Distribution of Root-Knot Nematode on Crossandra in Rayalaseema Region of Andhra Pradesh

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In Rayalseema zone of Andhra Pradesh crossandra is widely grown as flowering intercrop in horticultural ecosystem. It is cultivated in an area of 1951.0 hectares with 6243.0 metric tonnes production. In Kadapa and Chittoor districts of Rayalaseema region it is grown in 143.0 and 150.0 hectares, respectively (Anonymous, 2013). However, its production is severely constrained by root-knot nematodes. The plants can be maintained for over three years if the crop is free from nematode infestation. Nematodes are one of the important biotic limiting factors in the commercial cultivation of crossandra, affecting the seedling establishment in the nursery and

plant growth and yield in the main field (Nagesh and Reddy, 1997). The information on occurrence and distribution of root-knot nematodes is essential for adopting appropriate control program, therefore the current study was initiated to evaluate the prevalence, incidence, and diversity of root-knot nematodes of crossandra grown in the Rayalaseema region of Andhra Pradesh.

Random survey was conducted in different localities of Kadapa and Chittoor districts in Rayalaseema region of Andhra Pradesh, India during October-2011-12. A total of 76 fields were surveyed in which 33 fields were identified as infested with root-knot nematode, ten infested plants per field (1000 sq m) were selected for collection of soil samples in zigzag patteren. An estimation of root-knot nematode galling index on root systems of the crossandra was done on 12 plants per field. Root system was visually rated for galling and egg masses indices. Gall index (GI) were determined based on the following scale: 0=0, 1=1-2, 2=3-10, 3=11-30, 4= 31-100 and 5= greater than 100 galls per root system (Taylor and Sasser, 1978). The incidence of the disease (number of plants galled/total number of plants sampled) and frequency of occurrence (percent) of the disease in each locality was calculated by the following formula:

Frequency of occurrence =

$$\frac{\text{Number of fields with root-knot nematode infection}}{\text{Number of fields surveyed}} \times 100$$

The species were identified on the basis of perineal pattern characteristics (Eisenback *et al*., 1981).

The survey conducted to assess the frequency and incidence of root-knot disease on crossandra in 2 districts of 9 mandals in Rayalseema zone of Andhra Pradesh (Table1) showed that crossandra crop grown in all the localities were infected by root-knot nematodes, particularly two to three year old crop was found severely infested. The incidence in general was high. Similarly, the intensity of the disease was also high. Crossandra cultivation was being done along with tomato, brinjal, chillies, papaya, betelvine, banana and cucurbits crops. Frequency of the disease was 43.42% in the surveyed mandals of both districts. The mandal-wise variations in the frequency of the disease revealed that highest frequency (56.25%) of occurrence of root-knot nematodes in Kodur. Root-knot nematode populations in the soil ranged from 168 to 667 with an average of 363.88 root-knot nematodes in 300 g of soil and 96 to 534 with

Table 1. Prevalence and incidence root knot nematodes infestation and distribution in crossandra crop in Rayalseema zone of Andhra Pradesh

District	Mandal	No. of fields visited	No. of fields found infested	Frequency (%)	Incidence*	Gall Index	J2s in 300 g soil	Nematodes in 50 g root	Root-knot nematode spp.
Kadapa	Kodur	16	9	56.25	100	5	667	534	*M. incognita*
	Khajipeta	9	5	55.55	58.33	4	463	417	*M. incognita* + *M. javanica*
	Rajampet	9	4	44.44	75	4.5	331	469	*M. javanica*
	Duvvur	7	3	42.85	41.66	4	317	206	*M. incognita*
Chittoor	Peddathippa-samudram	12	6	50	50	3	508	312	*M. incognita* + *M. javanica*
	Kurabalakota	5	2	40	41.66	2.5	298	251	*M. javanica*
	Peddamandyam	4	1	25	33.33	2	267	165	*M. incognita*
	Thamballapalle	8	3	37.5	50	4	256	105	*M. javanica* + *M. incognita*
	B. Kothakota	6	1	16.66	33.33	3	168	96	*M. incognita*
Total		76	33	43.42	53.70	3.55	363.88	283.88	

* based on 12 plants per field

a mean of 283.88 root-knot second stage juveniles in 50 g of roots. The root and rhizosphere soil analysis also revealed the presence of five other plant parasitic nematode genera namely *Criconema, Helicotylenchus, Hoplolaimus, Longidorus* and *Xiphinema*. However, root and soil populations of these nematodes were very low and not reaching the threshold plant damage levels compare to root-knot nematode populations. A similar survey conducted by (Nagesh and Reddy, 1997) indicated that commercial cultivation of crossandra, affecting due to root-knot nematodes in seedling establishment in the nursery and plant growth and yield in the main field. On the basis of perineal pattern characteristics, *Meloidogyne incognita* and *M. javanica*, the two species of root-knot nematodes were identified to infect crossandra. The species were either found singly or in mixed populations. Out of the two *M. incognita* was more frequent. It was found in 7 mandals out of 9 mandals either singly or concomitantly with *M. javanica*. It was present alone in two mandals (Rajampet and Kurabalakota) . Our findings provide the information that *M. incognita* is wide spread and damaging nematode pest of crossandra in rayalaseema regions of Andhra Pradesh

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First Report of Root-Knot Nematode (*Meloidogyne* spp.) on Garlic in India

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Garlic (*Allium sativum* L.) belongs to Alliaceae family is the most important commercial crop grown all over the world and consumed in various forms. It is grown throughout the country especially in the states of Maharastra, Uttar Pradesh, Orissa, Gujarat, Haryana, Punjab, Rajasthan, Uttaranchal, Jammu and Kashmir, Bihar, Andra Pradesh and Karnataka. Recently, during routine field visits it was observed that some garlic plants were dying exhibiting wilt symptoms. When such plants were pulled out along with root system, minute gall like structures as produced by *Meloidogyne* spp., were noticed. Upon teasing such galls, active juveniles (J2), 5-7 per gram of root were observed (on 30 days old crop). Literature scanning revealed that there are no such reports on root-knot nematode infecting garlic from India

Galls on garlic roots