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Observation of local, improved and hybrid rice varieties in Rampur Baghelan, Satna district (M.P.) India

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Abstract

The field studies were carried out for performance of local, improved and hybrid varieties of rice in Rampur Baghelan, Satna district. Study of performance was done from 2020 to 2021. To study the incidence of various pests 16 rice cultivars five were local cultivars namely Dehula, Newari, Bhataphool, Loachai & Lohindi & six were improved varieties viz Pusabasmati, IR-36, IR-64, Vandana, IR-20 & Pusa Sugandha and five were hybrid varieties i.e. PA-6201, KRH-2, PRH-10, JRH-4 & JRH-5. The observations were made regarding the plant height, number of tillers, number of primary and secondary panicle, maturity days and grain yield.

Keywords: *Oryza sativa*, Satna, Rampur Baghelan

Introduction

Rice (*Oryza sativa* Linn.) is one of the most important food crops of India. Rice has shaped the culture, diets and economic of Thousands of millions of peoples. For more than half of the humanity “rice is life”. Major share of rice is cultivated during Kharif season (Krishnaiah *et al.* 2012) [1]. Madhya Pradesh is an agrarian state with about 74% population of the state depending directly or indirectly on agriculture. Agriculture and its allied services contribute 31% share of the state's economy. In M.P. rice is grown in the area of about 15.59 lakh ha with production of 14.62 lakh tons and productivity 989 kg/ha which is far below than the average national productivity (2010 kg/ha). In Madhya Pradesh around 5000 ha is under hybrid rice particular in under irrigated production system. Rice hybrid produce about 14-18% higher grain yield including a more vigorous and extensive root system (Neeta *et al.* 2013 and Anonymous, 1998) [2, 11].

There is a decline in per capita land holding from 0.5 ha in 1951-52 to 0.14 ha in 1995-96, and is expected to further decline to a level of 0.09 to 0.05 ha by the end of first two decades of the twenty first century. For attaining and maintaining sustained self-sufficiency the production growth rate of rice has to be raised to 2.35 t ha⁻¹ (Chauhan, *et al.* 1991) [12].

Though there has been impressive rate of growth in the rice production in the non-traditional rice growing areas, the growth rate has been comparatively poor in the traditional rice growing areas of eastern India where 62% of the total rice lands are located. Due to continuous cereal-cereal cropping sequence in the non-traditional rice growing areas,

there is soil degradation and rice cultivation may be phased out in due course of time (Cramer, 1967 and DRR, 2002) [5, 6].

The present investigation was observed local, improved and hybrid rice varieties performances during 2020 in Rampur Baghelan, Satna district.

Materials and Methods

The study was conducted in the season of 2020. During this time period, the average temperature was 30.6 °C (maximum) and 15.64 °C (minimum). During 2020 the monsoon was received on 16th June whereas in 2020 it was on 12th June. Rainfall was adequate in 2020 (669.6 mm) in 41 rainy days but in the year 2020 it was comparatively high ranging up to 672.5 mm.

In order to study the 16 rice cultivars were tested during year 2020. Among the tested cultivars, five were local cultivars namely Dehula, Newari, Bhataphool, Loachai & Lohindi & six were improved varieties viz Pusabasmati, IR-36, IR-64, Vandana, IR-20 & Pusa Sugandha and five were hybrid varieties i.e. PA-6201, KRH-2, PRH-10, JRH-4 & JRH-5. The observations were made regarding the plant height, number of tillers, number of primary and secondary panicle, maturity days and grain yield. The quantitative method was used to this study.

Results and Discussion

Rice, the staple diet of over half of the world's population, is grown on over 145 million ha in more than 110 countries, and occupies almost one-fifth of the total world cropland under cereals (Pathak and Dhaliwal, 1981) [7]. John (1981)

[8] reported that inadequate crop protection in India causes annual losses more than 36 percent by insects alone. In the present study during 2020 season, the performance of 16 experimental rice varieties were observed under the following heads Plant height in cm, Number of Tillers/plant, Number of Tillers per m², Number of primary panicle per

plant, Number of secondary panicle per plant, Length of panicle in cm, Wt of panicle in grams, Number of filled grains per panicle, Number of chaffy grains per panicle, Days for 50% flowering, Maturity days, Weight in grams of 1000 grains and Grain yield in q/ha (Table 1).

