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Growth Performance of Transplanted Rice Genotypes under Different Irrigation Regimes in TBP Area

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A B S T R A C T

Field experiment was conducted to know the growth performance of transplanted rice genotypes under different water regimes during *Kharif*2018 at Agricultural Research Station, Gangavathi, University of Agricultural Sciences, Raichur. The experiment was laid out in split plot design with three replications. There were three irrigation regimes as main plot treatments and five rice genotypes as sub-plot treatments. Among the different irrigation regimes, alternate wet and dry method was recorded significantly higher plant height, number of tillers, leaf area and higher dry matter production at 30, 60, 90 DAT and at harvest, respectively as compared to other irrigation regimes. With respect to genotypes, GNV-11-09 (V_3) recorded significantly growth attributes of above said parameters as compared to other genotypes. Interaction effect was found non-significant respect to growth parameters of experiment.

Introduction

Rice (*Oryza sativa* L.) is the world's most important crop and is a staple food for more than half of the world's population. Asia accounts for 60 per cent of the global population, about 92 per cent of the world's rice production and 90 per cent of global rice consumption. In India, rice is grown over an area of 42.94 million hectares, with annual production of about 112.90 million tons and productivity being 2585 kgha^{-1} (Anon., 2018). India is the second largest country for rice production and rice continues to hold the key to sustained food production by contributing 20-25 per cent of agriculture and assures food security for more than half of the total population (Anon., 2012).

Lack of appropriate genotypes and water management practice is a limiting factor for successful rice cultivation under shrinking

water condition. Appropriate agronomic management is thus, a prerequisite to exploit full potential of the available resources, to realize the maximum possible benefits from the suitable genotypes under different irrigation regimes. Hence, it is essential to develop appropriate package of practices for successful cultivation and yield maximization. In this study, attempts have been made to test the possibility of optimizing and improving growth of rice genotypes by the alternation in water management practices. Keeping these facts in view, the present investigation entitled growth performance of transplanted rice genotypes under different water regimes was conducted during *kharif* 2018.

Materials and Methods

A field experiment was conducted at Agricultural Research Station (ARS), Gangavathi, University of Agricultural Sciences, Raichur, Karnataka during *Kharif* 2018 to study the growth parameters of transplanted rice genotypes under different irrigation regimes comprised of three irrigation regimes *viz.*, (I_1: Alternate wetting and drying (AWD), I_2: Saturation maintenance (Moisture at hair crack) and I_3: Continuous flooding levels) as main factors and five rice genotypes (V_1: GGV-05-01, V_2: MTU-1010, V_3: GNV-11-09, V_4: GNV-10-89 and V_5: RNR-15048), as sub factors was laid out in split plot design with fifteen treatment combinations and three replications. The soil of the experimental site was medium deep black clay in texture. Observations on growth parameters of rice were recorded at 30, 60, 90 DAT and at harvest from five randomly selected plants. Standard techniques were used for recording observations. The data collected from the experiment at different growth stages and at harvest were subjected to statistical analysis as described by Gomez and Gomez (1984).The level of significance used for 'F' was P=0.05. Critical Difference (CD) values were calculated at 5 per cent probability level, where the F test was found to be significant.

Results and Discussion

The results of the investigation indicated that the different irrigation regimes and genotypes had significant influence on different parameters of transplanted rice. Among different irrigation regimes, alternate wetting and drying recorded significantly higher plant height at harvest (105.0 cm), number of leaves at 60 DAT (85.4), no of tillers per square meter at harvest (700), leaf area at 60 DAT (1366) and leaf area index (6.83) as compared to continuous flooding which noticed plant height at harvest (102.2 cm), number of leaves at 60 DAT (71.0), no of tillers per square meter at harvest (83), leaf area at 60 DAT (1147) and leaf area index (7.74). With respect to rice genotypes, RNR-15048 recorded significantly higher plant height at harvest (106.3 cm) as compared to other genotypes. However, it was on par with MTU-1010(106.2 cm) and significantly lower plant height (100.6 cm) was recorded with GNV-10-89. Genotypes, GNV-11-09 recorded significantly higher number of leaves at 60 DAT (87.2,) as compared to other rice genotypes. Genotypes, GNV-11-09 recorded significantly higher number of leaves at 60 DAT (87.2), number of tillers at harvest (722), leaf area at 60 DAT (134) and leaf area index (6.73) as compared to other rice genotypes (Table 1).

