

Return on hybrid rice *Agriculture*

By Dr Ali Muhammed
Khushk and
M. Ibrahim Lashari

TWO varieties of hybrid rice GNY 50 and 53 have been introduced in Sindh and Balochistan. These varieties have become popular and created so much demand among growers and consumers that the government had to approve their commercial cultivation.

The performance of hybrid rice and other conventional varieties was ascertained through a field survey of major rice-growing areas in Sindh and Balochistan. The study is based on random interviews of rice growers who had planted hybrid rice during 2008-09.

The data was collected through interviews on farm size, varieties adoption, and inputs and output costs. The analytical techniques such as farm cost analysis and gross margin analysis have been carried out to assess the performance of hybrid rice and other conventional varieties.

Area under rice varieties: The area planted under major rice varieties by selected growers were analysed which is as follows:

Overall hybrid rice was planted on 23.12 per cent area, of which 19 per cent was hard's hybrid and 4.11 per cent other hybrid rice varieties. However, among the conventional varieties IRRI-6 was the most common and planted on about 56.68 per cent area, followed by B-2000, Shandar, Sarshar, DR-83, Rosi and other local varieties planted on 9.53, 4.05, 2.31, 1.35, 1.27 and 1.70 per cent areas respectively.

The survey revealed that by cropping zone, hybrid rice varieties in lower Sindh were

cultivated hybrid rice obtained highest gross margin (Rs56,742/ha), whereas gross margin of rice growers who cultivated IRRI-6 variety seem to be the lowest (Rs40,964/ha) than other conventional varieties B-2000 (Rs48,432/ha) and Rosi (Rs48,446/ha).

Comparing the average gross margin of hybrid rice by cropping zones, it is apparent that the gross margin of lower Sindh is higher (Rs70,167/ha) than upper Sindh (Rs55,758/hectare) and Balochistan (Rs51,693/ha).

According to the average total variable costs, there is no

IRRI-6.

Rice growers who cultivated hybrid rice attained the highest average gross margin during the year 2008-09 (Rs56,742/ha) while growers who cultivated other conventional varieties i.e. IRRI-6, B-2000 and Rosi varieties earned an average gross margin of Rs40,964, Rs48,432 and Rs48,446/ha respectively.

The study revealed that hybrid rice has a distinct yield advantage over conventional varieties. In fact, the production cost of hybrid rice is higher due to high cost of seed and higher need of chemical fertil-

have a single shaft of grain on them.

The seed companies are importing hybrid seed from China and there are wide differences in soil and climatic conditions of Pakistan and China. It is suggested that provincial agriculture department should test such varieties on their research farms to check whether the imported seed is suitable for our soil and climatic conditions." The agriculture department should also certify such varieties before their cultivation.

There is a need to conduct a research to find out the suitable

ing on early and late maturing varieties. Course grain varieties are early maturing while fine grain varieties are late maturing.

It has been found that total rice area, 62 per cent is under fine varieties and 27 per cent under course grain varieties, and 11 per cent under others varieties.

Moreover, about 96 per cent of fine varieties are grown in Punjab because there is suitable climate for maintaining the quality and aroma of these varieties. The yield of fine varieties is much lower than the course grain varieties but the demand is high in the national and international markets. Most of the farmers prefer to grow fine varieties despite low yield, high production cost and more water requirement.

Hybrid rice was first commercially cultivated in China in 1976 and its area had been expanded to more than 13 million ha in 1990. During the last decade, Vietnam, India, Philippines, Bangladesh and United States have also started its commercial cultivation.

Hybrid rice not only has a distinct yield advantage over inbred varieties but also is more responsive to fertiliser and can adapt to varying environments.

Contrary to these advantages, certain disadvantages have also been reported in China and other growing regions. In India hybrid rice had a 15 per cent yield gain over the inbred varieties, but that it got lower prices in the market because of poor grain quality. There are evidences to show that farmers cultivating hybrid rice realised higher yield gains at 16 per cent over current inbred varieties in similar agro-climatic zones of Karnataka and Andhra Pradesh. However, in Orissa and Tamil Nadu, India; hybrid rice gave lower yield due to pests and disease attack compared with

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significant difference between the hybrid rice and other major varieties. The highest variable cost was recorded Rs43,986/ha in hybrid rice and lowest variable costs were reported in Rosi variety Rs30,428/ha. However, the average total revenue between hybrid rice and other conventional varieties is significantly different (hybrid rice Rs100,728/ha, IRRI-6 Rs 78,983/ha, B-2000 Rs81,370/ha and Rosi Rs78,874/ha).

