

The Evaluation of Three Pickling Cucumber Cultivars on Plastic Mulch and Bare Ground Culture in North Florida 97-12

Robert C. Hochmuth, Jennifer L. Hornsby, and George J. Hochmuth¹

Introduction

This trial was conducted in cooperation with Mt. Olive Pickle Company, Mt. Olive, NC. Pickling cucumber is a possible alternative crop for the Suwannee Valley area. Mt. Olive Pickle Co. has expanded its southern production area into southern Georgia in recent years and continues to explore the potential of expanding into northern Florida by establishing a grading station in the region. To support this effort, a trial was conducted to evaluate three pickling cucumber cultivars and plastic mulch culture for northern Florida.

Materials and Methods

Plots were established in a Lakeland fine sand at the Suwannee Valley Research and Education Center near Live Oak, Florida. Preplant soil tests (Mehlich-1 extract) showed 62 ppm P, 32 ppm K, 33 ppm Mg, and 453 ppm Ca. Soil pH was 6.4 using a 1:2 (soil:water) solution. The soil was fertilized prior to planting with 600 lbs/A of 13-4-13 (N-P₂O₅-K₂O) on March 11, 1997. The crop also received an additional 80 lbs/A of N and K₂O via weekly fertirrigations from April 7 to May 23. Beds were formed on 5 foot centers, fumigated with a methyl bromide:chloropicrin mixture (98:2) at a rate of 400 lbs per acre. All plots were covered with black plastic mulch, and irrigation tubing was laid in a 1-inch deep open groove in the center of the bed. The final beds were 36 inches wide and 6 inches high. The no-mulch plots had the plastic mulch removed just prior to seeding.

Plots 40 feet in length were established on the beds and were seeded on March 18, 1997. Each cultivar had a mulched and no mulch treatment and was replicated 4 times in a randomized block design. Each plot had 2 rows per bed with 6-inch spacing in each row and 1 plant per hill.

¹ Robert C. Hochmuth, Multi County Extension Agent, Suwannee Valley Research and Education Center, University of Florida/IFAS, Live Oak, FL 32060
Jennifer Hornsby, Technician, Suwannee Valley Research and Education Center, University of Florida/IFAS, Live Oak, FL 32060
George J. Hochmuth, Professor, Horticultural Sciences Department, University of Florida/IFAS, Gainesville FL 32611-0690

Plots were irrigated by drip irrigation using resistance blocks as a scheduling aid. Water was applied to maintain a soil moisture level of -8 to -12 centibars at a 12-inch depth. Insects and diseases were managed in accordance with a recommended spray program.

Pickling cucumbers were harvested 9 times from May 6 to May 23. Fruits were graded, counted, and weighed as No. 1 (0-1 1/16"), No. 2 (1 1/16" - 1 1/2"), No. 3 (1 1/2" - 2"), oversized (over 2") or cull. Data were subjected to analysis of variance procedures.

Results and Discussion

The statistical analysis of this trial compares two main effects, mulching vs. no mulch; and the three different cultivars. The analysis also considers interactions between mulching and cultivar. Data were analyzed for early yield, considering only the first three harvest dates and is presented in Table 1. Total season yield for all harvests is presented in Table 2.

There were no differences in early harvests for No. 1, oversized, or cull fruits between the three cultivars. Plastic mulch resulted in higher No. 1 yield and lower oversized yield. There was, however, an interaction of mulch and cultivar for early yield. Early yields generally ranged from 10,500 to 12,000 for each cultivar with or without mulch. The exception was 'Napoleon' when grown on mulched beds. 'Napoleon' on mulch produced much higher early yields, (15,840 lbs/A) than any other combination of mulch and cultivar. Mulched plants of each cultivar out performed unmulched plots in terms of No. 2 grade cucumbers. The larger No. 3 grade cucumber yield was higher on unmulched plots of 'Vlastar' and 'Calypso', but lower for unmulched 'Napoleon'.

Total seasonal yields of total marketable No. 1, No. 2, and cull grades were higher from mulched plants. Total yield of No. 1 and No. 2 grades were highest for 'Napoleon' with 1630 lbs/A of No. 1 grade and 12,440 of No. 2 grade cucumbers. 'Vlastar' and 'Calypso' each produced about 1150 lbs/A fewer culls (misshapen fruit) than either 'Vlastar' or 'Calypso'.

