



RESEARCH NOTE

Evaluation of rice varieties for aerobic soil condition of eastern Uttar Pradesh

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Abstract : A field experiment was conducted to evaluate popular rice varieties *viz.*, NDR 97, Sushk Samrat, NDR 359, Sarjoo-52, Sahbhagidhan, Arize 6444 and IR 64 in Randomized Block Design with three replications in aerobic rice production system in eastern Uttar Pradesh. Among the rice varieties Sarjoo-52 was found most promising and produced highest grain yield of 5.10 t ha⁻¹ in aerobic soil of eastern Uttar Pradesh. The next best variety was Arize 6444 (4.75 t ha⁻¹) and it was at par with NDR 359 (4.23 t ha⁻¹) and IR 64 (3.58 t ha⁻¹).

Key Words : Rice varieties, Aerobic soil condition

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Rice is the major cereal crop of the world. It is also the major source of nutrition of rice eating population of the world. Of the total rice production in world, about 90 is grown and consumed by the peoples of the Asian countries which constitutes more than 58 per cent population of the World. Rice production contributes a major share in the agriculture based economy of the country. Uttar Pradesh is the 2nd largest rice producer of the country after West Bengal with the annual production of 14416 thousand tons from an area of 5.90 million hectare. The Food and Agriculture Organization (FAO) estimated that 4000-5000 lit. of water is required

to produce 1 kg of rice grain. Rice production in the eastern part of the Uttar Pradesh threatened due to erratic rainfall coupled with frequent drought. International Rice Research Institute (IRRI) developed a new technology named “aerobic rice technology” to address the problem of rice farmers of scarce water areas, with a mission of “more rice with less water”. In aerobic rice production system, the crop is established in non-puddled, nonflooded fields (Singh *et al.*, 2008) and rice is grown like an upland crop (unsaturated condition) with adequate inputs and supplementary irrigation when rainfall is insufficient (Bouman, 2001). Irrigation is applied

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to bring the soil water content in the root zone up to field capacity after it has reached a certain lower threshold level (Bouman and Tuong, 2001). Achieving high yields under aerobic rice production system is a challenge and required new varieties having high yield potential and drought-resistant characteristics of upland varieties (Lafitte *et al.*, 2002). Varieties should also possess fertilizer responsive traits.

In view of above mentioned facts, the existing popular rice varieties of Uttar Pradesh were screened for their adaptation and performance under aerobic soil condition of eastern Uttar Pradesh.

A field experiment was conducted at Crop Research Station (NDUAT), Masodha, Faizabad, Uttar Pradesh during *Kharif* 2012 to evaluate the popular rice varieties for aerobic rice production system in eastern Uttar Pradesh. The experimental site is located at 26° 47' N latitude, 82° 08' E Longitude and 113 m altitude above mean sea level. The soil of the experimental site was sandy loam in texture and slightly alkaline in reaction (pH 7.5) with low organic carbon (0.42 %), available phosphorus (P₂O₅ 27.0 kg ha⁻¹), available potassium (234 kg ha⁻¹) and low in available nitrogen (200 kg ha⁻¹). The experiment was laid out in Randomized Block Design with three replications. The experiment was consisted of 7 popular rice varieties *viz.*, NDR 97, Sushk Samrat, NDR 359, Sarjoo-52, Sahbhagidhan, Arize 6444 and IR 64. The plot size of experimental plot was 20 m². The experimental field was prepared by using tractor drawn disc plough, cultivator and rotavator. The sprouted seeds of the rice varieties were line sown with a spacing of 20 × 5 cm. Recommended dose of fertilizer *i.e.*,

120:60:60:25 NPKZn kg/ha was applied for nourishment of crop during growth period. Half dose of nitrogen and full dose of P₂O₅ and K₂O were applied as basal while the remaining dose of nitrogenous fertilizer urea was applied in two equal parts at maximum tillering and panicle initiation stages of crop growth. Standard package of practices was adopted to control the menace of weeds, diseases and insects. Observations pertaining to yield and ancillary characters were recorded.

Result (Table 1) clearly shows that the number of panicles per unit area was significantly influenced by the rice variety. Among the rice varieties, Sarjoo-52 recorded maximum number of panicles (335 m⁻²) and it was significantly superior among tested rice varieties. The lowest number of panicles per unit was recorded in short duration rice variety NDR 97 (205 m⁻²). The panicle wt (g) also varied with rice varieties and it was maximum in Sarjoo-52 (3.02 g) followed by Arize 6444 (2.90 g) and IR 64 (2.88 g). The grain yield was significantly influenced by the different rice varieties. The maximum grain yield was recorded for Sarjoo-52 (5.10 t/ha) followed by Arize 6444 (4.75 t/ha) and NDR 359 (4.23 t/ha). The higher grain yield of rice variety Sarjoo-52 may be attributed its agro-morphological characteristics of highest panicle number per unit area and high panicle weight. This rice variety also possess moderate degree of drought resistant.

On the perusal of result obtained in the present study it was concluded that the rice variety Sarjoo-52 was found most promising for aerobic rice production in eastern Uttar Pradesh due to its moderate drought resistant traits and higher water productivity. These results are in

Table 1 : Yield and ancillary characters of popular rice varieties in aerobic soil of eastern Uttar Pradesh during WS 2012

Varieties	Panicle/m ² (No.)	Panicle wt. (g)	Test weight (g)	Grain yield (t/ha)
NDR 97	205	2.17	21.20	2.55
Sushk Samrat	212	2.22	20.15	2.73
NDR 359	290	2.75	23.85	4.23
Sarjoo 52	335	3.02	24.50	5.10
Sahbhagidhan	261	2.52	21.56	3.42
Arize 6444	302	2.90	25.22	4.75
IR 64	278	2.88	3.02	3.58
C.D. (P=0.05)	2.55	0.01	-	0.13
C.V. (%)	7.21	1.18	NS	6.79

NS = Non-significant

agreement with those of Martin *et al.* (2007).

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