

Information Sheet

8.12 Nematode management



Nematodes can be managed (not eliminated), thus reducing the damage they cause in various ways. Management methods include chemical nematicides, using a suitable variety, planting and harvesting in late summer- early autumn if possible, and the use of organic amendments and green manures.

◀ **Nematode root damage in sugarcane.**

Chemical nematicides

The most effective and common control method is the use of chemical nematicides.

In soils with less than 6% clay

A nematicide should routinely be used to treat cane on poor sandy soils, i.e. where the clay content is less than about 6%.

In soils with more than 6% clay

Where there is any doubt as to what may be the cause of poor growth, particularly on less sandy soils, it is advisable to first assess the value of using a nematicide. This may be done by applying the nematicide to a few rows immediately after harvest. If nematodes are the main factor limiting growth then a clear growth response will be observed in the treated strips within eight weeks. The remainder of the field should then be treated without delay. When cane is harvested and treated in winter the response to treatment may take longer than eight weeks to be discernible.

Where a nematicide should be applied?

In the plant crop nematicides are best applied in the furrow to protect the new roots as they appear from the sett. Treating with a nematicide over the row, once shoots have started to emerge leaves a large number of new, vulnerable roots having been unprotected. In the ratoon, the nematicide must be applied as soon as possible over the row. Application can be delayed in winter but must be done before shoot emergence or within 120 days after harvesting.

Whenever a nematicide is used, it is advisable to leave a few lines untreated in each field in order to monitor the effectiveness of the chemical in each crop.

Precautions for chemical nematicides

Most nematicides are extremely toxic. According to Registration No. L871 (Act No. 36 of 1947), chemical pesticides are classified into different colour categories (Green: safe, Blue: caution, Yellow: harmful, Red: toxic to very toxic) depending on their toxicity to animals and humans. Only red and yellow label nematicide products are currently registered for use in sugarcane. As with all agrochemicals, always adhere to the warnings and precautions stipulated on label booklets which accompany these products. Care must be taken when storing and applying chemicals as well as disposal of containers.

Factors that influence the efficacy of chemical nematicides registered for use on sugarcane

Soil moisture

Nematicides should not be applied to very dry soils unless treatment is followed soon after by irrigation or rain. Response to treatment is less in a dry season than in a wet season.

Duration of the crop

The response to treatment with a nematicide is disproportionately greater in crops grown for more than 13 months than in younger cane.

pH

The active ingredients of most nematicides are rapidly broken down under alkaline conditions. Response to treatment on soils with a high pH (>8) is therefore likely to be less than on other soils. Where lime is required, it should be incorporated in the soil at least six weeks before applying a nematicide to the plant crop or, if necessary, top-dressed six weeks after applying the nematicide.

Residual responses

A residual or carry-over response of about nine tons of cane per hectare following treatment with a nematicide can usually be expected in the subsequent crop on Fernwood series soils. On the better sands, the residual response may be almost as large as the response from re-treating cane. Unnecessary re-application of a nematicide can be avoided by testing the response to retreatment in observation strips

Nutrition

Nutritional deficiencies in the soil should be corrected before applying a nematicide.

Herbicides

Herbicides containing the active ingredient metribuzin applied as a pre- or post-emergent spray, are phytotoxic to plant cane growing on poor sandy soils, particularly when used in combination with nematicides containing the active ingredient carbofuran, applied in the planting furrow.

Percentage response to nematicide in various soils

Irrigation

None of the nematicides currently registered for use in sugarcane are registered for application through an irrigation system and can therefore not be applied in this way. Granules must be incorporated into the soil either mechanically or by thorough irrigation. For sprinkler irrigation, apply a minimum of 10 mm irrigation water after applying the nematicide to the soil. For drip irrigation, the granules must be applied along the dripper line which must be on, or close to, the cane row. The distribution of the granules should not extend beyond the wetted area. Dripper outlets must be close enough together, and the drip-time long enough, to moisten the soil along the entire length of treated cane. Application of a nematicide in fields with buried dripper lines will require supplementary overhead irrigation in the absence of timeous rainfall.

