

## Manurial Studies on American Cotton (*Gossypium hirsutum* L.) in Rajasthan\*

by

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**Introduction:** Sriganganagar district occupies about 43% of the total cotton area in the Rajasthan State. Cotton in this district is grown under irrigated conditions and the variety prevalent is 320F. The average yield of seed cotton is about 650 Kg/ha only. From a survey conducted to study the agronomical practices followed by the cultivators of this district, it was observed that the cultivators of this district in general apply 20-30 Kg N/ha either at the time of first or second irrigation. Phosphorus, potash and farm yard manures are very rarely applied to this crop. The low yield of cotton may, therefore, be attributed to inadequate application of fertilizers. Jaisinghani and Mehta (1964) found that application of 33.6 and 67.2 Kg N/ha increased the cotton yield significantly over control in Sriganganagar district. They further reported that the nature of response was linear with equation  $Y=9.73+0.093 X$  and suggested that higher doses of N may be tried for working out optimum dose. With this object, a trial was conducted to find out the manurial requirement of American cotton under Sriganganagar conditions of Rajasthan State.

**Materials and Methods:** A trial with three levels each of N, P, potash and farm yard manure was laid out at the Government Agricultural Research Farm, Sriganganagar (Rajasthan) during 1966-67 and 1967-68. The treatments were as under :

*Levels of nitrogen*

N-0 0 kg N/ha  
N-1 75 kg N/ha  
N-2 150 kg N/ha

*Levels of phosphorus*

P-0 0 kg P<sub>2</sub>O<sub>5</sub>/ha  
P-1 35 kg P<sub>2</sub>O<sub>5</sub>/ha  
P-2 70 kg P<sub>2</sub>O<sub>5</sub>/ha

*Levels of potash*

K-0 0 kg K<sub>2</sub>O/ha  
K-1 35 kg K<sub>2</sub>O/ha  
K-2 70 kg K<sub>2</sub>O/ha

*Levels of F. Y. M.*

F-0 0 Qtl/ha  
F-1 50 Qtl/ha  
F-2 100 Qtl/ha

Farm yard manure was applied one month before sowing where as P and potash were applied at the time of sowing. N was applied in two split

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applications, half at the time of thinning (about one month after sowing) and the rest half at square formation stage. N, P and potash were applied through ammonium sulphate, single super phosphate and muriate of potash respectively.

The cotton (variety 320F) was sown in the last week of April in fallow fields in both the seasons. The design of the lay out was 3<sup>4</sup> confounded factorial of 9 blocks each of 9 plots. The net plot size was 8.7 m. x 3.0 m. The sowing was done at a spacing of 75 cm. row to row and 30 cm. plant to plant by dibbling. Four to five seeds were dibbled about 3 cm. deep in each hole. Thinning was done after the first irrigation and only one healthy plant was left at each place. Three insecticidal sprays were given to protect the crop against insects and pests. In all three pickings were taken one each in the months of early November, December and January. The soil of the field was sandy loam, low in N and medium in available P and potash. The pH of the soil was 8.3 and calcium carbonate content 0.85 percent.

**Results and discussion:** The yield data of seed cotton as affected by N, P, potash and Farm yard manure have been given in table 1, 2, 3 and 4 respectively. None of the interactions were significant, hence two way tables have not been presented and only main factors are dealt in this paper.

TABLE 1. *Effect of nitrogen on the yield of cotton*

Levels of nitrogen	Yield of seed cotton in kg/ha		
	1966-67	1967-68	Mean
N-0	1984	1682	1833
N-1	2191	2013	2102
N-2	2186	2055	2121
Mean	2120	1917	2019
S.Em. +	50	56	—
C.D. at 5%	139	161	—
C.D. at 1%	182	204	—

Application of N increased the cotton yield significantly over control. The results were highly significant in both the years. On an average 75 and 150 kg N/ha produced 269 and 288 kg more seed cotton per ha. than control respectively. The difference in the yield of seed cotton obtained with 150 and 75 kg N/ha. was very nominal and not significant statistically (Table 1). Similar were the findings of Verma and Ghonde (1959) and Kanniyar and Krishnamoorthy (1964) who found that application of N increased the cotton yield significantly over control. They further reported that N at higher levels did not increase the cotton yield appreciably. It was also observed that N application enhanced the plant height and number of bolls per plant

plant significantly over control. The enhanced yield due to application of N may, therefore be attributed to better plant growth and higher number of bolls per plant. The results are in agreement with Verma and Ghongde (1959) and Dastur and Dabir (1962) who also found that application of N increased the plant height, number of bolls per plant and ultimately the yield of seed cotton.

