

NITROGEN FERTILIZATION OF HIGH POPULATION COTTON

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This experiment was conducted to determine the effect of various rates of applied nitrogen on the growth and yield of cotton planted at a high population. Stoneville 213 was planted May 7, 1970 at Marana on the flat with an alternation of 14 and 26 inches between rows. A final stand of approximately 170,000 plants/acre was obtained. The experiment contained four rates of nitrogen applied prior to planting and was replicated four times. Plant height was controlled by using small applications of irrigation water and applying a mild stress between irrigations. First flowers were observed on July 14 and the crop was ready for harvest by mid-September.

Table 1 shows some of the results obtained. The petiole nitrate samples reflect the nitrogen treatments. All nitrate levels are lower than normally considered desirable for conventional full-season cotton production with normal plant populations. At the time petiole samples were taken on July 8, the plants were squaring. At this stage of growth, past experience and research have indicated that the levels for conventionally grown cotton should be at least twice the highest value shown here. By August 7 open bolls were not yet evident. It is normally recommended that the petiole nitrate level be somewhat higher than the highest value shown here when conventionally grown cotton is at this stage of growth.

The data have not been analyzed statistically, but the applied nitrogen appears to have had little or no effect upon seed cotton yield. There is an indication that the highest nitrogen rate caused more vegetative growth. Both the weight of stalks per acre and the plant height were slightly increased. The plants within each treatment of this experiment were extremely uniform and no indication of excessive crowding was noted. There was an average of 2.3 open bolls per plant.

One of the important advantages of growing cotton at high populations is the possibility of reducing the fruiting period. The average node on the plant main stem of the attachment of the lowest retained boll was 10.9 and the node of attachment of the last open boll was 13.9. Thus, there was only an average difference of 3 nodes between the first and last open bolls. Normally development of one node on the main axis requires from 3 to 3 1/2 days. This indicates that the majority of the bolls retained by the plant were set within a 2-week period. Narrowing the effective fruiting period to this level has exciting possibilities in the management of the cotton crop. The chances for boll rot are greatly reduced and the length of time that harmful insects such as bollworm and pink bollworm must be controlled is greatly reduced. Also, fiber quality should be very uniform.

Data from this experiment are suggestive of the need for more research about fertilization of cotton grown at high populations. Recommendations drawn from conventionally grown cotton must be used with caution.

Table 1. The effect of applied nitrogen on Stoneville 213 planted at 170,000 plants/acre on May 7, 1970 at Marana.

Applied N (pounds/A)	Petiole NO ₃ -N(ppm)		Seed Cotton (pounds/A)	Stalks (pounds/A)	Plant Height (inches)
	Jul 8	Aug 7			
25	2438	800	2378	3523	23.6
50	3078	875	2541	3463	26.4
75	3890	975	2484	3313	24.8
125	<u>6292</u>	<u>3900</u>	<u>2505</u>	<u>3702</u>	<u>27.6</u>
Mean	3924	1638	2477	3500	25.6