



Diploid cotton (*G. arboreum* L.) variety JLA 505 for central zone states

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ABSTRACT : Phule JLA 505, diploid cotton variety, was derived by hybridization through pedigree selection method from a cross JLA-794 (BL) x AKA-7. It had good fibre properties having 25.8 mm staple length and 21.8 g/t staple strength. The variety was moderately resistant to BLB, ALB and grey mildew disease. JLA-505 consistently recorded 6.09% and 17.58% increased yield over variety JLA-794 and AKA-7. The Variety in coordinated varietal trial, the culture JLA-505 recorded 16.96 percent higher yield over zonal check AKA-7. Thus it was released and named Phule JLA-505 for commercial cultivation in Central zone states, Maharashtra, Madhya Pradesh and Gujarat

Key words : Diploid cotton, JLA 505, quality parameters, yield components

Cotton is an important *khariif* crop in Maharashtra state and is grown over an area of 38.27 lakh ha with total production of 75.0 lakh bales in year 2015-2016 and in year 2016-2017 area was 38.06 lakh ha with total production of 89.0 lakh bales. The major area and production of MPKV comes under *Khandesh* tract. Both *G. arboreum* and *G. hirsutum* varieties and hybrids are cultivated in this area. Under rainfed conditions, *G. arboreum* cotton 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. Looking to the present trend of growing organic cotton, *arboreum* can be suitable alternative.

At present there is larger coverage under old varieties JLA 794, Y 1 and AKA 7, As the yield potential of those varieties were found to be low, work of developing superior varieties was continued at Jalgaon and result of that variety

JLA-505 is released for central zone states Maharashtra, Madhya Pradesh and Gujarat

Cross of JLA 794 (BL) with AKA 7 was made during *khariif* 1998-1999 (Anonymous, 2000). Hybrid derivative and subsequent generations were raised during *khariif* 1999-2000 to 2004-2005 and selection for individual plants/progenies was made by following pedigree selection. In F₆ generation in year 2005-2006, one progeny from the cross JLA 794 (Bold Leaves.) x AKA 7 and other selections were tested along with check for further evaluation at Agricultural Research Station.

The diploid cotton, variety JLA-505, tested in station trial for quality characters, yield parameters during 2006-2007 to 2007-2008 in randomized block design with three replications at Jalgaon and Dhule. During 2008-2009 to 2009-2010, the genotype was evaluated in multilocation trials at various cotton research centers in Maharashtra. The genotype was

evaluated in central zone project trials during 2009-2010 to 2012-2013. The performance of the genotype was consistently superior over the checks JLA 794, Y 1 and AKA 7. The statistical analysis was carried out according to Panse and Sukhatme (1967).

Performance of JLA 505 in different trials : The genotype was tested in preliminary yield trial and station trial during 2006-2007 to 2007-2008 at Agricultural Research Station, Jalgaon and multilocation trials were conducted at 11 location in Maharashtra during 2009-2010 and the genotypes JLA 505 recorded significantly higher yield over 6.09 and 17.58 per cent over the check JLA 794 and AKA 7, respectively (Table 1).

In coordinated Varietal trial (Pr,Br.22B) during 2009-2010 genotype was tested at seven locations in Central zone and recorded 24.6 per cent increased yield as compares to the zonal check AKA 7 and genotype was promoted in central zone coordinated trials 24b and tested for three years (2010-2011, 2011-2012 and

2012-2013) and consistently recorded superior yield over zonal check AKA-7 and increase over is 14.66 per cent and over all 2009-2010 to 2012-2013 coordinated performance in 24 location gave 16.96 pr cent increase seed cotton yield over zonal check AKA 7 (Table 2).

Pest and diseases : The genotype was screened against diseases and pest reaction in IET and CVT trials in central zone during 2009-2010 to 2012-2013 at various locations. It has shown moderately resistant reaction to bacterial leaf blight, Alternaria leaf blight and gray mildew diseases (Table 3). The culture was found resistant to sucking pest. (Table 4) and better tolerant to bollworms in comparison with AKA 7 and JLA 794.

Quality characters : The staple length of the culture JLA 505 falls in medium staple category and 2.5 per cent span length is 25.8 mm as against 24.9 mm for zonal check AKA 7. The variety has good fibre strength 21.8 g/t (Table 5). Being high seed cotton yield,superior

Table 1. Seed cotton yield of JLA 505 in state multilocation trials *kharif* 2009-2010

Year	Locations	JLA 505	Y 1	JLA 794	AKA 7	SE	CD (p=0.05)	CV(%)
2009-2010								
1.	Jalgaon	1371	1212	1341	1138	94.93	269.83	13.51
2.	Dhule	1118	1051	1168	1101	71.28	202.62	10.77
3.	Rahuri	0899	724	743	0814	47.03	134.89	11.00
4.	Parbhani	1319	—	1201	1212	42.23	116.83	5.67
5.	Nanded	1868	—	1868	1834	78.95	218.41	7.83
6.	Somnathpur	1121	—	1332	1314	73.10	202.33	10.76
7.	Badlapur	1452	—	0860	965	28.99	80.23	5.58
8.	Akola	1546	—	1275	1252	145.23	414.48	14.39
9.	Achalpur	2008	—	2064	1318	186.26	531.59	14.50
10.	Amravati	1356	—	1192	922	136.70	390.26	13.92
11.	Nagpur	1464	—	1585	1336	—	441.0	12.8
	Mean	1411	996	1330	1200	82.24	272.95	10.97
Per cent increased over			41.66	6.09	17.58			

