total of fourty five (45) petri dishes was used. Count of dead nematodes were made every twenty four (24) hours for three days. The result revealed that all the plant extracts had nematicidal property, *Datura stramonium* was the most effective followed by *Tamarin indica* and the least mortality was recorded in the control. It is recommended that screen house and field trial be carried out before recommending to farmers.

Keywords: *Extracts, Meloidogyne javanica, Petri dishes, Laboratory.*

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Abstract

Despite the high value of plantain, growing pest and disease pressure have affected its production. The banana weevil (*Cosmopolites sordidus*) is the most important insect pest of plantain, which in conjunction with parasitic nematodes causes yield losses and limits the length of plantain orchards. This study evaluated the potency of acalypha leaf extract against the banana weevils and plant parasitic nematodes in pared and non-pared plantain suckers. **The suckers were planted at 3x3 m spacing and treatments arranged in a randomized complete block design. The treatments consisted of Pared (P), Pared + Red acalypha (PA), Non- Pared (NP), Non- Pared + Red acalypha (NPA). Plantain** growth parameters

were measured at four-week intervals for fifteen months. Pared suckers gave the best growth performance, followed by pared suckers treated with red acalypha. Fewer numbers of adult weevils and plant parasitic nematodes were observed on pared plants treated with red acalypha. Plantain yield parameters (bunch weight, number of hands and fingers) in the plant crop were not significantly different among the treatments in the planted crop. In the first ratoon, plants from pared suckers treated with red acalypha gave the highest yield. Paring of suckers and treatment with acalypha leaf extract before plantain establishment may be recommended to plantain farmers since they both improve vegetative growth and yield of plantain.

Keywords: *Paring, Red acalypha, Plantain pests, Potency, Plant extract.*

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ISOLATION, MYCELIA RADIAL GROWTH AND SPORULATION OF NEMATOPHAGOUS FUNGI IDENTIFIED FROM DECAYED LEAF DEBRIS OF ORCHARD CROP IN ZARIA, NIGERIA.

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ABSTRACT

Nematophagous fungi are natural enemies of slow moving plant parasitic nematodes as well as some free living nematodes. These fungi have a significant contact with nematodes in their vicinity and thus can constantly capture and consumed nematodes as an important source of nitrogen during growth on carbohydrate containing substrates. A survey was carried out in some orchard crops around Zaria, Nigeria with the view to isolate and test the most appropriate media for mass culture of some nematophagous fungi. After 7 to 10 days of incubation, it was recorded that the leaf debris collected from different locations within Zaria inoculated in water agar faecal medium (AFM) were found to harbour some nematophagous fungi. These fungi were identified as *Arthrobotrys*, *Dactylaria*, *Dactylella* and *Monacrosporium* species based on their morphological characteristics. The fungi capture their prey by constricting ring, three-dimensional constricting ring, sticky knobs and non-stalk constricting ring in which about 74 to 93 % of the nematodes tested were

completely captured and consumed by these isolated fungi. In all the cereals tested for mycelia radial spread and sporulation of the isolated fungi, complete radial growth was observed in all the media between 15 and 21 days with better result achieved for *Dactylaria* species in millet after 6 days and 9 days in rice grain media. However, rate of growth was slow for *Arthrobotrys* species except in sorghum in which complete colonization of the Petri dish was attained at 15 days of incubation. Wheat, millet, sorghum and rice grain responded well to these fungi mycelia radial spread, while wheat and millet grain media responded well to mycelia radial spread of *Dactylaria* and *Dactylella* species respectively at ($P<0.05$) level of probability.

Keywords: *Nematophagous fungi, Radial spread, Sporulation.*

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Characterisation of root- knot nematodes (*Meloidogyne* spp.) associated with some vegetable crops grown on Covenant University Farms

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ABSTRACT

Vegetable crops are highly susceptible to a wide range of pests and diseases agents among which are the root-knot nematodes. Traditionally, identification of nematode species had been based on use of morphological characters, however in recent times, accuracy of nematode identification using only morphological characters has been challenged. The aim of this study was to identify the root-knot nematodes associated with some vegetable crops cultivated on Covenant University farm using molecular tools and to determine the population densities of *Meloidogyne* spp. on the crops. Plant- parasitic nematodes were extracted from soil and roots of *Abelmoschus esculentus*, *Celosia argentea* and *Corchorus olitorius* collected from Covenant University farms. The nematodes were counted and identified under a compound microscope while single female adults and eggs were picked out for DNA extraction and were amplified with specific primers through polymerase chain reaction. The population of *Meloidogyne* spp. recovered from *C. argentea* and *Corchorus olitorius* were significantly higher than those obtained from *Abelmoschus esculentus* and the result from the PCR confirms that the nematodes found in association with the vegetable crops belong to the genus *Meloidogyne*.

Keywords: *Horticulture, Indigenous vegetable, Molecular biology*

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