

## Effect of Synthetic and Biological Nematicides against Root-Knot and Free-living Beneficial Nematodes

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The purpose of this project is to control the root knot nematodes, *Meloidogyne chitwoodi* and *M. hapla*, the most economically important nematodes of potatoes in the Pacific Northwest. An additional purpose of this project is to improve soil health and to enhance soil microorganisms, including free-living beneficial nematodes. Both of the above purposes will be achieved by using low rates of synthetic nematicides in combination with organic amendments. Both laboratory and greenhouse assays were performed while the field assays are in progress. We are reporting only the organic amendment results. The low rates of nematicides in combination with organic amendments are in progress.

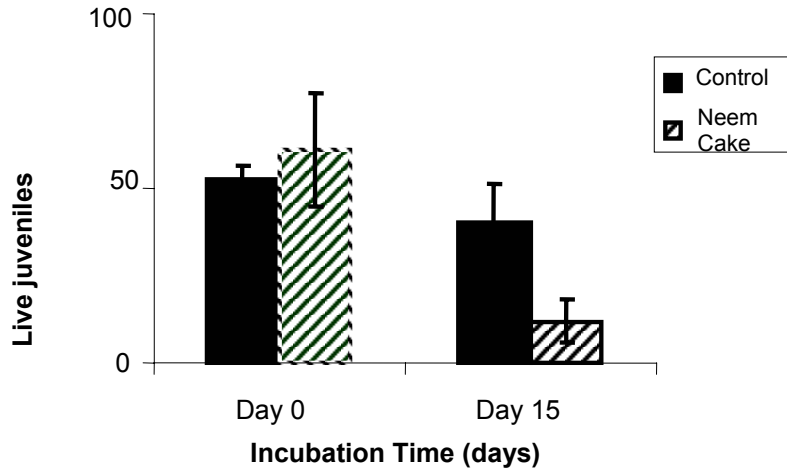
In the laboratory assays, organic amendments were soil incorporated and incubated either 0 or 15 days. After incubation, either plant parasitic or free-living nematodes were added to the amended soil. After 7 days nematode survival was evaluated. The greenhouse assay is similar to the laboratory assay with the exception that after nematode incubation, a host plant was introduced into the amended soil for 4 to 6 weeks to find out if the root knot nematodes can cause an infection.

Neem Cake laboratory assays are shown on Figs 1-3. Neem Cake reduced *M. chitwoodi* juveniles in the 15 day incubation assay and reduced *M. hapla*, at the 0 and 15 day incubation assay. Neem Cake increased the population of the beneficial nematode *C. elegans*, at both incubation periods. Neem Cake greenhouse assays are shown on Figs. 10 and 11. The greenhouse results are comparable to the laboratory results. Neem Cake, under laboratory and greenhouse conditions, has the potential to decrease root knot nematodes while increasing the numbers of the beneficial free-living nematodes.

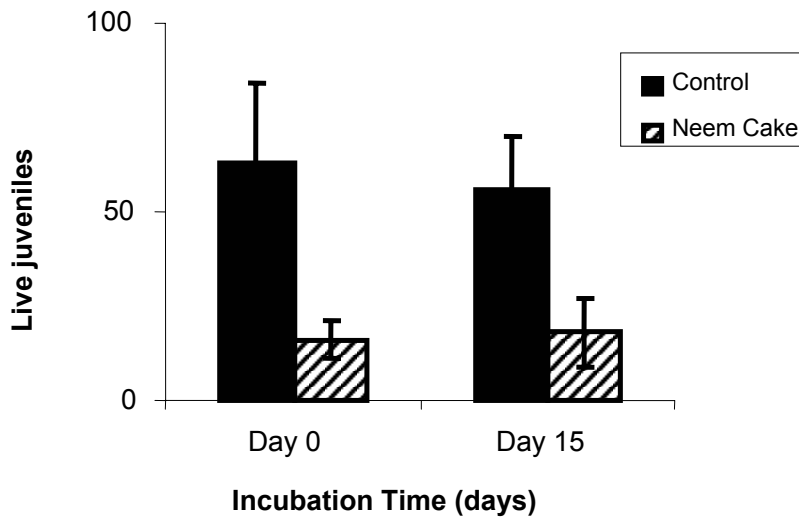
DiTera laboratory assays are shown on Figs. 4-6, and the greenhouse assays are shown in Figs. 12 and 13. DiTera reduced *M. chitwoodi* juveniles in the 0 and 15 day incubation assay, and reduced *M. hapla* in the 0 and 15 day incubation assay. DiTera increased the population of *C. elegans* at 0 day incubation assay. The greenhouse results are similar to the laboratory results. DiTera has the potential to decrease root knot nematodes while increasing the numbers of the beneficial free-living nematodes.

