

**Performance of long linted *Gossypium arboreum*
genotypes for yield and fibre quality parameters
under rainfed condition**

Presented by

(V.N.Chinchane)

Cotton Breeder

Cotton Research Station

Mahboob Baugh Farm

Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani

Quantitative change in cotton species composition

Species	% of total cotton area						
	1947	1970	1980	1990	2000	2007	2015
<i>G. arboreum</i>	65	30	20	30	17	4	2.0
<i>G. herbaceum</i>	32	17	14	12	11	5	1.5
<i>G. hirsutum</i>	3	53	54	48	69	90	96.0 (Bt-95.0)
<i>G. barbadense</i>	-	-	11	10	3	1	0.5

Introduction

Gossypium arboreum cotton

- Inherent ability to resist major pests and diseases
- Suitable for rainfed cultivation being drought tolerant
- Easy care and eco-friendly crop suitable for low input technology
- Suitable for sustainable cotton production
- Yield potential comparable with *hirsutum* cotton under rainfed condition
- Suitable for cultivation in light and medium soils

Introduction

- **Smaller boll size and lack of compact bolls results in cotton shedding**
- **Tall and lanky plant type**
- **Inferior fibre properties as compared to *hirsutum* cotton**

Staple length : 17-26 mm

Micronaire : 5.0-7.0 $\mu\text{g}/\text{inch}$

Fibre strength : 16-24 g/tex

Experimental Details

No. of genotypes	:	14 (conventional and introgressed)
Checks	:	4 (PA 08, PA 402, NH 615, NHH 206)
Design	:	Randomized Block Design
Replications	:	Two
Net plot size (m)	:	1.8 x 5.40
Spacing (cm)	:	45 x 22.5 for <i>desi</i> cotton, 60 x 30 for NH 615, 60 x 60 for NHH 206
Fertilizer (kg/ha)	:	50 + 25+ 25 NPK
Plant protections	:	
I)Insecticides		
a) <i>desi</i> cotton		1
b) <i>hirsutum</i> cotton		4
II) Pesticides		Nil

Characters studied

- **Boll weight**
- **Lint index**
- **Seed index**
- **Lint yield**
- **Seed cotton yield**
- **Ginning out-turn**
- **Upper half mean length**
- **Uniformity ratio**
- **Micronaire**
- **Fibre strength**
- **Fibre elongation**

Per se performance of *G. arboreum* genotypes for different characters

Genotype	Seed cotton yield (kg/ha)	Lint yield (kg/ha)	G.O.T. (%)	Boll wt. (g)	Lint index	Seed index
PA 801	1386	516	37.29	2.85	3.85	7.64
PA 808	1223	445	36.42	2.78	3.76	6.55
PA 809	1357	493	36.37	2.84	3.99	6.54
PA 810	1441	520	36.09	2.88	3.58	6.69
PA 812	1495	534	35.73	2.82	3.56	6.36
PA 825	1241	455	36.74	2.80	3.63	6.55
PA 828	1356	500	36.93	2.80	3.69	6.58
PA 835	1478	559	37.83	2.92	3.88	6.96
PA 837	1337	498	37.29	2.88	3.52	6.47
PA 841	1429	546	38.27	2.84	3.75	6.15
PA 847	1184	425	35.92	2.76	3.41	6.48
PAIG 377	1156	409	35.39	2.78	3.90	7.60
PAIG 378	1046	357	34.21	2.84	3.57	7.41
PAIG 380	1300	487	37.51	2.80	3.68	6.71
Checks						
PA 08 (c)	1267	460	36.36	2.78	3.47	6.08
PA 402 (c)	1172	434	37.06	2.86	3.85	6.96
NH 615 (c)	1310	498	38.02	2.90	4.02	6.45
NHH 206 (c)	1222	464	37.99	2.78	3.55	6.41
SE $\pm$	74.07					
CD at 5%	220.68					

