

## Farmers recommendation

Sr. No.	Recommendations	Year
1.	Applications of pressmud @ 15 t/ha (broadcast) a week prior to seeding is recommended for effective management of root- knot disease in <i>kharif</i> okra	1992
2.	Green Manuring with Naffatia/besharmi (ICBR 1:2.09) OR Water hyacinth (ICBR 1:2.52) or Aak (ICBR 1:2.26) or Congress grass (ICBR 1:2.09) each of 3 kg/m <sup>2</sup> before flowering, 15 days prior to seeding is recommended for economic and effective management of root-knot disease in nematode infested tomato nursery	1992
3.	Rabbing of root-knot infested tomato nursery with bajra husk @ 7 kg/m <sup>2</sup> a week prior of seeding is recommended for economic and effective management of root- knot disease (ICBR 1:5.12)	1992
4.	For effective management of root-knot nematodes and weed in tomato nursery, soil solarization through tarping with 100 gauge LLDPE clear plastic film for 15 days during May is recommended. It increased the numbers of transplantable seedlings by 615 per cent and decreased the root-knot disease and weeds by 66 per cent and 93 per cent, respectively (ICBR 1: 5.65)	1993
5.	Farmers are advised to transplant apparently root-knot disease free tomato seedlings (cv. Pusa Ruby) for getting maximum fruit yield with least root-knot disease. They are discouraged to transplant moderately or heavily root-knot infected tomato seedlings as they decrease fruit yield by 11.6 and 12.7 per cent and increase root-knot disease by 29.0 per cent and 48.4 per cent in nematode infested field, respectively	1993
6.	Application of poultry manure either 2.0 or 2.5 or 3.0 t/ha 15 days prior to tomato seeding is recommended for effective management of root-knot disease and production of more transplantable seedlings in tomato nursery giving ICBR of 1: 4.54 or 1:5.63 or 1:6. 68, respectively	1993
7.	For middle Gujarat tomato growers, poultry manure @ 2 t/ha followed by soil solarization with 100 gauge LLDPE clear film for 15 days in hot summer is recommended for economic control of root-knot nematodes and higher production of tomato transplants in tomato nursery (ICBR 1: 3.10)	1997
8.	For getting economically higher yield of summer greengram with lower root-knot disease index, cultivation of summer greengram after root-knot resistant tomato variety in <i>kharif</i> season is recommended (ICBR 1:4.44)	1998

9.	Farmers of middle Gujarat are advised for spot application of pressmud @ 10 t/ ha (ICBR 1:18.95) or mustard cake @ 3333 kg/ha (ICBR 1:16.10) or neem cake @ 4286 kg/ha a week prior to seeding is recommended for effective management of root-knot nematodes in bottle gourd and there by to harvest maximum fruit yield.	1998
10.	Farmers growing <i>Kharif</i> groundnut in middle Gujarat Agro-climatic Zone are advised to apply carbofuran @ 1 kg/ ha coupled with either neem oil @ 5 liter/ha (@ 2000 liter water/ ha with 0.1 per cent detergent powder) one day earlier (ICBR 1:3.4) or castor cake 1000 kg/ha one week earlier (ICBR 1:1.58) under crop row for effective management of root- knot disease and higher groundnut yield.	1999
11.	Tomato growers of middle Gujarat zone III are advised incorporation of green materials of Naffatia and neem leaves each @ 2 kg/1.44 m <sup>2</sup> (ICBR 1: 15.7) or Congress grass and Neem leaves each @ 2 kg/1.44 m <sup>2</sup> (ICBR 1: 15.6) or Aak, Naffatia, Congress grass and Neem leaves each @ 1 kg/1.44 m <sup>2</sup> (ICBR 1:14.7) 15 to 20 days prior to tomato seeding for effective management of root-knot disease and production of more healthy transplantable seedlings in tomato nursery during <i>Kharif</i> season.	2000
12.	Application of carbofuran and phenamiphos @ 2 kg/ha in papaya nursery in <i>kharif</i> a day or two, prior to seeding reduced the root-knot disease by 36.2 and 43.4 per cent thereby increased transplantable seedlings by 14.8 and 20.8 per cent, respectively. Thus, the loss of 12.9 per cent and 17.3 per cent in transplants due to root-knot infection could be avoided.	2000
13.	Farmers of middle Gujarat Agro climatic zone raising chilli and fennel nursery are advised to follow rabbing with castor husk @ 7 kg/m <sup>2</sup> (ICBR 1:1.67 and 1:3.36, respectively) OR soil solarization with 25 $\mu$ LLDPE clear film for 15 days during summer (ICBR 1:1.57 and 1: 2.43, respectively) for effective and economical management of root-knot nematode, <i>Meloidogyne javanica</i> pathotype 2 and weeds.	2003
14.	For effective and economical management of root-knot nematode, <i>Meloidogyne javanica</i> pathotype 2 in pigeonpea, the farmers of Kapadwanj area of Kheda district are advised to apply dry azolla @ 2 t/ha (ICBR 1:4.49) (if available) or poultry manure @ 3 t/ha (ICBR 1:3.43) one week prior to sowing in furrows and there is no need to apply any nitrogenous fertilizer.	2003
15.	Farmers of middle Gujarat of root- knot nematode, growing rabi maize are advised to treat the seeds with <i>Trichoderma harzianum</i> @ 4 g/ kg seeds having 2x10 <sup>8</sup> CFU/g carrier (ICBR 1:6.30) OR benomyl @ 25 g/ kg seeds before sowing and apply castor and neem cake each @ 250 kg/ ha in open furrows 15 days prior to seeding ( ICBR 1: 4.84) for effective and economic management of stalk rot and nematodes (stunt and lesion) and to achieve highest grain and fodder yield.	2005

