

# Effects of Nitrogen Rates on Yields and Quality Of Watermelon, Cantaloupe and Honeyloup

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## ABSTRACT

*A study was made of the response of six kinds of melons to different nitrogen fertilizer rates when grown with drip irrigation. Results indicated a general response of petiole nitrate and yields to increasing N rates, depending on the kind of melon. The study will be continued in 1990 and include water and N rates with three kinds of melons.*

## MATERIALS AND METHODS

Drip-irrigated field plots used for a melon study in 1988 were used in 1989. The field had remained fallow after the 1988 crop, and few weeds were present due to the dry winter. Beds were reshaped over the buried drip lines with a tractor-drawn blade and melons were seeded in dry soil with a Planet Jr. type planter on 15 March. Drip lines were reconnected to laterals, water meters and fertilizer injectors and the crop was irrigated daily as needed. The three N treatments were replicated three times and melons were planted in each row.

Three N fertilizer levels were based on results of the previous year and weekly monitoring of petiole nitrates for each melon variety. The experimental irrigation system did not, however, allow for differences in N application rates to cantaloupe and watermelons. The schedule used for applying Solution 32 (urea-ammonium nitrate) is shown in Table 1 and final rates were 40, 100 and 170 kg N/ha. Zinc in the form of EDTA was applied to all plots on 1 June at a rate of 1.1 kg/ha. Total water applied was 600 mm.

Melons used in 1989 were 'Laguna' and 'Topmark' cantaloupe, 'Royal Sweet' and 'Mirage' watermelon, and 'Gallicum' and '11818' hybrid honeyloups. Each of the six melons was planted in 50-ft. plots in each row.

A satisfactory stand was obtained, except some reseeded of 'Mirage' watermelon was required on 29 March. Thinning and weed control were done by hand.

Petioles from youngest fully expanded leaves were collected on a weekly basis, beginning as early as 26 April for the more vigorous melons. Samples were dried and analyzed on a timely basis in order to use the data as a guide for N application.

Melons were harvested twice a week, weighed and graded on an individual basis. Yields are shown in Table 2.

Table 1. Amounts and times of nitrogen fertilizer applied to the drip irrigated melons, Maricopa, 1989.

Date	Nitrogen Rate		
	1	2	3
	----- kg/ha -----		
14 April	0	10	10
18 April	10	20	30
3 May	0	10	20
10 May	0	20	30
17 May	10	0	20
25 May	10	20	30
13 June	10	20	30
Total	40	100	170

Table 2. Summary of total numbers and weights of marketable and cull melons produced as influenced by nitrogen fertilizer rates, Maricopa, 1989.

<u>Nitrogen Rate</u> kg/ha	<u>Marketable</u>		<u>Culls</u>	
	<u>Number</u> per ha	<u>Weight</u> T/ha	<u>Number</u> per ha	<u>Weight</u> T/ha
<u>Laguna Cantaloupe</u>				
40	7520	7.91	4620	2.47
100	8710	10.83	4220	3.25
170	8050	8.83	4620	3.33
<u>Topmark</u>				
40	8320	8.09	2900	1.54
100	6730	6.27	2640	1.36
170	6600	5.88	3040	1.27
<u>Gallicum Honeyloup</u>				
40	8050	8.68	6200	4.07
100	9900	12.17	5810	4.99
170	5410	5.84	4620	2.95
<u>11818 Honeyloup</u>				
40	7920	6.99	4620	2.42
100	10430	11.09	3170	2.13
170	8180	7.92	3430	1.88
<u>Royal Sweet Watermelon</u>				
40	530	1.54	9900	13.37
100	2640	13.13	8180	18.58
170	530	1.51	8710	13.48
<u>Mirage Watermelon</u>				
40	2240	11.55	4880	10.60
100	2900	17.78	3300	9.92
170	1980	10.50	7000	13.50

