

## A Study into Economics of Adopting a Technological Change in Agriculture

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### ABSTRACT

A study undertaken to evaluate the economics of cultivating Hybrid Bajra-1 strain in Coimbatore taluk revealed that there was a general tendency for the adopter farms to invest more on various input factors than the non-adopters. Adopter farms realised a higher income due to the cultivation of hybrid Cumbu and the gross income and profit per acre were higher in adopter farms.

### INTRODUCTION

In all the developing countries, the use of high fertility and high yielding strains coupled with package of practices is a major means for increased production. Speedy and extensive introduction of technological change is now recognised as crucial in India's agricultural development. Hence studies on the economics of adopting technological change are essential to introduce innovations which are holding promise of additional gain. This study was undertaken to evaluate the economics of cultivating Hybrid Bajra-1 strain in garden land farms of Coimbatore taluk.

### MATERIALS AND METHODS

A random sample of ten villages were selected from the 81 revenue villages in Coimbatore taluk. From the list of farmers who had grown hybrid and local cumbu 60 farmers who were growing hybrid cumbu (adopters) and 40 farmers who were growing local cumbu

(non-adopters) were selected at random at the rate of six farmers in each village in the first category and four farmers in each village in the second category. The data were collected by survey method and related to the agricultural year 1966-67 (Fasli, 1376).

### RESULTS AND DISCUSSION

The cost of production of hybrid cumbu and local cumbu is presented in Table 1.

The results showed that the amount spent on preparatory cultivation was almost the same in both the cases. As both the types of cumbu crop were grown under irrigated condition and were of same duration, the amount spent did not differ much. But the percentage of amount spent on this operation to the total cost of cultivation was more in the case of non-adopters than adopters. This showed that eventhough hybrid cumbu was a high yielding strain it did not require any extra expenditure for preparatory cultivation.

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TABLE 1. Difference in the cost of cultivation of cumbu

Items	Adopters (Rs./acre)	Non-adopters (Rs./acre)	Difference (Rs./acre)
Preparatory cultivation	54.13	51.09	3.04
Manures and manuring	238.95	124.20	114.75 **
Seeds and sowing	33.53	5.22	28.31 **
Irrigation	26.65	20.88	5.77 **
After cultivation	40.90	30.17	10.73 **
Harvesting and Processing	54.80	46.98	7.82 **
Total	448.96	278.54	

\* Significant at 0.05 level

\*\* Significant at 0.01 level

The cost on manures and fertilizers were significantly higher in the case of adopters and the percentage of amount spent to total cost of cultivation was comparatively more in the case of adopters resulting in more than 50 per cent of the total cost of cultivation on manures and manuring. Thus it is apparent that adopters had applied more manures and fertilizers to hybrid cumbu commensurate to its high fertility nature.

The hybrid cumbu growers had spent a significantly higher amount on seeds and sowing and the percentage of amount spent to the total cost of cultivation was 7.5 in the case of adopters while it was 1.9 in the case of non-adopters. The wide difference was due to differences in prices of the seeds and nature of cultural practices. Hybrid seeds cost Rs. 10.50 per kilogram whereas the cost of local cumbu seeds was Rs. 3.00 to Rs. 4.00

per kilogram. Further hybrid cumbu was raised in the nursery and was transplanted while local cumbu was raised by broadcasting.

The adopters spent significantly a higher amount on irrigation, after-cultivation, harvesting and processing operations. A significantly higher cost in the case of after-cultivation in adopters was due to their resorting to plant protection measures to a greater extent than the non-adopters. The percentage of amount spent on all the operations to the total cost of cultivation was more in the case of non-adopters than the other group of farmers. This showed that even though a higher cost of cultivation was involved on all these operations in the cultivation of hybrid cumbu, yet they constituted 27.2 per cent only on the total cost of cultivation while it was 35.2 per cent in the case of non-adopters.

**Production Efficiency:** Efficiency in general refers to the ratio of output to input. One technique of production is said to be more efficient than another when it yields a greater output per unit of input used. In order to evaluate the efficiency of production of cumbu between these groups of farms, the cost of production, income and profit per acre for adopters and non-adopters were worked out and presented in Table 2.

TABLE 2. Efficiency factors in cumbu cultivation.

Particulars	Unit	Adopters	Non-adopters
Gross income	Rs.	891.58	391.21
Total cost of production	Rs.	706.04	508.25
Profit or loss	Rs.	185.54	-117.04
Yield	Kg.	1038.8	485.1
Cost of production per unit, per kg	Rs.	0.68	1.05
Input-output ratio	—	1.26	0.77

The results revealed that there was an increase of Rs. 197.79 in the cost of production of hybrid cumbu as compared to local cumbu. But the gross income per acre was Rs. 891.58 in the case of adopters whereas it was only Rs. 391.21 in the case of non-adopters. Thus there was a difference of Rs. 500.37 in gross income per acre between adopters and non-adopters. As such the additional costs that accrued were more than compensated by the additional

returns obtained by the adopters. The adopters had a profit of Rs. 185.54 per acre while the non-adopters incurred a loss of Rs. 117.04 per acre. The fact that cultivation of local cumbu was uneconomical in this tract was in agreement with the farm management studies conducted in Tamil Nadu State by the Directorate of Economics and Statistics, Government of India (1956-57).

It was found that on an average there was an increase in yield by 553.7 kg in the case of adopters as compared to non-adopters indicating that hybrid cumbu yielded 114 per cent over and above the local cumbu varieties. This aspect of the particular technological change causing an increase in yield is in general agreement with Patil (1965).

The cost of production of one kilogram of cumbu was Rs. 0.68 for adopters as against Rs. 1.05 for non-adopters. The return per unit of input was greater in the case of adopters (1.26) than non-adopters (0.77). This clearly showed that adopters were getting increased returns while non-adopters were getting decreased returns. Hence it could be concluded that by growing hybrid cumbu instead of local cumbu, the adopters operated more efficiently than non-adopters.

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