Effect of organic cakes against infestation of *Meloidogyne incognita* in cucumber (*Cucumis sativus* L.)

**J. KONSAM, A. K. MUKHOPADHYAY, 1K. ROY AND 1A. PRAMANIK**

*Department of Agricultural Entomology, 1AICRP on Plant Parasitic Nematodes Bidhan Chandra Krishi Viszavidyalaya Mohanpur-741252, Nadia, West Bengal*

*Keywords: Cucumber, *Meloidogyne incognita*, organic cakes*

Most of the cucurbits are extremely susceptible and severely infected with root-knot nematodes, *Meloidogyne* spp., causing immense crop losses. Slow declinations of crop health leading to stunted growth, day time wilting during hot and dry weather condition are the important above ground symptoms of root-knot nematode infection to the crop. Root galls, which give the root system a knobby appearance, are most characteristic underground symptom of the disease. The number of nematicides labeled for managing cucumber is limited and hazardous. In order to prevent from hazardous effects, effective prophylactic management programme like use of organic matter should be adopted against nematodes starting from land preparation. Amendment of soil with decomposable organic cake is known to alter the soil and root rhizospheric environment particularly of the micro flora. Oil cakes have been demonstrated to incite the soil microflora releasing some substances which is fungicidal and nematicidal (Tousson et al., 1964). Keeping this background information in mind an approach was made to study the effects of organic cakes on *Meloidogyne incognita* in cucumber (*Cucumis sativus* L.).

The trial was conducted in a field infested with *M. incognita* (342 second stage infective juveniles per 200 cc of soil) at Central Research Farm of Bidhan Chandra Krishi Viszavidyalaya, Gayeshpur, Nadia, West Bengal during rabi season of 2009-2010. The experimental site was geographically located at 23°N latitude, 89°E longitudes and at an elevation of 9.75 meter from the mean sea level. The experiment was laid out in Randomized Block Design having 5 treatments @ 30g pit\(^{-1}\) and 5 replications. The treatments consisted of neem cake, castor cake and jatropha cake, which were applied out in Randomized Block Design having 5 treatments @ 30g pit\(^{-1}\) and during final harvest to a depth of 15-20 cm from the mean sea level. The experiment was laid at 23ºN latitude, 89ºE longitudes and at an elevation of 9.75 cm. For gall indices, number of galls were counted and during final harvest to a depth of 15-20 cm from the control. Application of jatropha cake @ 30 kg pit\(^{-1}\) recorded the highest fresh and dry root weight of cucumber being 97g and 11.2g, respectively. Control showed the lowest fresh (54g) and dry root weight.
yield and to reduce nematode population in cucumber. It has been observed from the study that adoption of jatropha cake @ 30g pit⁻¹ fruit was recorded in plants treated with jatropha cake @ 30g pit⁻¹ (11.06 kg plot⁻¹). Similar with the present findings Khan et al. (1974) stated that the liberation of ammonia from the decomposition of oil cakes, meant for the inhibitory effect on nematic activities avenue for the better growth as well as the improvement of the tomato yield. The treatment T₄ (jatropha cake @ 30 kg pit⁻¹) was found significantly superior in reducing root gall index and root knot nematode population. The lowest root gall index and soil population of root knot nematodes being, 2.3 and 339.4 second stage infective juveniles per 200cc of soil, respectively.

Table 1: Effect of treatments on root biomass, yield, gall indices and nematode population of cucumber

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Fresh root weight (g)</th>
<th>Dry root weight (g)</th>
<th>Yield (kg plot⁻¹)</th>
<th>Root-knot index</th>
<th>Population of J/200cc of soil</th>
</tr>
</thead>
<tbody>
<tr>
<td>T₁ : Neem cake @ 30 g pit⁻¹</td>
<td>67ᵇ</td>
<td>7.72ᵇ</td>
<td>11.06ᵇ</td>
<td>3.44ᵇ</td>
<td>413.5ᵇ</td>
</tr>
<tr>
<td>T₂ : Castor cake @ 30g pit⁻¹</td>
<td>56ᵇ</td>
<td>6.64ᵇ</td>
<td>9.39ᵇ</td>
<td>3.58ᵇ</td>
<td>455.4ᵇ</td>
</tr>
<tr>
<td>T₃ : Jatropha cake @ 30g pit⁻¹</td>
<td>97ᵃ</td>
<td>11.20ᵃ</td>
<td>13.91ᵃ</td>
<td>2.30ᵃ</td>
<td>339.4ᵃ</td>
</tr>
<tr>
<td>T₄ : Carbofuran 3G @ 10g pit⁻¹</td>
<td>65ᵇ</td>
<td>6.86ᵇ</td>
<td>10.75ᵇ</td>
<td>2.66ᵇ</td>
<td>352.6ᵇ</td>
</tr>
<tr>
<td>T₅ : Untreated control</td>
<td>54ᵇ</td>
<td>6.10ᵇ</td>
<td>8.81ᵇ</td>
<td>3.66ᵇ</td>
<td>479.1ᵇ</td>
</tr>
</tbody>
</table>

Note: Initial nematode population: 342 second stage infective juveniles per 200 cc of soil. Data marked by common letters are not statistically significant according to DMRT at 5% level of probability.

Carbofuran 3G @ 10g pit⁻¹ was found as second promising treatment where root gall index was 2.66 and soil population of the nematode was 352.6 second stage infective juveniles per 200cc of soil. This observation was in tune with the findings of an experiment conducted at the Kalyani centre of AICRP on plant Parasitic Nematodes, revealed efficacy of organic amendments like neem cake, mustard cake and jatropha cake to manage the root-knot nematode infestation in cucumber. All the organic cakes showed superior result over carbofuran 3G with regard to yield, gall index and soil nematode population in cucumber (Annon., 2008). Parkeerathan et al. (2009) also stated that use of eco-friendly green leaf manure which not only improves the plant growth but also increases the yield of tomato plant and reduces the nematode attack.

Similarly, Kalaiarasan et al. (2007) also stated that application of jatropha cake @ 20g plot⁻¹ increased the plant growth of tomato and reduced egg hatching and increase juvenile mortality to the tune of 44.07 and 49.33%, respectively over control.

Therefore, it can be inferred that, application of jatropha cake@ 30g plot⁻¹ as spot application at 10 days before sowing were found to be effective compared to all other treatments for the management of *Meloidogyne incognita* in cucumber. Beside jatropha cake, neem cake and castor cake also showed good results to enhance growth and yield and to reduce nematode population in cucumber. It has been observed from the study that adoption of jatropha cake @ 30g plot⁻¹ at 10 days prior to sowing could be effective control measure against root-knot nematodes infestation in cucumber.

REFERENCES


