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Performance of *Gossypium arboreum* genotypes of different agro-climatic zones for yield and fibre quality parameters under rainfed condition

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Abstract

Cotton is an important agriculture commodity for export in the form of raw cotton, cotton yarn and other value added textile goods. The textile industry demands long staple cotton genotypes for better clothes. Therefore in the present investigation, *Gossypium arboreum* genotypes from different agro-climatic zones were evaluated to study their superiority for yield and quality parameters. The genotypes evaluated in the present study showed high yield potential on par with the zonal check AKA 7. These genotypes show wide range of variation for different yield and fibre quality characters. Among the twenty eight genotypes of *G. arboreum* cotton, the genotype PA 785 and CISA 6-2 were the best genotypes for seed cotton yield as well as fibre properties like fibre length, fibre strength, uniformity ratio and fibre fineness.

Keywords: Fibre quality, *G. arboreum*, agro-climatic, rainfed

Introduction

Cotton is one of the most important cash crops in India. On account of its agricultural as well as industrial importance, it is called as White Gold. Millions of people depend on cotton cultivation, trade, transportation, ginning and processing for their livelihood. Of the four spinnable lint bearing species grown in India, *G. arboreum* cultivars have inherent ability of resistance against insect pests and diseases and withstand moisture stress. At the same time they have short and coarse fibre. Overall performance of cotton crop is assessed by its yield and fibre characteristics. A significant varietal differences for fibre properties has been observed in various strains of upland cotton. In the present investigation genotypes developed by research stations and institutes of different agro-climatic zones of India have been evaluated for yield and fibre quality traits in comparison to check varieties.

Materials and Methods

In the present investigation twenty eight genotypes of *arboreum* cotton from different agro-climatic zones of India were evaluated for yield and fibre quality traits along with two checks viz. PA 402 and AKA 7. Trial was conducted in Randomized Block Design with three replications. Each genotype was planted in 5.85 meter length with a spacing of 45×22.5 cm. Sowing was done by dibbling method using 2-3 seeds per hill. Optimum plant stand was maintained by thinning of extra plants. Normal recommended agronomical package of practices were followed to raise the crop. Observations were recorded on seed cotton yield (on plot basis) and yield contributing traits (on five competitive plants taken randomly). Lint samples were sent to CIRCOT, Nagpur for evaluation of fibre quality traits.

Results and Discussion

Twenty eight genotypes along with two checks viz., PA 402 and AKA 7 were evaluated under rainfed condition. To give more emphasis on quality aspects, results on seed cotton yield, boll weight, ginning percent, lint yield in addition to quality parameters have been discussed. Data on seed cotton yield were statistically significant with a coefficient of variation 12.13 per cent. Out of twenty eight genotypes evaluated in this investigation, the genotype NDLA 3068 (2271 kg/ha) recorded highest seed cotton yield followed by local check PA 402 (2218 kg/ha) and NDLA 3077 (2160 kg/ha). Genotype NDLA 3068 (845 kg/ha) recorded highest lint yield followed by NDLA 3077 (824 kg/ha) and local check PA 402 (810 kg/ha). A range of 33.80 (GAM 219) to 42.11 per cent (HD 514) was observed for ginning out turn. The genotype HD 514 recorded highest ginning outturn (42.11%) followed by AKA 2008-7 (40.70%) and PBD 4 (40.57%). 2.5% span length ranged from 18.4 mm (RG 776) to 28.5 mm (PA 785 and CISA 6-2). The genotype PA 785 and CISA 6-2 recorded highest 2.5% span length (28.50 mm)

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by DWDa 1402 (28.20mm). Micronaire value ranged from 4.6 (JLA 0916) to 7.3 (RG 776). Fibre strength ranged from 15.7 g/tex to 22.4 g/tex. The genotype PA 785 and CISA 6-2 recorded highest fibre strength (22.4 g/tex) followed by local

check PA 402 (22.3 g/tex) and JLA 0916 (21.7 g/tex). In general, performance of genotype PA 785 was most promising for seed cotton yield with better combination of staple length and fibre strength.

Table 1: Performance of *G. arboreum* genotypes for different characters

Sr. No.	Genotype	Seed Cotton Yield (kg/ha)	Ginning Outturn (%)	Lint yield (kg/ha)	Boll Weight (g)	2.5% Span Length (mm)	Uniformity Ratio (%)	Micronaire (mv)	Fibre Strength (mm)	Elongation (%)
1	CCA2006	1516	36.35	547	2.54	26.3	52	5.1	20.6	6.3
2	CISA 6-2	1872	40.00	745	2.73	28.5	51	4.9	22.4	6.5
3	RAAS 752	1930	38.07	732	2.84	25.5	54	5.1	20.3	6.5
4	DWDa 1401	1736	38.28	663	2.70	25.0	50	5.1	20.0	6.5
5	PBD 4	1771	40.57	714	2.70	18.7	55	7.2	15.7	7.0
6	ARBa1402	1888	37.01	695	2.88	24.8	52	5.3	19.9	6.5
7	GAM 216	1701	37.57	637	2.71	24.8	53	5.3	20.0	6.6
8	JLA 0916	1786	37.23	663	2.64	26.6	51	4.6	21.7	6.6
9	FDK 252	1522	39.95	606	2.49	23.0	52	5.6	18.0	6.5
10	RAAS 751	1804	40.32	728	2.59	26.8	49	5.1	20.0	6.4
11	JLA 0716	1952	38.06	740	2.85	25.2	51	5.3	19.8	6.3
12	RG 772	1399	36.93	509	2.46	25.7	50	5.2	18.4	5.9
13	PA 402 (LC)	2218	36.71	810	2.87	26.4	52	5.1	22.3	6.4
14	FDK 249	1574	40.52	636	2.62	20.7	54	5.6	16.7	6.6
15	AKA 2004-29	1730	38.31	660	2.73	24.6	53	5.3	20.8	6.5
16	ARBa1401	1875	39.70	728	2.89	23.1	55	5.3	19.4	6.5
17	PBD 2	1779	39.98	709	2.75	18.8	56	5.5	15.9	6.0
18	DWDa 1402	1944	36.58	709	2.83	28.2	50	5.1	21.6	6.4
19	NDLA 3077	2160	38.70	824	2.87	22.4	55	5.5	18.3	6.4
20	CNA 2009	1537	38.33	585	2.47	25.3	51	5.5	19.3	6.3
21	CNA 449	1726	39.03	672	2.65	24.4	49	5.3	20.9	6.5
22	AKA 2008-7	1985	40.70	806	2.88	25.7	51	5.2	20.4	6.5
23	PA 785	2080	35.83	744	2.45	28.5	51	4.8	22.4	6.9
24	NDLA 3068	2271	37.29	845	2.87	26.0	51	5.4	21.1	6.8
25	CCA 1022	1543	36.88	568	2.52	26.5	53	5.2	22.2	6.4
26	AKA 7 (ZC)	1495	38.13	570	2.59	24.9	53	5.0	20.5	6.6
27	GAM 219	1783	33.80	600	2.74	25.6	53	5.7	20.6	6.2
28	HD 514	1561	42.11	655	2.69	19.0	56	7.2	16.0	6.4
29	PA 778	1967	36.58	717	2.83	26.8	53	5.6	16.1	6.7
30	RG 776	1584	38.16	602	2.67	18.4	56	7.3	15.7	6.7
	SE±	125.43								
	CD at 5%	347.13								
	CV (%)	12.13								

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