



## SVPR 3 - A high yielding short duration cotton variety for rice fallow tracts of Tamil Nadu

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**Abstract:** SVPR 3 (TSH 288) is a high yielding cotton variety developed by Cotton Research Station, Srivilliputhur. It was released in the year 2000 for the rice fallow tracts of Tamil Nadu. It is a hybrid derivative of the cross between LH 900 and 1301 DD. It is a compact genotype, maturing in 135-140 days. It has recorded a mean seed cotton yield of 1294 kg ha<sup>-1</sup> which is 23.8, 34.1 and 19.4 per cent higher than MCU 7, ADT 1 and Anjali respectively. Its fibre qualities are comparable to that of MCU 7 and can spin 30's - 40's. It is tolerant to stem weevil and moderately resistant to leaf hopper and *Alternaria* leaf spot and resistant to Bacterial leaf blight disease. Hence SVPR 3 cotton was released as an alternative variety of MCU 7 for the rice fallow tracts of Tamil Nadu.

**Key words :** Cotton, Genotype, Rice fallow.

### Introduction

The rice fallow cotton zone (Cauvery delta) is potential for area expansion as well for eco cotton production. The present acreage 10000 hectare is very meagre and there is a great possibility in expanding the area over one lakh hectares in the rice fallow cotton zone. If only, a high yielding short duration cotton variety (135 days) with resistance to leaf hopper is developed along with ideal production technologies to this environment. The existing ruling varieties of cotton viz. MCU 7 and ADT 1 were highly susceptible to leaf hopper and could not withstand the high temperature prevailed in the summer season. Hence to overcome the above, attempts were made to develop a high yielding short duration cotton variety with resistance to leafhopper and drought. This has resulted in the release of SVPR 3 cotton variety.

### Materials and Methods

In the resistant breeding project, a few types from the medium staple cotton gene pool maintained at Cotton Research Station, Srivilliputhur during 1999 namely JR 36, JR 7, 1301 DD and G.Cot. 10 used as donor parents for leafhopper resistance were crossed with MCU 7, LH 900, Tamcot 3711 and TSH 164 during 1986. Pedigree method of selection was followed from F<sub>2</sub> to F<sub>5</sub> generation under unprotected condition for screening against

leafhopper. From the cross LH 900 x 1301 DD an early superior segregant with resistance to leafhopper was isolated from F<sub>2</sub> population and was further evaluated upto F<sub>5</sub> generation to reach homozygosity. Based on the consistent performance at station yield trials (see Table 1) the cotton culture TSH 288 was selected for large scale testing and forwarded to multi-location trial for testing in three research stations of Tamil Nadu during Summer 1994. The performance of the culture TSH 28 was evaluated in co-ordinated varietal trials of AICCIP (South Zone) from 1995-1998. Adaptive research trials were also conducted over 66 locations under rice fallow condition.

### Results and Discussion

The culture TSH 288 was tested at Cotton Research Station, Srivilliputhur from the year 1990 to 1999. The mean of 11 yield trials conducted over 9 years indicated consistent superiority of this culture over the standard MCU 7. It has recorded an average seed cotton yield of 1172 kg ha<sup>-1</sup> as against 824 kg ha<sup>-1</sup> for MCU 7, accounting 42.2 per cent increase over check MCU 7 (Table 1).

In All India Co-ordinated Cotton Improvement Project trials, the culture TSH 288 was tested in co-ordinated varietal trial (Br.04(a)) of South Zone (Five centres) for three years

Table 1. Performance of TSH 288 at Cotton Research Station, Srivilliputhur (1990-1999)

