



RESEARCH NOTE

Assessment of hybrid rice (*Oryza sativa*) under farmers' condition in the east and south eastern coastal plain zone of Odisha

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Abstract : An on-farm experiment was conducted during *Kharif* season of 2013 in four villages of Khorda district in east and south eastern coastal plain zone of Odisha to assess the performance of rice hybrid Rajalaxmi in the farmers' field. The results revealed that there was increase in 60.07 per cent grain yield, 47.8 per cent straw yield and 68.6 per cent net profit due to the hybrid as compared to prevailing variety MTU 1010. The increase in yield of hybrid variety was due to 56.1 per cent more number of panicles/m², 22.8 per cent more grains / panicle and 2.98 per cent heavier grains than the high yielding variety.

Key Words : Hybrid rice Rajalaxmi, Grain yield, Net profit

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In India, rice production has shown a plateauing trend, which can be overcome by several measures. Among the technological options, hybrid rice is the commercially viable technology with 15 per cent yield advantage over the best available inbreds (Chandra *et al.*, 2008). In Odisha, rice is taken as the staple food and cultivated both during *Kharif* and summer seasons. Due to several natural and management reasons, the yield of the crop in the farmers' field is much low as compared to the yield obtained in other states and countries. The economy of farmers in Odisha is very much dependant on the productivity of rice. Growing low yielding traditional varieties by farmers is another important reason for low yield of the crop. There are a number of high yielding and hybrid varieties available, which if adopted can enhance rice yield substantially in

the farmers' field. Although several high yielding varieties have been used by the farming community in the state, encouraging effort has not been made to grow hybrids, which has much higher potential in increasing the productivity. As per its potential, hybrid rice can out yield other varieties of rice, it is accepted as a key technology that can take rice yield to a new height. Growing hybrid rice, it is possible to narrow down the yield gap between farmers' field and experimental plots. Higher yield will enable farmers to earn higher incomes from the same area of land. It was felt necessary to assess the potentiality of hybrid rice in the farmers' field with farmers' own management practices. With this objective, an on farm experiment was conducted to assess the performance of hybrid rice in the farmers' field.

A field experiment was conducted during *Kharif* season of 2013 in four villages namely Chingudia and Gendamalia of Baliana block and Nuapada and Jenapada of Balipatna block in Khorda district under east and south eastern coastal plain zone of Odisha. Five farmers were selected from each village to take up paddy crop with hybrid rice Rajalaxmi and conventional variety MTU 1010. The hybrid variety Rajalaxmi was released by Central Rice Research Institute, Cuttack during 2005. The variety matures in 135 days with yield potential of 7 t/ha. The experiment was laid in Split Plot Design taking village as main plot and varieties in the sub plot with individual farmer as replication. The crop was grown in medium low land situation having sandy clay loam soil with pH value ranging from 5.6 to 6.1. Sowing in nursery bed was done during last week of June and transplanting was done at a spacing of 20×15 cm during last week of July. For conventional variety 2-3 seedlings/hill were planted whereas for hybrid variety single seedling was planted per hill. The crop was uniformly fertilized with 2 tonnes of farm yard manure, 80 kg N, 40 kg P₂O₅ and 40 kg K₂O per hectare. The observations on yield, yield attributing characters and economics were recorded as per standard procedures.

The results revealed that the yield of rice was enhanced from 3.73 t/ha in conventional variety to 5.97 t/ha when hybrid variety was grown. There was increase in yield by 60.07 per cent due to cultivation of hybrid variety, irrespective of the

villages (Table 1). Highest grain yield of 5.18 t/ha was obtained by the farmers of village Chingudia followed by Nuapada (4.98 t/ha). Due to better management by the farmers, there was more production in of these villages; which depicts the contribution of farmers' own management strategy for success of any field demonstration. There was significantly higher straw yield with hybrid variety (7.16 t/ha), which was 47.8 per cent higher than the high yielding variety, probably due to more number of tillers per hill in case of hybrid. Due to different in spacing of transplanting, there was 26 per cent reduction in hills per unit area, but the effect was not observed in effective tillers per m² because of better tillering habit of the hybrid than the high yielding variety. Effective tillers per hill were more in Chingudia (10.7) and Nuapada (10.9) villages than Gendamalia (8.8) and Jenapada (8.8) villages. There were 13.35 number of effective tillers/hill with hybrid variety as compared to 6.25 number of effective tillers/hill by high yielding variety (Table 2). The high yielding variety MTU1010 produced 288.6 number of panicles per m² against 450.6 number per m² in case of hybrid Rajalaxmi, which is the major contributor towards yield of grain and straw. There were 22.8 per cent more grains observed per panicle with hybrid as compared to the high yielding variety, of course, there was no significant difference between hybrid and high yielding variety with respect to thousand grain weight. The increase in yield of hybrid variety was probably due to 56.1 per cent more

Table 1 : Yield and economics of hybrid rice

Village	Grain yield (t /ha)	Straw yield (t /ha)	Net profit (Rs '000 /ha)	B:C ratio
Chingudia	5.18	6.41	28.50	1.96
Gendamalia	4.71	5.83	24.75	1.88
Nuapada	4.98	6.16	28.51	2.05
Jenapada	4.53	5.61	23.15	1.85
C.D. (P=0.05)	0.39	0.49	NS	NS
Variety				
Rajalaxmi	5.97	7.16	32.93	2.03
MTU 1010	3.73	4.85	19.53	1.84
C.D. (P=0.05)	0.33	0.41	4.29	NS

NS=Non-significant

Table 2 : Yield attributing characters of hybrid rice

Village	Hills/m ²	Effective tillers/hill	Effective tillers/m ²	Grain/panicle	1000 grain weight (g)
Chingudia	40.6	10.70	414.5	116.8	25.40
Gendamalia	39.2	8.80	327.5	103.7	25.20
Nuapada	40.9	10.90	416.1	113.4	26.70
Jenapada	38.3	8.80	320.3	105.4	25.00
C.D. (P=0.05)	NS	1.87	NS	10.3	NS
Variety					
Rajalaxmi	33.8	13.35	450.6	121.05	25.95
MTU 1010	45.7	6.25	288.6	98.6	25.20
C.D. (P=0.05)	1.46	1.30	48.98	9.2	NS

NS=Non-significant

number of panicles/m², 22.8 per cent more grains / panicle and 2.98 per cent heavier grains than the high yielding variety.

Due to higher yield of grain and straw, the net profit was higher with hybrid variety (Rs. 32930 /ha) than the high yielding variety MTU 1010 (Rs. 19530). This was 68.6 per cent higher than the conventional method. Among the villages, the farmers of Chingudia (Rs. 28500) and Nuapada (Rs. 28510) got significantly higher net profit than other two villages, of course due to higher grain yield. Janaiah (2000) also reported that hybrid rice was economically profitable on more intensively managed locations. There was no significant difference between the varieties with respect to benefit : cost ratio. The benefit : cost ratio for hybrid was 2.03, which was 10.6 per cent more than the prevailing variety MTU 1010.

With the findings of this experiment, it can be concluded that to enhance productivity and profit from rice in the farmers' field of east and south eastern coastal plain zone in Odisha, hybrids like Rajalaxmi may be preferred over the prevailing high yielding varieties.

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