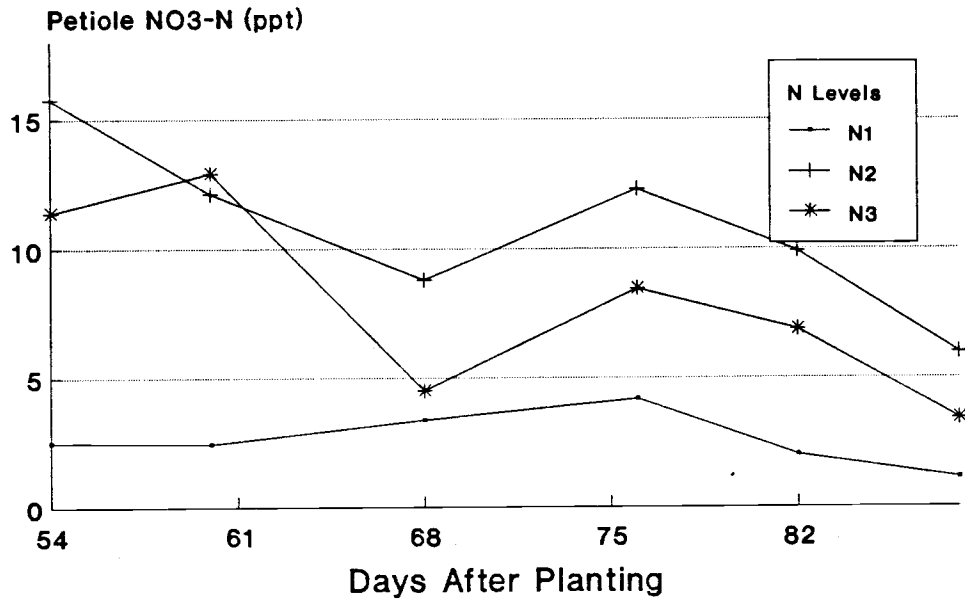
## RESULTS AND DISCUSSION

Petiole nitrate concentrations were determined on a weekly basis after plants were large enough to sample, and continued well into the harvest season (Figs. 1, 2, and 3). Low petiole concentrations were maintained using small application rates of N (N1). The high rate of N (N3), however, often produced lower petiole N concentrations than the medium N (N2) rate. Yields tended to be related to N rates and petiole nitrate concentrations. In one case (Topmark cantaloupe) the highest yields were obtained with the N1 rate and in one case (Royal Sweet watermelon) extremely low yields were obtained with the N1 rate. With the other four melons the N1 rate produced a reasonable yield in relation to the N2 rate. The N3 rate produced fewer marketable melons than N2 for all six melons in the study. Low and high N rates were detrimental to the watermelons, particularly for Royal Sweet.

Overall melon marketable and cull yields with time are shown in Table 2. Laguna was clearly earlier than Topmark cantaloupe and the Gallicum was the earlier honeyloup. Royal Sweet produced a large number of culls: small, split fruit that may be an indication of a lack of water. The water supply was inadvertently turned off for a few days at the end of April. The best watermelon, cantaloupe and honeyloup will be used for a water and N study in the spring of 1990.