S.No.	Year (Summer)	Name of the Trials	Yield of seed cotton (kg ha <sup>-1</sup> )					
			TSH 288	SVPR 1	MCU 7	LRA 5166	ADT-1	Anjali
1.	1990	RRYT (unprotected)	2132	-	1666	-	-	-
2.	1991	PST	1660	1557	1192	-	-	-
3.	1992	MST	681	682	400	869	-	-
4.	1992	EVT (protected)	807	804	-	710	-	-
5.	1993	MST	1633	1383	1226	-	-	-
6.	1994	MST	741	560	410	396	-	-
7.	1995	MST	1585	1325	818	1424	-	-
8.	1996	MST	778	419	474	667	-	-
9.	1997	MST	903	583	532	861	-	-
10.	1998	MST	720	595	550	575	277	662
11.	1999	MST	1250	1050	950	840	790	1037
	Mean		1172	897	824	714	534	850
	% of increase over check varieties		-	30.7	42.2	64.1	119.5	37.9

between 1995-1997. TSH 288 has established its superiority over LRA 5166 and MCU 5 by recording 18.1 and 18.0 per cent higher seed cotton yield respectively (Table 2).

During summer 1994, the culture was tested in three university research station trials in which TSH 288 registered a mean seed cotton yield of 1266 kg ha<sup>-1</sup> while MCU 7 recorded only 1051 kg ha<sup>-1</sup>, the yield increase over MCU 7 being 20.4 per cent (Table 3). The adaptive research trials at 18 locations during summer 1998 season revealed the superiority of TSH 288 over MCU 7 with an yield increase of 26.0 per cent under rice fallow condition (Table 4). Similarly in the adaptive research trials at 47 locations during summer 1999 season revealed that the culture TSH 288 was found to be superior to MCU 7 with a yield increase of 13.0 per cent (Table 4).

This culture, TSH 288 is moderately resistant to leafhopper and tolerant to stem weevil while the MCU 7 was highly susceptible for both, with a leafhopper injury index of 3.0 and stem weevil incidence of 57.17 per cent (Table 5). Similarly this culture was moderately

resistant to root rot and resistant to bacterial blight while MCU 7 was highly susceptible for both diseases (Table 6).

An overall analysis revealed that the cotton culture TSH 288 was superior over MCU 7 with an average seed cotton yield of 1294 kg ha<sup>-1</sup> as against 1045 kg ha<sup>-1</sup> of MCU 7, 965 kg ha<sup>-1</sup> of ADT 1 and 1085 kg ha<sup>-1</sup> of Anjali. The yield increase of TSH 288 was 23.8, 34.1 and 19.4 per cent over MCU 7, ADT 1 and Anjali respectively (Table 7). It has the yield potential of 2634 kg ha<sup>-1</sup> under favourable condition (Thiruvaidaimaruthoor of Thanjavur district).

Besides its high yield potential, TSH 288 possessed higher lint yield (456 kg ha<sup>-1</sup>) than MCU 7 (345 kg ha<sup>-1</sup>). Its fibre qualities are comparable to that of MCU 7 and can spin 30's - 40's (Table 8).

Based on the above desirable features, the cotton culture TSH 288 was released as SVPR 3 cotton by the Tamil Nadu Agricultural University, Coimbatore during January 2000 for the rice fallow tracts of Tamil Nadu.

Table 2. Yield data of TSH 288 in co-ordinated varietal trials (1995-1998).