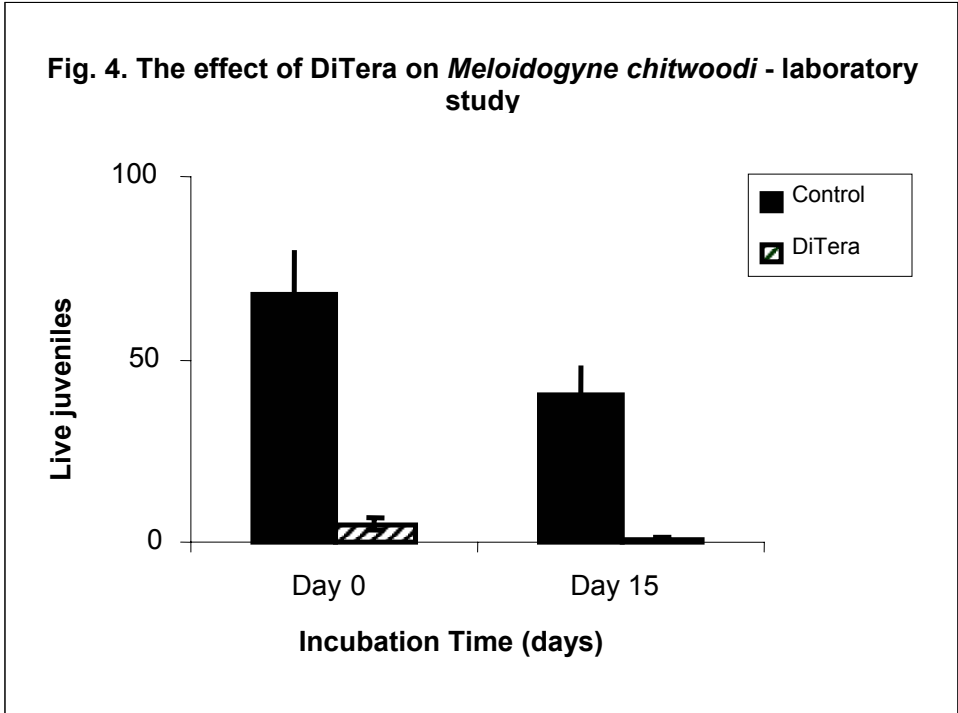
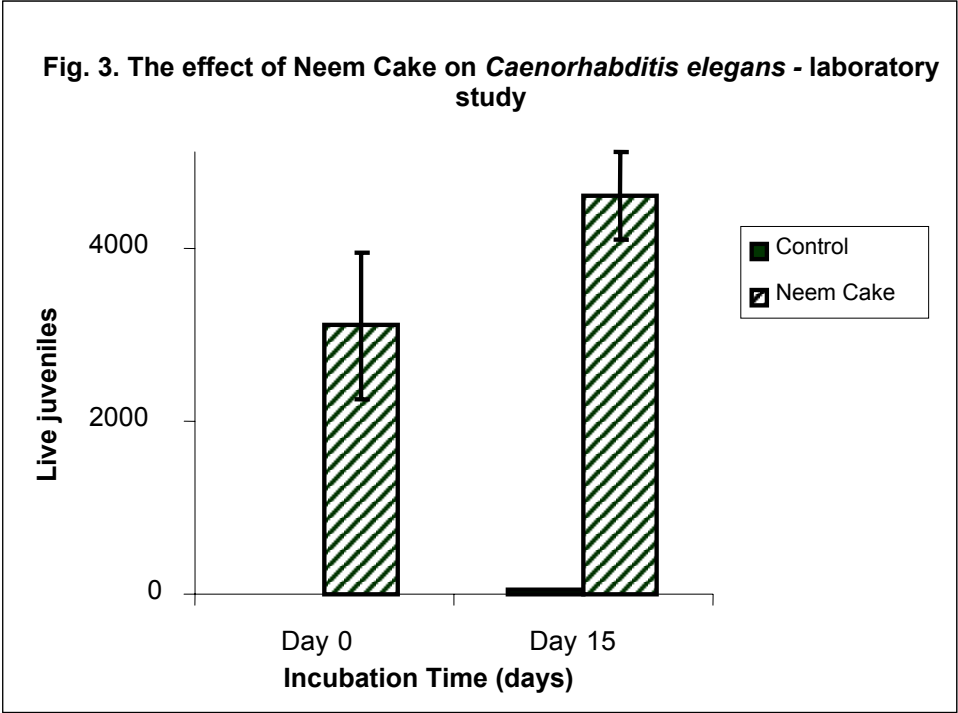
Neem oil + Karanja oil laboratory assays are shown on Figs. 7-9. This amendment reduced *M. chitwoodi* juveniles in 0 day incubation assay, and reduced *M. hapla*, at 0 day incubation assay, while the amendment increased the population of *C. elegans*, at 0 and 15 day incubation. Neem oil + Karanja oil, under laboratory conditions, have the potential to decrease root knot nematodes while increasing the numbers of the beneficial free-living nematodes.

