TPS 5 – A High Yielding Non-Lodging Rice Variety with Large Scale Adoption in Tamil Nadu

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Rice is one of the major crops cultivated in Kanyakumari District. It occupies more than 12000 ha in two seasons (*Kharif* and *Rabi*). ASD 16 is the popular rice variety cultivated by the farmers in *Kharif* season since 1980. As the harvesting of kharif crop coincides with north east monsoon, farmers experience yield loss to an extent of 20-30% in ASD 16 due to lodging. Frequent cyclones and flash floods affects rice crop in Cauveri delta region which ultimately reduced rice production in the state apart from financial losses to the farmers. Hence farmers of Tamilnadu need high yielding and non-lodging rice varieties.

Scope

A new rice variety TPS 5 was released from Agricultural Research Station, Thirupathisaram in the year 2014. It matures in 118 days with short bold grains as that of ASD 16. It has high yield potential of 6300 kg/ha which is 10% increase over ASD 16. It is non-lodging and moderately resistant to major pest and diseases especially stem borer, leaf folder, blast, BLB and sheath rot. This variety may fulfill the requirement of farmers.

KVK interventions

The new rice variety (TPS 5) was introduced to the farmers by KVK, Kanyakumari and ARS, Thirupathisaram through FLDs and training programmes. Created mass awareness by distributing leaflets, folders, Air Message, live programmes and print media. Integrated Weed Management and ICM practices for this variety were imparted through FLDs, trainings and special programmes.

Trainings and Frontline Demonstrations were conducted in TPS 5 rice variety with preemergence herbicide and early post emergence herbicide for effective weed management in direct sown rice cultivation. FLDs were conducted during 2014 at Ramapuram village of Agastheswaram block. FLDs on Integrated Weed Management in direct sown and puddled transplanted (TPS 5) rice were conducted during 2015-16 at Ramapuram and Manavalakurichi villages. FLDs on Integrated Crop Management in TPS 5 rice were conducted during 2016-17 in Manavalakurchi village of Kurunthankodu block. On and off campus trainings, Field days, extension functionaries trainings, special programmes, seminar, exhibitions were also conducted since 2014. The details of extension programmes conducted by KVK since 2014 is furnished in Table 1.

Impact

During 2014-15, TPS 5 rice variety performed better with 20-25 number of productive tillers/plant, 200-250 filled grains/panicle than ASD 16. TPS 5 rice recorded higher grain yield of 70.1 q/ha compared to ASD16 (56.5 q/ha). The yield increase was 26 per cent. Similarly, higher net return (Rs. 83389/ha) and BCR (2.69) were recorded with TPS 5 compared to ASD 16 which recorded net return of Rs. 59119/ha and BCR of 2.24.

During 2015-16, the TPS5 rice variety was demonstrated with IWM practices in direct sown condition and results indicated that TPS 5 recorded 54.9 q/ha compared to the ASD 16 (46.66 q/ha). The straw yield was also higher (50 q/ha) in TPS 5 while it was 35 q/ha in ASD 16. Hence farmers got higher gross income, net income and B:C ratio.

Frontline demonstration on integrated crop management practices in rice with TPS 5 during 2016-17 was conducted in Manavalakurichi village. The higher yield in TPS 5 was due to high productive tillers and grain yield/ panicle. The per cent yield increase ranged from 10.5 to 32.2. TPS -5 rice variety resulted in an additional income of Rs. 7000 to 12500/ha.

Spread

The farmers of Thovalai, Thuckalai, Agestheswaram, Kurunthencode and Rajakagamangalam blocks of Kanyakumari district started cultivating TPS 5 since 2015 and the area under cultivation of TPS 5 gradually extended to an extent of

2000 ha (Table 2). TPS 5 rice variety gradually replaces ASD 16 and occupies nearly 50% area of rice cultivation in Kanyakumari district in kharif season. (Fig.1 & 2). TPS 5 rice is also extensively cultivated in all districts of Tamil Nadu since 2020 due to its desirable attributes and adaptability to all regions of Tamilnadu. In Tamilnadu TPS 5 is cultivated in an area of 1.60 lakh ha (Table 3).

The supply of sufficient quantity of quality seeds of various classes *viz*.,breeder seed, foundation seed and certified seed aids in further expansion of area under TPS 5.

