

Response of *desi* cotton (*Gossypium arboreum* L.) hybrids to spacing and fertilizer levels under irrigated conditions

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ABSTRACT: An experiment was conducted at Research Farm of Cotton Section, Department of Plant Breeding and Genetics, Punjab Agricultural University, Ludhiana during *kharif* 2011 to work out the optimum spacing and fertilizer level of NPK for 3 *desi* cotton hybrids FMDH 9, FMDH 10 and PAU 626 H. Among the *desi* cotton hybrids FMDH 9 (2086.4 kg/ha) was statistically *at par* with FMDH 10 (1939.4 kg/ha) but proved significantly superior over PAU 626H (1827.8 kg/ha). Spacing of 67.5 x 45 cm and 67.5 x 60 cm were statistically *at par* with each other. Application of 100 per cent RDF (1997.5 kg/ha) and 125 per cent RDF (1986.6 kg/ha) recorded significantly higher seed cotton yield than 75 per cent RDF (1869.4 kg/ha).

Key words: Cotton, hybrids, nutrients, RDF, spacing

Cotton is one of the most important fibre crops of India and plays a dominant role in Indian farming and industrial economy. The average productivity of cotton is low in India as compared to many other cotton growing countries. In Punjab *desi* cotton (*Gossypium arboreum* L.) is also grown on considerable area in the south west districts for its quality values, domestic consumption, industrial requirements and comparatively less prone to insect pests and diseases. Low productivity of *desi* cotton is a major bottle neck in its expansion in area. However, to reap the maximum productivity, adoption of promising hybrids along with agro techniques such as suitable plant spacing and optimum fertilizer level plays a crucial role. Keeping these points in view, the present investigation was undertaken to find out the suitable plant population and optimum fertilizer level for promising *desi* cotton hybrids.

An experiment was conducted at Research Farm of Cotton Section, Department of Plant Breeding and Genetics, Punjab Agricultural University, Ludhiana during *kharif* 2011. Soil of the experimental field was sandy loam in texture, low in available nitrogen, medium in available phosphorus and high in available potassium. The experiment was conducted in split plot design having a total of 18 treatment combinations with 3 replications.

Main plots consisted of 3 hybrids of *desi* cotton (FMDH 9, FMDH 10 and PAU 626 H), sub plots consisted of 2 spacings (67.5 x 45 cm and 67.5 x 60 cm) and sub sub plots consisted of 3 fertilizer levels of NPK (75 % RDF, 100 % RDF (150:30:30 NPK kg/ha) and 125 % RDF). The crop was sown on April 30, 2011. Full dose of phosphorus and potassium were applied as basal dose through DAP and Mop. Nitrogen was applied through urea in two equal splits *i.e.* first half at the time of thinning and second half at flowering stage of crop. All other agronomic practices were followed as per recommendations.

Data presented in the Table 1 depicted that *desi* cotton hybrids varied significantly for seed cotton yield. Among the three hybrids, in respect of seed cotton yield, FMDH 9 (2086.4 kg/ha) was statistically *at par* with FMDH 10 (1939.4 kg/ha) but significantly better than PAU 626 H. These results were favoured due to significantly higher bolls/plant in FMDH 9 as compared to PAU 626 H. FMDH 10 and PAU 626 H were statistically *at par* with each other. All other parameters like plant height, monopods and sympods/plant, boll weight, ginning outturn and plant population were statistically *at par* among three hybrids.

Among the spacing, seed cotton yield, plant height, sympods/plant, boll weight and ginning outturn were found to be non significant, however, monopods and bolls/plant were

Table 1. Seed cotton yield and other characters of *arboreum* hybrids under different spacing and nutrients levels

Treatments	Seed cotton yield (kg/ha)	Plant height (cm)	Monopods/plant	Sympods/plant	Bolls/plant	Boll weight (g)	Ginning outturn (%)	Plant population/ha
Hybrids								
FMDH 9	2086.4	164.2	1.84	22.3	49.5	2.43	37.4	26778
FMDH 10	1939.4	173.7	1.89	21.3	47.4	2.52	37.3	27344
PAU 626 H	1827.8	169.2	1.72	22.2	43.3	2.44	38.6	26534
CD (p=0.05)	170.4	NS	NS	NS	4.6	NS	NS	NS
Spacing (cm)								
67.5 x 45	1979.6	170.9	1.70	21.7	45.3	2.45	37.7	30245
67.5 x 60	1922.8	167.1	1.93	22.2	48.2	2.48	37.8	23526
CD (p=0.05)	NS	NS	0.15	NS	2.1	NS	NS	1420
Nutrient levels								
RDF (75 %)	1869.4	167.5	1.48	21.0	43.4	2.43	37.6	27772
RDF (100 %)	1997.5	169.0	1.91	22.6	48.9	2.47	37.0	26237
RDF (125 %)	1986.6	170.6	2.06	22.2	47.9	2.49	38.7	26647
CD (p=0.05)	105.3	NS	0.19	NS	2.5	NS	NS	NS

significantly higher at spacing of 67.5 x 60 cm than spacing of 67.5 x 45 cm. Wider spacing might have favoured higher number of monopods and bolls per plant but significantly lower plant population might be the reason for mitigating their reflection in yield. The results of the study are in line with Buttar and Singh (2007) and Singh *et al.*, (2012).

Among the different nutrients levels, 100 per cent RDF (1997.5 kg/ha) and 125 per cent RDF (1986.6 kg/ha) recorded significantly higher seed cotton yield than 75 per cent RDF (1869.4 kg/ha). Both 100 per cent RDF and 125 per cent RDF were statistically *at par* with each other. Higher seed cotton yield with 100 per cent RDF and 125 per cent RDF was mainly due to significantly higher bolls per plant. Plant height, sympods/plant, boll weight, ginning outturn and plant population were not significantly influenced by different fertilizer levels. Similar results were also obtained reported by Nehra and Yadav (2012). Among the *desi* cotton hybrids FMDH 9 proved superior over PAU 626 H in respect of seed cotton

yield and yield attributes. Spacing of 67.5 x 60 cm was found to be suitable. Fertilizer dose of 100 per cent RDF (recommended dose of NPK) was found to be optimum as compared to 75 per cent RDF and 125 per cent RDF.

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