S.No.	Center	TSH 288		LRA 5166		MCU 5		SVPR 1
		Kapas yield kg ha <sup>-1</sup>	Ginning per cent	Kapas yield kg ha <sup>-1</sup>	Ginning per cent	Kapas yield kg ha <sup>-1</sup>	Ginning per cent	Kapas yield kg ha <sup>-1</sup>
	CVT (Br.04 (a))							
95	LAM - Guntur	1628	34.8	1223	-	905	31.0	-
95	Siruguppa	1600	35.0	1259	34.7	981	29.8	-
95	Raichur	612	35.6	705	34.5	446	33.0	-
95	Arabhavi	1784	36.8	1571	35.0	1521	32.5	-
95	Srivilliputhur	1491	36.0	1502	32.0	1926	32.0	989
	CVT (Br.04(a))							
96	Coimbatore	887	35.0	1231	36.0	783	34.7	-
96	LAM - Guntur	1431	35.6	627	32.0	839	29.5	-
96	Siruguppa	1030	36.2	700	32.5	670	31.0	-
96	Raichur	1500	32.7	1740	31.7	770	34.7	-
96	Arabhavi	1160	34.2	1160	32.5	1500	32.7	-
96	Srivilliputhur	694	35.0	601	33.5	568	33.0	332
	CVT (Br.04(a))							
97	LAM - Guntur	1566	-	1050	-	1136	-	-
97	Arabhavi	883	-	1057	-	886	-	-
97	Raichur	1130	-	666	-	993	-	-
97	Siruguppa	1177	-	707	-	699	-	-
97	Coimbatore	1262	-	843	-	979	-	-
97	Srivilliputhur	1137	35.5	1133	34.7	1194	35.5	1231
	Overall Mean	1234	35.2	1045	33.6	1047	32.4	851
Increase over LRA 5166		:	18.1					
Increase over MCU 5		:	18.0					
Increase over SVPR 1		:	45.0					

Table 3. Performance of TSH 288 in multilocation trials conducted during summer 1994

S.No.	Location	Seed cotton yield (kg ha <sup>-1</sup> )				
		TSH 288	LRA 5166	SVPR 1	MCU 7	ADT 1
	Regional Research Station, Paiyur	1378	-	1279	1434	1142
	Tamil Nadu Rice Research Institute, Aduthurai	1435	-	1143	-	1246
	Cotton Research Station, Srivilliputhur	986	774	797	667	667
	Mean	1266	774	1073	1051	1018
	% increase over check	-	63.6	18.0	20.4	24.4

Table 4. Yield performance of TSH 288 in adaptive research trial under rice fallow situation

S.No.	District	No. of trials	Kapas yield kg ha <sup>-1</sup>				% increase over		
			TSH 288	MCU 7	ADT 1	Anjali	MCU 7	ADT 1	Anjali
I.	1998-99								
1.	Thanjavur	4	962	869	940	752	10.7	2.3	1.1
2.	Thiruvavur	6	764	680	675	651	12.4	13.2	12.4
3.	Nagapattinam	3	1104	856	749	932	29.0	47.4	18.5
4.	Trichy	5	2083	1491	1383	1596	39.7	30.5	30.5
	Overall mean	18	1231	977	943	10.8	26.0	30.5	19.0
II.	1999-2000								
1.	Thanjavur	4	2060	1806	1717	1772	14.1	20.0	16.3
2.	Nagapattinam	4	1595	1650	1823	1783	-	-	-
3.	Trichy	5	1926	1582	1409	1857	21.8	36.7	4.0
4.	Salem	5	1291	1241	1174	1327	4.0	10.0	-
5.	Erode	5	1472	1254	1325	1402	17.4	11.1	5.0
6.	Cuddalore	5	1213	1284	1285	1371	-	-	-
7.	Madurai	5	715	673	637	654	6.2	12.2	9.3
8.	Dindigul	5	2010	1495	1250	1260	34.4	60.8	59.5
9.	Tirunelveli	5	1401	1226	1206	1243	14.3	16.2	12.7
10.	Virudhunagar	5	1448	1222	1141	1173	18.5	26.9	23.4
	Overall mean	48	1500	1327	1277	1368	13.0	17.5	10.0

Table 5. Comparative reaction of TSH 288 and other varieties to major pests under natural conditions

S.No.	Entries/Varieties	Leafhopper population No./Plant	Injury Grade	Bollworm incidence %	Stemweevil incidence %
1.	TSH 288	3.18	1.5 (MR)	7.7	39.04 (MR)
2.	SVPR 1	8.4	2.8 (S)	17.6	53.13 (S)
3.	SVPR 2	6.2	2.0 (MR)	15.6	49.20 (S)
4.	MCU 7	2.8	3.0 (S)	12.6	57.17 (S)
5.	LRA 5166	2.8	2.1 (S)	17.7	51.57 (S)
6.	ADT 1	9.0	3.0 (S)	18.0	55.00 (S)
7.	Anjali	5.0	2.1 (S)	17.0	26.09 (MR)

MR - Moderately Resistant ; S - Susceptible.

