PARTIAL LIST OF ABSTRACTS OF PAPERS PRESENTED AT THE XII ANNUAL MEETING OF OTAN AT POINTE-A-PITRE, GUADELOUPE, AUGUST 17-21, 1980.

LISTA PARCIAL DE LOS RESUMENES DE TRABAJOS PRESENTADOS EN LA XII REUNION ANUAL DE ONTA EN POINTE-A-PITRE, GUADELOUPE, 17-21 AGOSTO, 1980.

EFFECTS OF FUMIGANT NEMATICIDE ON NITROGENASE ACTIVITY IN PEANUT *RHIZOBIUM* NODULES [EFECTO DE NEMATICIDAS FUMIGANTES SOBRE LA ACTIVIDAD DE LA NITROGENASA DE LOS NODULOS DE *RHIZOBIUM* DEL MANI].

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--- Intact peanut *(Arachis hypogaea)* root systems were placed in gas-tight jars and evaluated by the acetylene reduction method for nitrogenase activity. After establishment of an untreated level of activity, the fumigants D-D, telone, DBCP, EDB-chloropicrin (54-45%) and EDB were injected into the jars at rates equivalent to those used in the field. As compared to the control, telone-treated plants had a 24% reduction in nitrogenase activity, EDB 47%, EDB-chloropicrin and D-D treated roots evidenced more than 85% reductions in nitrogenase activity. These results demonstrate that caution should be used in selection of fumigants for post-emergence application to legumes.

A TAXONOMIC SURVEY OF MARINE NEMATODES IN COASTAL WATERS OF THE LOWER FLORIDA KEYS [RECONOCIMIENTO TAXONOMICO DE NEMATODOS MARINOS EN LAS AGUAS COSTERAS DE LOS CAYOS BAJOS DE LA FLORIDA].

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--- A survey was conducted to investigate the marine nematode genera representative of the coastal water ecosystems of the lower keys and the environmental factors with which these genera are associated. Ten substrate samples consisting of 50 cm^3 cores were taken at random from a 1 m^2 quadrant in each of 8 areas on the Gulf of Mexico and Atlantic coasts. Environmental data were also collected from each area. Marine nematodes were extracted from the samples after refrigeration or narcotization with a few drops of 7% $MgCl_2$ followed by subsequent sieving, or by using Baermann funnels. Nematodes were then killed, fixed, and permanently mounted in glycerine for identification which was made primarily using male morphological characters. Nineteen different ganera were recognized. Fifteen genera were in the order *Chromadorida,* among which the following were identified: *Chromadora, Desmodora, Draconema, Epsilonema, Euchromadora, Hypodontolaimus, Pomponema, Prochaetosoma, Prochromadorella, Spilophorella,* and *Spirinia.* Three genera were in the order *Enoplida,* viz *Eurystomina, Metoncholaimus* and *Viscosia.* Only one genus, *Paramonhystera,* in the *Monhysterida* was identified. The frequency of occurence of Chromadorids suggests their successful adaptability to this particular environment.

JOINT INFLUENCE OF NITROGEN, PHOSPHORUS AND *PRATYLENCHUS PENETRANS* ON THE ONTOGENY OF *SOLANUM TUBEROSUM* [INFLUENCIA SIMULTANEA DE NITROGENO, FOSFORO Y *PRATYLENCHUS PENETRANS* SOBRE LA ONTOGENIA DE *SOLANUM TUBEROSUM*]. G. W. Bird, J. Noling, M. Vitosh and R. Chase, Dept. Entomol, Dept. Crop and Soil Science, Michigan State Univ., East Lansing, Mich. 48824, U.S.A. - - - Field studies were used in 1977-79 to evaluate the joint role of soil nutrients and nematicides on the control of *Pratylenchus penetrans* in relation to the growth and development of *Solanum tuberosum* cv. Superior. The experimental variables included three levels of nitrogen fertility (84, 168 & 336 kg/ha), three levels of phosphorus fertility (0, 84 & 168 kg P_2O_5/ha),and two nematicides (aldicarb, 2.2 kg/ha; 1,3-D+MIC, 94 l/ha). The soil nutrients had no direct influence on the population dynamics of *P. penetrans*. Excellent nematode control was obtained with both nematicides, and resulted in significant (P = 0.05) increases in *S. tuberosum* tuber yields. The highest two rates of nitrogen fertility had no significant influence on the ontogeny and tuber yield of *S. tuberosum* except when nematicides were applied. The highest two rates of phosphorus, however, significantly (P = 0.05) increased *S. tuberosum* yields in the absence of nematicides, despite very high initial phosphorus levels. The results indicate the significance of concomitant analysis of soil fertility and plant-parasitic nematodes prior to the development of decisions related to the management of *S. tuberosum* production systems.

