

Response of Pre Release Short Duration Rice Cultures To Nitrogen Levels During Summer Season

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Abstract: A Field experiment was conducted during early kharif (Summer), 2013-14 and 2014-15 at Agricultural Research Station, Nellore, Andhra Pradesh on clay loam soil with an objective to evaluate the effect of different levels of nitrogen on growth and yield attributes of pre release cultures of rice. The entries evaluated were NLR 40054, NLR 40058, NLR 40065 and NLR 30491 as check under five nitrogen levels (80, 120, 160, 200 and 240 kg N/ ha) replicated thrice in factorial RBD. Among the entries tested, test variety, NLR 30491(Bharani) recorded significantly highest grain yield (7518 kg/ha) and no. of panicles per hill (7.79) when compared to other entries tested. Significant highest grain yield of 7221 kg/ha was recorded in the treatment which received 160 kg N/ha. The yield in all the other treatments is on par with each other proving that higher doses of nitrogen will not enhance yield levels in rice crop.

Keywords: Rice, Pre release cultures, Nitrogen, Yield Attributes, Yield.

INTRODUCTION

Rice (*Oryza sativa* L.) is an important food of the world. It is the staple food of the people of South East-Asia and at present more than half of the world population subsists on this crop. Average yield of fine rice is much below than its production potential. There are a number of factors contributing to this yield gap. There is no alternative, than to use more plant nutrients for high productivity. Since fertilizer is an expensive and precious input, determination of an appropriate dosage of application that would be both economical and appropriate to enhance productivity and consequent profit of the grower under given situation needs intensive study. At present the world is facing the problem of shortage of major fertilizer nutrients especially nitrogen. Rice grain yield was recorded significantly highest between range of 90-250 Kg per ha nitrogen

application [1]. The present study was taken up to find out the optimum nitrogen dose for pre release rice cultures during summer season.

MATERIALS AND METHODS

The experiment was conducted at Agricultural Research Station, Nellore, A.P, India during *Early kharif* 2013 and 2014 (Summer season) to find out the most appropriate dose of fertilizer nitrogen for pre release short duration rice cultures developed at ARS, Nellore. The experiment was conducted in clay loam soil with 1.6 % organic carbon, 7.84 pH and 0.38 EC (dsm⁻¹). The available nitrogen, phosphorous and potassium were 178, 262, and 575 kg/ha respectively. The trial was set up in a factorial RBD with three replications. Four pre release rice cultures were selected as first factor i.e. V₁: NLR 40054, V₂: NLR 40058, V₃: NLR 40065

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and V₄: Test variety NLR 30491 and Four levels of nitrogen as second factor i.e N₁: 80 kg N/ha, N₂: 120 kg N/ha, N₃: 160 kg N/ha and N₄: 200 kg N/ha formed the treatment variables applied in three splits whereas phosphorus @ 60 kg per hectare as basal and potash 40 kg per hectare in two splits in each treatment. Water was maintained at a depth of 2 cm up to panicle initiation and 5 cm thereafter up to one week before harvest. Weeds were controlled by two hand weedings at 20 and 40 days after transplanting.

The experiment received uniform plant protection and cultural management practices throughout the period of crop growth. Data on Plant height, no. of panicles per hill, panicle length (cm), filled grains per panicle and test wt (g) were recorded. Grain from the net plot was thoroughly sun dried to 14 per cent moisture content, weighed and expressed in kg ha⁻¹. Data was analyzed using AGRISTAT software.

RESULTS AND DISCUSSION

Performance of pre release cultures and different nitrogen levels on yield attributing characters and yield was given Tables 1 and 2.

The lowest and highest plant height was recorded in NLR 40054 (91.23 cm) and NLR 40058 (101.34 cm) respectively. Lowest plant height of 91.82 cm was recorded at 80 kg N/ha and highest was recorded at 240 kg N/ha (99.01 cm). Plant height increased significantly and progressively with incremental levels of N up to the highest dose tried. This could be attributed to the fact that higher dose of nitrogen being constituent of enzymes and protein enhanced cell expansion and various metabolic processes.

