

**Studies on the effect of soil solarization, manure and their integration on root-knot and total nematode populations in cucumber fields**

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**ABSTRACT**

Studies on the effect of soil solarization, farm yard manure (40ton/ha) and the integration of soil-solarization and farm yard manure on incidence of root-knot nematodes (*Meloidogyne javanica* as a dominant species with about 70% of total pop.) on cucumber roots, and the total parasitic and free-living nematodes in the field, during the hottest period in the months of july-August for about five weeks in two consecutive years in 1992, 1993 in Esfahan, indicated that the temperature under the polyethylene mulchings were increased up to 10°C ( $\pm 1$ ) at 5 cm soil depth and the moisture were preserved more than 80%. The results showed that incidence of root-knot nematodes reduction were up to 52,56 and 83 percent in respective treatments, and in the total population of parasitic nematodes were reduced up to 71,69 and 79 percent respectively. The total free living nematodes increased only in farm yard manure and the integrated treatments up to 30 and 53 percent respectively.

**References**

- AKHIANL, A., MOJTAHEDI, H. and NADERI, A. 1986. The host of Root-knot nematodes in Iran. Pro.8th Plant protec. Cong. Iran. Isfahan, P. 134.
- GARRETT, S. D. 1958. Biology of Root-Infecting Fungi. Cambridge University Press. Cambridge, 293 pp.
- GOODEY, I. B. 1963. Soil and Freshwater Nematodes 2nd Ed. London, Methuen. 544 pp.
- GRECO, N., A. BRANDONISIO & F. ELIA 1985. Control of *Ditylenchus dipsaci*,

- Heterodera carotae* and *Meloidogyne javanica* by solarization Rev. Hort. 58: 99-102.
- HADAR, E., S. SOFER, S. BROSH, M. MORDECHAI, E. COHN, & J. KATAN 1983. Control of clover cyst nematode on carnation. *Hadessed*, 63: 1968-1700 (Hebrwe with English summary).
- JENKINS, W. R. 1964. A rapid centrifugal floatation technique for separating nematodes from soil. *Pl. Dis- Rept.* 48: 6999.
- KATAN, J. 1985. Solar disinfestation of soils. In biology and management of soilborne plant pathogens (C.A) Parker, A. D. Ravina, K. J. Moore, P. T. W. Wong, and J. F. Kollmorgen, eds, APS, St. Paul, pp. 274-278.
- KATAN, J. 1987. Soil solarization, pp. 77-105. In: Chet (ed). *Innovative Approaches to Plant Disease Control*. John Wiley and sons New York.
- OVERMAN, A. J. & J. P. JONES, 1986. Efficiency of soil solarization and fumigation for tomato, soil *Crop Sci. Soc. Fla. Proc*, 44: 35-39.
- PORTER, I. J. and L. R. MARRIMAN 1985. Effect of soil-solarization on nematode and fungal pathogen at two sites in victoria. *Soil Biol, Biochem.*, 15: 39-44.
- PULLMAN, G. S. and J. E. DEVAY, G. L. ELMORE, and W. H. HART 1984. Soil solarization a nonchemical method for controlling diseases and pests. Cooperative Extension Division of Agriculture and Natural Resources, Leaflet 21377. Uni. of California, Davis, Ca.
- RODRIGUEX-KABANAN, R. 1986. Organic and inorganic nitrogen amendments to soil as nematode suppressants. *Journal of nematology* 18, 129-35.
- ROBINSON, A. F. & C. M. HEALD 1986. Factors influencing the control of *Rotylenchulus reniformis* by soil solarization. *J. Nematol.* 18: 630.
- SIDDIQI, M. R. 1988. *Tylenchida Parasites of Plant and Insects*. Farnhem Royal, UK. CAB. 645 p.
- SITI, E., E. COHEN, J. KATAN, & M. MORDECHAI, 1982. Control of *Ditylenchus dispaci* in garlic by bulb and soil treatments. *Phytoparasitica*, 10: 93-100.
- STAPLETON, J. J. & J. E. DEVAY 1983. Response of phytoparasitic and free-living nematodes to soil solarization and 1,3-dichloropropene in California, *Phytopathology*, 73: 1429-1436.

- STAPLETON, J. J. & J. E. DEWAY 1984. Thermal components of soil solarization as related to changes in soil microflora and increase plant growth response. *Phytopathology*, 74: 255-259.
- STAPLETON, J. J. & J. E. DEWAY and B-LEAR 1987. Effect of combining ammonia-base fertilizers with soil solarization on pathogen control and plant growth. *Phytopathology* 77, 12 1747 (Abst).
- STIRLING, G. R. 1991. Biological Control of Plant Parasitic Nematodes 9. C. A. B. International. 282 pp. Wallingford, U. K.
- TAYLOR, A. L. and J. N. SASSER 1978. Introduction to research on plant nematology. An FAO guide to the study and control of plant parasitic nematodes. F.A.O Un. Rome Pl; cp/5-rev. z.

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