Table 1: Observation of rice local, improved and hybrid varieties in the year 2020.

Variety	Plant height cm	No. of Tillers/Plant	No of Tillers/m ²	No. of Primary Panicle/Plant	No. of Secondary Panicle/Plant	Length of Panicle cm	Weight of Panicle (g)	No. of Filled grains/Panicle	No. of Chaffy grain/Panicle	Days to 50% flowering	Maturity days	1000 grain Weight (g)	Grain yield q/ha
Dehula	112.4	4.3	125.4	7.8	45.8	23.3	2.7	130.1	32.4	61	90	21.2	16.4
Newari	111.5	5.9	135.2	8.6	50.4	26.6	3.8	150.2	27.7	64	100	21.7	21.2
Bhantap hool	145.1	8.6	145.0	9.7	51.7	27.7	3.4	135.7	21.5	103	140	20.8	29.3
Lochai	125.3	6.9	140.6	10.8	48.5	28.6	3.6	165.4	25.4	83	125	22.9	35.9
Lohnadi	109.9	4.6	120.2	6.7	40.2	23.7	3.7	185.3	24.8	67	96	23.8	29.6
Pusabas mati	119.9	8.6	148.6	8.9	41.5	29.8	2.6	133.2	33.7	86	126	22.6	36.7
IR-36	119.7	10.5	180.6	11.5	55.8	29.3	3.6	180.5	23.1	81	125	22.9	45.9
IR-64	122.5	14.6	168.8	14.7	58.6	27.4	3.4	175.4	19.8	83	127	22.9	56.7
Vandana	128.1	6.9	125.3	7.8	42.5	27.7	3.9	180.5	26.4	64	92	21.7	31.3
IR- 201	119.7	8.7	165.0	8.6	46.7	27.4	4.3	170.7	25.5	61	95	19.5	36.7
Pusasugandha	117.2	11.7	210.5	12.6	55.3	29.2	4.9	178.9	23.7	84	115	21.5	62.1
PA-6201	118.8	13.5	260.9	18.8	65.9	26.3	4.9	190.5	35.7	92	130	22.7	91.8
KRH-2	135.9	12.7	247.0	13.8	68.7	27.5	6.3	178.6	27.1	83	130	24.2 9	88.6
PRH – 10	122.1	8.8	256.0	12.7	45.4	26.3	5.9	296.9	21.3	77	124	22.7 9	90.7
JRH – 4	127.7	11.7	241.0	14.1	46.0	27.4	6.3	153.4	27.7	72	11	26.4 8	77.3
JRH – 5	133.5	11.6	235.0	13.5	45.9	29.5	4.5	185.7	17.5	79	106	27.77	75.4
SEM ±	0.862	0.121	1.136	0.129	1.426	0.204	0.220	1.251	0.708	1.495	2.503	0.462	0.614
CD (0.05)	2.495	0.351	3.286	0.374	4.118	0.593	0.636	3.613	2.047	4.317	7.228	1.33 2	1.771