BENEFITS OF ADDITIONAL APPLICATIONS OF NEMATICIDES ON PEANUT AT-PEGGING FOR NEMATODE CONTROL [VENTAJAS PARA EL COMBATE DE NEMATODO EN MANI EN LA EPOCA DE 'PEGGING' MEDIANTE EL USO DE APLICACIONES ADICIONALES DE NEMATICIDAS]. D.W. Dickson and R.E. Waites, Department of Entomology and Nematology, University of Florida, Gainesville, Florida 3211, USA - - - The benefits of additional applications of nonfumigant nematicide at-pegging for control *Meloidogyne arenaria* on peanut was evaluated during the past four seasons in an Arredondo fine sand near Williston, Florida. The following nematicides were applied at-plant : aldicarb, DBCP, EDB, phenamiphos and standak. DBCP or EDB were injected 8 inches deep in-row with 2-chisels per row spaced 8 inches apart. Nonfumigants were applied in a 12-inch band at plant incorporated with a rolling cultivator to a depth of 2-4 inches. One treatment was applied directly in the seed furrow at time of planting. The at-pegging applications were made at first bloom (ca. 45 days after planting) in a 14-inch band directly over the peanut vines. Three out of 4 years the fumigant (at-plant) plus aldicarb (at-pegging) was the most effective treatment. This treatment resulted in yield increases over the single at-plant treatment of the fumigant of 18, 25 and 58% in 1976, 1977 and 1978, respectively. In 1979 the most effective treatment was phenamiphos (at-plant) plus an additional application made at-pegging. Results of these investigations suggest the additional application of a nematicide at-pegging further reduces *M. arenaria* and increases peanut yields.

COMPARACION DE UN METODO DE FLOTACION CON UNO DE TAMIZADO PARA LA DETERMINACION DE *RADOPHOLUS SIMILIS* DE RAICES DE BANANO [COMPARISON BETWEEN A FLOTATION METHOD AND A SIEVING METHOD FOR DETERMINATION OF *RADOPHOLUS SIMILIS* IN BANANA ROOTS] J. Escobar y R. Rodríguez-Kábana, respectivemente, Universidad de Guayaquil, Facultad de Agronomiá y Veterinaria, Ecuador, y

Department of Botany, Plant Pathology and Microbiology, Agricultural Experiment Station, Auburn University, Alabama 36849, U.S.A. - - - El número de *Radopholus similis* en raíces de banano fue determinado después de efectuar el licuado de 25 g de raíces siguiendo el método tradicional de licuado-tamizano (Taylor & Loegering) en conjunto con uno basado en la flotación de los nematodos en una solución molar de sacarosa que contenía, 12.5 ug/ml del agente floculador Separan NP-10. De la comparación entre los dos métodos con 50 muestras de raíces los resultados obtenidos con el método de flotación estuvieron altamente correlacionados (r = 0.98) con los obtenidos con el otro método. El método de flotación consiste en diluir el material licuado en 100 ml de agua añadiendo 250 ml de la solución molar de azúcar. La mezcla se dejó reposar por dos min y a continuación la porción clarificada de la mezcla se pasó por dos tamices de 10 cm de diám, uno de 80 micras sobre otro de 400 micras. Los nematodos en el tamiz inferior se traspasaron a una placa de conteo. El método de flotación es más sencillo que el de licuado-tamizado por requerir menos materiales y agua, menor tiempo de procesamiento por muestra y por ser de fácil manejo para personal con poco entrenamiento.

EFFECT OF CLONING ON RESISTANCE OF *SOLANUM SISYMBRIIFOLIUM* TO *MELOIDOGYNE INCOGNITA* AND *M. JAVANICA* [EFECTO DE "CLONING" SOBRE LA RESISTENCIA DE *SOLANUM SISYMBRIILFOLIUM* A *MELOIDOGYNE INCOGNITA* Y *M. JAVANICA*]. G. Fassuliotis, U.S. Vegetable Laboratory, USDA, SEA, AR, 2875 Savannah Highway, Charleston, SC 29407 - - -*Solanum sisymbriifolium* Lam. is resistant to *Meloidogyne incognita* and *M. javanica*. Isolated segments of stem pith were induced to form callus on a modified Murashige and Skoog (MS) medium supplemented with indole-3-acetic acid (IAA) and 2,4-dichloro-phenoxyacetic acid (2,4-D). Complete plantets were obtained by transferring the callus to MS medium containing a proper auxin/cytokinin ratio (IAA) and 6 (dimethylallyl-amino)-purine (2ip) in the medium. The plants regenerated from the callus differed morphologically and cytogenetically from the original diploid plants and were completely fertile. The regenerated callus plants were determined to be tetraploid. Both the diploid and tetraploid plants were evaluated for response to root-knot nematode infection. Observations for gall development and reproduction of *M. incognita* and *M. javanica* on the roots were made 50 days after inoculation with 5,000 eggs of either species in 10-cm pots. Penetration by the root-knot nematode larvae induced swelling of roots in both the diploid and tetraploid plants. Diploid and tetraploid plants were equaly resistant to *M. incognita*. When inoculated with *M. javanica* the diploids were resistant but the tetraploid plants showed significantly higher rates of reproduction. The roots of both plant populations infested with *M. incognita* or *M. javanica* were examined histologically.

