

EFFECTS OF VARIOUS NITROGEN RATES ON WATERMELON YIELD AND SIZE

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Introduction

The University of Georgia had recommended a rate of 90-120 pounds per acre of nitrogen (N) for watermelons for many years. In more recent years, UGA has increased the recommended rate to as high as 150 pounds N per acre. Since watermelons are produced at higher plant populations on plastic than on bare ground and since varieties have changed dramatically over the years, the rate of N required to maximize yields on watermelons was investigated. Watermelons are annually Georgia's largest vegetable commodity based on acreage. Production usually exceeds 30,000 acres and \$70 million in farmgate value. This study was initiated to investigate the effects of various N rates on yield and fruit size of watermelons.

Methods

Watermelon plants (variety “Tri-X Carousel”, Syngenta Seed Co.) were produced in a greenhouse by a commercial transplant grower. Plots were established at the Stripling Irrigation Park (elev. ~175 feet) in Camilla, GA. Plot land was tilled and phosphorous and potassium were applied according to soil test recommendations and incorporated. Preplant N rates of 30, 60 and 90 pounds per acre were also applied and incorporated at the same time. Methyl bromide was applied (134 lb. a.i./acre) when black plastic mulch and drip tape were installed.

Watermelons were transplanted on April 12, 2004 into a Lucy loamy sand (loamy, siliceous, thermic Arenic Paleudults) soil. Plots consisted of three rows of watermelons planted on raised beds that were spaced nine feet apart (from center to center). In-row spacing was 32 inches per plant. This resulted in a per plant allocation of about 24 square feet per plant. Plots were each 30 feet long and were replicated four times. The experiment was arranged in a Randomized Complete Block Design.

Additional fertilizer was applied through the drip irrigation system for a total of 130, 160 or 190 pounds per acre of N. Watermelons were harvested on June 24, July 1 and July 13, 2004 and data collected on yield and fruit size. Other than fertilizer treatments, normal cultural and pest control practices were used.

Results and Discussion

Results are presented in Table 1. There were no significant differences between melons grown with 160 pounds N per acre and the other two rates. However, melons grown with 190 pounds N per acre produced significantly higher yields than melons produced with 130 pounds N per acre. There was a trend for higher yields with more N. Although there was no significant differences in fruit size or fruit number per acre, there was a trend for greater fruit number with greater N rates. Also, melons produced with 190 pounds N per acre weighed an average of 0.8 pounds more each than those produced with lower rates of N. This data suggests that at least 160 pounds of N should be used for commercial watermelon production on light soils like the ones where this test was conducted. There is also evidence that a rate of 190 pounds per acre could increase yields beyond the recommended rate. Taking these raw numbers into account, assuming a price of \$0.05/pound and a price for N of \$1.30 per pound, a grower could conceivably increase profits by as much as \$200/acre with the highest N rate over the 160 pound per acre rate.

Table 1. Yield by weight, fruit number and average fruit weight of watermelons grown with three nitrogen rates using nine-foot row middles at the Stripling Irrigation Park near Camilla, Georgia in 2004.

Nitrogen Rate (#/A)	Yield (#'s/A)	Fruit No./A	Avg. Fruit Wt. (#'s)
190	90,882 a	5447 a	16.8 a
160	85,854 ab	5393 a	16.0 a
130	75,818 b	4734 a	16.0 a
Mean	84,184	5192	16.3
C.V.	9.1	11.2	4.7
L.S.D. (0.05)	13,217	1007	1.3

Means in a column followed by the same letter are not significantly different at $p=0.05$.