



On-Farm Demonstration of ADT 58 Rice Variety in Villupuram District

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Popularization of newly released variety in a new environment through field demonstrations is important role after variety release to increase the productivity and sustainability of particular location. Keeping In this view, the field demonstrations were carried out at farmer's field by introducing new rice variety ADT 58. The ADT 58, drought tolerant rice variety was released by Tamil Nadu Rice Research Institute, (TNAU), Aduthurai, during 2023. A total of twenty field demonstrations were conducted by using new rice variety (ADT 58) at farmer's field organized by Krishi Vigyan Kendra, Villupuram, Tamil Nadu during 2024. The farmers cultivating variety ADT 39 was used as the check variety (farmer's practice). An average yield of 6,385 kg.ha⁻¹ was recorded in ADT 58 demonstrations which was 10.84% increase over the farmers cultivating variety ADT 39 (5761kg.ha⁻¹). The farmers had gained additional revenue of Rs. 11,948 ha⁻¹ from ADT 58 demonstrations. In this regard, one training programme on production technologies for rice crop was organized by KVK, Villupuram, (Tamil Nadu) for the beneficiary's farmers to improve the productivity in Villupuram District through new varietal demonstrations.

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Keywords: New rice variety; ADT 58; demonstrations; gross income; net income.

1. INTRODUCTION

Rice (*Oryza sativa* L.) is the world's most important food crop belongs to Poaceae family. The "Global Grain" cultivated widely across the world and feeds millions of people. It serves as the staple food for more than half of the world's population (Khan et al., 2013). Worldwide, it was grown on an area of 166.1 million hectares with yield of 745.2 million tonnes. In India, rice ranks second in both area and production, and cultivated over 43.90 million hectares, yielding 114.45 million tonnes with a productivity of 2607 kg/ha (Government of India, 2022; Daquiado, 2019).

Rice was cultivated under diverse soil types and climatic conditions; the productivity level of rice was low when compared to the productivity levels of many countries in the world. Also about 90 % of the cultivated land belongs to marginal, small and medium farmers which are another constrain in increasing the productivity of rice in the country. It is, therefore, there is ample scope to increase the productivity of rice in the country. The highest productivity is 6710 kg per ha of China followed by Vietnam (5573 kg /ha), Indonesia (5152 kg/ha), Bangladesh (4375 kg/ha) etc., There are improved technologies and introduction of new high yielding variety which could be adopted to increase the productivity in the country.

Production and productivity of rice was mainly depended on choice of varieties, season and agronomic practices with supply of balanced major nutrients (Ganapathy & Jayakumar, 2023). Among the above components, selection of varieties plays an important role to increase the productivity of farmers. Hence it is essential to popularize the new high yielding varieties to replace the deteriorating old varieties so that overall productivity can be stabilized. Therefore, to meet the immediate needs of the rice farming community, there is a need to popularize the high yielding new variety (ADT 58) with good agricultural practices to meet the challenges in rice cultivation (Ganapathy et al., 2024). Cultivation of newly released drought tolerant rice variety has the potential to increase the productivity and needs to be promoted and popularized. Keeping in this view, the present study was conducted at farmer's field by field demonstrations of the newly released rice variety ADT 58.

2. MATERIALS AND METHODS

2.1 Experimental Materials and Location

The new drought tolerant rice variety ADT 58 was used as the experimental materials in the present study. A total of 20 field demonstrations were conducted at farmers holdings in Villupuram District, Tamil Nadu, India (latitude: 11° 46' North; longitude: 79° 46' East; altitude: 4.60 m MSL) during *Kharif* 2024 by new rice variety (ADT 58) and compared to check variety ADT 39 (farmer's practice) for yield and economics. The soil type of the demonstration fields is clay loam with pH 7.0- 7.5 and low in organic carbon content and total N content. The soil in available P₂O₅ and K₂O was medium. The climatic conditions of the research locations are tropical. Average rainfall of the region is 1000-1100 mm per annum and relative humidity ranges from 45-85 per cent.

2.2 Experimental Methodology and Crop Monitoring

The rice variety (ADT 58) seeds were distributed to selected farmers at no cost basis for one acre along with critical inputs. The critical inputs include seeds, post emergence herbicide and bio-fertilizers. The farmers are advised to raise the crop by direct sowing method by drum seeder after seed treatment with bio-fertilizers along with ruling rice variety as check. The selected farmers were trained for improved production technologies in rice through training programme funded by National Intervention on Climate Resilient Agriculture (NICRA) Project, and organized by Indian Council of Agriculture Research (ICAR), Krishi Vigyan Kendra, Villupuram (TN), during 2024. On 15-20th day after sowing, the post emergence herbicide (Bispyribac sodium) @ 400 ml/ha was applied. All the agronomic practices and need based plant protection measures were followed in all the demonstrations and control plots uniformly by monitoring the frequent visit by KVK scientists. The demonstration plots and check plots were evaluated in completely Randomly Block Design (RBD) with two replications. The observations were recorded on number of productive tillers per plant and grain yield per hectare (kgs). For data collection, ten to fifteen representative plants were selected randomly in each demonstration plots in all the farmers' fields of ADT 58 as well as check plots. All the collected data were

statistically analyzed by statistical method described by Pansi & Suckatme, (1978).