Table 6. Reaction of TSH 288 to major diseases

S.No.	Entries	Disease intensity (0-4 grade)		
		Rootrot %	Alternaria blight	Bacterial blight
1.	TSH 288	12.7 (MR)	2 (MR)	1 (R)
2.	SVPR 1	54.8 (HS)	2 (MR)	4 (S)
3.	MCU 7	26.4 (S)	2 (MR)	4 (S)
4.	LRA 5166	21.3 (MS)	2 (MR)	4 (S)
5.	Anjali	23.5 (MS)	2 (MR)	4 (S)
6.	ADT 1	40.1 (S)	2 (MR)	4 (S)

MR - Moderately Resistant ; S - Susceptible; MS - Moderately Susceptible; HS - Highly Susceptible



S. No.	Particulars	No. of trials	Kapas Yield in kg ha <sup>-1</sup>						Percentage increase over				
			TSH 288	LRA 5166	SVPR 1	ADT 1	MCU 7	Anjali	LRA 5166	SVPR 1	ADT 1	MCU 7	Anjali
1.	Cotton Research Station, Srivilliputhur trials (1990-1998)	11	1172	714	897	534	824	850	64.1	30.7	119.5	42.2	37.9
2.	TNAU - Res. Stations Trials (MLT 1) (1994)	3	1266	774	1073	1018	1051	-	63.6	18.0	24.4	20.4	-
3.	AICCIP Trials (1995-1998)	17	1234	1045	851	-	-	-	18.1	45.3	-	-	-
4.	Onfarm - Trials (Summer'94)	19	1358	-	1245	1054	-	-	-	9.1	28.8	-	-
5.	Adaptive Research Trials 1998 (Rice Fallow)	18	1231	-	1104	943	977	1038	-	11.5	30.5	26.0	19.0
6.	Adaptive Research Trials 1999 (Rice fallow)	48	1500	-	1402	1277	1327	1368	-	7.0	17.5	13.0	10.0
	Overall mean	116	1294	844	1095	965	1045	1005	65.2	18.2	34.1	23.8	19.4

Table 8. Comparative fibre and spinning test of TSH 288, MCU 7, ADT 1 and Anjali

S.No.	Culture	2.5 % span length mm	Ginning per cent	Uniformity ratio (%)	Fineness micronaire value	Maturity co-efficient	Bundle strength 1/8" gauge	CSP for 40s
1.	TSH 288	25.4	35.2	49	3.50	0.74	20.9	2125
2.	MCU 7	24.4	33.0	49	3.41	0.71	21.2	1973
3.	ADT 1	24.0	32.8	48	3.50	0.72	20.0	1930
4.	Anjali	27.3	34.0	47	4.10	0.74	21.2	2254

The morphological description of TSH 288 are

a. Height (cm) : 80-90

b. Distinguishing morphological characters

i. No. of monopodia : 0-1

ii. Leaves and petiole : Leaves are small, thick and leathery with silvery pubescence on the lower surface of the leaves

iii. Stem : Sympodial, light purple pigmentaton in the stem portion exposed to sunlight.

iv. Petal colour : Cream

v. Anther colour : Puff

vi. Petal spot : Absent

vii. Boll : Small and round

viii. Boll weight : 3.0 g

ix. No. of locules/boll : 4-5

x. Seeds : Fuzzy

xi. Seed index : 7.6 g

xii. Lint index : 4.3 g

xiii. Lint colour : White

c. Maturity : 135-140 days

d. Maturity group : Early

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