

**STUDIES ON THE COMPARATIVE PERFORMANCE OF THREE
SHORT DURATION RICE VARIETIES (VELLAYANI-1, ADT. 27
AND PTB. 10) AT VARYING LEVELS OF NITROGEN
UNDER SEMI-DRY CONDITIONS IN VELLAYANI**

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Rice is the staple foodcrop of Kerala, the cultivation of which is carried out in the State during different seasons such as Virippu (May-September), Mundakan, (September - January) and Punja (January - March). Majority of the area is cultivated during Virippu season under dry sown conditions and it accounts for more than fifty percent of the total production of rice in the State. The average yield of rice grown during this season is found to be comparatively low. Two probable reasons attributable to the poor yields are the non-availability of suitable high yielding strains adapted to the semi-dry system of cultivation and the relatively poor nitrogen utilisation of dry sown rice as compared to the transplanted crop. Earlier experiments by Kalam *et al* (1966) and Daniel (1966) under identical conditions showed that for the tall *indica* varieties the optimum nitrogen requirement was 60 kg. nitrogen per hectare. Nair (1967) however, observed that yield of rice dibbled and grown under semi-dry rainfed conditions stabilised at a nitrogen dose of 30 kg. per hectare.

The present investigation was undertaken with the object of assessing the performance and adaptability of two fertilizer responsive short duration varieties, namely Adt 27 (*Japonica indica* strain) and Vellayani 1) an irradiated selection from Ptb 10) as compared to the local selection Ptb 10 and to assess their nitrogen requirement under the semi-dry condions.

Materials and Methods

The experiment was conducted during Virippu season of 1967 at the Agricultural College Farm, Vellayani. The soil was sandy clay loam having 0.104% total nitrogen, 0.088% total phosphoric acid, 0.095% total potash, 0.002% available phosphoric acid, and 0.001% available potash. The PH was 5.8

The experiment was laid out in a randomised block design with 9 treatments (3 levels of nitrogen 40 Kg/ha, 60 Kg/ha and 80 Kg/ha and 3 varieties - Ptb. 10, Vellayani 1 and Adt. 27) replicated 4 times. The entire

quantity of phosphorus and potassium was applied in the field prior to dibbling so as to supply 40 Kg/ha each of P_2O_5 and K_2O respectively. The nitrogen was applied in two equal splits, one as basal and the other on the 30th day after dibbling.

Results and Discussion

The effect of levels of nitrogen and varieties on yield components and grain yield are summarised in Table 1.

Table I. Effect levels of nitrogen and varieties on yield components and grain yield

Treatments	No of Productive tillers	No. of grains per earhead	Percentage of filled grains	1000 grain weight (gm)	Grain yield (Kg/ha)
LEVELS OF NITROGEN KG/HA					
40	12.97	87.54	85.36	22.81	2088.44
60	13.14	84.12	87.79	21.86	2264.47
80	12.17	89.72	88.73	22.61	2277.15
F. Test	N.S.	N.S.	Sig.	N.S.	N.S.
C.D at 5%			2.62		
VARIETIES					
PTB.10	13.85	65.24	87.84	26.51	2428.12
Vellayani.1	10.85	123.70	86.03	23.00	2752.85
ADT.27	13.52	72.44	88.00	17.77	1408.80
F.Test	N.S.	Sig	N.S.	Sig.	Sig.
C.D at 5%		9.24	---	0.84	365.63

It was seen that the effect of levels of nitrogen on yield components such as number of productive tillers, number of grains per earhead, 1000 grain weight and grain yield was not significant. The lack of response to nitrogen may be attributed to the inability of these strains to respond to higher doses of nitrogen under dry sown conditions. The absence of significant response can also be attributed to the relatively higher nitrogen status of the soil under study. All yield components except percentage of filled grains were not significant. The effect of filled grains probably was not of conspicuous magnitude so as to affect grain yield favourably.

The varietal effect was significant in the number of grains per earhead, 1000 grain weight and grain yield; Vellayani, 1. produced the maximum number of grains per earhead, followed by Ptb. 10 and Adt. 27. The irradiation might have resulted in increasing the number of grains per earhead

in Vellayani 1 and the poor performance of Adt. 27 can be attributed to the unsuitability of the strain under semi-dry conditions. The varietal effect was significant in the case of 1000 grain weight. Ptb.10 showed maximum weight followed by Vellayani 1 and Adt 27. Vellayani. 1 produced the highest mean grain yield viz. 2792. 85 Kg, per hectare followed by Ptb.10 and Adt, 27. The number of grains per earhead was very high in Vellayani 1 as compared to other varieties. The 1000 grain weight was also high in case of Vellayani 1 as compared to Adt. 27. The significant superiority of Vellayani 1 in terms of grain yield as compared to Ptb. 10 and Adt- 27 may thus be attributed to the favourable effect of these two yield components. The low grain yield of Adt. 27 may be due to several reasons. This is a variety mostly suited to alluvial soils. But the present study was done on sandy clay loam soil which might have resulted in poor performance, Moreover, Adt. 27 is mostly grown under transplanted conditions with assured water supply whereas the present study was undertaken under dry sown conditions. Hence these seasonal and climatic variations might have affected the variety unfavourably which resulted in poor growth and yield.

Table 2. Mean weight of 1000 grains in gm

Varieties	levels of nitrogen (Kg/ha)		Mean
	60	80	
Ptb.10	27.80	24.24	26.51
Vellayani.1.	23.26	23.40	23.00
Adt.27	17.36	17.95	17.77
Mean	22.81	21.86	22.61

C. D at 5 % for comparison between combinations 1.45

The variety X nitrogen interaction was significant in the case of 1000 grain weight and grain yield. Tables 2 and 3 clearly show this. Vellayani 1 showed substantial increases in grain yield with increases in nitrogen application. It gave the maximum grain yield of 3321.23 kg/ha at the highest level of nitrogen tried viz 80 kg. nitrogen per hectare. In the case of Ptb. 10 the maximum yield of 2528.66 kg/ha was obtained at 60 kg. nitrogen per hectare beyond which the yield decreased. Adt.27 gave maximum yield of 1547.19 kg/ha at the lowest level of nitrogen application viz 40 kg. nitrogen/ha. This is attributed to the unsuitability of this strain to seasonal and climatic conditions of the locality.

Table 3. Mean yield of grain in kg. per hectare

VARIETIES	Levels of Nitrogen (kg/ha)			
	40	60	80	
Ptb.10	2453.18	2528.66	2302.21	2428.12
Vellayani 1.	2264.47	2792.85	3321.23	2792.85
Adt.27	1547.39	1471.90	1207.72	1408.80
Mean	2088.44	2264.47	2277.15	2209.82

C. D. at 5% for comparison between combinations — 632.54

Summary

A field experiment on paddy has been carried out under semi-dry conditions during Virippu season of 1967 at the Agricultural College Farm Vellayani using three varieties (Vellayani 1, Adt. 27 and Ptb. 10) at three levels of nitrogen (40 kg, 60 kg and 80 kg/ha). The results showed that the levels of nitrogen had no significant effect in increasing the grain yield. The variety effect and the variety X nitrogen interaction were significant in the case of grain yield. Vellayani 1 produced the highest grain yield followed by Ptb. 10 and Adt. 27.

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