
The Evaluation of Three Pickling Cucumber Plant Populations on Plastic Mulch Culture in North Florida 97-05

Robert C. Hochmuth, Jennifer L. Hornsby, 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 research the potential of expanding into northern Florida by establishing a grading station in the region. To support this effort, a trial was conducted to determine appropriate plant populations on plastic mulch culture for northern Florida.

Materials and Methods

Plots were established in a Lakeland fine sand at the North Florida Research and Education Center - Suwannee Valley near Live Oak, Florida. Preplant soil test (Mehlich-1 extract) showed 66 ppm P, 32 ppm K, 38 ppm Mg, and 487 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 11 March 1997. The crop also received an additional 80 lbs/A of N and K₂O via weekly fertigations from 7 April to 23 May. Beds were formed on 5-foot centers, fumigated with a 98:2 methyl bromide:chloropicrin mixture at a rate of 400 lbs per acre. Irrigation tubing was laid in a 1-inch-deep groove in the center of the bed and covered with black plastic mulch. The final beds were 36 inches wide and 6 inches high.

Plots 40 feet in length were established and seeded on March 18, 1997. The experiment consisted of three plant populations with 4 replications in a randomized complete block design. The first population (35,000/A) had two rows per bed with seeds spaced 6 inches and thinned to one plant per hill. The second population (52,000/A) had two rows per bed with seeds spaced 9 inches and thinned to 2 plants per hill. The third

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

population (70,000/A) had two rows per bed with seeds spaced 6 inches and thinned to 2 plants per hill. The plots were thinned to these final plant stands on March 26. Cucumbers 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, labeled spray program.

Pickling cucumbers were harvested nine times from 5 May to 23 May. Fruits were graded and weighed as No. 1 (0-1 $\frac{1}{16}$ "), No. 2 (1 $\frac{1}{16}$ " - 1 $\frac{1}{2}$ "), No. 3 (1 $\frac{1}{2}$ " - 2"), oversized (over 2"), or cull. The cull category included misshapen fruits. Data were subjected to analysis of variance procedures.

Results and Discussion

Total marketable yield in this trial was the sum of No. 1, No. 2, and No. 3 fruit grades. Oversized fruits (larger than 2" in diameter) were not considered as marketable. The cull grade included misshapen fruit of any size. The cull grade did not include diseased fruit as there were no diseases detected on any fruit during the trial period. Early marketable yield ranged from 15,000 to 16,000 lbs/A with no significant differences among the three plant populations (Table 1). Total season marketable yield ranged from 34,500 to 36,500 lbs/A, again with no significant differences among plant populations. Only the No. 2 grade showed differences between populations in the early harvests. The high population of 70,000 plants per acre resulted in a yield of 7,510 lbs/A which was higher than 5,410 lbs/A with the population of 35,000 plants per acre. The early No. 2 yield with the population of 52,000 plants per acre was 6,240 lbs/A and was not significantly different from the early No. 2 yield with the other plant populations. Total season No. 2 yield was also greater with the high plant population than with the low population.

Total season No. 3 grade yield was higher with the low plant population than with the high plant population. The No. 3 grade yield with the intermediate plant population was not significantly different from yield with the other populations. The data indicates higher plant population results in higher yields in the smaller fruit grades. Likewise, the lower populations result in higher yields in the larger No. 3 grade. No differences were found in the oversized grade category ranging from 1,310 to 1,790 lbs/A. There were more cull fruit from plants in the high population plots than with other plant populations.

These results indicate planting pickling cucumber at high populations will not increase total marketable yield, however, it will result in higher No. 2 fruit yield. The higher plant populations did not result in as high a yield in the large No. 3 category. This indicates the low plant population allowed the fruit to size more quickly between

harvests. Since a premium is paid for the smaller fruit grades, the highest population may result in the highest profit, even though total marketable yield was similar with all three plant populations.

Table 1. Effect of three plant populations on early yield, total yield, and quality of pickling cucumber at Live Oak, FL. Spring 1997.

Population (plants/acre)	Total Market Yield ^z	No. 1 ^y	No. 2 ^y	No. 3 ^y	Oversized ^y	Cull ^x
----- Early Yield^w (lbs/A) -----						
35,000	15,180	710	5,410	9,060	700	400
52,000	15,330	790	6,240	8,300	630	570
70,000	16,040	970	7,510	7,560	370	290
LSD (P=0.05)	NS	NS	1,430	NS	NS	NS
----- Total Season Yield (lbs/A) -----						
35,000	36,510	2,400	14,610	19,500	1,630	3,110
52,000	35,680	2,420	15,410	17,850	1,790	3,160
70,000	34,500	2,810	16,190	15,500	1,310	5,190
LSD (P=0.05)	NS	NS	1,170	2,030	NS	832
^z Total marketable yield is the total of No. 1, No. 2, and No. 3 grades. ^y Grades were determined by diameter, No. 1 = 0 - 1 1/16 inch, No. 2 = 1 1/16 - 1 1/2 inch, No. 3 = 1 1/2 - 2 inches, Oversized = over 2 inches. ^x Cull fruit were misshapen fruits of any size. ^w Early yield was calculated using three harvests.						