16.	For effective and economic management of root- knot nematodes in brinjal, the farmers of middle Gujarat Agro- climatic zone – III (AES-II) are advised to apply <i>Paecilomyces lilacinus</i> @ 25 kg spore dust with carrier ( $10^8$ conidia/g) at the time transplanting] along with poultry manure @ 10 tons/ ha (a week prior to transplanting) or mustard cake @ 2 tons/ ha (a week prior to transplanting) or <i>P. lilacinus</i> @ 25 kg spore dust with carrier [( $10^9$ conidia/g) at the time of transplanting] along with neem cake @ 2 tons/ ha (a week prior to transplanting).	2007
17.	Cotton growers of middle Gujarat Agro climatic Zone III are advised to apply seed treatment of a proteo bacteria, <i>Glucanacetobacter diazotrophicus</i> strain 35- 47 ( $2 \times 10^9$ cfu) @ 20 g/ kg seed for effective and economic management of root- knot nematode, <i>Meloidogyne javanica</i> pathotype 2 during Kharif season (ICBR 1:195.0).	2009
18.	Farmers of middle Gujarat growing <i>kharif</i> maize are advised to treat the seeds with carbosulfan 25 SD @30g/ kg and furrow application of carbofuran 3G @ 0.5 kg a.i/ ha (16.6 kg/ ha) at the time of sowing to manage the stalk rot ( <i>Fusarium moniliforme</i> ) disease and phytonematodes i. e. stunt ( <i>Tylenchorhyncus vulgaris</i> ) and lesion ( <i>Pratylenchus zae</i> ) nematode3s (icbr 1:5.63).	2009
19.	The farmers of North Gujarat region cultivating pomegranate are advised to apply talc based formulation of <i>Pochonia chlamydosporia</i> ( $10^8$ spores / g) or <i>Paecilomyces lilacinus</i> ( $10^8$ spores/ g) @ 100g/ plant+ mustard cake @ 1.5, 2.0 and 2.25 kg/ plant in first, second and third year, respectively; two times i.e., first during November and second during April for the effective management of root- knot nematodes.	2011
20.	Farmers of agro- climatic zone II growing red gram are advised to apply talc based mixture of <i>Trichoderma harzianum</i> ( $10^8$ spores / g) @ 5 kg/ha + <i>Pochonia chlamydosporia</i> ( $10^8$ spores / g) @ 20 kg/ ha in furrows at the time of sowing for effective and economical management of cyst nematode, <i>Heterodera cajani</i> .	2011
21.	The farmers of middle Gujarat growing <i>kharif</i> mung are advised to apply neem cake @ 1000 kg/ha + <i>Trichoderma viride</i> ( $2 \times 10^8$ spores/g) @ 2.5 kg/ha, 10 days before sowing to manage root knot nematodes and increase yield (ICBR 1: 2.14).	2012
22.	The farmers of middle Gujarat growing vegetables in nematode sick fields are advised to grow root knot resistant varieties i.e. cowpea variety - Anand Vegetable Cowpea-1 in <i>Kharif</i> and tomato variety Hisar Lalit in <i>Rabi</i> for three years to manage root-knot nematode population.	2013
23.	The farmers of Middle Gujarat zone (AES II) growing mung in <i>kharif</i> season in root-knot sick field are advised to adopt following crop rotation for two years to manage root-knot nematode effectively and economically (2015). <i>Kharif</i> : Mung <i>Rabi</i> : Cabbage and Summer: Clusterbean	2015

