



Fig. 1 Clusters of female Root Knot Nematode (*Meloiodogyne*) within root galls; **Fig. 2** Spiral Nematode (*Helicotylenchus*); **Fig. 3.** Damage to feeder roots, epidermis and outer root cortex due to Spiral Nematode (*Helicotylenchus multicinctus*). **Photo Credits:** 1 & 3, SJ Collins & HF Hunter, DAFWA 2009; 2, U Zunke, Nemapix Vol. 1, Mactode Publications 2000.

Since the 1950's it has been recognised that nematodes have the potential to impact banana production in Carnarvon, Western Australia (WA). In 1955, heavy infestations of Root Knot (*Meloiodogyne*), Root Lesion (*Pratylenchus*), Spiral (*Helicotylenchus*) and Burrowing (*Radopholus*) Nematodes were described. In recent years, diagnostic examinations of samples through AGWEST Plant Laboratories (Department of Agriculture and Food WA) indicate that the nematodes of concern to banana production in WA are Root Knot, Spiral, Root Lesion and Stubby Root (*Paratrichodorus*) Nematodes. Elsewhere, the Burrowing Nematode (*Radopholus similis*) is considered the main nematode threat to bananas.

Survey: In March 2009, Carnarvon banana plantations were surveyed. Nematodes were extracted from root and soil samples. Roots were also examined internally and externally for symptoms of nematode infestation. We were particularly interested to determine if *R. similis* was present in this area. Previously, this nematode had been identified rarely in WA, and only once since the 1950's at a low population from one sample from Carnarvon.

Nematode species and populations: Root Knot Nematode (RKN, *Meloiodogyne* sp.) and Spiral Nematode (*Helicotylenchus multicinctus*) were identified from the roots and soil of all samples. Detected nematode populations (up to 358/200g soil for RKN and 1419/200g soil for Spiral Nematode) were considered potentially damaging. A low population of Root Lesion Nematode (*Pratylenchus* sp.) was detected from the roots (2.7/g dry root), but not the soil, of only one sample.

Burrowing Nematode (*Radopholus similis*) was not identified from any sample.

Symptoms: Typical symptoms of RKN (root galling) were observed, and clusters of females could be seen within the galls (Fig. 1). Spiral Nematode (Fig. 2) causes superficial lesions on root surfaces and destruction of feeder roots (Fig. 3). This nematode only penetrates the epidermis and into the first few layers of the cortex, where brown to black shallow lesions are visible. Typical symptoms of Burrowing Nematode (purple to black necrosis throughout the root cortex) were absent.

Implications: Burrowing Nematode favours warm (25-30°C) moist soils of tropical to sub-tropical climates, ceasing reproduction below 16-17°C. Ability of *R. similis* to survive and multiply is restricted at Carnarvon, where minimum temperatures below 17°C are recorded annually from May to October, and the climate is classified as "arid".

RKN and Spiral Nematodes would not be considered a production constraint in tropical areas. However, these nematodes can cause severe decline in bananas where temperature and rainfall are limiting for *R. similis*. *H. multicinctus* is often the major nematode pest of bananas under these climatic conditions.

Further Reading: Goss 1958 *Journal of Agriculture Western Australia* **7(3)**: 317.
 Pattison *et al.* 2000 – *Managing banana nematodes*. Department of Primary Industries, Qld.
 Fallas and Sarah 1995 – *Fundamental and Applied Nematology* **18(5)**: 445-449.
 Ploetz *et al.* 1994 *Compendium of tropical fruit diseases*. American Phytopathological Society.

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Acknowledgements: Dr J Nobbs (SARDI Plant & Soil Health, Adelaide); Carnarvon Banana Producers' Committee; A. Mackie (DAFWA, Carnarvon); H Hunter, L DeBrincat, X Zhang, C Wang, M You, N. Eyres (DAFWA Plant Pathology, South Perth).