Sugar Research Australia

Information Sheet

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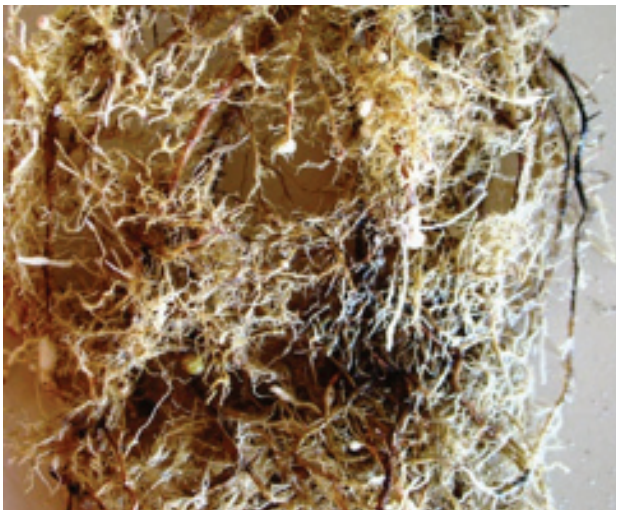
Nematode resistant legumes as a rotational crop with sugarcane

The two main types of nematodes that cause damage to sugarcane are root lesion nematode (RLN) and root knot nematodes (RKN). There are many other types of nematodes that can affect sugarcane, such as dagger and spiral nematodes, but these nematodes rarely cause serious damage.



Above: RKN damage to cane roots.

Above: RLN damage to cane roots.

Legume benefits

Legumes are a benefit in a crop rotation as they provide nitrogen to the following cane crop, can be harvested for grain as a cash crop and reduce nematode numbers. As can be seen in the table, legumes are a non-host to RLN but vary between susceptibility and resistance to RKN. Within the same species of legume there are differences between cultivars in resistance and susceptibility to RKN.

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.

The following table is a guide to the legume resistance to these two types of nematodes.

Legume	RLN	RKN
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

Above: Peanuts as a rotational crop with sugarcane.

Part of the solution but not the whole solution

It must be noted that legumes are not the final solution in controlling nematodes but only part of it. Nematode populations will build up over time in ratoon crops. Weeds and volunteer cane must be kept under control as these act as a host in the fallow.

Even with a 12 month weed free fallow, including a crop of a legume which is resistant to nematodes like Velvet bean, nematodes will not be completely eradicated from the field.

A holistic approach needs to be adopted, with trash blanketing, permanent bed system and minimum tillage to increase soil organic matter and the populations of beneficial organisms that help to reduce parasitic nematodes.

SRA and CSIRO are crossing sugarcane with wild relatives of sugarcane that are resistant to nematodes. The aim of this research is to develop nematode resistant sugarcane varieties. Initial indications are that some hybrids with the wild relatives of sugarcane have retained their resistance to nematodes. Further research is underway to introduce these nematode resistance genes into high yielding sugarcane varieties.