

Economics of Hybrid Rice Seed Production in India

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Introduction

- ❖ Area under rice was 43.66 mha with a production of 91.79 mt during 2006-07
- ❖ It is projected that India needs to produce 120 mt of rice by the year 2020
- ❖ Hybrid rice is practically feasible and readily adoptable genetic option to increase the rice production

National Project on Hybrid Rice

- Indian Council of Agricultural Research (ICAR), New Delhi, launched a national project on hybrid rice in 1989
- The project was implemented through a network comprising of 12 centers located across the country
- Coordinated by Directorate of Rice Research, Hyderabad
- Has another 20 voluntary centers represented by public, private and NGO sectors

Rapid expansion of area under Hybrid rice

- The area under hybrid rice had increased from 0.1 million hectare in 1995 to 1.2 million hectares in 2007
- It is projected that the area under hybrids will go up to 3 mha by the year 2010 and 6 mha by 2020
- This trend reflects a commendable performance and accelerated adoption of hybrid rice in India

Scenario of hybrid rice seed production

- The large-scale adoption of hybrid rice depends on the efficient and economical hybrid rice seed production
- Hybrid rice seed production in the country, starting with less than 200 tons of total production in the year 1995 has crossed 19,000 tons in 2007
- The requirement of hybrid rice seed during 2010 and 2020 is expected to be around 50,000 tons and 1,00,000 tons respectively

Role of Private Sector in Hybrid Rice Seed Industry

- Presently in India more than 95 % of the hybrid seed is being produced by the private sector
- Totally around 30 private sector seed companies (10 large and 20 medium to small) are presently engaged in large scale hybrid rice seed production
- The private seed companies leading in hybrid rice seed production are Pro-Agro, Pioneer, Mahyco, Bioseed, J.K.Seed, etc.

Seed Production in Andhra Pradesh

- Farmers in Northern Telangana region of Andhra Pradesh, India have taken up hybrid rice seed production
- Seed companies are providing back end and front end support to the seed growers by means of supplying seed and other crucial inputs like GA3
- Also offering technical expertise and guidance to hybrid rice seed producers by making visits to the fields at regular interval during the crop season
- The hybrid seed thus produced is procured by seed companies
- Seed producers in turn are reaping benefits from this technology

A case study of economics of hybrid rice seed production in Andhra Pradesh

- A study was conducted in Karimnagar and Warangal districts of Andhra Pradesh, where about 85% of the hybrid rice seed is produced in India
- Farm level data from hybrid rice seed producers who also cultivated high yielding variety of rice, were collected through surveys
- The data pertain to the year 2006-07
- Sample size was 96 seed growers

Cost comparison of hybrid rice seed production vis-a-vis HYV cultivation (US\$ per hectare)

Inputs	HRSP	HYV
Seed	17.77	18.96
Organic Manure	34.41	34.41
Chemical fertilizers	144.57	118.50
Plant Protection Chemicals	32.91	21.68
Irrigation costs	2.96	2.96
Human labour charges	331.68	226.92
Bullock labour cost	28.44	21.33
Machinery cost	142.20	127.98
Total costs	734.94	572.74

Additional costs for hybrid rice seed production (Per hectare)

Particulars	Amount (US\$)
GA-3	17.77
Human labour for GA3 application	6.63
Supplementary pollination	136.51
Rouging	21.33
Total additional costs	182.24

Employment Potential

- Hybrid rice seed production requires 61 person days per hectare more than that of high yielding variety rice cultivation
- Thus it requires about 45 percent more labour than the cultivation of improved varieties
- The labour intensiveness of hybrid rice seed production has created employment opportunities in rural areas where hybrid rice is taken up
- During the year 2007, the additional employment being generated, is estimated to be around 10,80,000 person days

Returns from HYV Cultivation

Grain yield (Kg/ha)	5730
Market price (US\$./t)	159.71
Straw value (US\$./ha)	49.77
Returns from grain (US\$./ha)	915.15
Total Returns (US\$./ha)	964.91

Returns from Hybrid Rice Seed Production

Hybrid seed yield (Kg/ha)	1935
Seed price (US\$/Kg)	0.70
Hybrid seed value (US\$/ha)	1354.5
Restorer Yield (Kg/ha)	1824
Price (US\$/Kg)	0.16
Restorer value (US\$/ha)	291.84
Straw value (US\$/ha)	44.17
Total returns (US\$/ha)	1690.51

Profitability of Hybrid Rice Seed Production

Particulars	Hybrid rice seed production	HYV cultivation
Gross returns (US\$/ha)	1690.51	964.91
Net returns (US\$/ha)	773.33	392.17
BC ratio	1.84	1.68
Cost of seed production (US\$/Kg)	0.47	—

Conclusions

- Hybrid rice a key strategy to maintain food security
- Availability of quality seed at an affordable price is essential for large scale adoption of hybrid rice technology
- Since the benefit cost ratio of hybrid rice seed production is 1.84, it can be considered as an economically viable technology

Conclusions (contd)....

- At present large scale hybrid rice seed production is concentrated in only two districts of Andhra Pradesh, viz., Karimnagar and Warangal
- More than 90 % of the hybrid seed is being produced in this region
- With increase in demand for hybrid seed, additional areas are required for seed production
- Therefore, there is an urgent need to identify new areas suitable for large scale seed production in other states to meet the projected future demand for hybrid rice seed

Thank You