# Maricopa Melon Study 1989

## Royal Sweet Watermelon



## Mirage Watermelon

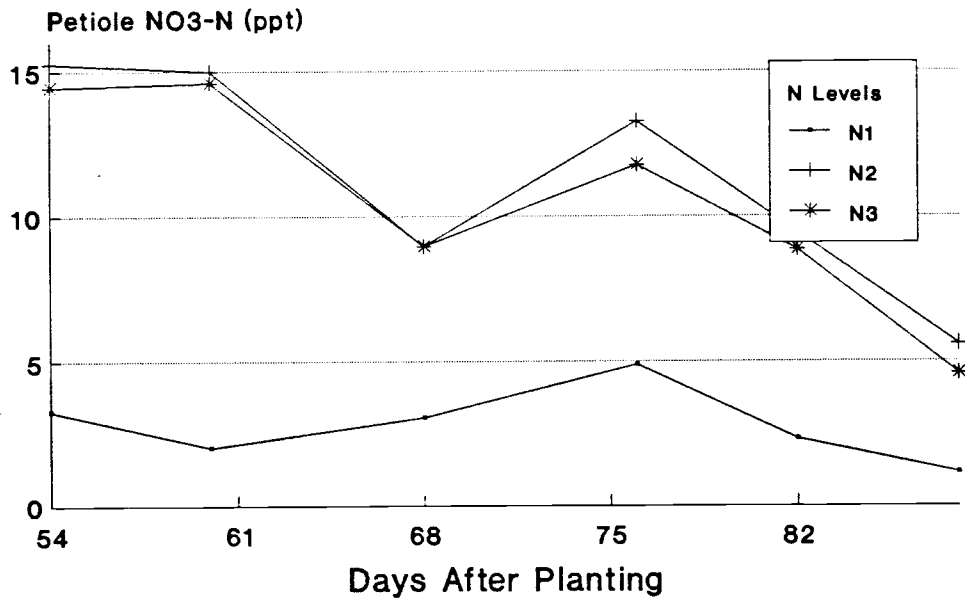
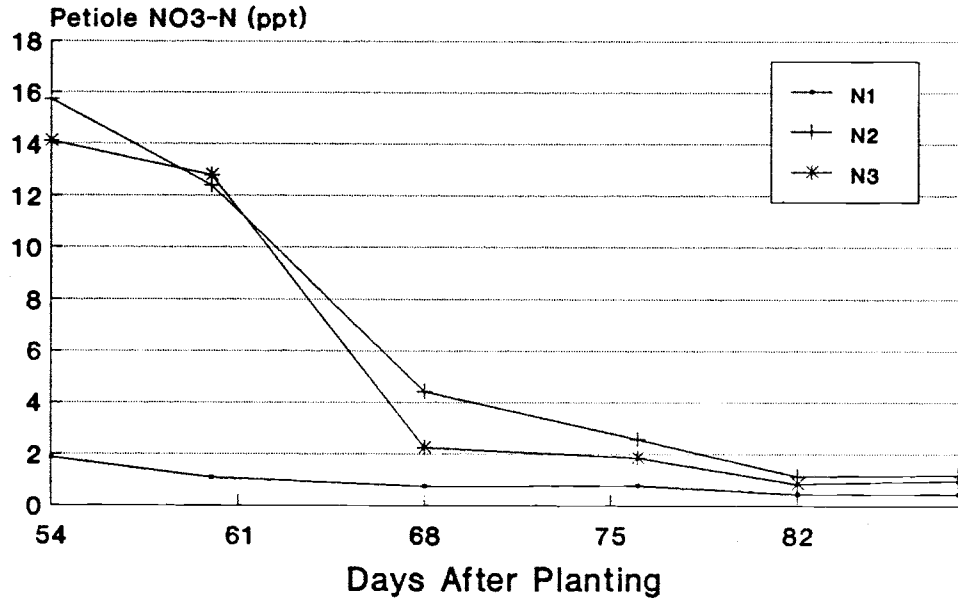


Figure 1. Watermelon petiole nitrate concentrations as affected by N fertilizer rates, Maricopa, 1989.