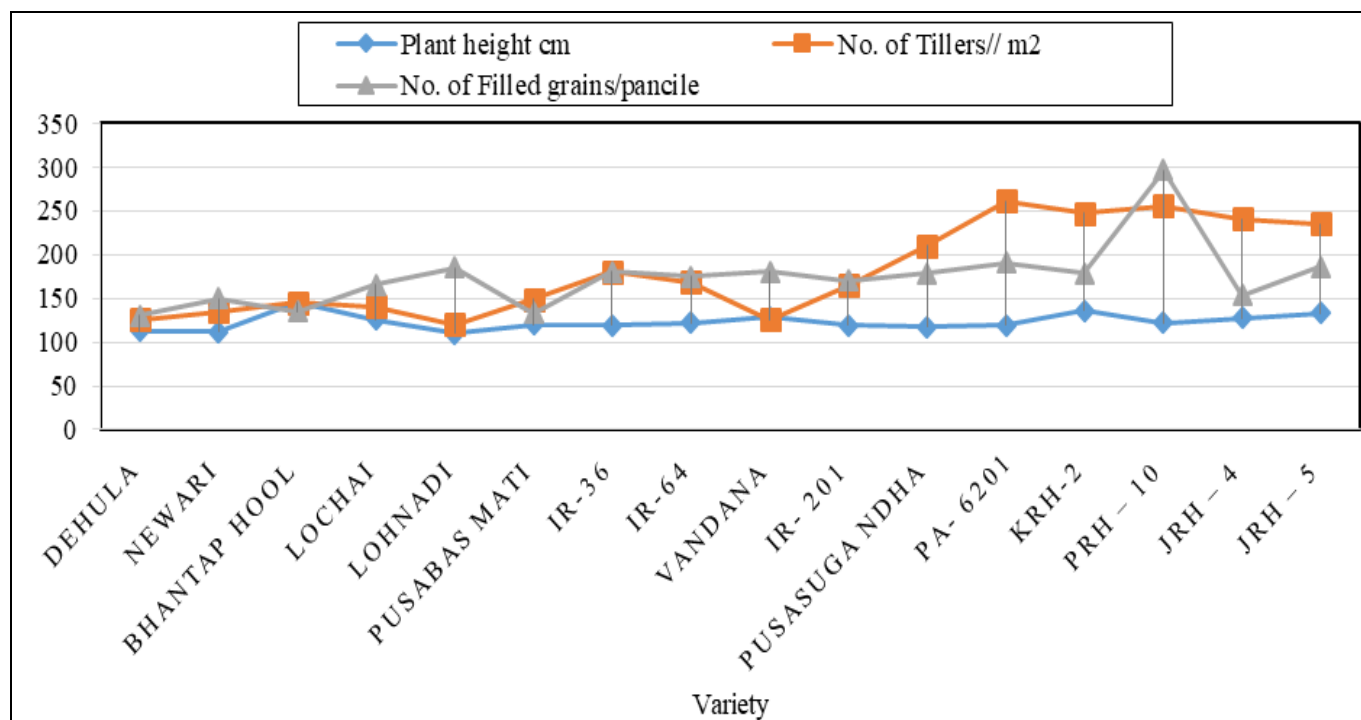


Fig 1: Graph analysis of Observation of rice local, improved and hybrid varieties in the year 2020