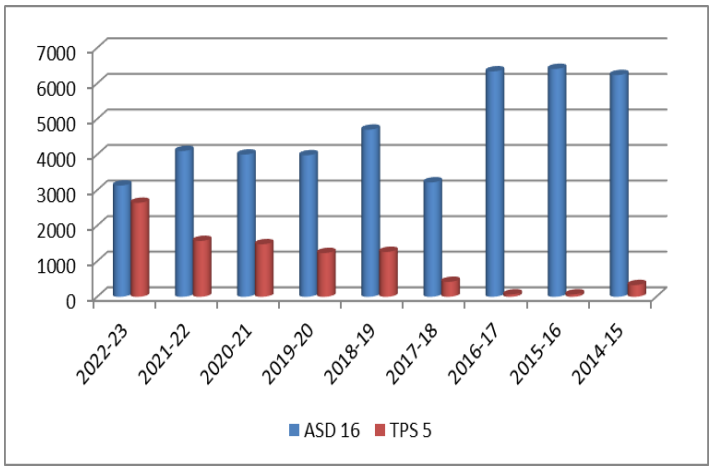

Fig. 1. Replacement of ASD 16 rice variety by TPS

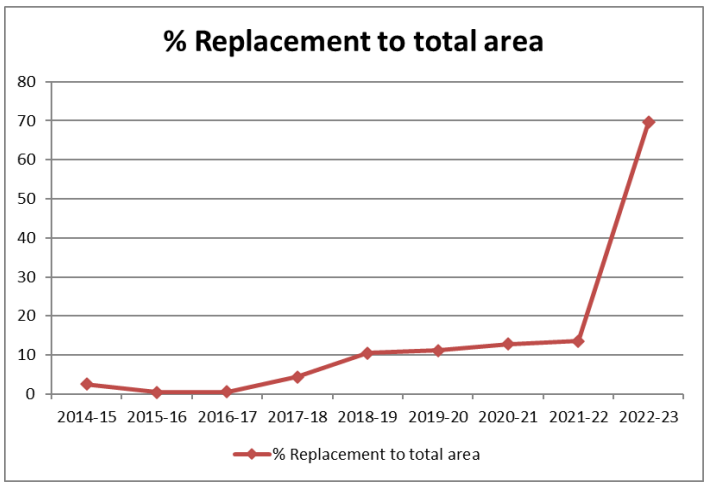

Fig. 2. Per cent area replaced by TPS 5

Table 3. Area under TPS 5 rice cultivation in Tamil Nadu

Sl.No.	Districts	Area in ha
1.	Thanjavur	30000
2.	Thiruvarur	35000
3.	Cuddalore	16000
4.	Thirunelveli	15000
5.	Erode	14986
6.	Dindigul	9069
7.	Thenkasi	6000
8.	Viruthunagar	5320
9.	Nagapattinam	4194
10.	Thoothukudi	4129
11.	Kancheepuram	1498
12.	Thiruvallur	596
13.	Thirupur	3887
14.	Madurai	2597
15.	Coimbatore	1093
16.	Namakkal	563
17.	Kanyakumari	1918
18.	Thiruchi	1741
19.	Theni	1559
20.	Kallakurichi	1312
21.	Pdukottai	1113
22.	Villupuram	891
23.	Ariyalur	693
24.	Thiruvannamalai	101
	Total	**160000**

The technology has spread to more than 2000 hectares in the district and nearly 1.6 lakh ha in Tamil Nadu. The seed requirement of the farmers is satisfied by KVK, ARS, Thirupathisaram as well as Department of Agriculture.

Table 1. FLDs, Trainings and Extension activities conducted

S. No.	Title	Nos.	Total Participants	Extension Functionaries (Nos.)
1.	FLDs on new variety TPS-5 with Integrated Crop Management practices	50	50	0
2.	On and Off campus training programmes	42	1260	160
3.	Field days	3	160	24
4.	Extension functionaries trainings	22	660	440
5.	Pre–*rabi* and pre-*kharif* training programmes, seminar, Exhibitions and *melas*	5	1800	120
6.	ATMA trainings	74	2960	296
7.	FFS	10	30	4
8.	Vocational training	1	25	0
9.	Demonstration on production, protection technologies and mechanization	53	1690	32
	Total	**260**	**8635**	**1076**

Table 2. Area expansion of TPS 5 in Kanyakumari district since 2014

(Area in Ha)

Rice Variety	2022-23	2021-22	2020-21	2019-20	2018-19	2017-18	2016-17	2015-16	2014-15	Year of introduction
ASD 16	3128	4100	4000	3980	4700	3217	6339	6407	6236	1986
TPS 5	2170	1570	1477	1230	1262	420	65	65	329	2014

Table 3. Successful farmers cultivated TPS -5

Thiru. Sundaramani of Manavalakurichi cultivated TPS 5 since 2017 and reported 7.5 tonnes/ ha of yield which is 1.5 tonnes more than ASD 16. He got additional income of Rs.48000/ha.	

Mr. A. Krishnakumar of Muthalakurichi cultivated TPS 5 instead of ASD 16 and got an additional yield of 1.0 tonnes/ha with an increased revenue of Rs.30000/ha.	
Thiru. Krishnamurthy of Cuddalore district started seed production of TPS 5 since 2020 and produced 7 tonnes/ha of foundation seed and earned net revenue of Rs.2.0 lakhs/ha.	
Thiru. Anbu from Kumbakonam recorded the highest yield of 10.0 tonnes /ha in Thanjavur district and got the award for highest yield in Rice in the year 2021.	

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