

at the time of treatment are less critical when applying granular nematicides than when injecting DBCP; however, treatments were not made during the wettest times of the year when the chemicals would be rapidly leached; neither were they applied during the dry season when they would not be properly incorporated in the soil. The absence of chemical applications during these times is not important because such climatic conditions are unfavourable to nematodes. Following studies of annual rainfall patterns and population trends in relation to climate and the physiological development of the plant (10) the following application schedules are suggested: Cameroon - rains last from March to November (peak in August) apply chemicals in early April, July and late September; Ivory Coast - rains last from late March to mid-July and mid-September to late November apply chemicals in Mid-April, mid-July and early November; Martinique and Guadeloupe where the seasons are irregular applications should be made in early April, mid-July and early December.

### RESUMEN

Los nuevos nematicidas granulados phenamiphos, ethoprop y carbofuran fueron evaluados en una serie de experimentos al oeste de Africa. Recomendaciones son que phenamiphos (3 g i.a.), ethoprop (4.5 g i.a.) y carbofuran (3 g i.a. excepto en Cameroon) tienen que aplicarse en 1 m<sup>2</sup> alrededor de cada planta tres veces/año con intervalos determinado para la distribución de lluvias. Nematicidas granulados fueron más efectivos que DBCP y con mejor incremento el producción sin embargo, una de las desventajas es que los nuevos productos son muy caros.

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NEMATODE SPECIES IN WEST AFRICA, MADAGASCAR AND REUNION, WITH SOME COMMENTS ON THEIR BIOLOGY [DIFERENTE ESPECIES DE NEMATODOS EN EL OESTE DEL AFRICA: MADAGASCAR Y LA REUNION CON COMENTARIOS SOBRE SU BIOLOGIA]. A. Vilardebo and R. Guerout, IRFA/GERDAT, B. P. 5035, 34032 Montpellier Cedex, France and P. O. Box 1740, Abidjan, Ivory Coast.

Of all the nematode species found in West Africa, Madagascar and Reunion, the most serious economic threat is *Radopholus similis*. It is widespread in all banana plantations, with the exception of the experimental plots established near Kaedi (Mauritania). In the Ivory Coast and Cameroon, as many as 160,000 *R. similis* have been counted in 100 g of roots. Peaks of 80,000 to 100,000 are

not uncommon. In most cases, counts are between 30,000 and 60,000. Lesions caused by *R. similis* expand quickly and penetrate into the root as far as the central cylinder. The lesions then spread up, down and around the root. When this happens the central cylinder is no longer protected. Even if there is no other attack on the distal part of the root, it will decay along its whole length and tissues will die. There is a clear line of demarcation between healthy and necrotic tissues the colour of which is reddish black. In Madagascar, similar symptoms are caused by another Pratylenchid, *Zygotylenchus taomasinae*. De Guiran first found this species in diseased banana roots and also in *Ravelana madagascariensis*, a plant native to Madagascar where pure populations of this plant cover large areas. *Zygotylenchus taomasinae* has also been found in Reunion where it was almost certainly introduced with banana corms. No *Pratylenchus* sp. has been found on bananas in Africa with the exception of *P. goodeyi* in the Canary Islands where *R. similis* does not occur despite introductions of banana plants from Africa known to be infested with the burrowing nematode. Reports of surveys in Colombia refer to *R. similis* and *P. coffeae* but usually not in the same block and, therefore, it appears that these 2 species cannot invade the same plant. Where these 2 species were occasionally found together, *R. similis* causes more damage to the plant than *Pratylenchus* spp. Lesions caused by *Pratylenchus* spp. develop more slowly than those caused by *R. similis* and the central cylinder remains alive longer. The lesions are not clearly defined and their colour is at first indefinite, eventually becoming a uniform reddish-black. At this stage they closely resemble those caused by *R. similis*. The effects of attack by these species are destruction of the cells quickly followed by rotting. *Hoplolaimus pararobustus* is also endoparasitic, however; this species has a fairly long life cycle (2 to 3 mos) and populations seldom exceed 5,000 per 100 g of roots. Unlike *R. similis*, *H. pararobustus* remains alive in the soil without food for mos. It is now widespread in the Ivory Coast, but in 1960-1961 it was only found in plantations previously planted with Gros Michel introduced from Cameroon. The species has been described from that country where it is present in all banana plantations. Goodey also found it on oil palm roots. Spiral nematodes *Helicotylenchus multicinctus* and *H. dihystra* are present in all plantations, the former in the roots and the latter only in the soil. The damage is less serious than that caused by burrowing or lesions nematodes. It is only in the absence of these species that *Helicotylenchus* spp. populations attain a high level and cause damage in plantations. They only penetrate slowly and the damage is less severe than that caused by *R. similis*. They are easier to control, and although they can be of economic importance, *R. similis* remains the most serious pest. Other species of no economic importance found in West Africa and Madagascar are *Hemicyclophora oosterbrinkii*, common in the Ivory Coast, and *Tylenchus megacephalus*. Occasionally a gall caused by *Meloidogyne* spp. may develop but destruction of the roots by *R. similis* is too rapid for *Meloidogyne* to complete its life cycle.

POPULATION DYNAMICS OF *RADOPHOLUS SIMILIS* IN RELATION TO CLIMACTIC FACTORS AND THE PHYSIOLOGY OF THE PLANT [DINAMICA DE POBLACIONES DE *RADOPHOLUS SIMILIS* EN RELACION CON EL CLIMA Y FISIOLOGIA DE LA PLANTA]. A. Vilardebo, IRFA/GERDAT, B. P. 5035, 34032, Montpellier Cedex, France - - - Over a long period of time, no climactic factor has been found to be related with nematode infection of roots. Levels of infection had fluctuated erratically without any apparent significance, until a