# Maricopa Melon Study 1989

## Laguna Cantaloupe



## Topmark Cantaloupe

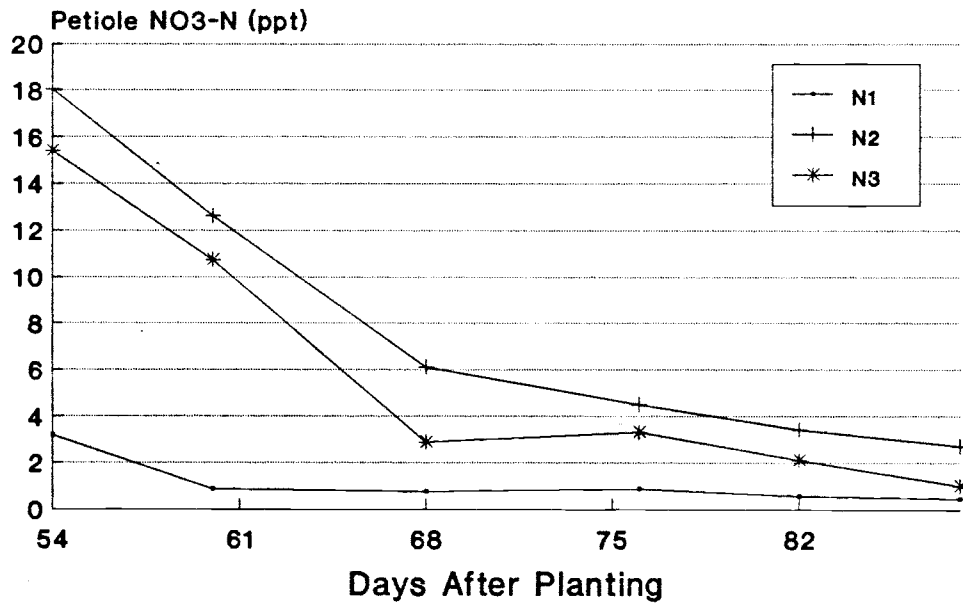
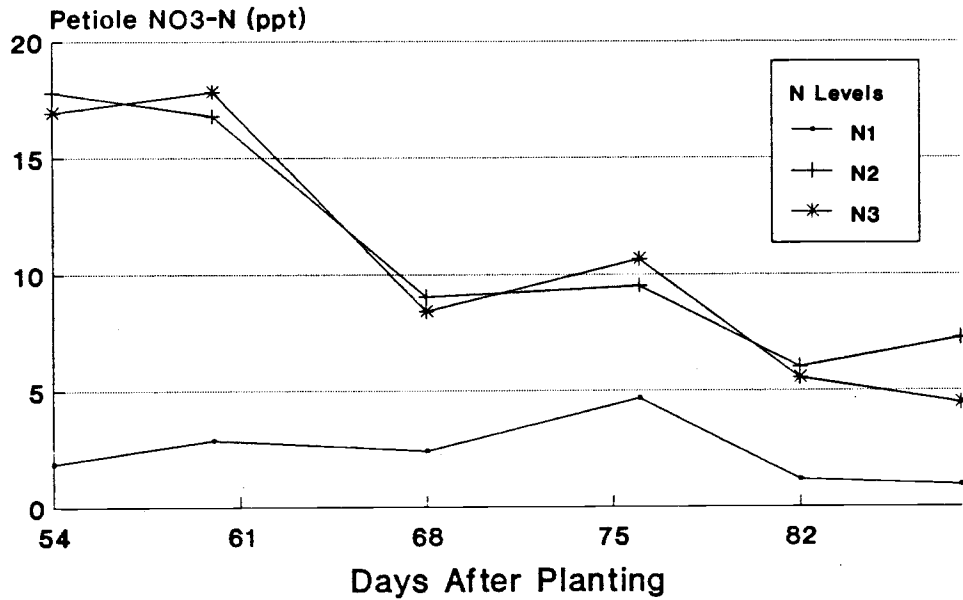


Figure 2. Cantaloupe petiole nitrate concentrations as affected by N fertilizer rates, Maricopa, 1989.

# Maricopa Melon Study 1989

## Gallicum Honeyloupe



## 11818 Honeyloupe

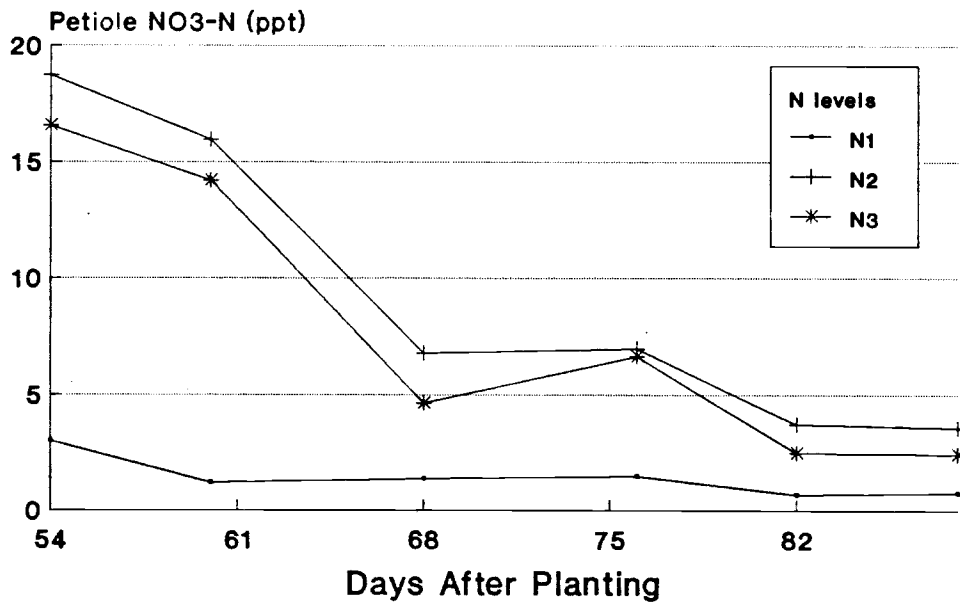


Figure 3. Honeyloup petiole nitrate concentrations as affected by N fertilizer rates, Maricopa, 1989.