

Original Research Article

Evaluation of Newly Released of Recently Released Varieties and Hybrids for Nutrient Requirement

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ABSTRACT

Keywords

Hybrids, Nutrient, uptake, N, P₂O₅, and K₂O

A field experiment was conducted at Crop Research Station, Masodha, Faizabad to estimate the nutrient requirement of recently released HYVs/hybrids. Among the tested genotypes nutrient uptake and requirement varied with genotypes. It was concluded that among the test cultures nutrient requirement for hybrids was more as compared to HYVs.

Introduction

Rice is the major cereal crop of India and it is grown in all the geographical regions of the country. Uttar Pradesh is the 2nd largest state of the country in terms of rice production after West Bengal. In 2012-13 the state produced about 144.64 lac metric tonnes of rice from an area of 58.95 lac hectares with a productivity level of 2.45 tones per hectare (Agriculture production in U.P.-2012-13). The productivity of the state is much below the national level due complex and vulnerable rice production ecosystem. At current growth rate of population the rice requirement of the country is estimated around 140-160 millions ton by 2020. To meet the food requirement of growing population without affecting environment is a great challenge. Development of new rice variety/hybrid specific to ecosystem is one of the solution to cater this problem. Beside this it is also

needed to develop variety specific suitable production technologies to explore the full yield potential of the variety/hybrid. Fertility management is one of the important factor in determining the productivity of variety//hybrid. The response of recent rice varieties/hybrids to various levels of NPK fertilizers varied with the varieties/hybrids.

Keeping in view of this, the nutrient requirement of three recently released hybrids along with a new high yielding rice varieties was studied.

Materials and Methods

The field experiment was conducted at Crop Research Station (NDUAT), Masodha, Faizabad during kharif 2013 to study the nutrient requirement (NPK) of recently released varieties and hybrids of mid early

to medium maturity duration. The experimental site was situated at 26.47⁰N, latitude, 82.12⁰E longitude and an elevation of 113 m above sea level. The soil of the experimental field was sandy loam in texture with almost neutral in pH (pH = 7.2). Organic carbon content of soil is very low and it was estimated 0.42%. The major nutrient composition of the soil was as follows: available N – 220 kg/ha, available P₂O₅ – 24 kg/ha and available K₂O – 234 kg/ha. The experiment was laid split design with three replications. The varieties/hybrids was taken in main plot while the fertility levels in subplots. The plot size of the sub plots is 20 sqm and spacing of 20 X 15 cm

was maintained between row X plant. The experimental material was consisting of 3 hybrids viz., VNR 203, 27P31, 27P63 and one HYV NP 218. These varieties were released for their high yield potential and resistance to major biotic stresses viz. diseases and insects. Genotypes were sown in the 1st week of the month of June in raised beds and thirty days old seedlings were transplanted in line in the 1st week of July. The genotypic responses to a set of combination of nutrient levels (0-60-100, 120-0-100, 120-60-0, 60-60-100, 120-60-100, 180-60-100 kg N, kg P₂O₅, and kg K₂O/ha) in terms of yield and nutrient accumulation were recorded and presented in table -1

Table.1 Nutrient requirement of recently released varieties and hybrids

Variety	Grain Yield (kg/ha)	Straw Yield (kg/ha)	Nutrient Uptake		
			N	P2O5	K2O
VNR 203	5018	10127	165.30	83.70	111.30
27P31	4913	9876	161.90	67.50	91.10
27P63	5227	9067	160.40	88.00	83.90
NP 218	4451	8638	167.10	88.10	23.50
CD (0.05)	NS	NS	39.60	NS	6.60
CV (%)	14.59	31.88	15.25	26.69	20.17
Nutrients					
N0P60K100	3076	6799	113.00	63.00	27.40
N120P0K100	3715	10610	164.90	87.50	25.90
N120P60K0	4000	10287	165.50	89.80	29.40
N60P60K100	4069	9405	174.70	83.80	33.30
N120P60K100	4347	9390	173.70	75.30	32.50
N180P60K100	4620	10070	190.40	91.60	31.00
Expt. Mean	3961	9427	163.58	81.58	88.91
CD(0.05) Nutrients	231	145	3	2.6	2.2
Interaction S in M	115	31	4.01	5.3	4.4
M in S	234	76	8.03	5.7	4.2
CV (%)	14.59	2.39	15.39	25.60	18.51
Av. NRE (%)	-	-	87.20	135.20	73.3

Table.2 Nutrient requirement of test varieties

Hybrids/ HYVs	Maximum Grain yield (kg/ha)	Fertility Level (kg/ha)	Nutrient uptake (kg/ha)			Nutrient Requirement (kg uptake/ton grain)		
			N	P2O5	K2O	N	P2O5	K2O
VNR 203	6575	N180P60K100	188.50	55.61	114.40	28.50	8.42	17.30
27P31	6510	N180P60K100	203.90	98.33	105.60	31.30	15.12	16.20
27P63	6475	N180P60K100	193.01	120.65	95.25	14.53	18.75	14.80
NP 218	5510	N120P60K100	179.48	86.01	78.96	32.50	15.60	14.18
Hybrids	5010	N60P60K100	177.79	61.82	115.91	34.78	12.10	22.70
HYVs	4912	N120P0K100	160.85	87.52	84.50	32.60	17.85	17.20

Results and Discussion

Observations recorded in the table – 1 revealed that genotypic response to the varied fertility/nutrient level varied with genotypes. The mean grain yields increased significantly up to fertility level 180-60-100 kg N, P₂O₅, and K₂O/ha. Among the genotypes 27 P 63 gave highest grain yield of 5227 kg/ha followed by VNR 203 (5018 kg/ha) while the maximum straw yield was recorded for genotype VNR 203 (10127 kg/ha).

Nutrient requirement

Based on the uptake of nutrients recorded at the highest yields of each variety, nutrient requirement (kg nutrient uptake/ton grain) was estimated (Table -2). Nutrient requirement in general varied from 14.53 – 32.50 kg N, 8.42 - 18.75 kg P₂O₅ and 14.18 – 17.30 kg K₂O per tonne of grain production. Among the test cultures nutrient requirement for hybrids was more as compared to inbred rice varieties.

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