



IMPACT of weeds and nematodes on crop production

NANCY NTIDI, ARC-Grain Crops, Potchefstroom

The role of weeds as hosts of other pests affecting crops does not only have an indirect effect, but also has an economic impact on crop production. Weeds serving as pest hosts in the absence of crop hosts are reservoirs for those pests, maintaining pest populations, which are available to attack crops when planted. Plant-parasitic nematodes cause tremendous yield loss on most cultivated crops worldwide. In South Africa, the root-knot nematodes, *Meloidogyne incognita* and *M. javanica* in particular, have been declared economic pests of most crops with a wide host range, including weeds.

Three on-farm experiments were conducted during the 2015/2016 growing season in three provinces (Potchefstroom, North West Province; Kuruman, Northern Cape and Mbombela, Mpumalanga) to evaluate the host efficiency of 20 weed species that commonly occur in production fields against two common *Meloidogyne* species. Two weed species, viz. *Hibiscus trionum* and *Tagetes minuta*, were used as the susceptible and poor-host standards. All three on-farm experiments had randomised complete block designs (RCBD), with each weed species entry being replicated four times.

A natural *M. incognita* population existed at the Potchefstroom site, the Kuruman site had a natural infestation of a monoculture *M. javanica* population, while at Mbombela a natural infestation of a mixed *M. incognita* and *M. javanica* population existed. Trials

were terminated at 60 days after planting, randomly selected plants were sampled and taken for extraction.

Outcome of on-farm experiments

Meloidogyne spp. dominated in root (5 g and 50 g) and soil (200 ml) samples obtained from the three on-farm experimental sites. Although other plant-parasitic nematodes such as *Pratylenchus* spp. and *Hoplolaimidae* were also present in 5 g root samples and the latter species as well as *Criconea* and *Tylenchorhynchus* were found in 200 ml soil samples, their population levels were relatively low and warrant no further discussions for the purpose of this study.

At Kuruman, *Solanum retroflexum* was the most susceptible weed to a *M. javanica* population, while the same was evident for *H. trionum* at Nelspruit, where a mixed population of *M. incognita* and *M. javanica* occurred and at Potchefstroom, where a population of *M. incognita* was present. Results from this study indicated that certain weed species are highly susceptible to root-knot nematodes and should be removed timeously and effectively to prevent increases in population levels of root-knot nematode pests in the fields of producers.

Cognisance

Since *Meloidogyne* spp. was maintained in roots of all the weed species tested, none of them were immune to either *M. incognita*,



➤ 1a and 1b: On-farm experiments.
▲ 2a: Roots of *H. trionum* infested with root-knot nematodes.
◀ 2b: Roots of *C. carinatum* infested with root-knot nematodes.

