

Comparative study of promising high yielding short duration rice varieties released by Tamil Nadu Agricultural University

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Abstract -The field trial was conducted for two consecutive seasons (2019 and 2020) during both kharif and Rabi seasons with three popular rice varieties of TNAU. Experimental soil was sandy clay loam in texture and having neutral in reaction. The treatments were laid out in a randomized block design with nine replications. Experimental results revealed that the variety ADT 53 showed better result with respect to all growth parameters and it was closely followed by CO51 and ADT 39.

Key words: High-yielding rice varieties, 1000 grain weight, yield attributes, yield.

INTRODUCTION

Rice is the most important staple food for whole India. Water logging and low land area are highly suitable for paddy cultivation for Indian farmers when ever heavy rains received farmers go for rice cultivation during both wet and dry seasons. Most of the time production is not satisfactory due to worst climatic condition coupled with non-availability of high yielding varieties (Subudhi et al., 2008). New varieties developed by TNAU, research centres to fulfil the major constraints to achieve future need for rice production. In Tamil Nadu, most of the rice research station being developed new varieties and full fill the gap (Anonymous, 2000). New varieties slowly occupied more area especially Co.51 and ADT 53. So there is a great challenge to increase rice production to attain self-sufficiency in food grain within very limited time span and small land holding. Slowly old long duration and short duration with low yielding varieties replaced by new high yielding and short duration varieties. There is an urgent need of extensive

adoption of short duration HYVs to achieve our target of rice production in Tamil Nadu. Our research stations are working for developing varieties suitable for different situation so there is a scope for achieving the target by the continues releasing of HYV in rice

MATERIALS AND METHOD

The field trials were conducted for two consecutive year (2019 and 2020) during kharif and rabi seasons to study the growth and yield of different three short duration rice ruling varieties. The trials were carried out at Agricultural College and Research Institute. Vazhavachanur, Thiruvannamalai. Tamil Nadu. The soil of the experimental field was sandy clay loam in texture. The trials were conducted under irrigated with good drainage facility. The physico-chemical properties of the trial soil were EC 0.3 ds/m, pH 7.2, organic carbon 0.58%, total N 0.04%, available P 17 kg ha⁻¹ and available K 122 kg ha⁻¹. The trials were laid out in randomized block design (RBD) with nine replication. Individual plot size was 5 m x 4 m. three treatments i.e., three different varieties were T1: Co.51, T2: ADT 53 and ADT 39. Seed rate of each variety was 20 kg/ha and transplanting of seedling (1-2 seedlings hill⁻¹) were done with a spacing of 20 cm x 15 cm. Age of the seedlings were 25 days. Recommended dose of fertilizer i.e. 120: 60: 60 N, P₂O₅ and K₂O were applied. Half does of urea (source of N) were applied as basal and rest amount in two equal splits at 21 and 42 DAT. Entire amount of Single Super Phosphate (source of P) were given as basal at the time of final land preparation. Muriate of potash (source of K) was applied in two splits – ⅓th MOP at

basal and rest ¼th at the time of 2nd top dressing of nitrogenous fertilizer. Other agronomic management practices were followed as per recommended package. Data collected from the field experiment were subjected to statistical analysis appropriate to the design (Gomez and Gomez, 1984). The significance of different sources of variation was tested by Fisher and Snedecor's 'F' test at probability level of 0.05. For the determination of critical difference CD at 5% level of significance, Fisher and Yates table was consulted.

RESULTS AND DISCUSSION

The maximum plant height was observed in the variety ADT.53 98.0 cm while ADT .39 88.0 cm and Co51 recorded 85.cm the same results obtained in IR 50 was noticed as short statured plant (80.20 cm) Venkatesan (2008). The maximum no. of productive tillers was obtained at harvesting. Similar type of observation were also revealed by Pandey et al. (2001). CO.51 variety of rice produced maximum no. of productive tillers (180 m-2) Dry matter production was recorded highest in ADT53 produced maximum dry matter (715 g m-2) which shows same results revealed in rice. Ganesan and Subramanian (1990) observed that dry matter production before or after flowering had a significant positive influence on again yield in high yielding varieties of rice. Leaf area index (LAI) was highest in ADT 53 significantly within the increasing age of the plant. All the varieties showed maximum LAI at 60 DAT and at the later stages, the LAI gradually declined due to senescence of matured leaves. Murty et al. (1991) reported that more leaf area formation was achieved during the early crop growth stage than at later stage i.e., at flowering stage to obtained higher photosynthetic rates. Filled grain panicle-1 of ADT 53 variety was significantly superior to all other varieties amounting 112. Other yield components like panicle length, panicle weight and 1000-grain weight for also the ADT 53 variety was slightly higher than other varieties studied. Yield and harvest index of different rice varieties. The higher grain yield (4.52 t ha-1), straw yield (5.2 t ha-1) and harvest index (44.58%) was high in ADT53 which was closely followed by CO51 and ADT 39 and in greengram reported by various authors Pandiyan *et al.* (2101), Pandiyan *et al.* (2008), Pandiyan *et al.* (2012), Sudha *et al.* (2015), Pandiyan *et al.* (2007), Pandiyan *et al.* (2006), Pandiyan *et al.*(2012) , Yu Takahashi *et*

al. (2019), Djanaguiraman *et al.* (2005) , Pandiyan *et al.* (2012) and Bisht *et al.*(2004) in sesame. The yield (grain and straw) and harvest index for all the varieties were higher in rice varieties. In general, it has already been reported by Jana and Ghosh (1996) that the yield of boro season rice crop was higher under the application of 100% RDF than the yield of crop grown during kharif season. Pal et al. (2008) reported that during both kharif and rabi season the highest grain yield, straw yield of Kshitish variety were recorded when the crop received 100% recommended dose of NPK on the basis of soil test. Banerjee and Pal (2009) opined that under HYV crop sequences, the higher production was fertilized with 100% recommended dose of nutrients through chemical fertilizer. Therefore, it can be concluded from the findings of the experiment that all the growth attributes, yield components and ultimately grain yield of the variety ADT 53 was much better than all other two tested varieties. Moreover, CO51 and ADT 39 were also closely economical.

CONCLUSION

Among three ruling short duration rice varieties, the ADT 53 and Co 51 spreading fast and replace the existing old varieties

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Table .1. Performance of short duration ruling varieties of rice released by TNAU

Varieties	Plant height cm	No. of productive tillers (m ²)	Dry matter production (m ²)	Leaf area index	Panicle length (cm)	Panicle weight (g)	Filled grain	1000 grain weight (g)	Grain yield t/ha	Straw yield tonns	Harvest index
CO.51	85.0	180	705	4.5	20.2	1.83	110	18.0	4.22	5.0	43.9
ADT.53	98.0	168	715	4.6	20.8	1.83	112	19.0	4.52	5.2	44.5
ADT.39	88.0	165	690	4.2	19.5	1.83	100	20.0	4.10	4.9	42.2
CD (P = 0.05)	2.02	8.02	10.8	0.03	0.56	0.05	3.65	0.55	0.18	0.08	0.06