

## POTENTIAL FOR COMMERCIAL PRODUCTION OF TOMATILLO IN FLORIDA

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**Abstract.** Trials were conducted in the spring 1992 and 1993 seasons to assess the feasibility of commercial tomatillo (*Physalis ixocarpa* Brot.) production in Florida. Tomatillo, also known as husk tomato, is a principal ingredient in salsa verde, and is used in numerous other ways in Mexican cuisine. In a preliminary test conducted in 1992, plants produced from seeds extracted from fruit purchased in a local supermarket produced yields equivalent to 17,131 lb/acre and average fruit weight was 1.25 oz. Variation among plants suggested that seeds had been obtained from hybrid fruit. In 1993, four entries obtained from commercial seed companies were evaluated. Average fruit weight varied from 1.02 oz for 'Toma Verde' to 1.25 oz for 'Tomatillo'. Yields varied from 16,080 lb/acre for 'Green Purple' to 28,320 lb/acre for 'Tomatillo'. Yield and average fruit weight were not affected by in-row spacing of 1, 2, or 3 ft at a constant between row spacing of 5 ft.

Tomatillo (*Physalis ixocarpa* Brot.) is a solanaceous fruit vegetable that is the principal ingredient in fresh and cooked green chili sauces used in Mexican cuisine. Tomatillo is also known as husk tomato, tomate de cascara, tomate verde, tomate de fresadilla, and miltomate (Quiros, 1984). Tomatillo is widely grown in Mexico and Guatemala, and has been since preColumbian times.

Efforts to popularize the tomatillo and Cape gooseberry (*P. peruviana* L.) in Florida and the Caribbean in the early 1950's were summarized (Morton and Russell, 1954). Some success was achieved with both species as winter home garden novelties in south Florida, however, there are no reports of successful commercial production.

Commercial production data in the U.S. are available only from California where 176 harvested acres produced 1255 tons valued at \$880,000 in 1991. In addition to the California-produced crop, 20,592 tons were imported in 1991 (Vegetables and Specialties, 1993), primarily from Mexico. It is estimated that there are 27,000 acres of tomatillos grown in Mexico (Myers, 1991).

In trials conducted in Louisiana with three varieties in each of eight trials (Can et al., 1992), yields above 15,000 lb/acre occurred in only three trials. The highest yield of 23,000 lb/acre was produced by 'Rendidora' in a trial that was transplanted on 1 Sept. It was reported that 'Rendidora' produces about 25,000 lb/acre in Mexico.

In Mexico, marketable yields of 'Rendidora' tomatillo were higher at an in-row spacing of 16 inches than in-row spacings of 20 or 24 inches and with row spacings of 40 inches and 50 inches than with 60 or 70 inch row spacing (Garzón Tiznado and Garay Alvarez, 1979). The highest

marketable tomatillo yield obtained in this trial was 35,680 lb/acre.

A preliminary trial was conducted at this location in the spring 1992 season. Plants were established from seed extracted from market purchased fruit. Marketable yield was equivalent to 17,131 lb/acre and average fruit weight was 1.25 oz. A fruit sample examined by a local wholesaler had fruit size and condition superior to that received from his usual out-of-state sources.

The object of the trials reported here was to ascertain the feasibility of commercial tomatillo production in west-central Florida.

### Materials and Methods

Soil samples from the experimental area obtained before fertilization were analyzed by the University of Florida Extension Soil Testing Laboratory (Hanlon and DeVore, 1989): pH = 7.0 and Mehlich I extractable P = 69, K = 12, Mg = 92, Ca = 712, Zn = 6.0, Cu = 2.4, and Mn = 8.0 ppm.

The EauGallie fine sand was prepared in early Feb. 1993 by incorporation of 0-46-0 lb N-P-K/acre. Beds were formed and fumigated with 67:33 methylbromide:chloropicrin at 200 lb/acre. Banded fertilizer was applied in shallow grooves on the bed shoulders at 270-0-311 lb N-P-K/acre after the beds were pressed and before the black polyethylene mulch was applied. The final beds were 32 inches wide and 8 inches high, and were spaced on 5-ft centers, with six beds between seepage irrigation/drainage ditches which were on 41-ft centers.

Tomatillo seeds were planted in a peat-lite growing mix in No. 150 Todd planter flats (1.5 × 1.5 × 2.5 in. cells) on 1 Feb. The tomatillo transplants were produced by a commercial plant grower.

For the variety trial, transplants were set in holes punched in the polyethylene mulch at 2-ft in-row spacing on 16 Mar. Transplants in the spacing trial were set at 1, 2, or 3-ft in-row spacing on 25 Mar. Each variety plot and each spacing plot had ten plants and were replicated three times and arranged in randomized, complete block designs.

Weed control in row middles was by cultivation and applications of paraquat. Pesticides were applied as needed for control of diseases (mancozeb, copper salts of fatty and rosin acids, and chlorothalonil) and insects (permethrin, insecticidal soap, endosulfan, methomyl, fenprothrin, methamidophos, and *Bacillus thuringiensis*).

