

# Managing nematodes in sugarcane production: Burdekin

## Nematodes

The two species of nematodes that cause serious damage to sugarcane are root lesion nematode *Pratylenchus zaei*. (RLN) and root knot nematodes *Meloidogyne spp.* (RKN). There are many other types of nematodes that can affect sugarcane, such as dagger and spiral nematodes, particularly if they are present in very high numbers.

## Distribution

Plant-parasitic nematodes (PPN) are widely distributed in cane growing soils, with at least five different species likely to be present in every cane field. The abundance and proportion of species will vary with soil type, climate and crop history. RKN are **mainly** found in the lighter, sandy soils, whereas lesion nematodes can be found in every cane-growing region in Queensland.

## Damage

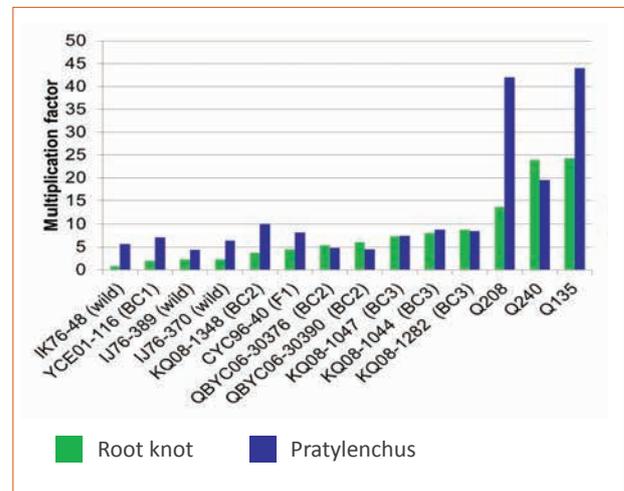
RKN and RLN enter through the root tips, while most other nematodes feed on the outer surface of the roots. Damage to the roots will depend on the species present. Typical symptoms are short, thickened and blackened primary roots with very few fine secondary or tertiary roots. RKN produces distinctive symptom of swelling and gall formation on the root tips. RLN produces the presence of many red lesions on root surface. It is believed that yield losses across all sugarcane soil in Australia are as high as 10 per cent (Plant) and 7 per cent (Ratoon). Where high nematode populations occur these figures are significantly higher.

## Varieties

There are no known nematode resistant varieties in the suite of varieties recommended for the Burdekin region.

The Introgression project is a collaborative project between SRA and CSIRO that aims to develop nematode-resistance sugarcane varieties. In the program sugarcane is crossed with wild relatives of sugarcane that are resistant to nematodes.

Promising clones have been selected and will be evaluated in the field to verify the reliability of glasshouse tests, and also for productivity in the 2014 final assessment trials.



**Above:** This graph shows a number of promising clones in the introgression project.



**Above:** Root lesion nematode damage – red lesions.



**Above:** Root knot nematode damage – galls.

### Management

- Monitor crops: a soil test which can confirm the species of nematode present can be arranged through your local productivity services group. Nematode counts are conducted at the SRA Tully assay laboratory.

### A guide to nematode threshold levels:

Species	Common name	Threshold for plant & 1 <sup>st</sup> ratoon	Threshold for older ratoons
Pratylenchus	Root lesion	300	900 +
Meloidogyne	Root knot	200	600 +

- Avoid plough-out/replant where possible.
- Harvest plough-out blocks early to give a maximum break before planting legume crops.
- Include a legume rotation in your crop cycle. Soybean and peanut crops can reduce PPN numbers by 80-90 per cent.

### A guide to the legume resistance to these two species of nematodes:

Legume	Root lesion nematode	Root knot nematode
Lablab (all cultivars)	R	HS
Cowpea (most cultivars)	R	HS
Cow Pea Meringa	R	MS
Soybean – Leichardt	R	HS
Soybean – A6785	R	R
Soybean – Stuart	R	R
Soybean (most cultivars)	R	HS
Peanut (all cultivars)	R	HR
Velvet Bean (all cultivars)	R	R

**HS:** Highly susceptible. Nematodes will multiply to high population densities

**MS:** Moderately susceptible: Nematodes will multiply readily

**MR:** Moderately resistant: Nematodes will multiply to some extent

**R:** Resistant: Limited nematode reproduction

**HR:** Highly resistant: No reproduction

- Ensure fallow crops are kept free of weeds and volunteer cane.
- Green cane trash blanket (GCTB). High populations of root lesion and root knot nematodes re-establish if a trash cover is not maintained. GCTB provides a better environment for beneficial organisms such as free living nematodes and predators of plant-parasitic nematodes.
- Minimum tillage systems which preserve the trash blanket between crops to help minimise populations of PPNs. Tillage operations kill beneficial nematodes, allowing PPNs to quickly re-establish.
- A number of chemicals are registered for nematode control in sugarcane. These includes Rugby® 100G, Nematicur® 100G (granules) and Nematicur® 400 (liquid). These nematicides also kill natural nematode enemies, and only reduce nematode populations for a short period of time.