performance of *G. arboreum* genotypes for fibre quality characters

Genotype	Upper Half Mean Length (mm)	Uniformity ratio (%)	Micronaire value (µg/inch)	Fibre strength (g/tex)	Elongation (%)
PA 801	30.7	85	5.0	29.6	5.9
PA 808	32.0	87	4.7	34.1	5.7
PA 809	33.7	88	4.1	29.6	5.6
PA 810	32.7	87	4.1	29.4	5.6
PA 812	32.2	86	4.8	29.7	5.7
PA 825	30.0	84	4.8	31.2	6.0
PA 828	29.8	83	5.1	31.1	6.4
PA 835	32.5	86	4.9	27.8	4.9
PA 837	30.7	85	4.8	29.3	5.8
PA 841	30.2	83	4.6	27.6	6.3
PA 847	31.3	84	4.6	28.8	5.8
PAIG 377	32.1	87	4.3	28.2	5.4
PAIG 378	29.4	85	4.3	26.7	5.9
PAIG 380	33.1	87	4.3	31.6	6.0
Checks					
PA 08 (c)	30.5	85	4.9	28.6	6.0
PA 402 (c)	27.2	83	5.1	28.5	5.7
NH 615 (c)	29.5	86	4.1	27.0	5.7
NHH 206 (c)	29.1	85	4.1	27.2	5.9

Screening of genotypes for multiple disease reaction

Genotype	Bacterial blight		Alternaria		Grey mildew	
	Grade	Reaction	Grade	Reaction	Grade	Reaction
PA 801	I	R	I	R	0	DF
PA 808	II	MR	0	DF	0	DF
PA 809	I	R	I	R	0	DF
PA 810	I	R	I	R	0	DF
PA 812	I	R	0	DF	0	DF
PA 825	I	R	I	R	0	DF
PA 828	II	MR	I	R	0	DF
PA 835	I	R	I	R	0	DF
PA 837	I	R	0	DF	0	DF
PA 841	I	R	0	DF	0	DF
PA 847	II	MR	0	DF	0	DF
PAIG 377	I	R	0	DF	0	DF
PAIG 378	II	MR	I	R	0	DF
PAIG 380	I	R	0	DF	0	DF
Checks						
PA 08 (c)	II	MR	0	DF	0	DF
PA 402 (c)	II	MR	0	DF	0	DF

Promising *G. arboreum* cotton genotype PA 812

Fibre Characters

Seed Cotton Yield (kg/ha)	Ginning Outturn (%)	Upper half mean length (mm)	UR (%)
2080	37.71	31.7	85
Mic (µg/inch)	Strength (g/tex)	Elg. (%)	Maturity Ratio
4.5	30.2	5.6	0.84



Performance of genotype PA 812 for Fibre quality characters

Br.24 (b) : Co-ordinated varietal trial of *arboreum* cotton

Year-2016-17

Zone	Locations	SCY (kg/ha)	UHML (mm)	Micronaire (µg/inch)	Fibre Strength (g/tex)	Rank
North Zone	5	1534	31.5	5.1	31.2	I
Central Zone	3	1373	29.2	4.5	30.4	I
South Zone	5	1162	29.4	5.1	30.6	I

Performance of genotype PA 812 for Fibre quality characters

Br.22 (a/b) : National varietal trial of *arboreum* cotton

Year-2015-16

Zone	Locations	UHML (mm)	Micronaire (µg/inch)	Fibre Strength (g/tex)	Rank
North Zone	6	29.3	4.8	30.6	I
Central Zone	4	30.3	4.7	31.0	I
South Zone	6	30.5	4.6	29.7	I

Performance of genotype PA 810 for Fibre quality characters

Br.22 (a/b) : National varietal trial of *arboreum* cotton

Year- 2016-17

Zone	Locations	SCY (kg/ha)	UHML (mm)	Micronaire (µg/inch)	Fibre Strength (g/tex)	Rank
North Zone	4	1448	30.6	4.9	31.3	I
Central Zone	5	1344	32.5	4.3	30.3	I
South Zone	2	1159	31.3	4.8	33.0	I