EFECTOS DEL CARBOFURAN Y OXAMIL EN EL CAFE CATURRA [EFFECTS OF CARBOFURAN AND OXAMYL ON CATURRA COFFEE]. A. Figueroa, Sección Nematología, MAG, Costa Rica - - - El experimento se efectuó en Sabanilla, Alajuela, Costa Rica. En un plantación de café *(Coffea arabica* L.) de año de edad en siembra definitiva, se determinó un crecimiento deficiente de las plantas relacionado con las poblaciones del nematodo *Pratylenchus coffeae*. Un area de 6989 m^2 (1Mz) con 5.000 arbustos se dividió en 2 parcelas. Una parcela no recibió tratamiento nematicida mientras que la otra fue tratada cada año, de la siguiente manera : 1) carbofurán granular en dosis de 0.75 g/arbusto y aplicado en el suelo alrededor de los troncos; 2) cuatro meses después se la hicieron 3 aplicaciones foliares en bajo

volumen y a intervalos mensuales de oxamil en dosis de 1.500 ppm. El nematicida granular fue aplicado al mediar el mes de mayo, al principio de la estación lluviosa. El programa se continuó por 2 años más. Los datos después de 2 años de experimentación, indicaron diferencias significativas en la cosecha, favorables a la parcela tratada, con un incremento de un 13%. Los resultados obtenidos durante el tercer año mostraron una cosecha ligeramente similar en la parcela tratada, mientras que en la no tratada la cosecha se redujo drásticemente. El incremento final de la cosecha en la parcela tratada fue de un 28%.

RESPUESTAS DE RESIEMBRAS DE CAFE CATURRA AL CARBOFURAN [RESPONSES OF RENEWAL COFFEE TREES (VAR. CATURRA) TO CARBOFURAN]. A. Figueroa, Sección Nematología, MAG, Costa Rica - - - En Alajuela, Costa Rica, se han determinado daños cuantiosos por nematodos en arbustos de café *(Coffea arabica* L.) utilizados como resiembras. En un cafetal viejo e infestado de *Pratylenchus coffeae,* se cultivaron 44 arbustos de café Caturra. A 22 arbustos se les trató con carbofurán granular sobre el suelo y en la base de los troncos, en dosis de 1 g/arbusto. Los tratamientos se hicieron en mayo y setiembre de cada año, durante 5 años consecutivos. La otra mitad de los arbustos no recibieron tratamiento nematicida. Los resultados obtenidos en un lapso de 4 años mostraron en los arbustos tratados con el nematicida, un incremento sistemático y altamente significativo en la altura, diámetros de tallos y números pares de ramas. La cosecha obtenida en el período 1978-79, fue 4 veces mayor en los arbustos tratados con el nematicida. La mortalidad de arbustos en el testigo durante todo el período experimental fue de un 40%.

RESULTADOS PRELIMINARES SOBRE DISTRIBUCION DE FITONEMATODOS EN LA ZONA CAFETERA DE LOS DEPARTAMENTOS DE CALDAS, RISARALDA Y QUINDIO EN COLOMBIA. [PRELIMINARY RESULTS ON THE DISTRIBUTION OF PHYTONEMATODES IN THE COFFEE AREAS OF THE DEPARTMENTS OF CALDAS, RISARALDA AND QUINDIO IN COLOMBIA]. J. Gómez T., FMC Corporation, Zona Andina. A.A.5511, Cali, Colombia - - - Con el objeto de determinar el nivel de distribución y grado de infestación tanto en el estado de semillero en plantas establecidas de los principales nematodos fitoparásitos se iniciaron muestreos de suelo y raíces en las áreas cafeteras de los departamentos de Caldas, Risarald y Quindio en Colombia. Desde Junio de 1978 a Abril de 1980 se procesaron y analizaron 684 muestras de suelo y raíces. Los resultados preliminares permitieron establecer que el 48% de las muestras fueron positivas para *M. exigua* y los ataques más severos se determinaron en los semilleros. La mayoría de las muestras fueron positivas para *Helicotylenchus* en poblaciones bajas. Pocas muestras mostraron poblaciones altas de *Pratylenchus.*

