New cyst nematode poses no threat to potatoes

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Introduction

During the systematic sampling of potato producing areas of South Africa (Knoetze *et al.*, 2006), a new cyst nematode was found on several farms in the Swartland and Sandveld areas. No indigenous *Globodera* spp. has been found in Africa until the discovery of this species in the Sandveld. This cyst nematode has since been described as *Globodera capensis* (Knoetze *et al.*, 2012). The presence of *G. capensis* in the Sandveld region has complicated the detection of the quarantine nematode, *G. rostochiensis* in regulatory samples from this area, since they are present in most samples and are morphologically very similar to *G. rostochiensis*. Exporters of potatoes need to have their fields tested for the presence of *Globodera* spp. The South African Seed Potato Certification Scheme also requires plots to be free of *G. rostochiensis*. The possible impact on accessibility to export markets, as well as certification of seed potatoes, prompted further investigation into the morphology and host range of *G. capensis*.

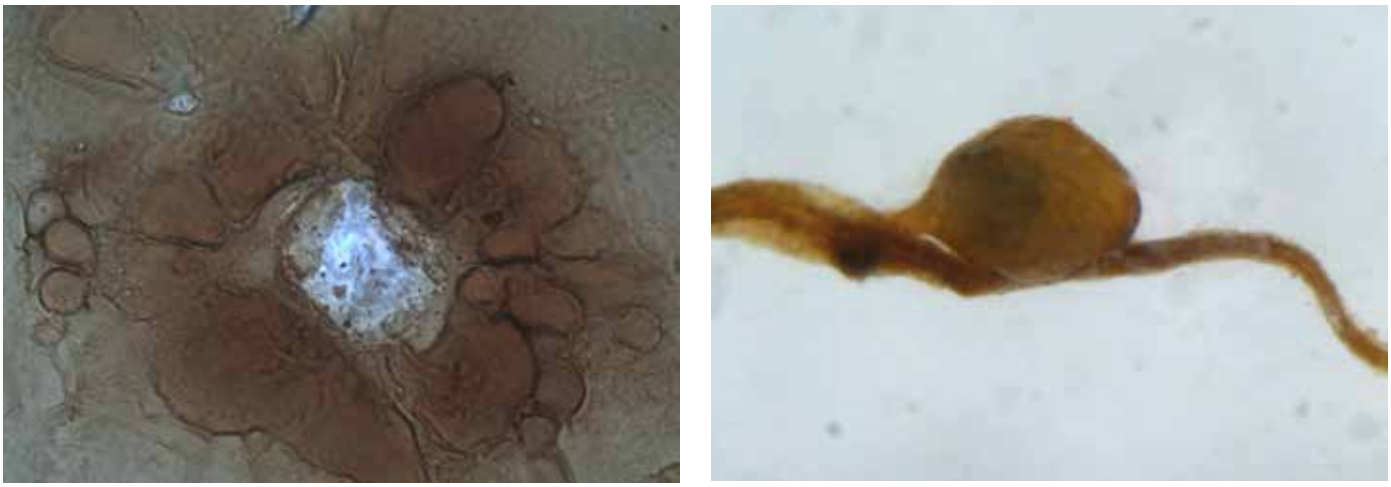
Morphology and Identification

Traditionally, the identification of the potato cyst nematodes (PCN), *G. pallida* and *G. rostochiensis*, is accomplished by using the morphology and morphometrics of the juveniles and mature cysts, especially as these are the life stages that are normally found in soil samples. *G. capensis* are morphologically very near or indistinguishable from PCN (*G. rostochiensis* and *G. pallida*), *G. artemisiae*, *G. millifolii* and especially *G. tabacum tabacum*, one of the three subspecies of *G. tabacum*.

G. capensis can, however, be distinguished from these species by the molecular characteristics of the ITS-region of the ribosomal DNA. The Polymerase Chain Reaction (PCR) is used to amplify the ITS regions. The amplification product is then sequenced and compared with known sequences from other cyst nematodes. Phylogenetic analyses indicate that *G. capensis* are closely related to *Globodera* species from Europe, Asia and New Zealand, which parasitize non-solanaceous plants.

Distribution and Hosts

Cysts of *G. capensis* are frequently detected in the very sandy soils of the Sandveld and are believed to be widespread in this region. The samples were collected in cleared potato fields, but sampling of natural veld that surrounds potato fields, as well as opportunistic plants within potato fields, revealed the presence of these cysts in the rhizosphere of, among others, *Conicosia pugioniformis* (varkslaai) and *Oncosiphon grandiflorum* (stinkkruid). However, the host plant of *G. capensis* still needs to be confirmed.



Globodera capensis

To determine if potatoes is a host for the nematode, the reproductive ability of *G. capensis* on potatoes was evaluated in the laboratory, glasshouse and field. In these experiments, viable cysts of *G. capensis* were unable to reproduce on potato plants (cv. BP1, VanderPlank and Avalanche).

Impact of *G. capensis* on potato farming in the Sandveld region

Since *G. capensis* is not a pest of potato, quarantine regulations, aimed at the control of *G. rostochiensis* (one of the potato cyst nematodes) do not apply to fields were only *G. capensis* is detected. At this stage, it is important to be aware that *G. rostochiensis* also still occur in the Sandveld region and that earlier detections of this prohibited organism were not necessarily due to misidentification of *G. capensis* in these fields. At the moment, quarantine regulations to prevent the spread of *G. rostochiensis* are being enforced on 11 farms in the Sandveld region. *G. rostochiensis* is a prohibited organism in terms of both the Plant Improvement Act (Act No. 53 of 1976) and the Agricultural Pests Act (Act No.36 of 1983) and seed potato fields containing this nematode are placed under quarantine for a period of 8 years. During this period no potatoes or other solanaceous plants may be produced in that particular field. Seed potato fields, which have undergone the compulsory 8 year quarantine period, can be re-tested, and if no PCN is detected, the quarantine will be lifted. Sampling and testing of these fields is a priority for DAFF and producers can expect feedback on the situation in due course.

Research into the host range of *G. capensis*, which indicate that *G. capensis* is not a pest of potato, as well as advances in identification techniques which enable us to accurately identify the nematode, has now greatly clarified the cyst nematode situation in the Sandveld, and producers can look towards the future with optimism.

Literature cited

KNOETZE, R., MALAN, A.P. & MOUTON, C. (2006). Differentiation of South African potato cyst nematodes (PCN) by analysis of the rDNA internal transcribed spacer region. African Plant Protection 12, 103 – 110.

KNOETZE, R., SWART, A. & TIEDT, L.R. (2013) Description of Globodera capensis n. sp. (Nematoda: Heteroderidae) from South Africa. Nematology 15, 233-250.