Promising *arboreum* cotton genotypes for fibre characters

Br 22 a/b LL : Long linted trial of *arboreum* cotton

Year-2016-17

Genotypes	Seed Cotton Yield (kg/ha)	Mean G.O.T. (%)	UHML (mm)	Micronaire (µg/inch)	Fibre Strength (g/tex)
PAIG 326	1451	34.83	30.3	4.8	26.7
PAIG 363	1253	35.57	31.0	4.4	26.7
PA 808	1244	35.87	31.3	4.6	28.3
PA 793	1208	35.54	31.4	4.4	30.4
PA 741	1206	36.74	31.5	4.7	27.7
Checks					
PA 402	890	37.34	26.4	4.9	27.3
AKA 7	1352	38.95	26.0	4.9	27.5

Fibre quality characters of promising genotypes

Sr. No.	Genotype	2.5% Span length (mm)	Uniformity ratio (%)	Micronaire (µg/inch)	Fibre strength (g/tex)
1	PA 719	28.9	49	4.3	25.1
2	PA 740	29.6	44	4.1	22.9
3	PA 741	32.2	49	4.9	23.1
4	PA 743	28.9	51	4.8	22.5
5	PA 760	30.4	50	4.8	25.2
6	PA 777	30.2	48	4.4	20.4
7	PA 778	29.4	49	4.3	23.0
8	PA 781	31.4	48	4.8	22.2
9	PA 783	31.1	47	4.6	20.7
10	PA 785	30.6	50	4.1	25.1
11	PA 788	30.1	52	4.9	23.9
12	PA 789	32.9	50	4.3	24.5
13	PA 791	31.7	48	4.7	22.8
14	PA 793	30.9	46	5.5	23.4

Fibre quality characters of promising genotypes

Sr. No.	Genotype	2.5% Span length (mm)	Uniformity ratio (%)	Micronaire ($\mu\text{g}/\text{inch}$)	Fibre strength (g/tex)
1	PA 794	32.7	49	4.1	23.8
2	PA 795	32.1	49	4.7	20.4
3	PA 796	30.4	51	4.7	22.4
4	PA 797	31.4	50	4.5	22.0
5	PA 815	28.8	49	4.9	23.7
6	PAIG 325	30.8	48	4.9	22.0
7	PAIG 62	29.3	50	5.1	22.4
8	PAIG 366	29.1	51	5.0	23.9
9	PAIG 368	31.7	48	5.2	22.1
10	PAIG 326	29.6	51	5.3	22.2
11	PAIG 77	30.1	43	4.5	21.3
12	PAIG 369	29.3	46	4.8	22.1
13	PAIG 371	31.3	45	4.4	25.5
14	PAIG 373	29.8	45	4.9	23.2

Promising *G. arboreum* cotton genotype PA 785



Fibre Characters

Seed Cotton Yield (kg/ha)	Ginning Outturn (%)	UHML (mm)	UR (%)
1641	37.77	30.6	85

Mic (µg/inch)	Strength (g/tex)	Elg. (%)	Maturity Ratio
4.1	29.4	5.9	0.85

Desi Cotton Variety PA 740

Recommended for cultivation in South zone of India

Year of Release : 2017
yield (Quintal/ hectare) : 15-17
Ginning Percentage (%) : 37-38
Fibre length (mm) : 28-29
Spinning counts : 30^S -40 ^S
Duration (days) : 150-160

Characters :
High ginning outturn
Superior fibre length, strength and spinning counts
Tolerant to sucking pests, bacterial blight and grey mildew
Tolerant to moisture stress.

Fibre quality characters :

1) 2.5% Span length (mm)	: - 28.86
2) Micronaire (µg/inch)	: - 4.7
3) Uniformity ratio	: - 85
4) Fibre strength (g/tex)	: - 28.6
5) Elongation (%)	: - 6.0
6) Ginning out turn (%)	: - 38.52



Conclusion

- **With the release of such quality *arboreums* having high productivity, tolerance to drought, diseases and pests, the marginal and rainfed cotton growers can produce quality cotton with minimum inputs**
- **The mill owners can satisfy their demand for quality cotton**



Thanks

