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Nimitz®

Nematodes in Australian Sugarcane

Conservative estimations of yield lost from nematodes in Australian Sugarcane systems in 2007 were \$82 M Aus (Blair, 2007) in QLD. The most common in the sugarcane growing regions of QLD and Northern NSW that can be economically damaging are plant parasitic nematodes of the *Pratylenchus* spp. and *Meloidogyne* spp.

Pratylenchus zeae tends to be the most common and found in all sugarcane growing regions and all soil types (Blair BL, 1999) however *Meloidogyne* species such as *M.javanica* are still endemic to low clay content soils and can reach economically damaging levels if not managed correctly.

Integrated approach to nematode management in Sugarcane

Several factors will reduce populations of nematodes in sugarcane systems:

- Green Cane Trash Blanket
- Legume rotation crops
- Fallow management
- Minimum tillage
- Practices to generally improve soil organic carbon.

Although when economic thresholds are exceeded or traditionally high-pressure sugarcane blocks are identified, there are requirements to look to nematicide options.

There have been limitations on nematicides which often made them ineffective, expensive and unviable for use in sugarcane. Nimitz however is revolutionary in its ease of use, nematode selective activity and benefit to yield increase.

Application at planting often shows the best response due to targeting the early establishment phase in the crop when nematodes can be most detrimental. Nematodes reduce yield by reducing early root and tiller establishment

Nimitz® at a glance

Active ingredient	480 g/L fluensulfone
Chemical name	5-Chloro-2-[(3,4,4-trifluoro-3-buten-1-yl)sulfonyl]thiazole
Chemical Group	heterocyclic fluoroalkenyl sulfones
Target Pest	Root-knot nematode, Root lesion Nematodes
Formulation Type	Emulsifiable Concentrate (EC)
Application Rate Range	4–8 L/ha

Key features

- True nematicidal control
- Fast acting and unique mode of action
- Simple, safe and effective application options at low rates
- Minimal impact on beneficial and non-target species.

Mode of action

Fluensulfone belongs to a unique new chemical class with a new Mode of Action. Studies have shown that fluensulfone is a true nematicide that kills the target by contact, rather than temporary nematostatic (paralysis) activity as seen with current organophosphate and carbamate chemistry.

Nimitz has rapid activity on nematodes. Within 1 hour of contact nematodes cease feeding and quickly become paralysed. Fluensulfone requires 24 - 72 hours to achieve complete mortality.

Any nematode eggs laid after exposure to Nimitz are likely to be unviable, or if juveniles do hatch, they do not survive.



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Target species

Root-knot nematode

The Root-knot nematode (RKN) group get their name from the characteristic formation of root galls on affected plants and are among the most damaging of plant-parasitic nematodes.

In Australia, there are five relatively widespread *Meloidogyne* species (*M. javanica*, *M. incognita* and *M. arenaria* in warm climates and *M. hapla* and *M. fallax* in cool climates).

They are capable of attacking a wide range of plants and can cause economic damage to crops with as few as 1 - 2 nematodes per gram of soil.

In Australia, RKNs have been reported to attack scores of different plant families including some of our biggest crops; Cucurbitaceae (Cucumbers, Melons, Squash, Zucchini), Solanaceae (Capsicums, Tomatoes), Fabaceae (Chickpeas, Soybeans, Peas, Beans, Lucerne), Musaceae (Bananas), Poaceae (Wheat, Barley, Corn and Rice), Vitaceae (Grapes), Sugarcane and Malvaceae (Cotton). The level of susceptibility varies in each host.



The characteristic root galls produced by RKN infested plants are outgrowths of the roots themselves.

Photo by Steve Tancred



Root-knot nematode larvae penetrating a tomato root. Once inside, the larva establishes a feeding site, which causes a nutrient-robbing gall.

Photo by William Wergi

Adult female RKNs live inside the root gall where they feed, mature and lay eggs.

Root-knot nematode damage most often results in poor growth and reduced resistance to other problems such as moisture stress and disease. High enough levels of damage early on can lead to total crop loss.

The diminished capacity of the roots due to galling usually leads to a reduction in the number of leaves - and therefore a decrease in photosynthetic ability - a reduction in flowering, and subsequent decrease in the yield of fruit produced.

Symptoms most visually obvious above the ground may include stunted plant growth, yellowing of the leaves and wilting on hot days as plants struggle to draw moisture from the soil effectively.

Root lesion nematodes

Nimitz is registered for the control of root lesion nematodes (RLN) for sugarcane only. The RLN species that cause serious damage to the sugarcane is *Pratylenchus zeae*. RLN are an important pest as they occur in all types of soil (while RKN are mostly present in light, sandy soils).

The damaged root system limits the ability of the plant to access moisture and nutrients, resulting in slower stalk growth and reduced crop yield.

Further Resources: <https://sugarresearch.com.au/wp-content/uploads/2017/02/Nematodes-IS13040.pdf>

Application

Crop	Pest	Rate/ha
Sugarcane	Root-knot nematode (<i>Meloidogyne</i> spp.), Root lesion nematode (<i>Pratylenchus zeae</i>)	4 L

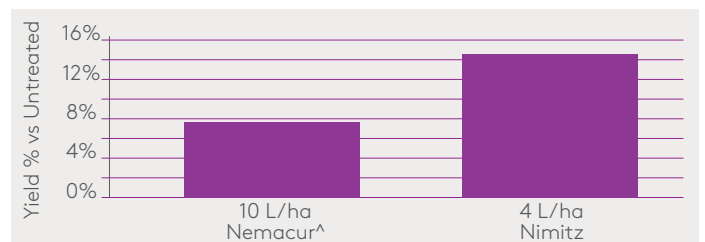
In Furrow

In Sugarcane, apply a single application of Nimitz as a spray into the furrow at planting. Use a spray nozzle that will deliver a coarse spray quality in a minimum volume of 100 L/ha, in a band 30 - 50 cm wide over the centre of the row immediately prior to soil cover being brought in over the sett.

Compatibility classification Nimitz® Nematicide

Partner Product	Rate/ha	Water L/ha	Classification
Strike-Out	2.0 L	60	Compatible
Pyrinex® Super	1.88 L	60	Compatible
Venom® 240	156 mL	60	Compatible
Kohinor® 350	1.44 L	100	Compatible
Albatross® 200	65 mL	60	Compatible
Jubilee® 500	500 mL	60	Compatible
Serenade Prime	7.0 L	200	Compatible

Nimitz® Sugarcane Yield (%) results 4 trial average



Conclusions from these trials and other trials

In Sugarcane based on a 4 trial average, a single application of Nimitz at the rate of 4 L/ha have contributed to a 15% yield increment vs the untreated control whereas Nematicur application at the rate of 10 L/ha have contributed to a 7.7% yield increment vs the untreated control.

FZ-13-N01-13-Mackay, FZ-13-N01-14-South Ballina, FZ-13-N01-15-Oakenden, FZ-13-N01-16-Burnett Heads. [^]Note - Nematicur is a registered trademark and is now de-registered for this use.



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