

Effect of High Density Planting System (HDPS) and varieties on growth and yield of *desi* cotton

*Pradeep Kumar, *A. S. Karle, *D. N. Gokhale, *A.K. Keteku and *A.S. Jadhav

ABSTRACT: A field experiment was conducted at Cotton Research Scheme, VNMKV, Parbhani during Kharif 2014-15. The sowing of cotton at 45 x 30 cm (74074 plants/ha) recorded significantly higher monopodial and sympodial branches per plant, functional leaves, leaf area and dry matter accumulation per plant, number of squares, picked bolls per plant and seed cotton yield per plant as compared to 45 x 15 cm, 45 x 22.5 cm, and 60 x 10 cm spacing. The seed cotton yield (Kg/ha) was recorded significantly higher at 45 x 15 cm as compared to other spacings. All the growth parameters i.e. (plant height, number of functional leaves, leaf area, number of sympodial branches, squares, green bolls and dry matter production) yield contributing and yield characters i.e. (Number of picked bolls per plant, seed cotton yield per plant, seed cotton yield per hectare) were significantly higher with *desi* cotton variety PA 528 over other two variety PA 08 and PA 255. However, number of monopodial branches per plant and boll weight were not significantly influenced by different varieties.

Key words: HDPS, *Desi* cotton varieties, Growth, Yield

In India cotton is grown over an area of 115.53 lakh hectares with production of 375.00 lakh bales with productivity of 552 kg lint/ha. (CAB, 2014). In Maharashtra cotton is cultivated over an area of 38.72 lakh hectares with production of 81 lakh bales and having productivity of 356 kg lint/ha. (CAB, 2014). Cotton productivity depends on various factors among them selection of potential genotypes along with plant densities play a vital role in increasing the productivity of cotton. Recently, VNMKV, Parbhani have released new genotype viz., PA 08, PA 528. The maximum exploitation of these genotypes can be achieved only after determining their optimum planting densities in comparison to recommended cotton varieties. By keeping in view of above facts, present research work has planned with the objectives to find out the effect of High Density Planting System (HDPS) on growth and yield of *desi* cotton, to study the performance of different *desi* cotton varieties under High Density Planting System (HDPS).

MATERIALS AND METHODS

A field experiment was conducted at Cotton Research Scheme, VNMKV, Parbhani during Kharif 2014-15. The soil was clayey in texture with low in available

nitrogen (157.51 Kg/ha), medium in available phosphorus (9.68 Kg/ha) and high in available potassium (466.86 Kg/ha). The soil Ph, organic carbon and electrical conductivity were 7.86, 0.70% and 0.48 ds/m, respectively. The experiment was laid out in split plot design with four levels of plant densities i.e. 45 x 15 cm, 45 x 22.5 cm, 45 x 30 cm and 60 x 10 cm in main plots and three levels of *desi* cotton varieties i.e. PA 08, PA 528 and PA 255 in sub plots. The biometric observation on growth and yield attributes were recorded as per the standard procedure.

RESULT AND DISCUSSION

Data on yield and yield attributes of *desi* cotton as influenced by various treatment are presented in Table 1. The plant height was favourably influenced by closer spacing 60 x 10 cm (V_4) at all growth stage. The other growth character viz., number of functional leaves and leaf area per plant, number of monopodial and sympodial branches per plant, number of squares and green bolls per plant and dry matter accumulation per plant favourably influenced by wider spacing 45 x 30 cm (V_3) at all growth stages. Plant density could not produce any material difference in mean boll weight. The yield attributing

* Department of Agronomy, College of Agriculture, VNMKV, Parbhani

Table 1
Yield and yield attributes of *desi* cotton as influenced by different treatments

Treatments	Seed cotton Yield (Kg/ha)	Cotton yield / plant (g)	No. of picked bolls / plant	Weight of bolls (g)
Plant densities (cm)				
S ₁ - 45 x 15 (148148 plants / ha)	2063	19.56	14.04	1.67
S ₂ - 45 x 22.5 (98765 plants / ha)	1807	24.33	14.67	1.84
S ₃ - 45 x 30 (74074 plants / ha)	1621	25.67	15.56	1.90
S ₄ - 60 x 10 (166666 plants / ha)	1798	14.89	10.16	1.67
SEm ±	27.46	0.38	0.25	0.02
CD at 5%	95.05	1.32	0.86	NS
Varieties				
V ₁ - PA 08	1803	20.91	14.25	1.70
V ₂ - PA 528	2085	24.66	14.65	1.89
V ₃ - PA 255	1579	17.75	11.91	1.70
SEm ±	18.11	0.29	0.09	0.01
CD at 5%	54.30	0.87	0.29	NS
Interaction (SxV)				
SEm ±	72.46	1.17	0.39	0.11
CD at 5%	NS	NS	NS	NS
G.mean	1822	21.11	13.60	1.76

characters viz., number of picked bolls per plant, seed cotton yield per plant were considerably higher under wider plant spacing 45 x 30 cm (V₃), while the seed cotton yield was highest (1944 kg/ha) in 45 x 15 cm plant spacing compared to wider spacing 45 x 30 cm (1523 kg/ha) due to more number of plants per unit area. These results are in accordance with those obtained by Buttar, G.S. and Sudeep Singh (2007), Narayana, E. and Aparna, D. (2011), Sharma *et al.* (2001), Giri and Gore (2006) and Namdev *et al.* (1991).. The *desi* cotton variety PA 528 produced significantly more plant height, functional leaves, leaf area, dry matter, sympodial branches, number of squares and

green bolls per plant, number of picked bolls per plant, yield per plant and yield per hectare than PA 08 and PA 255. However, boll weight and monopodial branches per plant were not affected significantly due to different *desi* cotton varieties.

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