**Nematode**

Non-chemical management methods for nematode pests in tropical farming systems are many and varied. They range from preventing the introduction of nematodes to biological, cultural and physical means. A few of these methods can be used in all cropping systems (eg. sequential cropping or rotation) and some could be used in particular systems. There are many reasons why there is an uptake of some but not all the alternatives to chemical management ranging from scientifically and financially sound reasons to local and unfounded beliefs. The non-chemical methods are not as widely adopted by farmers as one would expect although a change in pest management attitudes away from chemical use is now occurring

Farming systems and practices are very important in nematode management scenarios and consideration of the cropping systems is essential to any scheme of nematode management, regardless of the nematodes or crops involved.

Practices do exist that can successfully be used to manage nematodes, even in poor resource farming systems, but choice of practices will vary with the different systems and environmental situations .

**Table 1. Non-chemical nematode management methods**

1. Keeping land free of nematodes by preventing their introduction and spread

1) Use of nematode-free planting material

2) Eliminating nematodes from seed beds and potting soil

2. Cultural and physical field and soil methods by the use of:

1. Rotation of crops
2. Fallows
3. Resistant cultivars
4. Flooding: artificial and natural
5. Solarization
6. Adjusting planting time/escape cropping
7. Antagonistic plants and trap cropping
8. Burning stubble after harvest
9. Post harvest destruction/removal of infected crop residues
10. Cultivating/turning soil between crops
11. Grafting/use of resistant rootstocks
12. Improved crop husbandry (compensation for damage)
13. Organic soil amendments
14. Biological control: natural and induced

**Farmers can have difficulties accepting the use of crop rotation as a standard nematode management method for one or more of the following reasons:**

1. Non-host crops have little cash or marketable value and, unfortunately, the susceptible crop is usually the most profitable (Johnson, 1992). Farmers would prefer to grow good marketable cash crops as often as possible on the same land.

2. Lack of familiarity with alternative non-host crops and reluctance to introduce new crops.

3. The land is unsuitable for alternative crops.

4. Mixed cropping is a common practice with small scale farmers in the tropics. Rotations are fine for monocrops, but can be very difficult to effectively operate in a mixed cropping system where more than one crop is grown on the same land at the same time.

5. The farmer has to take a more long term view of managing the nematodes when he has been used to instant ‘control’ with pesticides.

6. More than one economically important nematode species is present with different host preferences.

7. Numerous pests are present other than nematodes (which is invariably the case) and these require a different rotational sequence in their management.

**Effects on native biodiversity:**



The cane toad, [*Bufo marinus*](https://en.wikipedia.org/wiki/Bufo_marinus)

Biological control can potentially have positive and negative effects on [biodiversity](https://en.wikipedia.org/wiki/Biodiversity). The most common problems with biological control occur via predation, parasitism, pathogenicity, competition, or other attacks on non-target species. Often a biological control agent is imported into an area to reduce the competitive advantage of an [exotic species](https://en.wikipedia.org/wiki/Exotic_species) that has previously [invaded](https://en.wikipedia.org/wiki/Invasive_species) or been [introduced](https://en.wikipedia.org/wiki/Introduced_species) there, the aim being to thereby protect the existing [native species](https://en.wikipedia.org/wiki/Native_species) and ecology. However the introduced control does not always target only the intended species; it can also target native species .In Hawaii during the 1940s parasitic wasps were introduced to control a lepidopteran pest and the wasps are still found there today. This may have a negative impact on the native ecosystem, however, host range and impacts need to be studied before declaring their impact on the environment.

Over the past 15 years with the rise in biological control interest there has become a greater focus on the non-target impacts that could occur.[[]](https://en.wikipedia.org/wiki/Biological_pest_control#cite_note-follett-3) In the past many biological control releases were not thoroughly examined and agents of biological control were released without any consideration. When introducing a biological control agent to a new area, a primary concern is its host-specificity. Generalist feeders (control agents that are not restricted to preying on a single species or a small range of species) often make poor biological control agents, and may become invasive species themselves. For this reason potential biological control agents should be subject to extensive testing and [quarantine](https://en.wikipedia.org/wiki/Quarantine) before release into any new environment. If a species is introduced and attacks a native species, the biodiversity in that area can change dramatically. When one native species is removed from an area, it may have filled an essential [ecological niche](https://en.wikipedia.org/wiki/Ecological_niche). When this niche is absent it may directly affect the entire [ecosystem](https://en.wikipedia.org/wiki/Ecosystem)

Other examples of biological control agents that subsequently crossed over to native species are: