RESEARCH NOTES — NOTAS DE INVESTIGACION

PROGRESS IN BREEDING FOR RESISTANCE TO *RADOPHOLUS SIMILIS* ON BANANAS [PROGRESO EN MEJORAMIENTO PARA RESISTENCIA A *RADOPHOLUS SIMILIS* EN BANANOS]. J. Pinochet and P. R. Rowe, Division of Tropical Research, United Fruit Company, La Lima, Honduras.

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In the banana breeding program of the United Fruit Company, the diploid Pisang Jari Buaya group of *Musa acuminata* accessions have been found to be resistant to the burrowing nematode, *Radopholus similis* (3). These accessions also have nice bunches and present possibilities as parental material with advanced agronomic characteristics (2). However, the absence of pollen and very poor female fertility of the PJB clones severely restrict their use in cross pollinations. In 1972, intensive pollinations of several hundred mats of PJB were begun. Although an adequate supply of seeds were produced, less than 5% germinated. Of the seedlings, most were abnormal and appeared to be genetically unbalanced. Since progenies of PJB are so difficult to obtain, it has not been possible to determine the genetic control of resistance of *R. similis* in these accessions. One normal hybrid of PJB, was selected in 1977 for further observation. This new hybrid, designated as SH-3142, was derived from the cross PJB II-115 x SH-1734 and tested for resistance against the burrowing nematode. Valery, a susceptible commercial banana, and PJB accession III-106, a resistant cultivar used in banana breeding, were used as controls.

Rhizomes of three cultivars were heat-treated at 56° C for 10 minutes and planted in 30-1 containers with autoclaved sandy loam soil. Each cultivar included inoculated and non-inoculated treatments of 4 replicates each. Inoculations were made with a suspension of 20,000 *R. similis* per pot. At 4 months after inoculation, nematode counts in the soil and roots plus lesion indices of roots, rhizomes, and fresh root weights were evaluated by the method described by Pinochet in another article of this issue. The test was carried out under outdoor conditions.

The results show that hybrid SH-3142 was highly resistant to *R. similis* and the most promising breeding material tested for nematode resistance so far (Figure 1). The low nematode population recovered at the end of the test, 870 in the soil per pot and 8,120 in the roots per plant, would indicate that this plant material is an unsuitable host for the burrowing nematode. The performance of Pisang III-106 was disappointing. Although rhizomes were clean, the roots were readily attacked by *R. similis*. Population levels in the roots were high, but never as much as in the susceptible Valery. This test also demonstrated that genetic resistance to *R. similis* in PJB is controlled by one or more dominant genes, a most desired feature that would make incorporating resistance into superior breeding material an easier process. The higher resistance of the hybrid as compared to the PJB accession is more difficult to explain. It is possible that the non PJB parent of the hybrid, SH-1734, has resistance to *R. similis*. The PJB x SH-1734 cross would then produce a complementary effect for resistance, and the hybrid could be expected to be more resistant that the PJB parent. A more satisfactory explanation of this phenomenon could be based on possible differences between PJB accessions since these were originally collected from diverse areas such as Bali, New Guinea, Malaysia, Sarawak, and Sabah. From the practical and breeding standpoint, the most important consideration is that a readily usable source of *Radopholus* resistance is now available in hybrid SH-3142. In contrast to the PJB parent, SH-3142

