

Short Communications

Allelopathic Control of Soil Nematodes by *Crotalaria juncia* in Mulberry Crop

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ABSTRACT

Keywords

Nematodes,
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Meloidogyne incognita is a nematode parasite which causes root not disease in mulberry crop and decrease the yield of mulberry leaf. The affected plants show yellowing of leaf. He affected plants show yellowing of leaf; stunted growth and necrosis apart from these root knots for galls are also found on the mulberry plants. Various treatments were given to control this nematodes use of larvicides, Furadon (carbofuran) neem oil cake etc are used for control of nematodes in the soil population. In spite of all these it is very difficult to control this nematodes because mulberry is a perennial crop, rooting out this disease is cumbersome. In the present study an attempt is made to control the soil nematodes of mulberry by inter-cultivating the mulberry garden by sun-Hemp (*Crotalaria juncia*). The results show that there is a decrease in number of root knots and yield of foliage is improved.

Introduction

Root knot nematodes are common in any mulberry garden and decrease the mulberry leaf yield (Hirata 1971, Govindaiah *et al.*, 1991, Narasimhamurthy 1986.)

Meloidogyne incognita is one of the nematode which causes damage to the M5 mulberry variety (Govindaiah, 1991). Nematode infected roots cannot utilize the water or fertilizers that are there in the soil. These parasites at the larval stage made holes to the roots by their stylet and enter into the sub epidermal layer. There it damages the parenchymal cells and induce hypertrophy and galls. Ultimately the yield of mulberry leaves decreases. Variety of methods were tried to control the soil

nematodes. Every technique is having its own advantage and disadvantage. Hence in the present study an attempt is made to control soil nematodes by allelopathic method which is ecofriendly and non-toxic. The efficacy of using Sun hemp in controlling the soil nematodes is discussed.

Materials and Methods

Study area

Mulberry garden is at outskirts of Kaligiri (latitude 14.8333300, Longitude 79.7000000) town. It is cultivated with M5 variety. This mulberry garden was already infested with the soil nematodes. It was

divided into two parts. The first half of the garden was kept as such as a control group. In the second half *Crotalaria juncia* seeds were sown within the mulberry garden. Ultimately it was seen that for every square meter eight plants were maintained and rest of the sun hemp plants were removed. At this stage and after 60 days the mulberry growth and yield was recorded. Apart from this the population of soil nematodes galls were enumerated.

Results and Discussion

The data regarding the morphology of mulberry plant due to infections present in Table- 1.

Meloidogyne incognita is a nematode parasite enters into the mulberry field at egg or larval stages. The second stage of female larva enters the mulberry plant by boring the roots. It reaches the parenchymal tissue and causes tissue hypertrophy. That's why root knots-galls are formed in the roots. Eventually the root cannot absorb the nutrients and water. Meanwhile xylem and phloem tissue are damaged by the parasites. If the soil moisture is high nematode population increases enormously. Toxic

chemicals such as Aldicarb, Furadon, other organo--phosphates and carbomates are used to kill the nematodes but also other microbial population which are useful for plant growth in the soil. Pesticide residues are also reached into the water bodies when there is soil runoff due to floods or rainfall significant amount of expenditure is to be incurred to control the soil nematodes.

At present neem oil cake is used to control soil nematodes as an alternate to the chemical pesticides. By using the allelopathic method one can control these soil nematodes. Previously *Tegetus petula* (Marygold) was used to control nematodes by allelopathic method. Later it was found that it not only control soil nematodes but also decrease soil microbial flora which are essential for soil fertility. Due to this reason in lieu of *Tegetus petula*. Sun hemp (*Crotalaria juncia*) is used. Because it is having dual benefits. It is not only kills the soil nematodes but also increases the nitrogen levels in the soil by nitrogen fixation.

Sun hemp is more effective in controlling soil nematodes when compared to other treatments.

Soil nematodes



Table.1 Effect of soil nematodes on the morphology of mulberry plants

S.No.	Parameter	Control Plot	Crotalaria junkie Planted plot	% change Over control
1	Plant Height(Cm)	430±23	520±41	+ 20.93 (P< 0.001)
2	Leaves/plant	68±8	104±12	+ 52.94 (P< 0.001)
3	Weight of 100 leaves(g)	270±13	380±23	+ 40.74 (P< 0.001)
4	Leaf Moisture (%)	65±6	73±9	+ 12-31 (P< 0.001)
5	Leaf yield (annum/hector/kg)	21488±844	25144± 1244	+ 17.01 (P< 0.001)
6	No root galls /plant	42±4.4	75±12.2	+ 78.75 (P< 0.001)

(Values are mean of 10 observations. ± indicates standard deviation. 'P' denotes the level of significance. + indicate percent increase over control.

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