More no. of panicles per hill was observed in NLR 30491 attributing to the highest grain yield in the test entry. No. of panicles per hill markedly increased with the rise in nitrogen levels from 80 to 160 kg N/ha and 240 kg N/ha. Highest panicle length of 24.9 cm was observed in the entry NLR 40058 followed by NLR 40065 (23.4 cm). Panicle length and no. of filled grains per panicle increased conspicuously with increasing N level from 80 kg/ha to 200 kg/ha and decreased at 240 kg/ha. More

number of filled grains was found in NLR 40054 (205 nos). Highest test wt. was recorded in NLR 40065 (19.23 g). The test weight is on par in all the treatments that were tested with incremental doses of nitrogen.

Highest grain yield (7517 kg/ha) was obtained with test variety Bharani (NLR 30491) and no significant difference in grain yield was observed among all the pre release cultures tested. More no. of panicles per hill was recorded in Bharani variety which is responsible for highest grain yield. Among the four nitrogen levels tested highest grain yield was obtained with 160 kg N/ha (7221 kg/ha). All the pre release cultures and test variety responded up to 160 kg N/ha and there was no increase in yield with increase in nitrogen up to 240 kg N/ha. [1,4] Reported decreased nutrient response with enhanced N levels.

The probable reason for lower N efficiency at higher N levels may be due to higher N losses with increased levels of N [2]. All the other treatments recorded on par grain yields except for the treatment with 160kg N/ha. Though highest yield was recorded in NLR 30491, it lodged at very low nitrogen doses of nitrogen but pre release rice cultures did not lodge even at higher nitrogen doses. These results are in conformity with [3].

CONCLUSION

Highest grain yield (7517 kg/ha) was obtained with test variety Bharani (NLR 30491) and no significant difference in grain yield was observed among all the pre release cultures tested. Among the four nitrogen levels tested highest grain yield was obtained with 160 kg N/ha (7221 kg/ha). Test variety Bharani (NLR 30491) recorded highest grain yield (8253 kg/ha) at 160 kg N/ha during summer season. All pre release rice cultures responded upto 160 kg N/ha and due to short plant stature lodging was not found. Due to more no. of panicles/ hill test variety Bharani recorded highest grain yield.

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Table 1
Yield attributes and yields of prerelease short duration rice cultures as influenced by different nitrogen levels during Early kharif (Summer), 2013 and 2014

Treatments	Pl. ht (cm)	No. of panicles/ hill	Panicle Length (cm)	Filled Grains/ panicle	Test Wt (g)	Grain Yield (kg/ha)
<i>Pre release cultures</i>						
NLR 40054	91.23	6.25	22.2	205	14.96	6661
NLR 40058	101.34	6.73	24.9	170	18.32	6592
NLR 40065	95.80	7.00	23.4	144	19.23	6729
Bharani (check)	93.70	7.79	21.2	143	17.78	7518
SEm ±	0.96	0.18	0.16	4.0	0.22	84
CD@5%	2.65	0.51	0.45	11.0	0.61	233
<i>Nitrogen levels (kg/ha)</i>						
80	91.82	6.73	22.6	159	17.25	6717
120	93.55	6.97	22.5	159	17.23	6878
160	96.48	7.16	23.1	173	17.73	7221
200	96.74	6.77	23.2	173	17.73	6857
240	99.01	7.10	23.0	163	17.91	6700
SE m +/-	1.07	0.2	0.18	4.4	0.24	94
CD@5%	2.96	NS	0.50	NS	NS	261
<i>Interaction</i>						
SEm ±	2.14	0.4	0.36	8.9	0.49	188
CD@5%	NS	NS	NS	NS	NS	580
CV	3.87	10.19	2.8	9.3	4.81	4.74

Table 2
Yield of prerelease short duration rice cultures as influenced by different nitrogen levels during Early kharif, 2013 and 2014

	NLR 40054	NLR 40058	NLR 40065	Bharani (check)	Mean
N 80	6411	6913	6524	7022	6717
N 120	6857	6224	6774	7657	6878
N 160	6695	6718	7220	8253	7221
N 200	6658	6537	6778	7455	6857
N 240	6685	6568	6348	7197	6700
Mean	6661	6592	6729	7518	
SEm ± CD@5%					
Pre release cultures	84	233			
Nitrogen levels	94	261			
Interaction:	188	580			

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