24.	The farmers of Middle Gujarat growing Pomegranate are advised to apply <i>Purpureocilliumlilacinum</i> @ 20.0 kg/ha (2 x 10 <sup>6</sup> spores/g talc) + castor cake @ 2 t/ha in root zone, 12 to 18 inch away from tree trunk in approximately 9 inch deep at 6 months interval to manage root-knot nematode with higherfruit yield (ICBR 1:7.2) (2015).	2015
25.	For effective and economical management of root-knot nematode, <i>Meloidogynespp.</i> infecting okra, farmers are advised to treat seeds with <i>Purpureocillium lilacinum</i> @ 5 ml/kg followed by soil application of vermin compost @ 2.5 t/ha enriched with <i>P. lilacinum</i> @ 10 ml/kg (ICBR 1:1.21) (Anon., 2018).	2018
26.	Farmers of middle Gujarat agro-climatic zone are advised to apply 2.5 tons of vermin compost/ha enriched with <i>Purpureocilliumlilacinum</i> @ 2.5 kg/ha before sowing for effective management of root-knot nematode, <i>Meloidogyne spp.</i> infecting bitter gourd	2019
27.	The farmers of Gujarat cultivating tomato are recommended to transplant tomato seedlings during the first-week of November for the management of root-knot nematodes.	2021
28.	Farmers growing tomato in Gujarat are recommended to drench fluopyram 34.48% SC @ 500g a.i./ha one day after transplanting for the effective management of root-knot nematodes. For this, prepare water solution by mixing 1250ml fluopyram 34.48% SC in the 5926 liters water and drench 200ml solution per plant near the root zone area.	2023
29.	Farmers raising tomato nursery in Gujarat are recommended for soil application of neem cake powder @ 200g/m <sup>2</sup> at 15 days prior to seeding in nursery for the effective management of root-knot nematodes and thereby increase in number of transplantable seedlings.	2024
30.	Farmers growing tomato in middle Gujarat are recommended to apply <i>Agniastra</i> 800 ml in 10 litres of water and then dip the seedling roots for six hours. Thereafter, drench 500 mL <i>Agniastra</i> solution per plant at the time of transplanting and at 15, 30 and 45 days after transplanting for effective management of root-knot nematodes.	2024

## Scientific Information

Sr. No.	Recommendations	Year
1.	The plant parasitic nematodes in banana can be managed effectively and economically by applying carbofuran @ 1.5 g/plant in the rhizosphere of plants each at 6 and 7.5 months after planting. Estimation of carbofuran residues from peeled banana (pulp) indicated that it contains 0.357 ppm residue which is 18 times above the prescribed MRL of 0.2 ppm. However, for effective management of plant parasitic nematodes and to avoid residue in banana, the nematicide should be applied at the time of planting and 2 months after instead of 6 and 7.5 months after planting.	1991
2.	<i>Meloidogyne javanica</i> (Pathotype 2) is first time recorded from Kapadwanj area of Kheda district in Gujarat, India.	1995
3.	Pigeonpea cyst nematode, <i>Heterodera cajani</i> was first time recorded on pigeonpea crop in Gujarat. It was more prevalent in Vadodara and Bharuch districts of the state.	1995
4.	Estimated loss of avoidable yield due to mix population of <i>Meloidogyne incognita</i> and <i>M. javanica</i> was 11 per cent in fruit yield of banana (cultivar Basrai).	1998
5.	It is recommended that application of bio-nematicide, <i>Paecilomyces lilacinus</i> spore dust with substrate carrier @ 50 kg/ha (10 conidia/g product) was found effective for management of <i>Meloidogyne javanica</i> (pathotype 2) in groundnut which was at par with carbofuran @ 1kg/ha.	1999
6.	Root-knot nematodes ( <i>Meloidogyne incognita</i> and <i>M. javanica</i> pathotype 1) cause 4.08 per cent loss in cotton yield.	2000
7.	Cyst nematode, <i>H. cajani</i> causes 49.59 per cent loss in pigeonpea yield.	2000
8.	The losses due to stunt nematode, <i>Tylenchorhynchus vulgaris</i> were 43.92, 45.25 and 40.05 per cent respectively in fodder, stover and grain yield of maize variety Farm Sameri and 36,15,29.89 and 35.03 per cent, respectively in variety Gujarat Maize 1.	2000
9.	It is recommended that application of bio-nematicide, <i>Paecilomyces lilacinus</i> @ 25kg/ha (granules having spore load 5 x 10 <sup>8</sup> conidia/g) with phenamiphos @ 1kg/ha was found most effective for management of root-knot nematodes, <i>Meloidogyne</i> spp. with highest yield of cotton. Phenamiphos alone and <i>P. lilacinus</i> with carbofuran @ 1kg/ha were next effective treatments. <i>P. lilacinus</i> alone was at par with carbofuran, the popular nematicide.	2000