FACTORS AFFECTING THE PATHOGENICITY AND CONTROL OF *MELOIDOGYNE HAPLA* ON POTATO [FACTORES QUE INFLUENCIAN LA PATOGENICIDAD Y EL CONTROL DE *MELOIDOGYNE HAPLA* EN LA PAPA]. G.D. Griffin, USDA-SEA-AR, Crops Research Laboratory, Utah State University, Logan, Utah, 84322 - - - Potato roots and tubers were slightly galled at 16 C, moderately galled at 18 and 20 C. and severely to very severely galled at soil temperatures from 22 to 30 C by *Meloidogyne hapla.* Nematode reproduction paralleled root

and tuber galling. Similar results were observed under field conditions. An increase in the number of hours of recorded soil temperatures above 20 C during the growing season resulted in increases in nematode reproduction and the percentage of galled tubers. Soil temperatures over 20 C for 13.7, 21.0, 19.0 and 11.4 hours/day during June, July, August, and September, respectively, resulted in 2, 54, 56, 60 and 89% galled tubers in plots treated with 1,3-dicloropropene, aldicarb, fensulfothion, or carbofuran, and in untreated control plots, respectively. Soil temperatures over 20 C for 9.6, 11.9, 9.5, and 4.0 hours/day during June, July, August, and September, respectively, resulted in 2, 12, 20, and 63% galled tubers in plots treated with 1,3-dichloropropene, aldicarb, or, fensulfothion, and in untreated control plots, respectively.

THE EFFECT OF CARBOFURAN OR PHENAMIPHOS ON PENETRATION OF *PRATYLENCHUS VULNUS* IN BEAN ROOTS (KENTUCKY WONDER) [EFECTOS DE CARBOFURAN O FENAMIFOS EN LA PENETRACION DE *PRATYLENCHUS VULNUS* EN RAICES DE FRIJOL (KENTUCKY WONDER]. N. Marbán-M. and D.R. Viglierchio, Centro de Fitopatología, Colegio de Postgraduados, Chapingo, Mex., y Division of Nematology, Univ. of Cal., Davis, Ca. 95616 - - - When assessing the ability of *P. vulnus* (L_3-adults) to penetrate bean roots while continuously exposed to nematicide solutions it was established that phenamiphos was more toxic at much lower concentrations than those of carbofuran under identifical conditions, e.g., 16.6 times as much carbofuran was needed to fully inhibit nematode penetration than phenamiphos (0.05 mM vs. 0.003 mM). However, *P. vulnus* treated by both carbofuran or phenamiphos, would regain their normal ability to penetrate bean roots, if allowed to recover in aerated distilled water. Reversibility of activity occurred with both compounds within a range of dosage time exposures. Phenamiphos was again more active at lower concentrations than was carbofuran. On the other hand, foliage treatments with other carbofuran or phenamiphos solutions, irrespective of nematicide concentrations, were ineffective inasmuch as no inhibition of penetration of *P. vulnus* was observed different from that of controls.

CONTROL DE *PRATYLENCHUS COFFEAE* EN REPOBLACION DE CAFE CON NEMATICIDAS SISTEMICOS APLICADOS AL SUELO Y FOLLAJE [CONTROL OF *PRATYLENCHUS COFFEAE* IN COFFEE REPLANTS USING SOIL AND FOLIAR APPLICATIONS OF SYSTEMIC NEMATICIDES]. G.R. Moreira y D. Chaves L., Departamento de Café, Ministerio de Agricultura y Ganadería, San José, Costa Rica - - - Para evaluar su efectividad en el control químico del nematodo fitoparásito *Pratylenchus coffeae* en café, se aplicaron al suelo y al follaje los nematicidas: carbofurán granulado al 5% (20 gr/planta); ethotrop granulado al 5% (20 gr/planta); aldicarb granulado al 10% (10 gr/planta); carbofurán granulado al 5% (20 gr/planta + oxamil concentrado emulsificable aplicado al follaje 1500 ppm). Los nematicidas granulados se aplicaron al suelo alrededor de la planta en la banda de raíces absorventes. El nematicida en concentrado emulsificable se aplicó al follaje. El comportamiento de los nematicidas se estudió durante 4 años consecutivos, aplicándolos 2 veces por año en Junio y Diciembre y para su evaluación se midieron los siguientes parámetros : a. Altura de la planta en centímetros; b. Grosor del tallo en mm; c. Número de pares de bándolas por planta; d. Población de nematodos por 100 gramos de raíz; e. Cosecha en kg/ha. Los mejores tratamientos en su orden fueron aldicarb granulado del 10%, carbofurán granulado del 5% + oxamil concentrado emulsificable, carbofurán granulado del 5% y ethotrop granulado del 5%.