Considering the average total variable costs of hybrid rice by cropping zone, it shows that in lower Sindh the total variable cost was higher (Rs54,411/ha) than in Balochistan (Rs41,710/ha) and upper Sindh (Rs41,278/ha), because the hybrid rice production has very high total labour

iser coupled with lower market prices for hybrid rice.

Overall, the profit of hybrid rice was higher than the conventional varieties due to high yield per acre. Results show that hybrids rice is more profitable in lower Sindh compared to upper Sindh and Balochistan due to favourable climatic condition. The cost of hybrid seed is relatively higher than ordinary seeds, which is discouraging small farmers to take advantage of this new technology. Rice growers have to depend on seed companies to buy hybrid seed in every season.

Majority of the rice growers were unwilling to adopt hybrid seed due to its scarce availability during the last two years, particularly in upper Sindh and Balochistan. It was reported that paddy fields were lush

with the climatic and soil conditions of the area where the hybrid seed varieties are being cultivated to stabilise the yield advantage across the location.

The production cost of hybrid rice could be cut by reducing the cost of hybrid seed, chemical fertiliser and pesticide prices.

Rice is an important food crop and one of the main export items accounts for 6.1 per cent of the value-added in agriculture and 1.3 per cent to the GDP. The country in respect to area and production of rice ranks 10th and 14th in world respectively.

Rice enjoys a good position in the economy as the second food source after wheat and an important foreign exchange earner.

total varieties planted on 9.53, 4.05, 2.31, 1.35, 1.27 and 1.70 per cent areas respectively.

The survey revealed that by cropping zone, hybrid rice varieties in lower Sindh were more popular than total hybrid rice area on selected farmers' field. Out of which 40 per cent was under Guard's Hybrid rice, followed by 22 per cent in Balochistan, and 18 per cent in upper Sindh of total hybrid rice area. While in upper Sindh, growers preferred conventional varieties.

The reason of more area under conventional varieties in upper Sindh and Balochistan, was, as reported, mainly because of poor performance of hybrid seed during the last two years.

Yield and prices: The average yield and prices of hybrid rice and other conventional varieties are as follows:

Overall highest yield obtained was 195 mds/ha from hybrid rice followed by IRRI-6 (151 mds/ha), B-2000 (91 mds/ha) and rosi (94 mds/ha). By cropping zone, growers from lower Sindh received more yield 227 mds/ha from guard's hybrid rice compared to upper Sindh 190 mds/ha and Balochistan 185 mds/ha.

The reasons behind obtaining more yield, as reported, were that in lower Sindh the climate was suitable for hybrid rice varieties. As prices were concerned, the growers received lower prices for guard's hybrid rice Rs516/40 kg as compared to IRRI-6 Rs 524/40 kg. The reasons of lower price for guard's hybrid rice were its poor quality and increased percentage of broken rice and variation in grain size.

Gross margin of hybrid rice & other varieties: The analysis of gross margin has been derived from the difference between total revenue and total variable costs.

Total variable costs are calculated from the summation of total labour costs and total factor cost. The results presented in Table shows that rice growers in selected region who

variable cost was higher (Rs54,411/ha) than in Balochistan (Rs41,710/ha) and upper Sindh (Rs41,278/ha), because the hybrid rice production has very high total labour costs compared to other conventional variety especially

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respectively.

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It is one of the highest water requirement crop and depend-

at 16 per cent over current inbred varieties in similar agro-climatic zones of Karnataka and Andhra Pradesh. However, in Orissa and Tamil Nadu, India; hybrid rice gave lower yield due to pests and disease attack compared with inbred varieties.

Table 3. Gross Margin of Hybrid Rice and Other Varieties, 2008-09

Unit	Region	Guard' Hybrid Rice	Conventional Varieties		
			IRRI-6	B-2000	Rosi
Total Revenue	Upper Sindh	97036	78439	81370	78874
	Lower Sindh	124578	85917		
	Balochistan	93404	75968		
	Average	100728	78983	81370	78874
Total Variable Cost	Upper Sindh	41278	35822	32938	30428
	Lower Sindh	54411	42748		
	Balochistan	41710	37710		
	Average	43986	38019	32938	30428
Average total labor cost	Upper Sindh	12145	11955	12493	12810
	Lower Sindh	20759	17559		
	Balochistan	11468	11305		
	Average	13726	13156	12493	12810
Average total factor cost	Upper Sindh	29133	23867	20445	17618
	Lower Sindh	33653	25189		
	Balochistan	30243	26405		
	Average	30260	24863	20445	17618
Average gross margin	Upper Sindh	55758	42617	48432	48446
	Lower Sindh	70167	43168		
	Balochistan	51693	38258		
	Average	56742	40964	48432	48446