Waterways

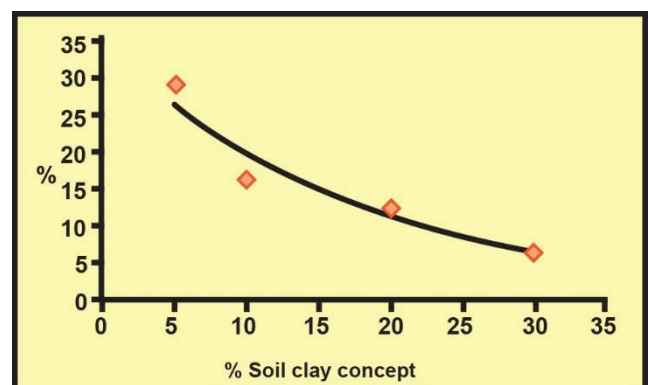
Do not apply nematicides to cane rows adjacent to (< 10 m from) waterways, natural watercourses, wetlands or dams to prevent risks of run-off and contamination of the environment.

Mulch

A mulch layer conserves soil moisture, reduces soil erosion, suppresses weeds and can increase yields on sandy soils by about six tons cane per hectare. For most nematicides (except those containing the active ingredient carbofuran), the previous crop could be mulched at harvest. Where nematicides containing carbofuran are used, it should ideally be applied below the soil surface on burnt fields.

Clay %

The response to nematicide decreases as the clay percentage increases. Generally, response to nematicide is 10% or more on soils with 20% clay or less.



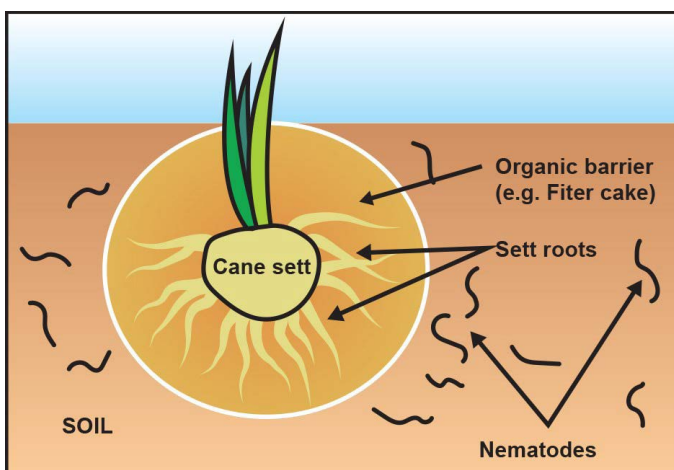
Green Manures

By paying attention to the green manure crop and selecting it carefully, it can successfully be used to manage plant parasitic nematodes in the plant crop. Many plant species can reduce plant parasitic nematode numbers in the soil. These plants reduce numbers in one of two ways. Firstly, they are a non-host to a particular type of nematode and thus the nematode cannot reproduce in this plant. Secondly, they release allelopathic compounds that directly kill the nematodes. Poor hosts of sugarcane nematodes (e.g. buckwheat, oats, sunn hemp, velvet beans) can be grown for 3-6 months between sugarcane cycles. More information on green manures can be found in the **SASRI Green Manuring Bulletin**.



Time of planting/ratooning

On poor sandy soils under irrigation in Mpumalanga, crop loss from nematodes can be partially avoided by planting and harvesting early in the season (April, May) rather than in spring (October, November). This was observed in varieties N14, N23, N25, N28 and N32. The same principle is very likely to also apply to rainfed cane.



Using organic amendments

The sett roots of plant cane can be shielded from plant-parasitic nematodes by encasing the planted sugarcane setts in an envelope of filtercake applied at approximately 100 tons/ha in the furrow. This provides protection for sufficient time to ensure that the young shoots are well grown before the roots are attacked. When using filtercake in this way, a nematicide should not be applied. The effect of the filtercake can persist through to the following crop. Other useful organic amendments include fly-ash and kraal manure.

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