EFFECT OF OXIMECARBAMATES, ORGANOPHOSPHATES AND ONE AVERMECTIN ON THE HATCHABILITY OF THREE *MELOIDOGYNE SPECIES* [EFECTO DE OXIMECARBAMATOS, ORGANOFOSFATOS Y UN AVERMECTIN EN LA ECLOSION DE TRES ESPECIES DE *MELOIDOGYNE*]. D. Nordmeyer and D.W. Dickson, Department of Entomology and Nematology, University of Florida, Gainesville, FL 32611, USA --- The inhibitory effect of four concentrations of oximecarbamates, organophosphates and one avermectin on the hatchability of eggs of *Meloidogyne javanica, M. arenaria* and *M. incognita* was determined. The chemicals and concentrations evaluated were: Merck, Sharp and Dohme L-6-76,897-00G18 (avermectin B2) 0, 1/64, 1/16, 1/4. and 1 ppm; aldicarb ethotrop, phenamiphos 0, 1, 2, 5 and 10 ppm; oxamyl 0, 5, 10, 50 and 100 ppm; carbofuran and FMC 35001 (carbosulfan) 0, 5, 25, 50 and 150 ppm. Five egg masses, replicated six times, were exposed to each concentration of the chemicals at 28C for 5 days. Each day the number of the larvae that hatched were counted and removed. After the 5th day the egg masses were rinsed and placed in distilled water. The daily hatching rate was determined for the next 5 days. The EC-50 value was calculated for each treatment after the 5th day in the nematicide solution. The average inhibitory effect of the nematicides on all three species decreased in the order of avermectin B2> phenamiphos> ethotrop> aldicarb> oxamyl> carbofuran> carbosulfan. There was no uniform differential effect of the nematicides on hatching between the three species. However, after transferring the treated egg masses to water, the reactivation of hatching was faster and more complete for *M. javanica* than for *M. arenaria,* or *M. incognita.* The average recovery rates for the three species were 59%, 38%, and 19%, respectively.

INVESTIGATION ON THE INTERACTION BETWEEN *HETERODERA DAVERTI* AND *FUSARIUM AVENACEUM* ON *TRIFOLIUM SUBTERRANEUM* [INVESTIGACION SOBRE LA INTERACCION ENTRE *HETERODERA DAVERTI* Y *FUSARIUM AVENACEUM* EN *TRIFOLIUM SUBTERRENEUM*]. D. Nordmeyer and R.A. Sikora, Department of Entomology and Nematology, University of Florida, Gainesville, Florida 32611, USA, and Institut für Pflanzenkrankheiten, Universitat Bonn, 5300 Bonn, Federal Republic of Germany --- The interaction of *H. daverti* and *F. avenaceum* was evaluated on "48G" a tunesian ecotype of *Trifolium subterraneum.* This ecotype, which is tolerant to both organisms, was treated with: nematode alone, fungus alone, nematode + fungus inoculated simultaneously, nematode inoculated one and 2 week(s) after the fungus. Each treatment was replicated 5 times. The single inoculations of the nematode and the fungus alone reduced yields 9% and 12% respectively. The simultaneous inoculation did not influence the yield over the additive effect of the single inoculations, but split inoculations resulted in a synergistic reduction in yield of 40%. The disease index of the split treatments was significantly increased over the additive effect. Also, the number of cysts/g roots was increased from 2 cysts for the single inoculation to 18 cysts when the nematode was inoculated 2 weeks after the fungus. In addition, an alteration in the pigmentation of the leaves to both yellow and/or red occurred in plants receiving the split treatments. To determine the time required for the fungus to predispose the clover to the nematode, a susceptible cultivar 'Clare' was infested with 10^6 conidia of *F. avenaceum*/25 cm^3. Five days later the seedlings were removed from the sand, the roots washed, and 10 plants were transplanted per pot in sterile sand. Five, 7, 9, 13 and 21 days after transplanting, the pots were inoculated with 2000 *H. daverti*/10 cm^3. Four weeks after the inoculations were made, the number of cysts per pot was

determined. Plants predisposed 5 and 7 days to the fungus had a 69% and 68% higher number of cysts, respectively, than the control, whereas a longer exposure time resulted in a decreasing number of cysts over the control for the 9 (32%), 13 (30%) and 21 (27%) day periods.

MIGRATION OF *PRATYLENCHUS COFFEAE* AND *P. BRACHYURUS* ON CITRUS AND IN SOIL [MIGRACION DE *PRATYLENCHUS COFFEAE* Y *P. BRACHYURUS* EN CITRICOS Y EN SUELO]. J. O'Bannon, USDA, SEA, AR, IAREC, Prosser, Washington 99350 - - - Single one-year-old *Citrus limon* seedlings previously infected with either *P. coffeae* or *P. brachyurus* were transplanted in one end of 275 x 45 cm soil bins filled with Astatula fine sand. A single row of noninfected seedlings were planted at 30-cm intervals from the infected seedlings to the opposite end of the soil bin and randomized in 3 replicates in a greenhouse. Soil and root samples were taken at monthly intervals along the seedling row for 11 months. At intervals roots were cut between seedlings to minimize root overlap. To determine the nematode margin, samples were taken from positive to no extraction of nematodes. Once established, the distance behind the margin was sampled to determine population equilibrium. *Pratylenchus coffeae* recovery, from soil and roots showed that successive generations migrated a distance of 76 cm in 11 months, an average of 6.9 cm per month, while *P. brachyurus* migrated a distance of 23 cm or $<$ 2 cm per month. Equilibrium population of approximately 3,000 *P. coffeae*/g root were found 23 cm behind the margin. Because *P. brachyurus* moved such a short distance, its equilibrium was not determined.

