



## THE YIELD PERFORMANCE OF HYBRID RICE (DRRH-3) IN AGENCY AREA OF RAMPACHODAVARM, A.P.

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### ABSTRACT

The Hybrid rice DRRH-3 recorded higher plant height (90 cm), effective tillers hill<sup>-1</sup>(21.5), Length of panicle (24.1 cm), grains panicle<sup>-1</sup> (248) and test weight (23.65 g) than the local check (MTU-1001) . The same also recorded grain yield 59.5 q ha<sup>-1</sup> which is 67 % higher yield than local check with harvest index of 36.2 % over the years of study. In spite of increase in yield of improved technology the technological gap, extension gap and technology index existed which was 8 q ha<sup>-1</sup>, 12.3 q ha<sup>-1</sup> and 23.76 % respectively. The improved technology of hybrid rice gave higher gross return of Rs. 74500 ha<sup>-1</sup> with a benefit cost ratio of 3:1 and additional net return of Rs.23000 ha<sup>-1</sup> as compared to local check. Hence the existing MTU-1001 can be replaced by Hybrid rice DRRH-3 since it fits to the existing farming situation for higher productivity and income.

**KEY WORDS:** Extension gap, FLD, Hybrid rice, Technology gap, Technology index.

### INTRODUCTION

Rice (*Oryza sativa* L.) is one of the world's most important food crops and a primary source of food for more than half of the world population. More than 90% of rice produced and consumed in Asia. It is planted in about 163 million ha annually (FAO, 2013) of the world's cultivated land ( Degenkolbe *et al.*, 2013). Among the rice growing countries in the world, India has the largest area under rice crop (about 42.5 million ha, FAO 2013) and ranks second in production next to china. Rice contributes 43 per cent of total food grain production and 46 percent of total cereal production in India By conduction of on farm trails on farmer's field there was significant increase in knowledge level of the farmers and majority of farmer's showed high level of satisfaction about demonstrated technologies (Raj *et al.*, 2014). Keeping in view such problems and after detailed survey the KVK, Pandirimamidi made an attempt with an objective to substitute existing variety in medium land situation with a newly released promising Paddy hybrid DRRH-3. Therefore, it was considered important to evaluate the impact of on farm trails on yield parameters and economics of rice variety for its suitability in the existing farming situation for higher productivity and income in the adopted villages of KVK, Pandirimamidi

### MATERIALS & METHODS

The study was carried out through on farm testing during *kharij* season of 2012 and 2013 in two adopted villages of East Godavari district in Andhra Pradesh. Twenty farmers each having 0.4 hectares of land cultivated the hybrid rice DRRH-3 with recommended package of practices. They were supplied with seed and fertilizers. Besides farmers practice of one old HYV MTU-1001 was selected as local check. The soil of the study area was moderately alkaline in reaction (pH:6.5-7.4), loam in texture with high organic carbon content (0.76-0.78 %), high in nitrogen (480-485 kg ha<sup>-1</sup>), low in phosphorus (9.0-10 kg ha<sup>-1</sup>) and medium in potassium(145-178 kg ha<sup>-1</sup>) content. The crops were transplanted during 2nd week of July and harvested during 4th week of November. Observations on different growth and yield parameters were taken and economic analysis was done by calculating cost of cultivation, gross return, net return and B:C ratio. Final crop yield (grain and straw) were recorded and the gross return were calculated on the basis of prevailing market

price of the produce. Harvest index is the relationship between economic yield and biological yield (Gardner *et al.*, 1985).

It was calculated by using the following formula

$$HI = \frac{\text{Economic yield}}{\text{Biological yield}}$$

For the introduction of the technology, different extension approaches through regular field visit and interpersonal communication were made by the scientists of Krishi Vigyan Kendra, Pandirimamidi. Trainings on farmers and farm women were conducted for the awareness among the farmers and field days were celebrated for the horizontal spread of technology. Also leaflets and pamphlet on improved package of practices on rice cultivation were distributed among the farmers in the villages. Further study on technology gap, extension gap and technology index were calculated by the formula as suggested by Samui *et al.*(2000).

Technology gap = Potential yield - Demonstration yield

Extension gap = Demonstration yield-Farmers yield

$$\text{Technology index (\%)} = \frac{\text{Technology gap}}{\text{Potential yield}} \times 100$$

Tabular analysis involving simple statistical tools like mean was done by standard formula to analyze the data and draw conclusions and implications.

### Details of technology

The hybrid rice "DRRH-3" was released from DRR in 2009, Hyderabad, by as a suitable for the States of Madhya Pradesh, Orissa, Uttar Pradesh, Gujarat and Andhra Pradesh under irrigated transplanted conditions. Medium duration - 131 days. a) Plant height: Semi tall (98-102 cm), b) Distinguishing morphological Characters are Erect plant type, Erect, broad and long flag leaf with semi tall stature, strong culm, long panicles with medium slender grains and white apiculus colour., Plant type: Erect, No. of tillers/plants: 15-18, No. of panicles/sq.m: 280-295, Days to 50% flowering: 101-103. Resistant to neck blast and moderately resistant to Leaf blast, rice tungro, brown spot diseases and tolerance to white backed plant

hopper. Keeping all these in view the hybrid “ DRRH-3” has been recommended for cultivation in Andhra Pradesh