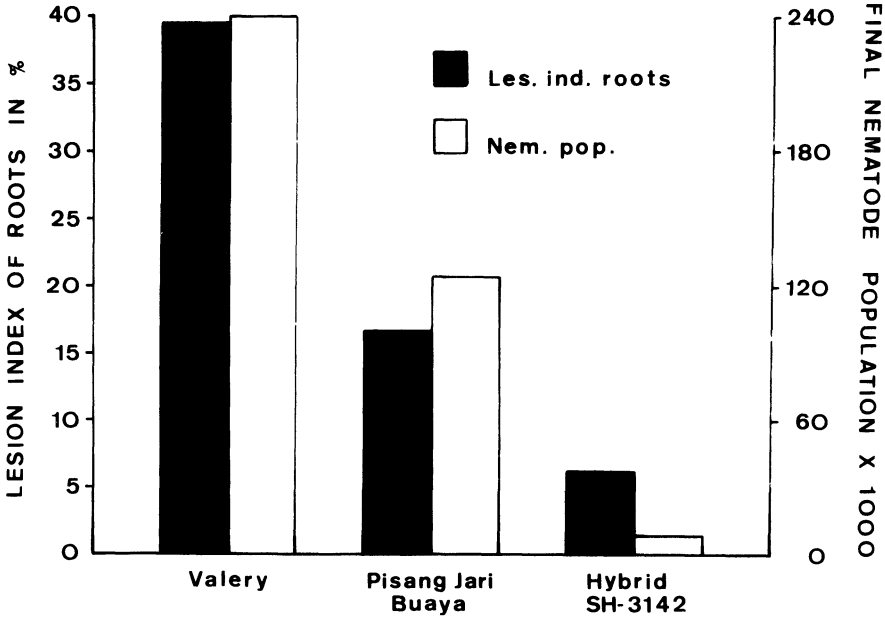

Figure 1: Lesion index of the roots (percent of lesioned root) and final nematode population per plant in three banana accessions at 4 months after inoculation with 20,000 *Radopholus similis* per plant.

is pollen fertile and produces several seeds per bunch. The hybrid was not tested for reaction to the lesion nematode, *Pratylenchus coffeae.* Another accession, PJB III-116, tested in the past against the nematode proved to be resistant to *R. similis*, but highly susceptible to *P. coffeae* (1).

RESUMEN

Un nuevo híbrido de banano (SH-3142) evaluado para resistencia contra el nematodo barrenador, *Radopholus similis,* fue comparado con Valery un banano comercial susceptible y Pisang Jari Buaya accesión II-106, un clon resistente usado en fito-mejoramiento del banano. Este híbrido resultó ser altamente resistente a *R. similis* y el material genético mas valioso probado hasta la fecha para resistencia a este nematodo. PJB accesión III-106 mostró ser susceptible aunque en menor grado que Valery. La transmisión de resistencia a *R. similis* parece estar controlada por uno o más genes dominantes. Entre otras características importantes, este híbrido posee polen fértil el cual permite incorporar resistencia contra *R. similis* con mayor facilidad. El híbrido SH-3142 servirá de material parental en futuros cruces para resistencia al nematodo barrenador.

Claves: Musa acuminata, fitomejoramiento, cultivares resistentes a nematodos, combate de nematodos

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REMAINING ABSTRACTS OF PAPERS PRESENTED AT THE X ANNUAL MEETING OF OTAN IN AGUADILLA, PUERTO RICO, JUNE 3-10, 1978.

REMANENTE DE LOS RESUMENES DE TRABAJOS PRESENTADOS EN LA X REUNION ANUAL DE ONTA EN AGUADILLA, PUERTO RICO, 3-10 DE JUNIO, 1978

OBSERVATIONS ON SEASONAL POPULATION CHANGES OF SELECTED PLANT PARASITIC NEMATODES ON SUGARCANE [OBSERVACIONES SOBRE LOS CAMBIOS ESTACIONALES EN LAS POBLACIONES DE FITONEMATODOS DE LA CAÑA]. N. D. Singh, The University of the West Indies, St. Augustine, Trinidad, W.I. - - - Seasonal variations in field populations of *Pratylenchus zeae, Meloidogyne incognita, Helicotylenchus dihystera* and *Tylenchorhynchus annulatus* on sugarcane were studied at monthly intervals for one year, January to December, 1975 at the University Field Station, Trinidad. Nematodes were counted in 200 cm^3 soil and 10 g root samples. Nematode populations varied in relation to month of sampling but there was a recognizable low (January to May) and high (August to September) seasonal pattern. Soil populations of *M. incognita* reached a peak in August (292) but the root population increased steadily from June to December. Soil populations of *P. zeae* began increasing in June (76) and reached its peak in August or September (242) followed by a decline from October (186) to December (118). Numbers of *T. annulatus* and *H. dihystera* were relatively low between January and May but reached peaks in August (92) and Septmeber (148), respectively. There exists a relationship between nematode population densities and soil moisture.