

# CONTROL OF ROOT-KNOT BY BIOFUMIGATING TREATMENTS ON CARROT-TOMATO ROTATION CROP

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**R**oot-knot (*Meloidogyne* spp.) nematodes cause heavy yield losses to vegetable crops, such as carrot, onion, tomato and potato, in the coastal sandy soils of province of Foggia, southern Italy, due to the intensive cropping systems and the absence of suitable crop rotations.

Technical applicability and effectiveness for the control of the root-knot nematode *Meloidogyne incognita* of soil biofumigation treatments with *Brassica juncea* and *Eruca sativa* green manures, *B. juncea* hay, and a brassica seed meal commercial pellet were investigated over two years 2006-2007 in field experiments on a carrot-tomato rotation crop.

## Cropping systems under investigations

Conventional control of root-knot nematode in intensive horticultural cropping systems is compared with actually available control strategies that allow an effective and environmentally sustainable alternative:

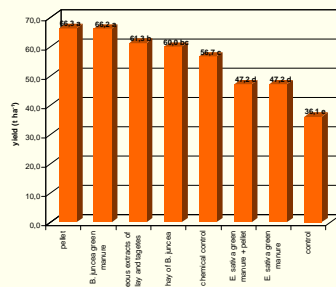
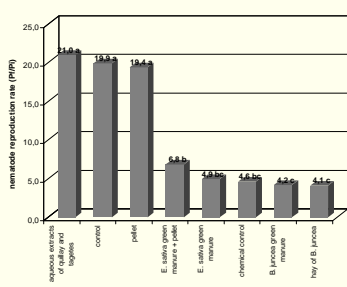
- Cultivation of green manuring crops (*Brassica juncea* and *Eruca sativa*);
- Application of *Brassica juncea* hay as amendment;
- Application of commercial amendment from brassica oil panel meals (pellets);
- Association of pellets and *E. sativa* green manure;
- Application of commercial formulations of aqueous extracts of quillay and tagetes;
- Application of chemical nematicides (a.i. fenamiphos).



## Main results

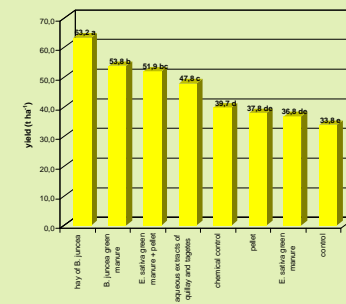
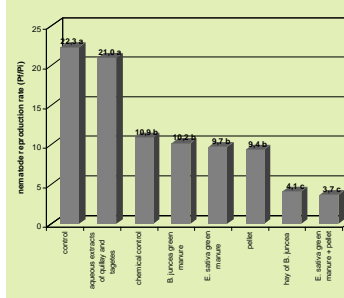
### Carrot

- Soil population density of *M. incognita* were significantly lower in the plots treated with green manure or hay of *B. juncea* or with green manure of *E. sativa*, either alone or combined with seed meal pellet, compared with untreated control.
- Nematicidal effect of biofumigating treatments was found not different from that of fenamiphos.
- Commercial pellet and *B. juncea* green manure and hay resulted also in carrot yield almost double than control, whereas lower increases were provided by *E. sativa* green manure, either alone or combined with the pellet.



### Tomato

- In the following tomato crop the lowest *M. incognita* densities were recorded in soil treated with *B. juncea* hay or with *E. sativa* green manure plus pellet.
- Hay and green manure of *B. juncea* and integrated treatment with *E. sativa* green manure and pellet resulted in the highest tomato yields, always significantly higher than fenamiphos.



### Acknowledgement

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### References

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## Conclusion

Overall, this research has indicated good potential for the use of brassica green manure in helping to control root-knot (*Meloidogyne* spp.) nematodes in a typical vegetable crop rotation of coastal sandy soils of province of Foggia.

All the treatments with the biofumigant crops or plant-derived formulations used in the experiments have been effective to reduce losses caused by root-knot nematode attacks in carrot and tomato crops.

According to these results biofumigation will be incorporated into an integrated pest management package for dissemination throughout the horticultural cropping systems of the area investigated.



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