



Phule JLA-0603 diploid cotton (*G.arboreum* L.) variety recommended for southern India

S. S. PATIL*, T.R. PATIL and S.D. RAJPUT

Mahatma Phule Krishi Vidyapeeth, Oilseeds Research Station, Jalgaon - 425 001

*Email : sanjivspatil@gmail.com

Abstract : Phule JLA 0603, diploid cotton variety, was derived by hybridization through pedigree selection method from a cross JLA-1693 x AKA-9110. It has good fibre properties medium staple length (24.6 mm). and good (23.8 g/t) staple strength. The variety was resistant to bacterial leaf blight (BLB) and moderately susceptible to Alternaria leaf blight (ALB) and grey mildew disease. Phule JLA-0603 gave highest seed cotton yield (1515 kg/ha) over zonal check DLSa-17 (1367 kg/ha) and local check (1351 kg/ha), which is 10.78 and 12.14 per cent higher over DLSa-17 and local check, respectively in coordinated varietal trials. Thus it was released and named Phule JLA-0603 for commercial cultivation in south zone of India comprising states of Andhra Pradesh, Telangana, Tamil Nadu and Karnataka under rainfed conditions.

Keywords : Diploid cotton, Phule JLA-0603, quality parameters, yield components

Cotton is an important *kharif* crop in southern states of India and is grown over an area of 30.25 lakh ha with total production of 97.0 lakh bales in year 2019-2020 and productivity was 545 kg lint/ha. Due to over cultivation of *Bt* hybrids, the area under *G.arboreum* varieties are declining continuously. On other hand due to vagaries of weather, the *Bt* hybrids are not performing well under the rainfed cultivation and *G.arboreum* cotton varieties is very well adopted to the fluctuating rainfall condition and hence suits well to scanty resources of the poor farmers. It is also resistant to many biotic and abiotic stresses. (Din *et. al.*, 2016. and Mohammed Iqbal *et. al.*, 2019) Growing of organic cotton is trendy in recent years. Therefore *G.arboreum* can be right option.

Looking to the future scope of *G.arboreum* varieties under rainfed condition and the low yield potential of existing varieties, work of developing new *G.arboreum* varieties superior in yield and fiber properties was continued at Jalgaon and result of that variety Phule JLA-0603 is found superior and released and notified for commercial cultivation in south zone of India comprising states of Andhra Pradesh, Telangana, Tamil Nadu and Karnataka under rainfed condition

MATERIALS AND METHODS

Cross of JLA-1693 x AKA-9110 was made during *kharif* 1999-2000 (Anonymous, 2000). Hybrid derivatives and subsequent generations were raised during *kharif* 2000-2001 to 2005-2006 and selection for individual plants/progenies was made by following pedigree selection method. In F₆ generation selections were made and evaluated at Agricultural Research Station, under AICRP, cotton project, Jalgaon.

RESULTS AND DISCUSSION

Performance of JLA- 0603 in different trials

In coordinated varietal trial (Pr, Br.22b) during 2013-2014 genotype was tested under national trials in all the three cotton growing zones of India as a result of this the genotype found superior for seed cotton yield at three locations of south zone and recorded 16.9 per cent increased yield as compares to the zonal check DLSa-17 and genotype was promoted in South zone coordinated trials 24b and tested for two years (2014-2015 and 2015-2016) and consistently recorded superior yield for both years over zonal check DLSa-17 and different Local checks and increase over is 7.32 and 20.26 per cent

Table 1. Seed cotton yield performance of Phule JLA-0603 in south zone trials

S. No.	Name of the trial	Year	Locations	Seed cotton yield (kg/ha)		
				JLA-0603	DLsa-17 (Z.C.)	Different L.C.) as per Locations
A)	National Trial					
1	Br.22a/b IET of <i>G.arboreum</i>	2013-2014	03	1730	1480	1712
B)	Zonal Trials (SZ)					
1	Br.24bCVT of <i>G.arboreum</i>	2014-2015	03	1480	1360	1228
2	Br.24bCVT of <i>G.arboreum</i>	2015-2016	03	1334	1262	1112
Mean of zonal trials (2014-2015 & 2015-2016)			03	1407	1311	1170
Overall mean (2013-2014 to 2015-2016)			09	1514.67	1367.33	1350.67
per cent increase over the checks				--	10.78	12.14

Table 2: Reaction to major diseases of variety JLA-0603

Year of testing	Trial location	Proposed variety JLA-0603	Zonal check DLsa17 (Ck-1)	Mean of all Local check (Ck-2)	GAM-198 (Qual. Var.1)	PA-740 (Qual. Var.2)	NDLA-2985 (Qual. Var.3)
A. Bacterial leaf blight (Grade)							
2013-2014	KWD	1	1	1	1	1	-
2013-2014	DWD	0	0	0	0	0	-
B. Alternaria leaf spot (Grade)							
2013-2014	KWD	2	1	1	1	1	-
2013-2014	DWD	4	4	4	4	4	-
2015-2016	DWD	3	3	3	2	2	-
C. Grey mildew (Grade)							
2013-2014	KWD	1	1	2	1	1	-
2013-2014	DWD	4	4	4	4	4	-
2015-2016	DWD	4	4	4	4	4	-

Norms followed to categorize the reaction to foliar diseases.

