

Nematological Myths

Can Nematodes in irrigation water cause damage to crops?

Many farmers worry about the danger of nematodes in irrigation water and the introduction to a clean field of nematodes that then damage an established clean crop. The reality is that this fear is misplaced, except in very specific conditions referred to below. Typically, the damage caused by nematodes results from the pre-existing population even when nematicides have been used.

It is true that nematodes can be moved in irrigation water, especially following heavy rain and soil erosion. Such conditions can move the nematodes physically into a river from where they can be pumped out on to another field.

This will be a problem if you run a nursery and need to have nematode free plants. Irrigation water must then be nematode "clean" and basic hygiene factors must be in place to prevent transfer of nematodes to the plants.

But if you are a potato farmer next to one of the main rivers and pump water directly from the river on to your fields, this

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A potato root heavily invested with potato cyst nematodes, showing the live females before they turn into cysts.



Potato roots damaged by cyst nematodes showing poor tuber development.

chance movement will not transfer enough nematodes to cause a commercial crop failure in an existing crop.

The facts are:

- Most (all) soils used for potato production in South Africa are heavily infested with root knot nematodes, *Meloidogyne* spp.
- If one infective root knot juvenile occurs in 200ml of soil, that translates to 12.5 million per hectare in the root zone. This is a low but potentially damaging population of nematodes and does not include the egg population which could be considerable.
- If one infective stage is

found in one litre of irrigation water, which is a very high number for irrigation water and this one litre is added to ten litres of the above soil, that one nematode, if it survives, will join a large number, >50, that already exist. This is an extreme case. Normally irrigation water will contain far fewer nematodes and an infested soil far more.

- In a situation where a nematicide has been applied only a part of the soil will be treated, e.g:
 - if a band placement is applied, nematodes will survive outside that band, and

- if the nematicide is applied to 15cm depth, nematodes will survive below 15cm.

- Thus, even following the use of a nematicide, the resident population beyond the treated zone will dwarf any introduced infestation in irrigation water.

One useful tip should be followed. Plant parasitic nematodes sink in free water. Thus in the river, they will soon end up in the sediment near the bottom. So, if you irrigate from a river, ensure your water inlet point floats near the surface of the river. By this simple technique most

nematodes will be left behind.

One complicating issue results from the discovery of the Golden cyst nematode in South Africa, *Globodera rostochiensis*. If you farm down river from a known infested site, water from that river will carry infective stages that will eventually infest potato fields downstream. The infestation will take many years to reach a pest status, but strict hygiene measures must be implemented. It is for this reason that all *G. rostochiensis* sites are identified and appropriate containment measures applied.



More Nematological Myths will be discussed in future editions of Chips.