RESPONSE OF *CITRUS* AND *PONCIRUS* TO *RADOPHOLUS SIMILIS, TYLENCHULUS SEMIPENETRANS* AND *PRATYLENCHUS COFFEAE* [REACCION DE *CITRUS* Y *PONCIRUS* A *RADOPHOLUS SIMILIS, TYLENCHULUS SEMIPENETRANS* Y *PRATYLENCHUS COFFEAE*]. J.H. O'Bannon, USDA, SEA, AR, IAREC, Prosser, Washington 99350 - - - Seven rootstocks resistant to or susceptible to either *Radopholus similis* or *Tylenchulus semipenetrans* were separately inoculated with each species and *Pratylenchus coffeae* respectively, to study individual nematode response under comparable conditions. Five-month-old seedlings were transplanted into separate soil bins in a greenhouse, each heavily infested with a single species, or in noninfested soil to serve as controls. After 2 months seedlings were selected for uniformity and transplanted into 20 cm pots and randomized in 10 replicates on a greenhouse bench and grown at ambient temperatures for 1 yr. At harvest, roots were incubated in jars to extract nematodes. All life stages were extracted from roots infected with *R. similis* and *P. coffeae,* but only males and larvae of *T. semipenetrans.* Numbers of nematodes per g of root of *R. similis, T. semipenetrans* and *P. coffeae* (in parentheses) for each rootstock were respectively: four *R. similis* resistant cultivars, Milan lemon *(Citrus* sp) (0, 6500, 5500), Algerian navel orange *(C. sinensis)* (30, 4000, 1000), Ridge Pineapple orange *(C. sinensis)* (10, 3000, 1800), Carrizo citrange *(C. sinensis* x *P. trifoliata)* (90, 4500, 2500); one *T. semipenetrans* resistant cultivar, Argentine trifoliate orange *(Poncirus trifoliata)* (100, 5, 3000); and two susceptible cultivars, rough lemon *(C. limon)* (400, 2000, 1500) and sour orange *(C. aurantium)* (100, 6800, 4500). All cultivars were highly susceptible to *P. coffeae.* Growth of all cultivars infected with *P. coffeae* were significantly less ($P \leq 0.01$) than their respective controls, while growth of neither the *R. similis* or *T. semipenetrans* resistant cultivars were significantly different from their respective controls.

COMPARISON OF THE REPRODUCTION RATES OF 5 POPULATIONS OF *RADOPHOLUS SIMILIS* FROM CENTRAL AND SOUTH AMERICA. [COMPARACION DEL INDICE DE REPRODUCCION DE 5 POBLACIONES DE *RADOPHOLUS SIMILIS* DE CENTRO Y SUDAMERICA]. J. Pinochet and O. Ventura, AGRAR, Actividades Agrícolas Aragonesas, Zaragoza, Spain and Division of Tropical Research, United Fruit Company, La Lima, Honduras - - - The reproduction rates of 5 populations of the banana biotype of *Radopholus similis* were compared. All were originally isolated from Valery bananas from La Lima, Honduras; Coto, Costa Rica; Changuinola and Puerto Armuelles, Panama; and Machala, Ecuador. Nematodes were raised in the absence of microorganisms on carrot disks under laboratory conditions. Population increase was measured at 45 and 75 days following inoculation with 10 females per culture jar. Each treatment was replicated 5 times. The Honduran population reproduced at a significantly lower rate at 45 days than the rest. At 75 days the Honduran population also differed from the Panama-Changuinola, Costa Rican and Ecuatorian populations, but not from the Panama-Armuelles. There were no differences between the Costa Rican, Panamanian and Ecuatorian cultures. This physiological difference might explain why losses due to this nematode on bananas in Honduras are not important as compared to those of other countries. Differences in pathogenicity between populations of *R. similis* on bananas appear to be related to speed of reproduction.

INVESTIGATIONS ON THE CONTROL OF YAM *(DIOSCOREA ROTUNDATA)* NEMATODES [INVESTIGACIONES SOBRE EL COMBATE DE LOS NEMATODOS DEL ÑAME *(DIOSCOREA ROTUNDATA*]. J. Román, D. Oramas and J. Green, Agricultural Experiment Station, University of Puerto Rico, Rio Piedras, Puerto Rico - - - In an effort to control the dry-rot disease of yam, *(Dioscorea rotunda)* caused by *Pratylenchus coffeae,* a series of field and greenhouse experiments have been conducted at the Agricultural Experiment Station of the University of Puerto Rico during the last few years. In 1977 a field experiment was conducted to evaluate oxamyl 10G, carbofuran 10G and ethoprop 10G (108 kg/ha) and fensulfothion 15G (75 kg/ha) when applied to the soil at the time of planting yam tubers treated with a solution of dibromochloropropane (600 ppm/15 min) and untreated tubers. In addition, two other treatments were included where nematicides were not applied to the soil, one using treated tubers and the other using untreated tubers. The greatest yield of high quality yams (16.2 MT/ha) was obtained when oxamyl was applied to the soil planted with untreated tubers. Another experiment, conducted during 1978, consisted of combining tubers treated with oxamyl L (1200 ppm/10 min) and untreated tubers with soil application of the following nematicides: fensulfothion 15G (75 kg/ha at planting), fensulfothion 15G (37.5 kg at planting and 37.5 kg four months after planting), carbofuran 10G (107.6 kg/ha at planting) and carbofuran 10G (53.8 kg at planting and 53.8 kg four months after planting). Two other treatments, where no nematicides were applied to the soil, were included, one with treated tubers and the other with untreated tubers. The greatest yield of high quality yams (6.5 MT/ha) was obtained with the combination of treated tubers and two soil applications of carbofuran. The last field experiment, where the seed tubers were not-treated, was conducted in 1979. Four nematicides were applied: carbofuran 5G, carbofuran 10G, fensulfothion 15G and aldicarb 10G, each applied at six doses : 32.04 kg/ha at planting, 16.02 kg at planting and 16.02 kg four months after planting, 64.08 kg at planting, 32.04 kg at planting and 32.04 four months after planting, 96.12 kg at planting. The greatest yields of high quality yams were obtained when fensulfothion

