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Response of Wagad Cotton Varieties to Row Spacing and Levels of Nitrogen Under Rainfed Conditions

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ABSTRACT

Experiments were conducted to find out optimum requirement of nitrogen and spacing different varieties of wagad cotton *(Gossypium herbaceum)* at the Agricultural Research Station, Viramgam, during *kharif* 1981-82 to 1983-84 under rainfed conditions. Guj. Cot. 13 gave significantly higher seed cotton yield of 12.47% and 12.86% over promising variety 1501 and local V-797, respectively. Linear response to nitrogen upto 80 kg/ha was obtained for seed cotton yield in all varieties. Row spacings had no significant influence on seed cotton yield. Response of nitrogen to Guj. Cot. 13 was higher than that observed for 1501 and V- 797.

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INTRODUCTION

The potentiality of cotton varieties can be fully exploited only if proper package of practices are followed. Keeping in view the competition that occurs between plants for plant nutrient and moisture, it is essential to find out the appropriate requirement of spacing and dose of nitrogen under rainfed conditions. Therefore, row spacing and nitrogen dose were worked out for newly released variety Guj. Cot. 13 and promising Strain 1501 compared to cotton variety V 797 in the deshi cotton growing tract under rainfed condition of Gujarat.

MATERIALS AND METHODS

A field experiment was carried out at the Agril. Research Station, Viramgam, Gujarat Agricultural University during kharif 1981-82 to 1983-84 under rainfed conditions in split plot design with three (45, 60 and 75 cm) row spacings, as main plot treatments and three nitrogen levels i.e. 0, 40 and 80 kg/ha as sub-plot treatments. Half of the nitrogen was applied as basal dose and the other half was applied 30-40 day after sowing when soil had enough moisture. Crop was grown under plant protection measures, as and when required.

RESULTS AND DISCUSSION

The average and year-wise data presented in Table 1 indicate that differences in seed cotton yield due to row spacing were non-significant during all the three years as well as on pooled basis. The seed cotton decreased with increasing row spacing at the order of 95 kg/ha and 147 kg/ha in 60 cm and 75 cm, respectively as compared to 45 cm row spacing (982 kg/ha). These results are in agreement with those obtain by Nagwekar *et al.* (1987) and

Chandra *et al.* (1985). In rainfed condition, it was advisable to sow the crop at narrow spacing as it provides adequate plant stand and crop assurance even under adverse environmental conditions.

Significant differences in yield due to varieties were observed during 1981-82 and 1983-84 as well as in pooled analysis, while it was nonsignificant only during 1982-83 (Table 1). Variety Guj. Cot. 13 recorded significantly higher seed cotton yield during the year as compared to local variety V-797 and Strain 1501. Average figure revealed that newly released variety Guj.Cot.13 produced significantly higher seed cotton yield of 974 kg which was 12.47% and 12.86% more than promising Strain 1501 and local variety V-797 respectively, the two being at par with each other.

TABLE 1

Seed cotton yield (kg/ha) as influenced by plant density varieties and nitrogen levels.

Treatment	*1981-82*	*1982-83*	*1983-84*	*Pooled average*
Row spacing				
45 cm	1208	701	1037	982
60 cm	948	736	977	887
75 cm	868	801	836	835
S.Em. ±	107.80	30.66	74.86	44.92
C. D. at 5%	NS	NS	NS	NS
C.V. %	55.57	21.36	40.95	44.86
Varieties				
1501	975	730	895	866
Guj. Cot.-13	1083	778	1060	974
V-797	966	730	895	864
S.Em. ±	36.08	23.80	46.87	21.25
C. D. at 5%	102.71	NS	133.42	58.90
C.V. %	18.6	16.58	25.64	21.22
Nitrogen levels				
0 kg/ha	954	670	866	830
40 kg/ha	1014	746	929	896
80 kg/ha	1056	822	1055	978
S.Em. ±	36.08	23.80	46.87	21.25
C. D. at 5%	NS	67.76	133.42	58.90
C.V. %	18.60	16.58	25.64	21.22

The results presented in Table 1 show significant effect of nitrogen levels on seed cotton yield during 1982-83 and 1983-84 as well as on pooled basis. Significant linear response of nitrogen levels on seed cotton yield was observed during 1982-83, while in 1983-84, the differences between two consecutive nitrogen levels for seed cotton yield were not significant but 80 kg N/ha yielded significantly higher than control.

Mean data indicated that application of 80 kg N/ha gave significantly higher seed cotton yield than rest of the N levels which was 17.83% and 9.15% more than that of 0 and 40 kg N/ha respectively (Table 1). These results confirmed the finding of Nagwekar *et al.* (1987), Singh *et al.* (1985), Upadhyay *et al.* (1977), Gomas *et al.* (1985), Chandra *et al.* (1985) and Jain *et al.* (1985) who reported positive response of nitrogen levels to seed cotton under different condition.

TABLE 2

Monetary return (general and for individual variety) as influenced by nitrogen levels.

N levels kg/ha	*Average yield kg/ha*	*Addi. yield over control kg/ha*	*Addi. income over control Rs/ha*	*Addi. cost over control Rs/ha*	*Addi. net profit over control Rs/ha*
0	830	—	—	—	—
40	896	66	330	212	118
80	978	148	740	424	316
Strain 1501					
0	806	—	—	—	—
40	868	62	310	212	98
80	926	120	600	424	176
Variety Guj. Cot. - 13					
0	879	—	—	—	—
40	967	88	440	212	228
80	1075	196	980	424	556
Variety V-797					
0	805	—	—	—	—
40	854	49	245	212	33
80	932	127	635	424	211

Rates of Nitrogen/kg : Rs. 5.30

Rates of Cotton/kg : Rs. 5.00

Economics of Nitrogen Application

Economics of different levels of nitrogen was also worked out for individual variety. The data (Table 2) indicated that application of 80 kg N/ha to Guj. Cot. 13 recorded highest pr of Rs. 556/ha as compared to V-797 (R 211/ha), and Strain 1501 (Rs. 176/ha).

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