

## Biological Control of Cardamom Root Grub Management with Entomo Pathogenic Nematodes (EPN)

**Problem:** Cardamom root grub, *Basilepta fulvicorne* Jacoby is a major pest of cardamom widely noticed in nurseries and main fields of Kerala. It is a serious pest damaging cardamom roots, causing 70% yield loss under various levels of infestation. The grubs feed and damage roots and portions of rhizomes; sometimes the entire root system is eaten away.

The pest has been managed with chemical pesticides viz. Chlorpyrifos or Phorate. Due to the highly toxic nature, the Government of Kerala has imposed a ban on these pesticides.

**Source of Technology:** ICAR-NBAIR

### Technological Intervention:

Soil application of EPN infected *Galleria* cadavers were implanted @ 4 cadavers / plant.

Name of technology (With brief details)	Source (Name of ICAR Institute)	Year of release	From which year promoted?	Efforts made by KVKs for its dissemination (Year wise and activity wise quantification)			No. of farmers benefitted (Approximate)	Area covered (ha) or (Approximate)
				Year	Activity	Qty		
Small Cardamom	ICAR - NBAIR	2009	2011-12	Biological Control of Cardamom Root Grub Management with <b>Entomo Pathogenic Nematodes (EPN)</b>			13070	690 ha
				2011	OFT	5		
					TRG	45		
				2012	OFT	5		
					TRG	162		
				2013	OFT	5		
					TRG	365		
				2014	FLD	10		
					TRG	1060		
				2015	FLD	10		
					TRG	4320		
				2016	FLD	10		
					TRG	6240		
				2017	FLD	25		
					TRG	685		
2018	FLD	5						
2019	TRG	163						

\*\* (OFT - On farm testing, FLD - Front Line Demonstration and TRG - Training)

**ICAR-NBAIR  
EPN TECHNOLOGY for  
Control of Small  
Cardamom Root Grub**



Root Grubs



Soil application of EPN



ICAR- ATARI-XI Director  
Visited EPN applied field



EPN infected Galleria  
cadavers



Field day conducted



Awareness Programme –  
EPN technology

**Horizontal Spread of the technology:**

Sl. No.	Villages	Area under EPN technology Before KVK intervention in ha	Increase in area EPN technology after KVK intervention in ha
1.	Senapathy	2	50
2.	Konnathady	35	160
3.	Santhanpara	210	210
4.	Bison valley	100	345
5.	Nedumkandam	180	690

**Vertical Spread of the technology:**

Sl. No.	Year	Production in kg(ha)	Productivity (qt. / ha)
1.	2011-12	824	3.94
2.	2012-13	912	4.68
3.	2013-14	1022	4.90
4.	2014-15	1120	5.50
5.	2015-16	904*	4.38
6.	2016-17	1175	5.61
7.	2017-18	1282	5.72
8.	2018-19	650**	2.10

\*Productivity decreased in 2015-16 due to increase in day temperature and acute drought.

\*\* Productivity decreased in 2018-19 due to heavy rainfall.

**Economic analysis:**

<b>Parameters</b>	<b>Demonstration</b>	<b>Local practice using chemicals</b>
% reduction in root grub attack	98	22
Gross cost (Rs. / ha)	358000	310000
Gross Return (Rs. / ha)	776000	488000
BCR	2.16	1.57

**Conclusion:**

Soil application of EPN infected *Galleria* cadavers implanted @ 4 cadavers /plant was effective cardamom root grub and the technology is well accepted by the farmers in Idukki district of Kerala

**Steps for Scaling up:**

Large Scale demonstrations in convergence with State Department of Agriculture