TOMATO FUMIGATION TRIAL SPRING 1995

S.M. Olson*, J.R. Rich and D.O. Chellemi. University of Florida/IFAS, NFREC, Quincy, FL

This study is part of a larger cooperative project supported in part by the University of Florida, Florida Fruit and Vegetable Association and industry. This the third year of state wide coordinated trials to evaluate alternatives to methyl bromide for tomato production. In this study at NFREC, Quincy, we are utilizing large plots where treatments remain in the same place from year to year to look at effect of alternatives over time. This is the second year of the study.

Materials and Methods. Soil type was a Orangeburg loamy fine sand. Tomato cultivar used was 'Agriset 761'. Total fertilizer applied was 175-54-175 lbs/A of N-P_2O_5-K_2O. Treatments and rates are listed in Table 1. Mulched bed size was 36 inches with between row spacing of 72 inches. Plots consisted of 4 rows 65 feet long (32 plants per row). Yield, root gall ratings and nematode data was collected from the center 12 plants of the center 2 rows. All fumigant treatments were applied using a Varea-Meter flow meter with product tanks pressurized at 100 psi with N_2 gas. Equipment was calibrated and materials applied 9 inches deep with 3 chisels spaced 12 inches apart. Black polyethylene mulch was applied immediately after fumigant application. The Basamid and Vapam treatments were applied modified broadcast to the soil surface, beds pulled up, pressed and mulch applied. Tilliam 6E was applied at 4 lbs ai/a to all plots except the methyl bromide and untreated plots. All fumigant and herbicide treatments were applied on 28 February 1996. Drip tube used was Chapin Twin Wall IV, 10 mils thick with delivery rate of 0.5 gpm at 10 psi. Design was a random complete block with 4 replications. Planting date was 25 March 1996. Data collected for tomatoes included yield of medium (2.25 - 2.50 inches), large (2.50 - 2.75 inches) and extra-large (> 2.75 inches) fruit, total yield, root gall rating and root knot population at harvest. Nutsedge counts were made on the center 5 feet of the center 2 rows (30 square feet located in yield date area). Number of dead plants were counted on whole plots (n = 128 plants).

Results. Telone C-17 produced the highest yield of medium and large fruit and was significantly higher than the methyl bromide (MBr), Vapam and untreated treatments (Table 1). There were no significant differences among treatments for yield of ex-large fruit and total yield, but the MBr treatment produced the greatest (Table 1). The MBr, Telone C-17 plus Tilliam and chloropicrin plus Tilliam had significantly lower nutsedge (both yellow and purple) populations than the untreated check (Table 2). The Vapam plus Tilliam and Basamid

plus Tilliam did not significantly reduce the nutsedge population over the untreated check. Root gall ratings were reduced by all treatments over the untreated check except the Vapam treatment, but the root knot population was not significantly affected (Table 2). Fusarium wilt (race not determined at this time) caused a significant reduction in plant stand. Many of the plants died late in the season after first harvest. Plant death ranged from a high of 40.0 % for the untreated check to a low of 8.7 % in the Vapam treatment. All treatments except the Basamid treatment reduced plant loss over the untreated check (Table 2). The large plots are to be maintained and treatments applied in same location in 1997.

Table 1. Effect of fumigant treatments on yield of 'Agriset 761' tomatoes. Spring 1996. NFREC, Quincy, FL.

		Yield (25 lb boxes/a)			
Treatment[z]	Rate/a	Medium	Large	Ex-large	Total
Methyl bromide/ chloropicrin (67/33)	350 lbs	150 b[y]	294 b	1103 a	1547 a
Telone C-17	35 gal	281 a	460 a	686 a	1427 a
Vapam	100 gal	143 b	265 b	925 a	1333 a
Basamid	400 lbs	216 ab	363 ab	913 a	1492 a
Chloropicrin	350 lbs	190 ab	347 ab	971 a	1508 a
Untreated	----	148 b	282 b	761 a	1157 a

[z] All treatments injected into bed prior to applying mulch, except Vapam and Basamid treatments which were surface applied, incorporated, bedded, pressed and mulch applied. Tilliam 6E was applied to all treatments (4 lbs ai/a) except methyl bromide and untreated plots.

[y] Mean separation Duncan's Multiple Range Test, 5% level.

Table 2. Effect of fumigation treatments on nutsedge control, root gall rating, root knot population and percent dead plants of 'Agriset 761' tomatoes. Spring, 1996. NFREC, Quincy, FL.

Treatment[z]	Rate/a	Nutsedge control (plants/ft^2)	Root gall rating	Root knot population (no./100 cc)	Percent dead plants
Methyl bromide/ chloropicrin (67/33)	350 lbs	0.8 b[y]	0.1 b	0 a	13.5 b
Telone C-17	35 gal	1.6 b	0.5 b	52 a	9.2 b
Vapam	100 gal	7.2 ab	2.1 ab	450 a	8.7 b
Basamid	400 lbs	6.9 ab	0.1 b	11 a	20.4 ab
Chloropicrin	350 lbs	0.2 b	0.1 b	0 a	14.2 b
Untreated	---	15.7 a	3.5 a	515 a	40.0 a

[z] All treatments injected into bed prior to applying mulch, except Vapam and Basamid treatments which were surface applied, incorporated, bedded, pressed and mulch applied. Tilliam 6E was applied to all treatments (4 lbs ai/a) except methyl bromide and untreated plots.

[y] Mean separation Duncan's Multiple Range Test, 5% level.