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Down Under

Survival of *Radopholus similis* (Cobb) in Volcanic Soils without Host-plant

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The burrowing nematode *Radopholus similis* is the most damaging nematode on bananas. To minimize applications of nematicide, cropping systems based on fallow, rotation crop, and clean planting material have been developed in the French West Indies. Here, we study soil survival of *R. similis* to optimize the benefit of the intercropping period and to increase the economical durability of banana cropping systems.

We monitored for six months in the laboratory the survival of calibrated populations of *R. similis* on nitisol and andosol, two soils derived from volcanic ashes and pumices. We studied different water potentials ranging from 0 to -700 kPa, on soil previously treated by frost or undisturbed. Mortality of adult *R. similis* follows a sigmoid decrease. In soils previously treated by frost, *R. similis* survive better in wet soils (-0,1 kPa) than in dry soils (-100 to -700 kPa). At the opposite, on undisturbed soils, *R. similis* survived better in dry soils. Half lives were two weeks inferior (from 27 to 37 days) for juveniles *R. similis* compared to adult females. Males survived from 40 to 71 days, significantly longer than females; one possible explanation is that males' energy is totally directed towards the reproduction and not for food foraging (males doesn't feed as they exhibit no functional stylet and digestive tractus). These results are consistent with the absence of anhydrobiosis strategy in *R. similis* compared to *Pratylenchus coffeae*. These results also suggest that *R. similis* survival depends not only of environmental conditions such as soil moisture and microbial activity, but also of their behaviour.

Water Dissemination of *Radopholus similis* (Cobb) on Nitisol in Martinique

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New cropping systems have been developed in the French West Indies that combine fallow or rotation crops with nematode-free vitro-plants to avoid the repeated applications of nematicides in banana fields. However, sometimes after only two to four years, the burrowing nematode *Radopholus similis* progressively reinfests banana fields and causes damages and economic losses again. Among different hypothesis for reinfestation, we studied the possibility that nematodes were disseminated by runoff and leached water from upstream infested fields. At the decimetre scale, we analyzed the dispersion of *R. similis* individuals on soil surface under a 1 m^2 rainfall simulator; water leaching of nematodes was also studied using soil cylinders apparatus in aspersion chambers. At the field scale, reinfestation of nematodes was monitored plant by plant. The experimental field was divided in plots surrounded or not by ditches. All studies were conducted on nitisol, which are representative of lowland banana fields in French West Indies. Results show that water runoff is likely to disseminate *R. similis* individuals over long distance on soil surface when soil moisture is already close to the field capacity. At the opposite, dissemination to soil depth of *R. similis* is limited: less than 8 % of the nematodes reached layers deeper than 10 cm after exceptional

rainfalls that represent several times the poral volume of the soil. A passive dissemination model could only explain partially the distance covered by nematode individuals and not the percentage of dead or non-active nematode which increases with covered distance or soil depth. It seems that *R. similis* have developed behaviour of escaping leaching. However, from a practical point of view, 50- to 80-cm deep ditches can efficiently prevent *R. similis* dissemination in banana fields.

Occurrence, Abundance and Distribution of Plant Parasitic Nematodes Associated with Sugarcane in Western Kenya

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A study was conducted in the four sugarcane growing zones of Western Province of Kenya to identify plant parasitic nematodes associated with the crop and determine factors influencing their occurrence and distribution. Soil was scooped from the sugarcane rhizospheres at a depth of 5-20 cm from which 200cm^3 was taken for analysis. Nematodes were extracted using the modified Baermann funnel technique and identified up to the genus level and enumerated. Plant parasitic nematodes belonging to 15 genera were recovered in sugarcane fields in Nzoia, Mumias, West Kenya and Busia sugar production zones in Kenya. Three genera namely *Pratylenchus*, *Scutellonema* and *Meloidogyne* were predominant with percentage densities of 21, 18 and 13, respectively. Soils in Nzoia Sugarcane Zone were more heavily infested with the parasites while the West Kenya Sugarcane zone was least infested.

Sandy clay soils were found to contain more parasitic nematodes than clay or clay loam soils. Nematode numbers were significantly different among the ecological zones from which samples were taken. Plant parasitic nematodes associated with sugarcane are widespread in western Kenya sugarcane zones and thus there is need to determine their effect on cane yields and quality.