3. RESULTS AND DISCUSSION

The results of all the demonstrations and check plots were presented in Table 1. The performance of rice variety ADT 58 field demonstrations with comparison to the farmers cultivating variety as farmers practice (checks) was monitored periodically by KVK, Villupuram. The data on number of productive tillers per plant revealed that, it was ranged from 18.75 to 24.52. The average of number of tillers in ADT 58 demonstrations was 21.45 and the check variety ADT 39 (farmers practice) was recorded in

18.54. The tillering potential of the variety directly contributes to grain yield. Number of tillers on rice was already reported by (Santhiya et al., 2024; Duraiswamy et al., 2024). With regard to grain yield in ADT 58 rice demonstration fields, the maximum grain yield 6572 kg.ha⁻¹ was observed and minimum yield was 6110 kg.ha⁻¹. The average yield of all demonstration (ADT 58) was 6385 kg.ha⁻¹ and for farmers practice, the yield was 5761 kg.ha⁻¹. It was 10.84 % increase over the farmers practice (check plots- ADT 39). These outcomes are somewhat comparable to (Najeeb et al., 2018). The yield grain through field demonstrations in rice was already reported in their research papers by (Gupte et al., 2023).

Table 1. Performance of Rice variety - ADT 58 demonstrations under direct sown condition at farmer's field

S. No	Farmers Name & Address	No. of Tillers / Plant		Grain yield		
		ADT 58	Control	Yield (kg/ha)	Control	% Increase
1.	Nagaraj Subramani Naduvananthal Village	18.75	16.45	6250	5750	8.70
2.	Sivakumar Selvaraj Naduvananthal Village	19.57	17.35	6435	5820	10.57
3.	Mani Ponnusamy Naduvananthal Village	23.92	21.33	6350	5780	9.86
4.	Thiruvengadam. S Naduvananthal Village	23.28	20.33	6475	5870	10.31
5.	Visalachi Gunasekaran Naduvananthal Village	21.65	18.25	6520	5860	11.26
6.	Muralitharan, R Puliyannur Village	19.57	17.15	6230	5720	8.92
7.	Murugan, V Puliyannur Village	22.25	18.57	6470	5750	12.52
8.	Raju, S Puliyannur Village	21.45	19.71	6250	5720	9.27
9.	Murali, R Puliyannur Village	19.03	17.23	6450	5680	13.56
10.	Valarmathi, M Puliyannur Village	21.22	18.36	6572	5810	13.08
11.	Govindan, M Naduvanandhal Village	19.35	17.63	6350	5720	11.01
12.	Muralitharan, R Puliyannur Village	24.52	21.75	6570	5850	12.31
13.	Murugan, V Puliyannur Village	21.65	19.32	6350	5670	11.99
14.	Muralitharan, R Puliyannur Village	21.85	17.42	6440	5760	11.81
15.	Velmurugan, S Naduvananthal Village	20.53	18.25	6370	5730	11.17
16.	Pakkialakshmi, V Naduvananthal Village	21.33	19.81	6490	5820	11.51
17.	Govindhana, M Naduvananthal Village	20.65	18.01	6350	5870	8.18
18.	Valarmathi, V Naduvananthal Village	23.45	18.15	6430	5850	9.91
19.	Ravi Krishnan Puliyannur Village	22.35	17.55	6250	5540	12.82
20.	Thangadurai, M	21.67	18.25	6110	5650	8.14

S. No	Farmers Name & Address	No. of Tillers / Plant		Grain yield		
		ADT 58	Control	Yield (kg/ha)	Control	% Increase
Naduvanandhal Village						
	Mean	21.45	18.54	6385	5761	10.84
	CD (0.05%)	1.75	1.67	225.75	231.42	-
	CV (%)	3.63	3.85	2.25	2.85	-

Table 2. Yield and Economics comparison of demonstrations and farmer's practice

Treatments/ Intervention	Seed Yield (kg/ha)	Cost of cultivation (Rs/ha)	Gross income (Rs/ha)	Net income (Rs/ha)	B:C ratio	Additional Income (Rs.)
Improved Variety- (ADT 58+ Improved Production Technologies)	6385	65,500	1,40,470	74,970	2.15	11,948
Farmer's practice (Check variety- ADT 39)	5761	63,500	1,26,522	63,022	1.98	-

The economic analysis of field demonstrations and farmers practices was presented in Table 2. The cost of cultivation for demonstrations was Rs. 65,500/ ha⁻¹ and gross income was Rs. 1,40,470 ha⁻¹. The farmers gained additional revenue of Rs. 11,948 ha⁻¹ by cultivating new high yielding variety ADT 58. These findings align with those of (Gupte et al., 2023; Loganathan et al., 2021; Ganapathy et al., 2024; Singh et al., 2012; Gaur et al., 2024). The additional yield and net income (Rs. 74,970) was mainly due to cultivating new high yielding rice variety along with improved production technologies and timely supply of critical inputs. Similar kind of front line demonstrations in rice was already reported by (Hashim et al., 2023; Mandavkar et al., 2012; Hashim et al., 2022) and Ganapathy et al., (2024). The ADT 58 rice variety produced higher yield over the check variety (ADT 39) in all the demonstrations, clearly indicated that showing constant performance in Villupuram district. The ADT 58 variety was easily adopted to new environments and having high stability over the locations in northern district of Tamil Nadu. Any new variety giving stable performance in different locations was good shine for Indian farming and popular among the farmers quickly.

4. CONCLUSION

Tamil Nadu is an important rice growing state in the country and faces several abiotic and biotic stresses. In this situation, necessitates location specific rice variety for the zone. In rice cultivation, water scarcity is an important factor in this crop, can lead to considerable economic losses. The cultivation of rice under direct seeding method by new high yielding varieties like ADT 58, along with suitable improved production technological interventions can be an important step in this direction. This high yield

rice variety ADT 58 with its excellent performance in the demonstrations at Villupuram district will play a significant role in improving the productivity, profitability and sustainability in rice cultivation.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (Chat GPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of manuscripts.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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