**Fig. 1. The effect of Neem Cake on *Meloidogyne chitwoodi* - laboratory study**

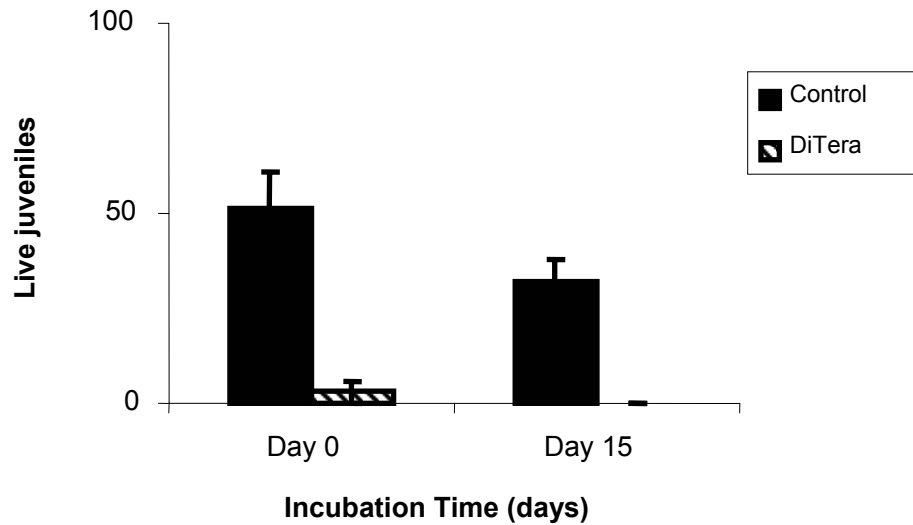


**Fig. 2. The effect of Neem Cake on *Meloidogyne hapla* - laboratory study**

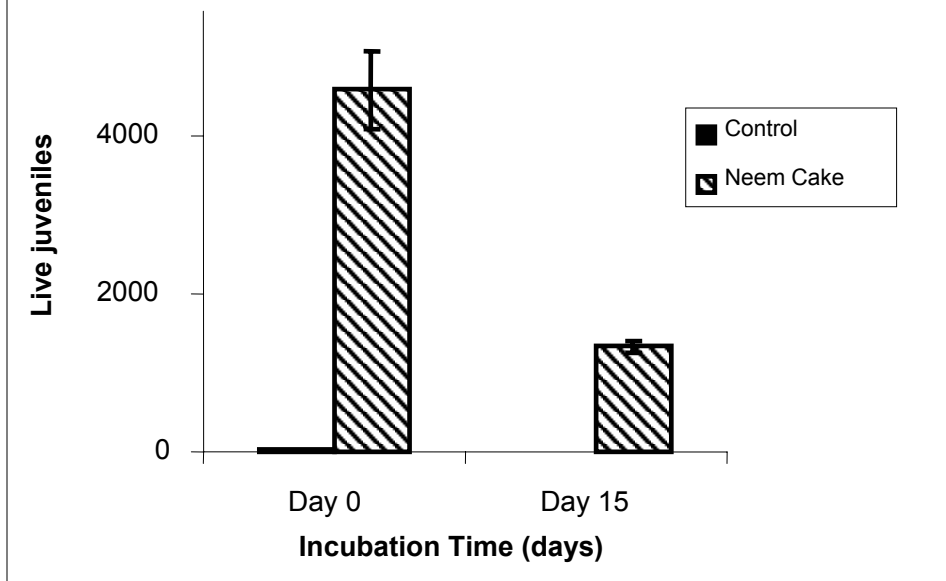




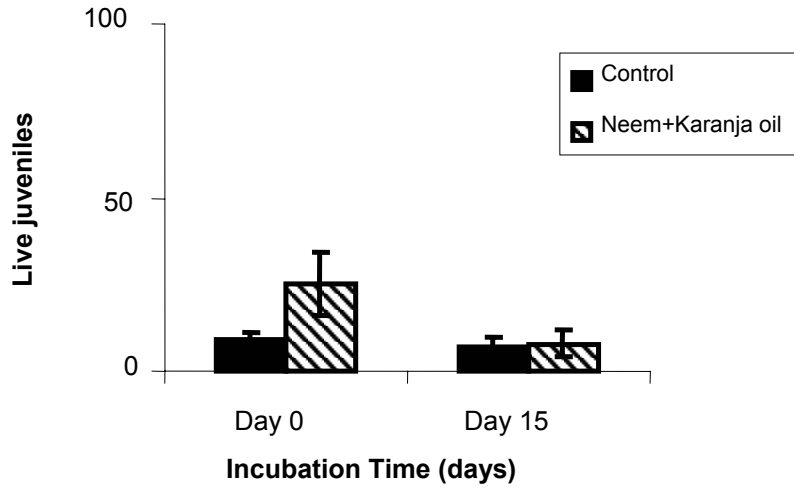
