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“Filling gaps and removing traps  
for sustainable resource management”

## Enhancing Potato Production in Kenya through Resistance Based Management of Potato Cyst Nematode

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### Abstract

Potato cyst nematode (PCN), *Globodera pallida* and *G. rostochiensis* are potato pests accountable for significant reduction in crop yield. They are common pests in temperate region, however in the last few decades the pests have spread and adapted to tropical environment where they are causing high damage. Symptoms associated with PCN infestation are often mistaken for other abiotic and biotic factors. Therefore the presence of the nematodes in the field may go undetected for a long time. If introduced in a potato field, PCN are difficult to control since they form survival structures known as cysts which protect the eggs and enable them remain viable in the soil for over a decade. *Globodera rostochiensis* and *G. pallida* were first reported in Kenya in 2015 and 2018, respectively. The presence of these nematodes is a major threat to food security considering that potato is the second most important food crop in Kenya. Use of resistant potato cultivars in the management of PCN has the potential to reduce damage and maintain nematode density below the damage threshold. A study was done to investigate the viability of resistant potato cultivars in the management of the Kenyan PCN. The virulence of the Kenyan PCN populations was tested on selected potato cultivars. PCN populations had significantly lower reproduction on resistant cultivars but higher fitness on susceptible cultivar. There was no difference in hatching and penetration of susceptible and resistant cultivars. However investigations revealed that the populations lacked obligatory diapause that is common with all temperate PCN populations. This has a high implication on the management of the pests. In addition, the pathotype(s) of the Kenyan populations was tested in a glasshouse experiment. Similarly, the biology of the populations was studied in resistant and susceptible cultivars and compared with the standard reference population *G. rostochiensis* Ro1 (Ecossee). The study showed that resistance potato cultivars have the potential of reducing the reproduction of the Kenyan PCN and hence boost potato production.

**Keywords:** Fitness, *Globodera pallida*, *Globodera rostochiensis*, virulence