

## Grafting increases production of eggplant in Honduras

**The use of grafting for eggplant production is a practical addition to management strategies because it offers direct benefits to the producers, as well as to human health and the environment in general.**



Researchers have shown that grafting eggplant onto the rootstock of a native relative will protect this important Honduran crop from nematodes.

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Eggplant (*Solanum melongena* L.) cultivation is an activity of growing economic importance in Honduras. One of the most important local challenges is the root-knot nematode (*Meloidogyne* spp) that feeds at a plant's roots, forming galls that negatively affect its ability to absorb nutrients and water from the soil. This results in arrested plant development and reduced productivity, in addition to increased vulnerability to other plant pathogens.

In Honduras, the control of root-knot nematodes has centered on the application of chemical nematicides applied to the soil around the base of the plants. Nematicides are costly, and pose a health risk to applicators and to the environment. The Honduran Foundation for Agricultural Research (FHIA) is promoting a non-chemical way to manage root-knot nematodes by grafting eggplants onto the plant with the root-knot resistant nematode native relative, *Solanum torvum*, known locally as "Friegaplatos." Friegaplatos occurs naturally in Honduras and is in the same genus as eggplant. Studies were conducted during the 2003-2004 and 2004-2005 production cycles to evaluate the performance of grafted eggplants in comparison to non-grafted ones with regards to: a) the severity of the nematode attack, b) development of the plant c) yield, and d) a cost-benefit analysis of the use of this technology for integrated pest management.

The studies were carried out at FHIA's Center for Horticulture Research and Demonstration (CEDEH), in the Comayagua Valley. In one study non-grafted plants were either treated with a commercial chemical nematicide or not treated. In the other study grafted and nematicide-treated non-grafted plants were compared using population densities recommended locally in commercial plantings for both types of plants (3,334 and 6,667 plants/ha, respectively).

The results of the studies revealed that, by grafting on "Friegaplatos", the useful life of the plants in the field was increased by two additional months in comparison to either type of non-grafted plants. This was the direct result of the inherent resistance of "Friegaplatos" to *Meloidogyne* spp. allowing a more abundant and vigorous root system, and enhancing the plant's ability to obtain water and nutrients from the soil, with a concurrent improvement in plant development and productivity.

**Table 1.** Nematode population, yield and economic comparison of grafted and non-grafted eggplant at FHIA's CEDEH station in the Comayagua Valley, Honduras. 2003-2005.

Type of plants	Mean quantity of nematodes <sup>1/</sup>	Yield <sup>2</sup> (1,000 kg/ha)		Gross income (US \$)	Production cost (US \$)	Profit (US \$)
		Gross	Exportable			
Grafted	166	159.9	71.1	26,594	10,612	15,982
Non-grafted + nematocide	5,262	97.1	42.8	16,014	7,874	8,139
Non-grafted w/o nematocide	8,186	--	--	--	--	--

<sup>1</sup> Root-knot nematode, *Meloidogyne* spp. Data generated in the 2003-2004 growing season. Averages of the initial and final counts in volumes of 250 cc of soil.

<sup>2</sup> The cycle from transplant to the end of the harvest lasted 7 months in the grafted plants and 5 months in the non-grafted. Data from the 2004-2005 growing season, using commercially recommended population densities.

The use of grafting for eggplant production is a very effective and useful addition to the arsenal of management strategies because it offers direct economic benefits to the producers, as well as to human health and the environment. As a result of the acceptance of this technology by the local growers, in the year 2005 FHIA alone filled orders for 322,000 grafted plants and in the first half of 2006 orders have increased to 375,000 grafted plants. It is estimated that at least 10 percent of the 800 ha planted yearly to eggplant in the Comayagua Valley are currently using grafted plants, with a potential for use in up to 200 ha that correspond to the silt loam soils more favorable for root-knot nematode attack. Through this program, eggplant farmers are using more environmentally-sound methods, while at the same time increasing their income.

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