**Fig. 5. The effect of DiTera on *Meloidogyne hapla* - laboratory study**



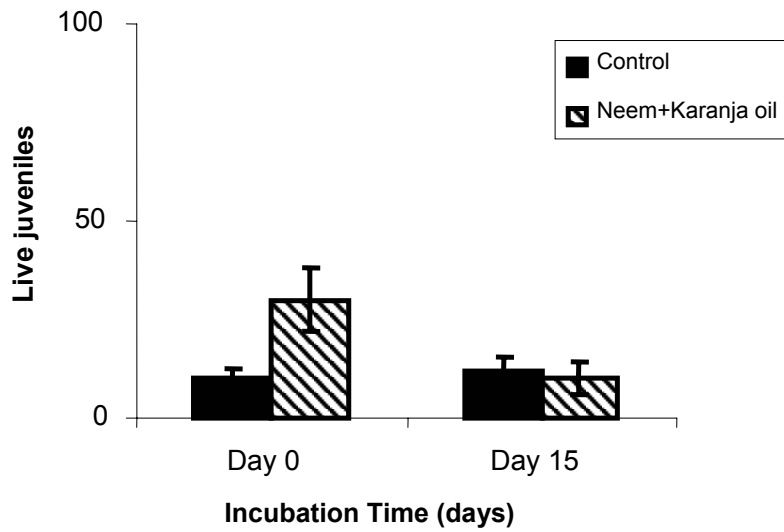
**Fig. 6. The effect of DiTera on *Caenorhabditis elegans* - laboratory study**



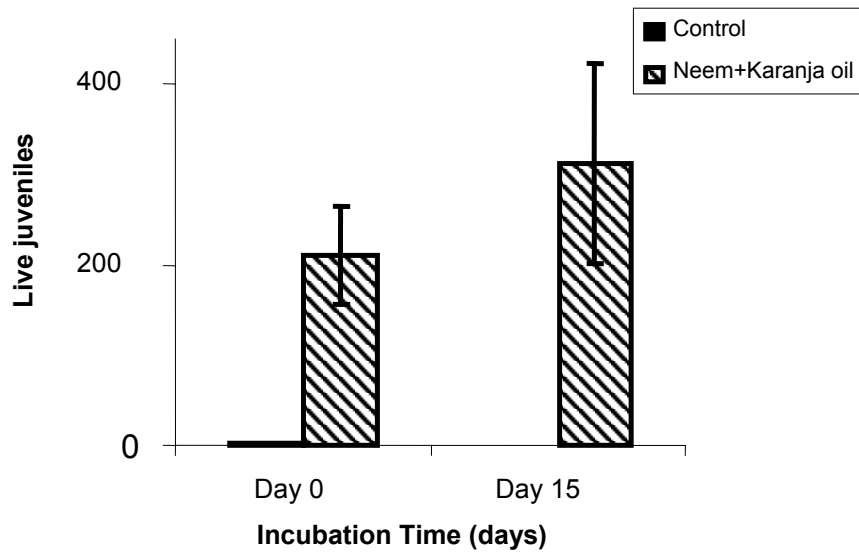
**Fig. 7. The effect of Neem oil + Karanja oil on *Meloidogyne chitwoodi* - laboratory study**



