Impact Evaluation of CropLife India Demonstration of Hybrid Cultivation Under GRES Programme

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General Features of Adoption Hybrid Rice

- Although hybrid varieties of rice are size-neutral in the sense that they are perfectly divisible and can be used irrespective of the size of farm, invariably they are not resource neutral.

- It is highly probable that in case of small farmers, the land augmenting character of this innovation might be the major factor favouring their adoption while labour saving character of new seeds might be an important factor favouring their adoption among large farmers.

- Since large farmers have a better command over resources and since their risk bearing capacity is greater than that of the small farmers, one should expect the adoption of hybrid technology to be more extensive among the large farmers.

- Evidently, however show that the average planted area under hybrid as a ratio to the average rice area declines with the increase in the size of holding.

Area Allocated to Hybrid Rice

- During 2010-11, the proportion of rice area allocated to hybrid rice accounted for 10.34 per cent in marginal farms which rises consistently with the rise in the size of holding to 14.38 per cent in small and 21.63 per cent in medium farms.

- Such a rise in the ratio of hybrid rice area to total rice area is accompanied by the corresponding decrease in the harvested area under HYVs as a ratio to the total area allocated to rice.

- Similar relationship is also observed during 2011-12.

- Considering all the farm sizes together, the percentage of rice area allocated to hybrid rice is 15.18 per cent in 2011-12, which was 12.73 per cent in 2010-11.

  The adoption of hybrid rice at the farm level is rather high over the years. It has picked up during the reference period obviously because of increasing popularity amongst the farmers.

Adoption of Hybrid Rice by Size of Farms

- It is fact that over the farm sizes, the currently available hybrid rice is not so popularly attractive to the marginal farmers who are mainly produce for household consumption.

Farm size (ha)	2010-11						2011-12					
	Average farm size (ha)	Average rice area (ha)	Average rice area (ha) under		Per cent of rice area under		Average farm size (ha)	Average rice area (ha)	Average rice area (ha) under		Per cent of rice area under	
			HYVs	Hybrid	HYVs	Hybrid			HYVs	Hybrid	HYVs	Hybrid
<1	0.55	0.87	0.78	0.09	89.66	10.34	0.55	0.9	0.8	0.1	88.89	11.11
1 – 2	1.32	1.53	1.31	0.22	85.62	14.38	1.34	1.6	1.31	0.29	81.88	18.13
2 – 4	2.63	3.93	3.08	0.85	78.37	21.63	2.75	4.2	2.85	1.35	67.86	32.14
4 – 10	-	-	-	-	-	-	-	-	-	-	-	-
>10	-	-	-	-	-	-	-	-	-	-	-	-
All sizes	0.77	1.1	0.96	0.14	87.27	12.73	0.78	1.14	0.96	0.17	84.82	15.18

- On the contrary, small and medium farmers who produce mainly for the market have shown interest in hybrid rice.

- The smaller sized farms have an advantage over the larger ones in regard to the traditional labour intensive farming where as hybrid rice cultivation is more labour intensive as compared to conventional HYVs.

Increase in Yield (%)

Overall, rice hybrid performed better with an average yield of 6408.53 kg/ha than average yield of 5377.60 kg/ha for HYVs during 2010-11.

Farm size (ha)	2010-11			2011-12		
	Mean yield (Kg/ha)		Per cent difference	Mean yield (Kg/ha)		Per cent difference
	Hybrid	HYVs		Hybrid	HYVs	
<1	6412.31	5217.36	22.9	6803.76	5330.83	27.63
1 – 2	6425.81	5414.06	18.69	6229.41	5299.83	17.54
2 – 4	6363.46	5671.43	12.2	6178.13	5429.75	13.78
4 – 10	-	-	-	-	-	-
>10	-	-	-	-	-	-
All sizes	6408.53	5377.6	19.17 (10.74)*	6551.28	5340.89	22.66 (18.45)*

*estimated 'paired t' values are significant at 5 per cent level of significance

During 2011-12, too hybrid rice recorded higher yield at 6551.28 kg/ha as against 5340.89 kg /ha for HYVs.

Among various farm size groups, smaller sized holdings obtained highest yield in both the years.

The mean yield of HYV rice however increased with the increase in the size of farm over the years. In other words, mean yield levels of HYVs were higher on larger sized holdings as compared to smaller ones in case of HYVs.