was applied in two application of 32.04 kg each and with all of the aldicarb doses. An additional greenhouse experiment was conducted to evaluate the effect of oxamyl 2 L, fensulfothion 6SC, carbofuran 4F, ethoprop 4EC and phenamiphos 3L (1200 and 2400 ppm/15 min each) and hot water (51°C/15 min) for control of the nematodes of the seed tuber and during germination. Statistical analysis demonstrated that hot water was the only treatment which, significantly controlled the nematodes but affected tuber germination adversely.

PATOGENICIDAD DEL NEMATODO NODULADOR *(MELOIDOGYNE* SP) SOBRE CUATRO VARIEDADES DE VID [PATHOGENICITY OF THE ROOT KNOT NEMATODE *(MELOIDOGYNE* SPP) ON FOUR GRAPEVINE VARIETIES]. P.P. Rondón, Universidad Centro Occidental "Lisandro Alvarado" Instituto de la Uva, Apartado de Correos 400, Barquisimeto, Venezuela - - - El nematodo nodulador *(Meloidogyne* spp) es uno de los parásitos de más amplia distribución en diferentes zonas vitícolas del mundo. En Venezuela este organismo ha sido reportado atacando cultivos de gran importancia económica, incluyendo la vid. Se realizó un experimento bajo condiciones de invernadero, con el fin de estudiar el efecto combinado de poblaciones de *Meloidogyne incognita* y *M. javanica,* sobre las variedades de vid Cardinal, Criolla Negra, Tucupita y Villa Nueva. Seis plantas de cada variedad fueron inoculadas con 20 cm^3 de una suspensión de raíces de tomate infestadas con poblaciones de ambas especies. El efecto patogénico del nematodo y la susceptibilidad de las plantas estudiadas fue evaluado para las siguientes características de las plantas: peso fresco y seco de raíces, altura de la planta e índice de nudosidad. De las cuatro variedades estudiadas, se encontró que la variedad Criolla Negra ofreció mayor resistencia a la penetración del nematodo, no presentándose cambios significantivos en las características de la planta. Para la variedad Villa Nueva, la combinación de ambas especies tampoco afectó las características de la planta, a pesar de que el nematodo penetró y se desarrolló en su sistema radicular. De las variedades restantes, se observó que la Cardinal y Tucupita fueron buenas hospederas, permitiendo un buén desarrollo del parásito en sus sistemas radiculares, siendo el índice de nudosidad radicular para ambas variedades de 4 y 5 respectivamente.

ANTAGONISTIC INTERACTION BETWEEN THE ENDOTROPHIC MYCORRHIZAL FUNGUS *GLOMUS MOSSEAE* AND *ROTYLENCHULUS RENIFORMIS* ON COTTON [INTERACCIONES ANTAGONISTICAS ENTRE EL HONGO ENDOTROFICO MICORRIZOGENO *GLOMUS MOSSEAE* Y *ROTYLENCHULUS RENIFORMIS* SOBRE ALGODON]. R.A. Sikora and K. Sitaramaiah, Institu für Pflanzenkrankheiten, Universitat Bonn, Nussallee 9, 53000 Bonn, Fed. Rep. of Germany - - - The fungus *Glomus mosseae* has been shown to increase plant resistance to a number of soil-borne nematode and fungal disease organisms. In this study the interaction between *G. mosseae* and *Rotylenchulus reniformis* was investigated in the greenhouse on the cotton varieties "Coker Carolina Queen" and "Acala SJ-4". Nematode densities, mycorrhizal levels and plant growth were measured 8 weeks after the introduction of the two organisms singly or in combination. When present simultaneously *G. mosseae* caused an 87 percent reduction in the number of *R. reniformis* adult females on the root system of "Coker Carolina Queen" and a 63 percent reduction on "Acala SJ-4". Mycorrhizal levels on both varieties were slightly reduced when *R. reniformis* was present. There was a significant increase in plant weight in all treatments containing *G. mosseae.* Observations made on "Coker

Carolina Queen", 5 and 10 days after nematode inoculation, showed that the fungus reduced nematode penetration 60 and 27 percent respectively. The fungus also adversely affected eggsac production and egglaying; mature females laid fewer eggs on mycorrhizal plants.