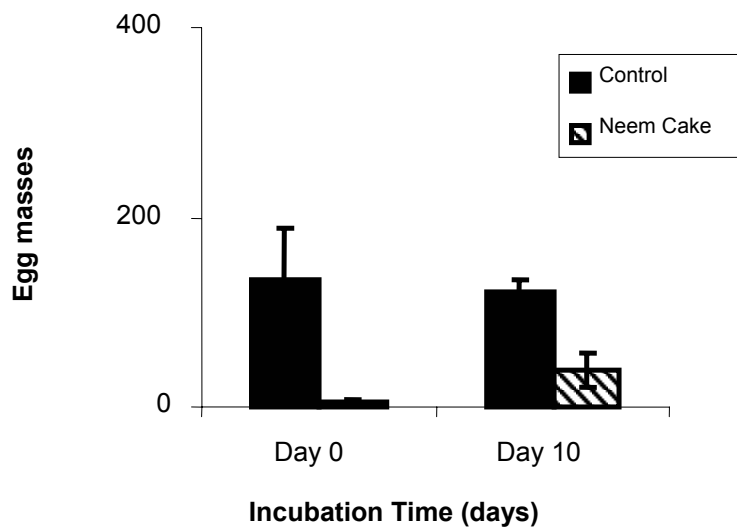
**Fig. 8. The effect of Neem oil + Karanja oil on *Meloidogyne hapla* - laboratory study**



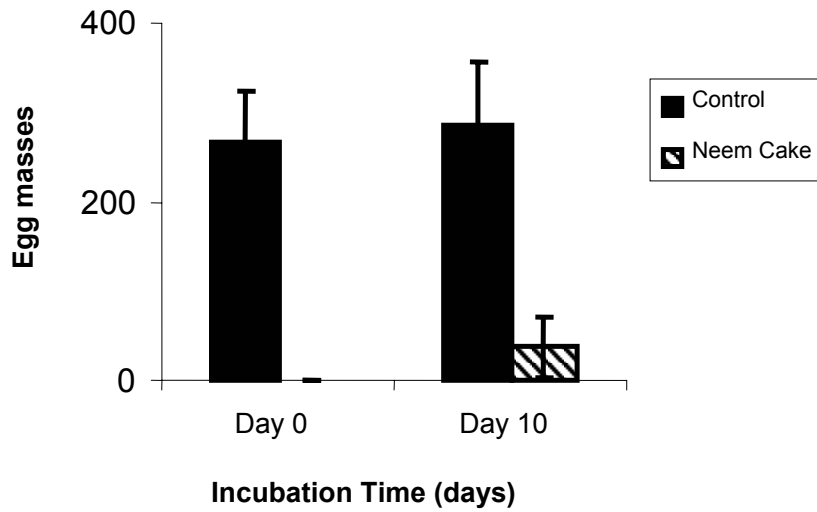
**Fig. 9. The effect of Neem oil + Karanja oil on *Caenorhabditis elegans* - laboratory study**



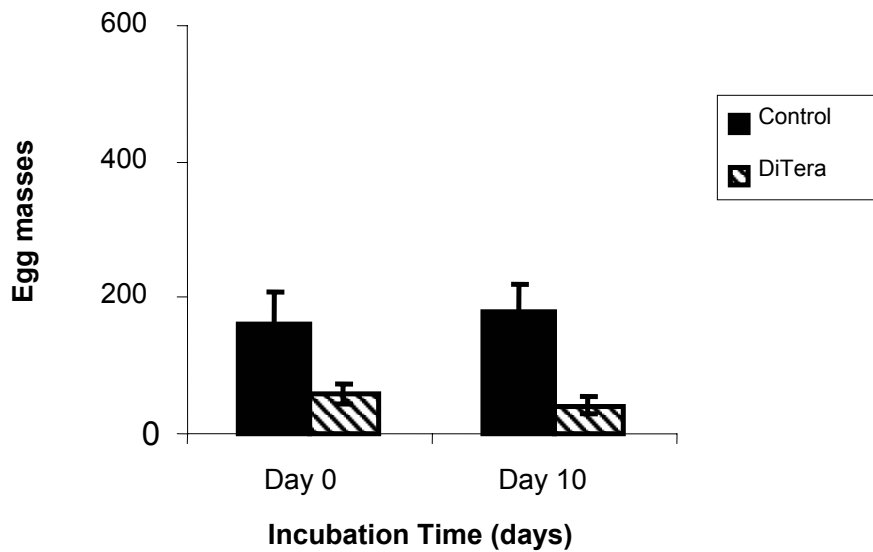
**Fig. 10. The effect of Neem Cake on *Meloidogyne chitwoodi* - Greenhouse study**



**Fig. 11. The effect of Neem Cake on *Meloidogyne hapla* – Greenhouse study**



**Fig. 12. The effect of DiTera on *Meloidogyne chitwoodi* – Greenhouse study**



**Fig. 13. The effect of DiTera on *Meloidogyne hapla* – Greenhouse study**