The higher number of leaves, number of tillers, leaf area observed with alternate wetting and drying was due to creation of good soil environment such as availability of good aeration and optimum moisture that promoted the growth of rice which is expressed in the more number of leaves per hill. Earlier Virdia and Mehta (2008) reported more number of green leaves due to intermittent irrigation.

Table.1 Plant height, Number of leaves hill^{-1}, No. of tillers m^{-2}, Leaf area, LAI and dry matter production as influenced by irrigation regimes and genotypes in transplanted rice

Treatments	Plant height (cm) at harvest	Number of leaves hill^{-1} at 60 DAT	No. of tillers m^{-2} at harvest	Leaf area (cm^2 hill^{-1}) at 60 DAT	Leaf area index (LAI) at 60 DAT	Dry matter production (g hill^{-1}) at harvest
Irrigation regimes (I)						
I_1: AWD	105.0	85.4	700	1366	6.83	83.1
I_2: Saturation	103.7	78.1	698	1251	6.26	73.5
I_3 : Continuous flooding	102.2	71.0	683	1147	5.74	68.1
S.Em.±	**0.6**	**2.0**	**5.1**	**38**	**0.15**	**3.0**
CD (*p*=0.05)	**2.6**	**7.6**	**16**	**118**	**0.58**	**9.6**
Genotypes (V)						
V_1:GGV-05-01	101.6	74.0	695	1226	6.13	73.2
V_2:MTU-1010	106.2	83.0	714	1266	6.33	77.6
V_3: GNV-11-09	103.6	87.2	722	1346	6.73	79.9
V_4 : GNV-10-89	100.6	75.6	696	1258	6.29	74.6
V_5 : RNR-15048	106.3	71.2	641	1178	5.89	69.1
S.Em. ±	**0.8**	**3.1**	**8**	**37**	**0.18**	**1.1**
CD (*p*=0.05)	**2.4**	**8.99**	**23**	**107**	**0.54**	**3.2**

The higher number leaves observed in the case of GNV-11-09 was due to genetic character. Sangeeta (2019) also reported higher number of leaves in the genotype GNV-11-09. The genotypic variation with respect to tillers might be due to its genetic makeup, though other climatic and management factors also influence the tillers. The results are in conformity with the findings of Lafitte *et al.,* (2006) and Wang *et al.,* (2007) who found that IR-64 recorded higher number of tillers m^{-2} as compared to other variety.

The results concluded that, alternate wetting and drying method of irrigation regimes was found superior with respect to growth parameters of transplanted rice genotypes (GNV-11-09) as compared to other methods of irrigation regimes and genotypes.

References

Anonymous, 2012, Agricultural Statistics at glance, Directorate of Economics and Statistics. Department of Agriculture and Co-operation, Ministry of Agriculture, Government of India.

Anonymous, 2018, Directorate of Economics and Statistics. www.indiastat.com

Gomez, K. A. and Gomez, A. A., 1984, Statistical Procedures for Agricultural Research, 2nd Edition. *A Wiley Inter-Science Publications*, New York (USA).

Lafitte, H. R., Guan, Y., Sheng, S. and Li, Z. K., 2006, Performance of rice genotypes under aerobic soil. *J. Expt. Bot.*, 58(2): 169-175.

Virdia, H. M. and Mehta, H. D., 2008, Integrated nutrient management in transplanted rice (*Oryza sativa* L.). *Rice Res.*, 2:2.

Wang, H., Boumman, B. A. M. and Msea, P. F., 2007, Aerobic rice in China. *IRRI Report*, 2007.

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