Sr. No.	Bacterial Leaf Blight, Alterneria Leaf Blight & Grey Mildew	
	Grading	Reaction
1	0.0 to 1.0	Resistant (R)
2	1.1 to 2.0	Moderately Resistant (MR)
3	2.1 to 3.0	Moderately Susceptible (MS)
4	3.1 to 4.0	Susceptible (S)
5	Above 4.0	Highly Susceptible (HS)

respectively and over all 2013-2014 to 2015-2016 coordinated performance in 09 location gave 10.78 and 12.14 per cent increase seed cotton yield over zonal check DLsa-17 and different Local checks respectively (Table-1).

Pest and diseases

The genotype was screened against diseases and pest reaction in Initial Evaluation

Trial and Co-ordinated Varietal Trials in south zone during 2013-2014 to 2015-2016 at various locations. It has shown resistant reaction to bacterial leaf blight, and moderately susceptible to Alternaria leaf blight and grey mildew diseases (Table 2). The culture was found moderately resistant to sucking pest and bollworms (Table 3) in comparison with zonal check DLsa17, local check and qual. varieties.

Table 4. Reaction to insect pests on variety JLA-0603

Year of testing	Trial locations	Proposed variety JLA-0603	Zonal check DLSa17 (Ck-1)	Mean of all Local check (Ck-2)	GAM-198 (Qual. Var.1)	PA-740 (Qual. Var.2)	NDLA-2985 (Qual. Var.3)
A. Leaf hopper/3 leaves							
2014-2015	DWD	3.2	3.2	6.6	3.4	4.2	3.2
2015-2016	DWD	1.6	3.2	1.8	2.4	1.8	-
B. Leaf hopper injury grade							
2014-2015	DWD	I	I	I	I	I	I
2015-2016	DWD	I	I	I	II	I	-
C. Fruiting body damage (%)							
2014-2015	DWD	6.15	7.12	7.05	4.31	7.1	6.1
2015-2016	DWD	9.50	9.30	10.00	9.70	10.50	-
D. Open boll damage pre cent (Boll basis)							
2014-2015	DWD	0.7	0.66	0.7	0.73	0.51	0.56
2015-2016	DWD	10.0	12.6	10.7	13.1	12.2	-
E. Good open bolls/5 plants							
2014-2015	DWD	29.5	29	29.5	30	27	25
2015-2016	DWD	69.25	49.90	50.0	67.75	55.25	-
F. Bad opened bolls/5 plants							
2014-2015	DWD	2.36	2.29	2.36	2.44	1.89	2.25
2015-2016	DWD	10.60	10.00	8.00	9.25	10.89	-

Table 4. Fibre quality characters of Phule JLA-0603 and DLSa-17

Year	Variety	Ginning outturn (%)	2.5 per cent SLmm	Micronaire value(m/m)	Staple bundle strength(g/t)	Strength/length ratio
2013-2014 to 2015-2016	Phule JLA-0603	37.67	24.53	5.90	23.77	0.97
	DLSa-17 (ZC)	35.37	27.97	5.03	23.67	0.85

Table 5. Salient features of variety Phule JLA-0603

Characters	Details	Characters	Details
Plant height	150-160 cm	Fertilizers	50 : 25 : 25 kg NPK/ha
Growth habit	Semi-erect determinate	Spacing	60 x 30cm or 75 x 30 cm
Leaf	Okra type with narrow lobes	Seed rate	12-15 kg/ha
Flower colour	Flower petal colour yellow and anther colour yellow	Quality characters	
Boll shape	Boll elliptic, pitted with pointed tip	Ginning percentage	37.7
Boll weight	2.5-2.9 g	2.5 per cent span length (mm)	24.6
Days to 50 per cent fowering	60-65	Micronaire value (av)	5.9
Strength/length ratio	0.97	Uniformity ratio	50
Duration of crop	160— 180(mid late)	Fibre strength (g/ t)	23.8
Lodging	Non lodging	Maturity coefficient	0.85

Quality characters

The staple length of the variety Phule JLA-0603 falls in medium staple category and 2.5 pre cent span length is 24.6 mm is lesser as compare to zonal check DLSa-17 (27.97 mm). The variety has good fibre strength 23.8 g/t and high ginning outturn 37.67 pre cent as compare to

zonal check DLSa-17 in the tune of 35.37 per cent. (Table 4). Being high seed cotton yield, superior fibre properties, resistant to BLB and moderately susceptible to ALB and grey mildew disease. Moderately resistant to bollworm and sucking pest in various trials, the genotype JLA-0603 was approved for release in 2017 by Central

Variety Release Committee (CVRC) The variety was notified and released for commercial cultivation in south zone states of Andhra Pradesh, Telangana, Tamil Nadu and Karnataka under rainfed condition by Central Seed Sub Committee in the year 2018 (Anonymous 2018). The newly breed variety Phule JLA-0603 was superior in respect of yield, earliness and quality parameters such as staple length and strength as compare to zonal check DLsa-17. The salient features of the variety Phule JLA-0603 are listed in Table 5.

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