Analysis of total season yield also shows an interaction between cultivar and mulching for No. 3 grade cucumbers and also total marketable yield (Table 2). No. 3 grade yields ranged from 16,000 to 18,000 lbs/A for each combination of cultivar and mulch, except 'Napoleon' on mulched plots. 'Napoleon' No. 3 yields on mulched plots were much higher, 24,070 lbs/A. Likewise, total seasonal yields for all marketable categories shows mulched plots higher for each cultivar, but much higher for 'Napoleon' at 40,210 lbs/A. This is nearly 10,000 lbs/A more than any other combination of cultivar and mulch.

In summary, mulched plots generally had higher total yields for each cultivar than unmulched plots. Early yields were similar for 'Vlastar' and 'Calypso' when grown on mulched versus unmulched. The extremely warm early spring season in Live Oak, Florida during 1997 could explain the smaller than expected differences. 'Napoleon' generally out performed 'Vlastar' and 'Calypso' in terms of total marketable yield, but especially did well in mulched culture.

Table 1. Effect of three pickling cucumber cultivars and plastic mulch on early season fruit production and quality in Live Oak, FL.

Cultivar	Mulch	Total Marketable ^z	No. 1 ^y	No. 2 ^y	No. 3 ^y	Oversized ^y	Cull ^x
Main Effects:		----- Early Yield ^w (first three harvests) (lbs/A) -----					
Napoleon		13,890	340	3,930	9,620	780	310
Vlastar		11,750	280	3,860	7,620	450	450
Calypso		11,220	350	3,830	7,050	600	390
Significance (P=0.05)		NS	NS	NS	NS	NS	NS
	Mulched	13,010	530	4,780	7,710	280	380
	No Mulch	11,560	120	2,960	8,480	940	380
	Significance (P=0.05)	NS	**	NS	NS	**	NS
Simple Effects:							
Napoleon	Mulched	15,840		4,550	10,770		
Napoleon	No Mulch	11,920		3,300	8,460		
Vlastar	Mulched	11,250		5,270	5,510		
Vlastar	No Mulch	12,250		2,440	9,720		
Calypso	Mulched	11,940		4,510	6,840		
Calypso	No Mulch	10,510		3,150	7,250		
LSD (P=0.05) ^u		2,120		2,040	2,200		
^z Total marketable yield is the total of No. 1, No. 2, and No. 3 grades. ^y Grades were determined by fruit diameter, No. 1 (0-1 1/16"), No. 2 (1 1/16" - 1 1/2"), No. 3 (1 1/2" - 2"), Oversized (over 2"). ^x Cull fruit were misshapen fruit of any size. ^w Early yield was calculated using the first three harvests. ^v Significance was either highly significant at the 1% level (**), significant at the 5% level (*) or not significant (NS). ^u Least significant difference (LSD) between treatments or treatment confirmations as determined at the 5% level of significance.							

Table 2. Effect of three pickling cucumber cultivars and plastic mulch on total season production and quality at Live Oak, FL.

Cultivar	Mulch	Total Marketable ^z	No. 1 ^y	No. 2 ^y	No. 3 ^y	Oversized ^y	Cull ^x
Main Effects:		----- Total Season Yield (lbs/A) -----					
Napoleon		35,010	1,630	1,2440	20,950	2,410	3,060
Vlastar		28,540	1,170	1,0070	17,290	3,210	6,790
Calypso		28,180	1,150	9,910	11,120	2,740	6,130
LSD (P=0.05) ^w		3,510	410	1,500	3,100	NS	950
Significance (P=0.05)		**	*	*	*	NS	
	Mulched	33,690	1,460	12,590	19,640	2,680	5,710
	No Mulch	27,460	1,170	9,020	17,270	2,900	4,940
	Significance (P=0.05)	**	*	*	*	NS	**
Simple Effects:							
Napoleon	Mulched	40,210			24,070		
Napoleon	No Mulch	29,820			17,830		
Vlastar	Mulched	30,600			16,940		
Vlastar	No Mulch	26,470			17,640		
Calypso	Mulched	30,260			17,900		
Calypso	No Mulch	26,090			16,340		
LSD (P=0.05) ^u		3,510			3,100		

^z Total marketable yield is the total of No. 1, No. 2, and No. 3 grades.

^y Grades were determined by fruit diameter, No. 1 (0-1 1/16"), No. 2 (1 1/16" - 1 1/2"), No. 3 (1 1/2" - 2"), Oversized (over 2").

^x Cull fruit were misshapen fruit of any size.

^w Significance was either highly significant at the 1% level (**), significant at the 5% level (*) or not significant (NS).

^v Least significant difference (LSD) between treatments or treatment confirmations as determined at the 5% level of significance.