Profitability of Hybrid Rice

During 2011-12 the gross return of Rs.67,583.51/ha in hybrid and Rs.61,327.32/ha in inbred. The gross return was 10.20 per cent higher in hybrid rice cultivation.

Net return realised in hybrid and inbred rice was of the order of Rs.38,696.10 and 37,776.32/ha respectively.

The profit gain realised in hybrid rice production was only Rs.919.78/ha or 2.43 per cent over inbred varieties of rice.

The benefit cost ratio was also lower in hybrid rice cultivation (2.34:1) in comparison with that for inbred rice (2.60:1).

Inter-temporarily net return from hybrids over the reference periods has increased from Rs.35,549.76/ha in 2010-11 to Rs.38,696.10/ha in 2011-12.

For inbred rice, the net return decreased from Rs.38,383.69/ha to Rs.37,776.32 during the same period.

The net result has been increase in benefit cost ratio for hybrid rice cultivation from 2.24:1 in 2010-11 to 2.34:1 in 2011-12.

Correspondingly, there has been decline in benefit cost ratio from 2.63:1 to 2.60:1 during the same period.

Product Price Difference

On an average, during 2011-12 the hybrid rice growing farmers realised a sale price of Rs.931.01/ quintal of paddy sold in the market which was lesser by Rs.8.45/quintal realised for inbred rice.

The product price difference was quite sharp during 2010-11 and during the year, price per quintal of hybrid paddy was lesser by Rs.29.13 compared with inbred rice.

During 2011-12, hybrid rice was more profitable by Rs.919.78/ha (2.43 per cent) than HYVs, while in 2010-11, the net return (profit) realized in hybrid rice cultivation was lower by Rs. 2833.93/ha as compared to HYVs.

Higher costs of production along with lower market price realization have contributed to lower profit margin of hybrid rice cultivation as compared to HYVs even with higher grain yield gain of 22.66 per cent for hybrid rice over inbred rice varieties.

This calls for improvement in technology to reduce costs of cultivation and enhancing the quality attributes of hybrid rice.

Quality of Grain

It is evident that hybrids have grain quality features by and large at par with those of varieties of conventional HYVs.

Hybrids have milling and head rice recovery ratios of 61 per cent and 54 per cent respectively. The corresponding figures for HYVs were estimated at 61 per cent and 55 per cent respectively.

Over the years under study, the ratios remained unaltered.

All these suggest that the parameters that primarily influence the adoption of hybrid rice cultivation are almost same across hybrid and inbred varieties of rice.

Major Problems in Hybrid Rice Cultivation

Lack of consumer demand for hybrid rice grain, lower head rice recovery and ultimately lower price received in the market are the major problems faced by the hybrid growers.

Other problems reported by the adopters included poor cooking and keeping quality (83.75 per cent), poor grain quality and as a result lack of market acceptance (86.25 per cent), traders not accepting hybrid rice grain lack of demand from millers and consumers (83.75 per cent) and more broken rice after milling (56.25 per cent).

Cent per cent of the sample farmers unanimously reported that there was yield gain in hybrids over connectional HYVs (inbred). Also hybrid rice production was reported to be profitable as conceived by 78.75 per cent of sample farmers.

Nearly 96 per cent of the sample farmers reported that grain quality of hybrid rice is poor compared with the grain quality of the existing popular HYVs of rice.

Reasons for Non-adoption of Hybrid Rice

The main reasons for non-adoption of hybrids are

Lower price of hybrid rice as compared to inbred

Poor extension activities by the government for the popularization of hybrids

Un-availability of quality hybrid seed

Higher seed cost

Higher yield loss for hybrids due to pests and diseases

Higher risks associated with hybrid rice cultivation.

Though higher seed cost is considered a constraint, it was given the least importance compared with other constraints.

The foremost constraint confronting the diffusion of hybrid rice technology is poor grain quality and as a result lack of market acceptance leading to lower price fetched for hybrid rice as compared to inbred variety.

Conclusion

Analyses showed that the higher yield potential of hybrid rice is clearly demonstrated in farmers' fields.

This technology has good potential to increase rice yield provided quality seeds are made available at reasonable prices in right time.

Since hybrid rice cultivation is a very new proposition to the farmers, efforts may be made to continue the technological and other supports to the innovative farmers for widespread adoption of hybrid technology.


Thank you