TABLE 2. Effect of phosphorus on the yield of cotton

Levels of phosphorus	Yield of seed cotton in kg/ha		
	1966-67	1967-68	Mean
P-0	2076	1872	1974
P-1	2132	1919	2026
P-2	2153	1958	2056
Mean	2120	1917	2019
S.Em. *	50	56	—
C.D. at 5%	—	—	—

Application of 35 and 70 Kg  $P_2O_5$ /ha increased the cotton yield by 2.6 and 3.6% over control respectively. The differences were however, not significant statistically (Table 2). The above results confirmed the findings of Jaisinghani and Mehta (1964) who found that application of P in Sriganaganagar district did not increase the cotton yield significantly over control. Vaidya (1953) and Anantharamiah *et. al.* (1961) also found no significant response of P on the yield of cotton.

TABLE 3. Effect of potash on the yield of cotton

Levels of potash	Yield of seed cotton in kg/ha		
	1966-67	1967-68	Mean
K-0	2085	1864	1975
K-1	2207	1947	2077
K-2	2069	1939	2004
Mean	2120	1917	2019
S.Em. *	50	56	—
C.D. at 5%	—	—	—

Potash and farm yard manure did have beneficial effect on the yield of cotton (Tables 3 and 4). These results are in confirmatory to those obtained by Sahni and Verma (1963) and Verma *et al.* (1965) who reported that potash did not increase the cotton yield significantly applied whether singly or in combination. Nayak (1953), Gursham Singh and Kanwar Singh (1959) and Chavda *et. al.* (1963) found that application of farm yard manure had no significant effect on the yield of cotton.

TABLE 4. Effect of F.Y.M. on the yield of cotton

Levels of F.Y.M.	Yield of seed cotton in kg/ha		
	1966-67	1967-68	Mean
F-0	2066	1939	2103
F-1	2079	1944	2012
F-2	2216	1877	2046
Mean	2120	1917	2019
S.Em. ±	50	56	—
C.D. at 5%	—	√	—

**Summary and Conclusion:** Application of 75 and 150 Kg N/ha increased the cotton yield significantly over control. The difference in the yield obtained with 150 and 75 Kg N/ha was very nominal. (ii) Application of 35 and 70 Kg  $P_2O_5$ /ha increased the cotton yield by 2.6 and 3.6% over control respectively. The differences were, however, not significant statistically. (iii) Potash and farm yard manure had no significant effect on the yield of cotton. (iv) None of the interactions were found to be significant.

**Acknowledgement:** This investigation was carried out as a part of Co-ordinated Agronomic Scheme on cotton financed by the Indian Council of Agricultural Research whose help is thankfully acknowledged. The authors are also thankful to the Director of Agriculture, Rajasthan, Jaipur for providing facilities and to Shri Hari Sharan Mathur for statistical analysis of the data.

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### Effect of Levels of N and P<sub>2</sub>O<sub>5</sub> and Split Application of Nitrogen on Growth and Yield of High Yielding Wheat Variety (S. 227)

by

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**Introduction:** The main superiority of dwarf high yielding varieties of wheat lies in higher response per unit nutrient giving nearly two to three times more response as compared with local varieties. Little work has been done on two aspects of manuring of high yielding varieties, i.e., how much and at what stage of plant growth the fertilizers should be applied in different agro-climatic regions.

**Materials and Methods:** To study the effect of different levels of N and P<sub>2</sub>O<sub>5</sub> and split application of N on growth and yield of high yielding wheat variety (S.227), an experiment was laid out in split plot design with levels of fertilizers in main plots and times of N application in sub-plots with three replications at Ranchi Agricultural College Farm, Kanke, during 1967-68. The soil was sandy-clay-loam of medium fertility with a pH of 5.65.

(a) Basal dose - 60 kg K<sub>2</sub>O/ha

(b) Main plot treatments -

Treatments	Levels of fertilizers, kg/ha		
	N		P <sub>2</sub> O <sub>5</sub>
L <sub>1</sub>	80	+	48
L <sub>2</sub>	180	+	72
L <sub>3</sub>	160	+	96