

BIOFUMIGATION FOR THE CONTROL OF ROOT-KNOT NEMATODES ON FLOWER CROPS



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Flower and ornamental plant cropping systems play an economically relevant role in the province of Bari, southern Italy, though their yield is constantly at risk due to soilborne pathogens and infestations of root-knot nematodes (*Meloidogyne* species). Phase-out of methyl bromide enhanced the problems raised by these pest and requires technically effective and environmentally sustainable alternatives. Aim of this study was to investigate the suppressivity of brassica biofumigating green manures and plant-derived commercial formulations on the root-knot nematode *M. incognita* on lisianthus and aster flower crops in greenhouse.

Cropping systems under investigations

Conventional control of root-knot nematode in intensive floricultural 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 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).

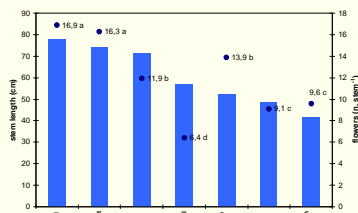
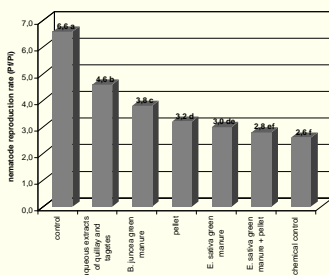


Main results

Lisianthus



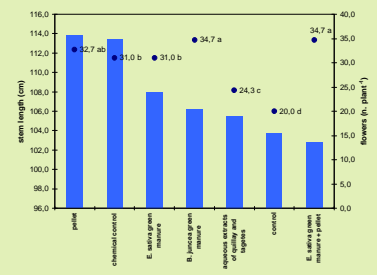
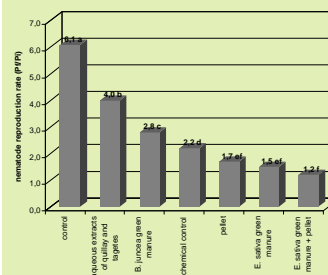
- Nematode population densities in plots treated with *B. juncea* and *E. sativa* green manures were reduced by 50 – 60% compared to untreated soil and resulted significantly lower than quillay treatment. Combination of *E. sativa* green manure with a reduced dose of pellet improved, though not significantly, the nematocidal effect of single green manure or pellet treatments.
- Compared to untreated soil, all treatments resulted in a significant increase of the number of flowers per stem. The highest stem length was recorded using pellets and chemical control.



Aster



- The highest suppression of *M. incognita* population was achieved after *E. sativa* green manure and pellet, alone or in combination, which resulted also significantly lower than fenamiphos. A consistent but lower reduction of nematode population was found also after *B. juncea* green manure.
- Control plots and plots treated with *E. sativa* green manure and pellet showed lower stem length. All the treatments with brassica green manure and pellets increased the number of flowers per plant.



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References

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Conclusion

High value industries, such as flowers have become so reliant on soil fumigation of soil, that these industries appear set to change to the next available chemical alternative, if and when registration and appropriate application methods become available.

Experiments to evaluate the relative efficacy of biofumigant crops compared to chemical fumigants have shown that *E. sativa* green manure and pellet, alone or in combination have been at least as effective as chemical nematicides for control of *M. incognita* population in flower crops management.



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