Fruit were harvested on 2, 11, and 21 June. Marketable fruit were considered to be greater than 1 inch in diameter, free from decay, and fully enclosed by the husk. Marketable fruit were counted and weighed. The resulting data from the variety trial were subjected to analysis of variance and mean separation was by Duncan's multiple range test. Regression analysis was used for data separation in the spacing trial.

### Results and Discussion

Despite a rigorous pest management program, tomatoes in adjacent and nearby plots were infested with pinworms and sweetpotato whiteflies and infected with bacterial

speck. The tomatillo plants were not affected even though the same pest management schedule was used. On the other hand, rugose, chlorotic, sometimes straplike leaves on some plants suggested the possibility of virus infection. Ten plants showing such symptoms were sampled on 10 June and tested by DAS-ELISA for tobacco etch virus (TEV), potato virus Y (PVY), potato virus X, tobacco mosaic virus, tomato spotted wilt, and cucumber mosaic virus. Two plants were positive, one each for TEV and PVY. Nucleic acid spot hybridization assay results showed one plant to be positive for tomato mottle virus.

Early yields (Table 1) ranged from 1360 lb/acre for 'Green Purple' to 9360 lb/acre for 'Tomatillo'. Average fruit weight at early harvest varied from 0.98 oz for 'Green Purple' to 1.22 oz for 'Toma Verde' (Petoseed). Total yield varied from 16,080 lb/acre for 'Green Purple' to 28,320 lb/acre for 'Tomatillo', but differences were not significant. Average total fruit weight ranged from 1.02 oz for 'Toma Verde' (Johnny's) to 1.25 oz for 'Tomatillo'.

Yields and fruit weight were not affected by in-row spacings of 1, 2, and 3-ft (Table 2). However, harvest was more difficult at the 1-ft in-row spacing because of the density of plant material.

Maximum yields in the variety trial were obtained from 'Tomatillo' - 28,320 lb/acre and from the 1-ft in-row spac-

Table 1. Tomatillo yields and average fruit weight. Gulf Coast Research and Education Center. Spring 1993.

Entry	Seed Source	Early harvest <sup>z</sup>		Total harvest	
		Yield (lb/acre)	Avg. fruit wt (oz)	Yield (lb/acre)	Avg. fruit wt (oz)
Tomatillo	Burpee	9360 a <sup>y</sup>	1.18 ab	28,320 a	1.25 a
Toma Verde	Petoseed	7500 ab	1.22 a	25,620 a	1.15 ab
Toma Verde	Johnny's	7520 ab	1.01 bc	17,300 a	1.02 b
Green Purple	Rogers NK	1360 b	0.98 c	16,080 a	1.20 ab

<sup>z</sup>Early harvest represents the first of three harvests.

<sup>y</sup>Mean separation in columns by Duncan's multiple range test, 5% level.

Table 2. Effects of in-row spacing on early and total yield and average fruit weight of 'Toma Verde' tomatillo. Gulf Coast Research and Education Center. Spring 1993.

In-row spacing (ft)	Early harvest <sup>z</sup>		Total harvest	
	Yield (lb/acre)	Avg. fruit wt (oz)	Yield (lb/acre)	Avg. fruit wt (oz)
1	4540	1.45	24,920	1.47
2	7060	1.31	24,700	1.37
3	6680	1.41	15,660	1.63
Significance	NS	NS	NS	NS

<sup>z</sup>Early harvest represents the first of three harvests.

ing - 24,920 lb/acre - in the spacing trial. These yields can be compared with 14,261 lb/acre from commercial plantings in California in 1991 (Vegetables and Specialties, 1993), 23,000 lb/acre in Louisiana trials (Can et al., 1992), and 35,680 lb/acre maximum plot yields in Mexico (Garzón Tiznado and Garay Alvarez, 1979). These comparative yields suggest that commercial tomatillo production in west-central Florida is likely to be feasible.

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## EFFECTIVENESS OF DIFFERENT INSECTICIDES FOR THE CONTROL OF SWEETPOTATO WHITEFLY, *BEMISIA TABACI* (GENNADIUS) (HOMOPTERA: ALEYRODIDAE) ON VEGETABLE CROPS IN SOUTHERN FLORIDA

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*Additional index words.* Imidacloprid, stylet oil, soil application, silverleaf.

*Abstract.* Studies were conducted to determine the effectiveness of different insecticides in controlling sweetpotato

whiteflies on 'Pod Squad' bean (*Phaseolus vulgaris* L.), 'Dusky' eggplant (*Solanum melongena* L.) and 'Dixie' squash (*Cucurbita pepo* L.) in 1993. In the first study, abamectin (0.01 kg/ha) in combination with pyrethrins (0.01 kg/ha)/rotenone (0.01 kg/ha) significantly reduced whiteflies on beans when compared with the nontreated plants after three applications at weekly intervals. In the second test, imidacloprid (0.04 kg/ha) controlled whitefly nymphs for 11 weeks when applied in soil at planting on raised beds. Eggs and nymphs of whiteflies per squash leaf sample were significantly fewer on imidacloprid treated plants than on nontreated plants in the third test. But the percentage of plants

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