#### Technology transferred

For varietal introduction, different extension approaches were made. Interested farmers were supplied with truthful label seeds of DRRH-3 by KVK, Pandirimamidi. The hybrid DRRH-3 could successfully out yield all other HYV varieties and recorded eye catching higher yield in medium lands. During *kharif* 2012 & 13, the area under hybrid DRRH-3 expanded horizontally to 40 hectares from a mere 48 hectares during first year 2012 of introduction and adopted by 90 farmers in 20 villages. Due to efforts of KVK, scientists field visit, interpersonal communication and individual efforts of the farmers, the hybrid DRRH-3 could spread to 100 hectares of the district

## RESULTS AND DISCUSSION

**Yield:** Results of 20 on farm trails conducted during *kharif* 2012 and 2013 in 8 hectares in farmers field of two villages indicated that the improved practice of hybrid hybrid DRRH-3 (Table 1) recorded grain yield 59.50 q ha<sup>-1</sup> which is 67.00 % higher yield than local check (MTU-1001). This might be due to the production of higher number of effective tillers plant<sup>-1</sup> and higher number of grains panicle<sup>-1</sup> which was in conformity with Maiti *et al.* (2003). This corroborates the findings of DRRH-3 are superior over MTU-1001. Thus the OFT might have a positive impact on farming community in the district over local check. Similar results were also reported by Mondal *et al.* (2005) in rice crops.

**Table 1:** Productivity, Technology gap, Extension gap and Technology index in Paddy (DRRH-3) under on farm trails

Year	Area (ha)	No of farmers	Yield (q ha <sup>-1</sup> )			% local check	Technolog y gap (q ha <sup>-1</sup> )	Extension gap (q ha <sup>-1</sup> )	Technology index
			Potential	Improved technology	Local check				
2012	4	10	65.00	60.00	35.50	69.01	05	24.50	7.69
2013	4	10	65.00	59.00	36.00	65.00	11	23.00	16.92
Mean	4	10	65	59.50	35.75	67.00	8	23.75	12.30

**TABLE 2:** Cost of cultivation, Gross return, Net return and B:C ratio as affected by on farm trails

Year	Cost of cultivation (Rs ha <sup>-1</sup> )		Gross return (Rs ha <sup>-1</sup> )		Net return (Rs ha <sup>-1</sup> )		B:C Ratio	
	Demo	Check	Demo	Check	Demo	Check	Demo	Check
	2012	15000/-	20000/-	75300/-	54000/-	60300/-	34000/-	3:1
2013	15000/-	20000/-	73700/-	59000/-	58700/-	39000/-	3:1	2:1
Mean	15000/-	20000/-	74500/-	56500/-	59500/-	36500/-	3:1	2:1

**Plant height, Effective tillers plant<sup>-1</sup>, Length of panicle and grains panicle<sup>-1</sup>:** The taller plant height (90.0 cm), higher effective tillers per plant (20.3), longer panicle (23.2 cm) and higher grains per panicle (245) were recorded in Hybrid DRRH-3 as compared to local check (MTU-1001) which was attributed to their varietal difference. The differential response of tillering in the genotype could be attributed to its genetic potentiality. These results are in agreement with Tripathi *et al.* (2013).

**Test weight, straw yield and harvest index:** The hybrid rice DRRH-3 recorded the higher test weight (of thousand grains) (25.75g), straw yield (60.3 q ha<sup>-1</sup>) and harvest index (36.2 %) as compared to local check. These results are in conformity with Akram *et al.* (2007).

**Technology gap:** The demonstrations in both the year recorded the technology gap of 5 q ha<sup>-1</sup> during 2012 which was 11 q ha<sup>-1</sup> higher than that during 2013 (Table 1). This may be attributed to the differential soil fertility status and variable climatic conditions (Mandavkar *et al.* 2012).

**Extension gap:** Higher extension gap (24.50 q ha<sup>-1</sup>) was found during 2012 and lower (23. q ha<sup>-1</sup>) was in 2013 (Table 1). More and more use of latest production technologies with high yielding variety will subsequently change this alarming trend of galloping extension gap. The new improved technologies will eventually lead to the farmers to discontinue the old varieties and to adopt new variety. Similar results were reported by Sharma *et al.* (2011).

**Technology index:** The Technology index was reduced from 7.69 to 16.9 per cent during 2012 to 2013 (Table 1) which shows the higher feasibility of the demonstrated technology of hybrid DRRH-3. This finding is in corroborated with the findings of Raj *et al.* (2014).

**Economics:** The Hybrid rice DRRH-3 recorded the higher gross return of Rs.74500 ha<sup>-1</sup> and additional net return of Rs.59500 ha<sup>-1</sup> over local check (Table 2). Higher B:C ratio (3:1) was found in improved technology of DRRH-3 due to higher net return as compared to local check (MTU-1001). These finding are similar with the findings of Nirmala *et al.* (2012).

## CONCLUSION

Thus, the cultivation of hybrid rice (DRRH-3) with improved technologies has been found more productive and grain yield might be increased up to 67.00 per cent. Technology and extension gap extended which can be bridges by popularity package of practices with emphasis of hybrid. Replacement of MTU-1001 with newly released hybrid will increase the production and net income. The existing MTU-1001 can be replaced with hybrid DRRH-3 because of higher productivity and income. Hybrid rice DRRH-3 was found to be suitable since it fits well to the existing farming situation and also it had been appreciated by the farmers.

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