10.	Entomopathogenic nematode, <i>Steinernema glaseri</i> with antidesicant was found effective against <i>Plutella xylostella</i> on cress inducing 59.1 per cent reduction in larval population. Biopesticide treated check, <i>Bacillus thuringiensis</i> , treatment remained most effective giving 87.5 per cent reduction of larval population with the highest cress seed yield followed by monocrotophos treated check.	2000
11.	Root knot nematode, <i>Meloidogyne javanica</i> pathotype 2 induced 6.28 per cent yield loss in fodder and 13.26 per cent in pod yield of groundnut cv. Local and 15.92 percent grain yield loss in pigeonpea cv. BDN 2.	2003
12.	Farmers of Middle Gujarat growing rabi maize are advised to treat the seeds with <i>Trichoderma harzianum</i> @ 4 g/kg seeds having 2 x 10 <sup>8</sup> CFU/g carrier (ICBR 1: 6.30) OR benomyl @ 2.5 g/kg seeds before sowing and apply castor and neem cake each @ 250 kg/ha in open furrows 15 days prior to seeding (ICBR 1: 4.84) for effective and economic management of stalk rot and nematodes (stunt and lesion) and to achieve highest grain and fodder yield.	2004-05
13.	For the management of root-knot nematodes in sick soil, the following rotations were found effective: <ul style="list-style-type: none"> <li>a. First year : Okra in kharif and tomato in rabi</li> <li>b. Second year : Root- knot resistant cowpea variety in <i>kharif</i> and root-knot resistant tomato variety in rabi</li> <li>c. Third year : Okra in kharif and tomato in rabi.</li> </ul>	2010
14.	The farmers of Middle Gujarat Agro-climatic Zone III growing okra crop in <i>kharif</i> are recommended to treat seeds with <i>Purpureocillium lilacinum</i> (2x10 <sup>6</sup> cfu/ml), 5 ml/kg and soil application of vermicompost before sowing @ 2.5 t/ha enriched with <i>P. lilacinum</i> , 10 ml/kg for effective and economical management of root-knot nematodes ( <i>Meloidogyne</i> spp.)	2017
15.	The farmers of middle Gujarat Agro-climatic zone growing cowpea in <i>kharif</i> season in root-knot nematode infested field are advised to adopt following crop rotation for three years to manage root-knot nematode effectively and economically. <i>Kharif</i> : cowpea (AVCP 1), <i>Rabi</i> : onion and Summer: cowpea (AVCP 1) vegetable	2020
16.	Drenching of fluazaindolizine 500 SC, 0.025% (10 ml/ 20 litre of water) at one day before transplanting (200 ml/ plant hole) found effective for management of root-knot nematodes, <i>Meloidogyne</i> spp. infecting cucumber in polyhouse.	2021

17.	Two applications of fluopyram 34.48 % SC @ 250 g a.i./ha one day after transplanting (DAT) and again 25 DAT with 200 ml water/plant or single application of fluensulfone 2% GR @ 1.5 g/plant one day after transplanting (DAT) were proved effective against root-knot nematode, <i>M. incognita</i> by reducing root-knot index and increasing fruit yield of capsicum.	2022
18.	Soil application of <i>Bacillus subtilis</i> 1 % WP (CFU $2 \times 10^8$ ) 2.5 kg/ha enriched with FYM (1 kg/ton FYM), prior to sowing followed by seed treatment with <i>B. subtilis</i> , 10 g/kg seeds was found effective in management of root-knot disease in chickpea.	2022
19.	The application of fluopyram 400SC, 0.625 lit./ha as soil drenching at 4 days before sowing reduced root-knot nematode population and RKI with increasing fruit yield of cucumber.	2023
20.	Soil application of <i>Bacillus amyloliquefaciens</i> strain No. IIHR Ba 2 ( $2 \times 10^8$ cfu/g), 1kg/1000 m <sup>2</sup> enriched with FYM at the time sowing and 45 DAS, for effective management of root-knot nematodes and increased fruit yield of cucumber under polyhouse.	2023
21.	The application of fluopyram 400 g/L SC, 34.48% SC, 0.625 L/ha as soil drenching with 200 ml solution at 4 days before sowing reduced root-knot nematode population and root knot index with higher fruit yield of cucumber without any phytotoxicity.	2024
22.	Soil application of FYM enriched <i>Bacillus amyloliquefaciens</i> strain No. IIHR Ba 2 ( $2 \times 10^8$ cfu/g), 1 kg/1000 m <sup>2</sup> before sowing and 45 DAS in soil is effective for management of root-knot nematodes and with higher fruit yield of cucumber under polyhouse.	2024