Table 2. Yield performance of JLA 505 in central zone trials

S. No.	Name of the trial	Year	Locations	Seed cotton yield (kg/ha)		
				JLA-505	AKA-7	JLA-794
1	Initial Evaluation Trial (Br. 22b)	2009-2010	07	1498	1202	1460
2	Co ordinated Varietal Trial (Br. 24b)	2010-2011	06	1440	1218	1453
3	Coordinated Varietal Trial (Br. 24b)	2011-2012	05	1610	1397	1504
4	Coordinated Varietal Trial (Br. 24b)	2012-2013	06	1533	1382	1368
Overall mean (2009-2010 to 2012-2013)		24	1520.25	1299.75	1446.25	
Per cent increase over the checks		—	16.96	5.12		

Table 3. Reaction of JLA 505 to Bacterial leaf blight (BLB), Alternaria leaf blight (ALB), and grey mildew (GM)

Year	Variety	BLB		ALB		GM	
		Grade	Reaction	Grade	Reaction	Grade	Reaction
2009-2010 IET	JLA 505	2	MR	3	MS	1	R
	AKA 7(ZC)	1	R	2	MR	1	R
	JLA 794 (LC)	2	MR	2	MR	1	R
2010-2011 CVT	JLA 505	1.3	MR	2	MR	1.3	MR
	AKA 7(ZC)	1.3	MR	2	MR	1.3	MR
	JLA 794 (LC)	1.0	R	2	MR	1.0	R
2011-2012 CVT	JLA 505	1.3	MR	2	MR	1.0	R
	AKA 7(ZC)	1.0	R	2	MR	0.5	R
	JLA 794 (LC)	1.3	MR	2	MR	1.0	R
2012-2013 CVT	JLA 505	1.7	MR	2	MR	1.0	R
	AKA 7(ZC)	1.3	MR	2.5	MS	1.0	R
	JLA 794 (LC)	1.7	MR	2.5	MS	1.0	R

ZC=Zonal Check, LC=Local check

Norms followed to categorize the reaction to foliar diseases Bacterial Leaf Blight, Alternaria Leaf Blight & Grey Mildew.

1. Resistant (R)- 0.0 to 1.0
2. Moderately Resistant (MR) - 1.1 to 2.0
3. Moderately Susceptible (MS)-2.1to 3.0
4. Susceptible (S) - 3.1 to 4.0
5. Highly Susceptible (HS) - Above 4.0

fibre properties, tolerance to bollworm and resistant reaction to sucking pest and gray mildew, alternaria leaf blight and bacterial leaf blight diseases, in various trials, the culture JLA 505 was approved for release in 2015 by Central Variety Release Committee (CVRC) The variety was notified and released for commercial cultivation in central zone states of Maharashtra, MadhyPradesh and Gujarat by Central Seed Sub Committee in the year 2015. The newly breed variety Phule JLA 505 was

superior in respect of yield, earliness and quality parameters such as staple length and strength over existing variety AKA 7. The salient features of the variety JLA 505 are listed in Table 6.

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Table 4. Reaction of Jassids, Whitefly, Aphids and bollworm damage on variety JLA 505

Year	Variety	Jassids		Whitefly		Aphids		Open boll damage (Boll basis)	Open boll damage (Locule basis)
		Grade	Reaction	Grade	Reaction	Grade	Reaction		
2009-2010 IET	JLA-505	3.1	MR	3.4	MR	12.1	MR	12.0	12.3
	AKA-7(ZC)	2.9	R	2.1	R	12.5	MR	11.5	11.3
	JLA-794 (LC)	2.0	R	2.8	R	10.9	MR	10.5	10.6
2010-2011 CVT	JLA-505	2.5	R	1.5	R	—		17.0	10.4
	AKA-7(ZC)	2.3	MR	1.8	R	—		23.1	13.7
	JLA-794 (LC)	2.2	R	1.8	R	—		18.4	10.1
2011-2012 CVT	JLA-505	2.4	R	2.0	R	—		23.0	13.1
	AKA-7(ZC)	1.8	MR	3.3	MR	—		20.6	11.2
	JLA-794 (LC)	3.8	R	2.8	R	—		17.8	10.0
2012-2013 CVT	JLA-505	1.8	MR	2.1	R	2.68	R	27.8	20.9
	AKA-7(ZC)	1.8	R	1.5	R	2.55	R	18.1	14.6
	JLA-794 (LC)	1.9	R	1.7	R	2.65	R	27.8	20.1

ZC=Zonal Check, LC=Local check; Figures in percentages are the arcsin values.NS=Non significant

Table 5. Fibre quality characters of JLA 505 and AKA 7

Year	Variety	2.5 per cent SLmm	Micronaire value(m/m)	Staple bundle strength(g/t)	Strength/Length ratio
2009-2012	JLA 505	25.8	5.35	21.8	84.6
	AKA 7(ZC)	24.9	5.22	20.5	82.4

Table 6. Salient features of variety Phule JLA 505

Characters	Details	Characters	Details
Plant height	150-160 cm	Fertilizers	50 : 25 : 25 kg NPK/ha
Growth habit	Semi erect deterrminate	Spacing	45 x 22.5cm or 90 x 30 cm
Leaf	Five narrow lobes	Seed rate	12-15 kg/ha
Flower colour	Floower petal yellow and anther colour yellow	Quality characters	
Boll shape	Boll elliptic,pitted with pointed tip	Ginning (%)	36.00
Boll weight	2.6-3.0g	2.5 per cent span length (mm)	25.8
Days to 50 per cent flowering	65-70	Micronaire value (av)	5.35
Strength/length ratio	84.6	Uniformity ratio	51
Duration of crop	170— 180(mid late)	Fibre strength (g/ t)	21.8
Lodging	Non-lodging	Maturity coefficient	0.88

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