INCREASED YIELD FROM MEYER LEMONS FOLLOWING NEMATICIDE APPLICATIONS [INCREMENTO EN LA PRODUCCION DE LIMONES MEYER DESPUES DE APLICACION DE NEMATICIDAS]. A.C. Tarjan, Department of Entomology and Nematology, University of Florida, Gainesville, FL 32611 -- - Meyer lemon trees, *Citrus limon* cv Meyer, located in mid-Florida's west coast and growing in a light sandy loam, exhibited decline symptoms and were infected primarily with *Belonolaimus longicaudatus* Rau. A 5 x 5 Latin square experimental design involving 25 trees was used with the following treatments: (1) aldicarb granular, a single annual application at 10 kg(ai)/ha; (2) aldicarb granular, a single annual application at 5 kg/ha; (3) aldicarb granular, 2 equal applications totalling 10 kg/ha per year applied semiannually; (4) oxamyl applied as a foliar spray at 1.3 kg(ai)/ha triannually (4 kg/ha annually); and (5) untreated control. Soil and root samples obtained 15 months after starting treatment had significantly fewer *Belonolaimus* from aldicarb-treated trees than from controls (37 to 60 : 127 per 250 g soil). Trees were rated visually 20 months after the test was initiated; those trees receiving chemical treatment were more vigorous and had more leaves with a greener coloration than control trees. Lemon yields were obtained immediately there after; only those trees treated annually with either a single or double application of aldicarb had significantly greater yields than those from untreated trees (3.4 or 2.9 : 2.0 boxes per tree).

DIFFERENCES IN FREQUENCY OF MORPHOLOGICAL VARIANTS AND IN HOST PREFERENCES AMONG POPULATIONS OF THE BANANA RACE OF *RADOPHOLUS SIMILIS* [DIFERENCIAS EN LA FRECUENCIA DE VARIANTES MORFOLOGICAS Y EN LA PREFERENCIA DE HOSPEDEROS ENTRE POBLACIONES DE LA RAZA DEL BANANO DE *RADOPHOLUS SIMILIS*]. R. Tarté, Carmen Gabrielli, J.A. Aguilar, Marisela Solano and D. Cordero, Unión de Países Exportadores de Banano, Apartado 4273, Panamá 5, Panamá and Facultad de Agronomía, Universidad de Panamá, Panamá, R. de P - - - Observations on the morphology of females of the banana race of *R. similis* revealed the existance of at least two distinct morphological variants, one possesing a rounded tail terminus and another with a pointed tail terminus. The frequency of such variants differed among different populations of the nematode. In thirteen populations studied from Mexico to Ecuador the ratio of pointed-tailed : rounded-tailed females ranged from 25 : 75 to 98.8 : 1.2. A relationship between nematode morphology and damage caused to the plant has been suggested. This suggestion is based on the results of experiments and on field observations that have shown that in nematode populations causing little or no damage to the banana plant there is a higher frequency of females possesing a pointed tail as compared to damaging populations. A non-agressive population from La Lima, Honduras, for instance, showed a frequency of 48.2% of pointed-tail females as compared to aggressive populations from Machala (Ecuador), Changuinola (Panama) and Armuelles (Panama), in which the percentage of pointed-tail females was found to be 25.6, 28.8 and 25.0 respectively. The above mentioned populations had been reared on carrot disc cultures for several generations when the morphological observations were conducted. The same populations were

used to inoculate a series of crop and plant species in order to determine physiological differences with respect to host preferences. Of six plant species, tomato, "Rutgers", sweet potato, "All Gold", and four oranges were not attacked by any of the populations. The highest build-up of the nematode occured in all populations with sorghum, "Dorado M", and cowpea, "Romefa". However, the number of nematodes recovered per root system, was many times as high in the Honduras as in the rest of the populations. Although the Machala population practically did not reproduce in pigeon pea, "64-2-B", this crop followed sorghum and cowpea in host efficiency, and again more nematodes were recovered from the Honduras than from the remaining populations. Okra, "Clemson's Spineless", corn, "Tocumen 7428" and *Desmodium ovalifolium* were poor hosts of the nematode. The only appreciable count occured in okra for the Honduras population and in corn for the Machala population. These studies confirm the existance of physiological differences among *R. similis* populations. Although it has yet to be proved, there is increasing evidence of a possible relationship between the nematode's physiological behavior and certain morphological characteristics.

NOTE — NOTA

The remaining abstracts of papers presented at Pointe-á-Pitre, Guadeloupe, will appear in the April 1981 issue.

El remanente de los resúmenes de trabajos presentados en Pointe-á-Pitre, Guadeloupe, aparecerá en la edición de Abril de 1981.