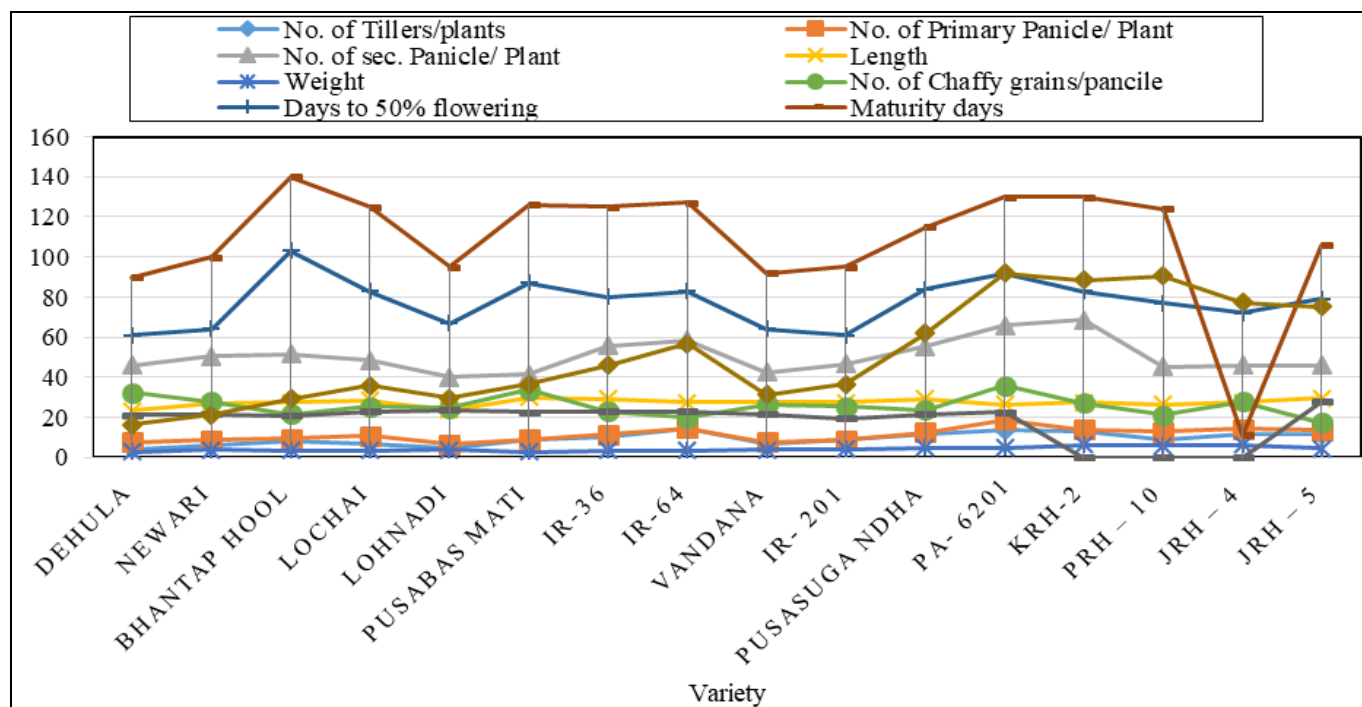


Fig 2: Graph analysis of Observation of rice local, improved and hybrid varieties in the year 2020

Number of Tillers/ plant: The number of tillers per plant was maximum in IR 64 during the year 2020 (14.6) while Dehula showed minimum numbers of tillers /plant (4.4).

Number of Tillers /m²: The number of tillers /m² were maximum in PA-6201 during the year 2020 (260.9) while Lohandi showed minimum number of tillers/m² (120.1).

Number of primary panicle/plant: Number of primary panicle/plant were maximum in PA-6201 during the year 2020 (18.8) while Lohandi showed minimum number of primary panicle/plant (6.6 and 6.8).

Number of Secondary Panicle/plant: Number of secondary panicle/plant were maximum in KRH -2 during the year 2020 (68.7) while Lohandi showed minimum number of secondary /panicle plant (40.2).

Length of panicle in cm: Panicle length was found to be maximum in JRH -5- during the year 2020 (29.5 cm) followed by Pusabasmati (29.2 cm) while Lohandi showed minimum length of panicle (23.5 cm).

Weight of panicle

The weight of panicle was recorded as maximum in PRH 10 during the years 2020 (5.9) while Dehula showed minimum weight of panicle (2.7).

Number of Filled grains / panicle

Number of filled grains/panicle where found to be maximum in PRH 10 during the year 2020 (296.9) while showed minimum number of filled grains/panicle (130.1).

Number of Chaffy grains / panicle

The number of chaffy grains/panicle were maximum in PA-6201 during the year 2020 (35.7) while JRH - 5 showed minimum number of chaffy grains/panicle (17.5).

Days to 50% flowering: Bhantaphool took longer days of flowering period 105 days, while the early flowering period cultivar were Dehula, Lohandi, Vandana and IR -201 (60-65 days).

Maturity days: Dehula took minimum (90 days) for maturing, while Bhantaphool took the longest period i.e. 140 days for maturing.

1000 grain weight (g): JRH-5 showed maximum 1000 grain weight during the year 2020 (27.77 gm), whereas minimum 1000 grain weight IR-201 (19.5 gm).

Grain yield q/ha: Grain yield was recorded as highest i.e. 91.8 q/ha in PA-6201 and lowest in Dehula i.e. 16.4 q/ha in the year 2020 respectively. Singh *et al.* (2013) ^[9] have studies field performance of rice varieties in South Asia. Dattatreya (1994) ^[10] also worked on performance of rice varieties.

Conclusion

In the present course of the investigation, we have to explore the performance of Local, Improved and Hybrid Rice Varieties in the Rampur Baghelan, Satna district. Adoption of cultural practices like cultivation of pests and diseases resistant / tolerant varieties, timely planting, judicious use of water and nutrient, optimum plant stand. The agricultural research though made considerable progress in addressing food security, adopted policies to grow more and more food to support the growing populations in Asian countries ignoring the issues of health and environment which lead to disastrous situation.

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