An Appraisal of Various Economical Models of Rice Production in District Sargodha-Pakistan

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Abstract

After wheat and cotton, rice is third crop, which is mostly growth in Pakistan. Its production is facing difficulties like shortage of land, and low availability of water. So to improve production, low cost, mild cost and high cost technologies can be used along with farmer's practice to increase production. Plant population, rate of fertilizer and weeding are classified in these technologies. Farmers practice gave paddy yield up to 1439 Kg/acre and low cast technology gave 1719 Kg/acre.

Mid cost and high cost technologies gave 2189 and 2439 Kg/ acre paddy yield respectively the increase in low cast technology increased yield by 19.5%, mid cost by 47.5% and that of high cost by 63.7% over farmer's practice. Economic implications suggested that net profit was highest where ratio of marginal revenue and cost is one. On this basis, farmer's can be advised to add more inputs included in high cost technologies. Course yield at the high at the research station was average about 800 Kg/ hectare.

Introduction

Rice is the third major crop of Pakistan. After wheat and cotton, rice is produced on most of the harvested land. It occupies almost 10% of total food production (Agriculture Statistics of Pakistan, 1995). Rice has attained good position in Pakistan's export commodities and so, it is major source of foreign exchange but still facing a tough competition from other major exporters of rice like Thailand, Vietnam and India (Govt. of Pakistan, 1990-2000). Due to over increasing cash crops is becoming deficient. An other major factor, which is problem in rice production, availability of water. The total amount of available water at farm gate is 122.12 million acre feet, out of which share of canal water is 6.3% and rest of 37% comes from tube wells. The availability of water at farm gate is expected to decrease further due to situations of dams. Water scarcity is bigger problem in rice production as compared to deficiency of land (Govt. of Pakistan, 1999-2000).

Keeping in view the problems in rice production there is intensive need of adoption of different scientific technologies to enhance rice production. the objectives of this research were to improve rice production, to delineate technologies for improving productivity and economical analysis of all technologies used during rice production.

Materials and Methods

Rice such a mix is proper combination of inputs such as plant population, fertilizer and weeding which were classified into low cost, mid cost and high cost technologies. There technologies were practiced along with farmer's practice at the Sargodha Adaptive Research Farm. Plant Population, rate of fertilizer and weeding is given Table 1.

Table 1. Technologies for higher rice productivities

Technology	Plant population (Plants/ acre)	Fertilizer N, P (Kg/ acre)	Weeding No./ acre
Farmers Practice	50000	27 12	1(50 DAT)
Low cost technology	50000	34 23	1 (35 DAT)
Mid cost technology	65000	41 27	2 (20& 45 DAT)
High cost technology	80000	55 34	2 (20 & 45 DAT)

*   = Nitrogen
*P = Phosphorus

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The production of rice obtained by three different technologies was subjected to statistical as well as economical analysis. The economic implications of all three technologies along with farmers practice was also calculated by using marginal revenue and marginal costs on the basis of production and economic implications all technologies were compared with each other.

Results and Discussion

Plant population, rate and fertilizer (Kg/ acre) and weeding (No/ acre) in farmer's practice, low cost technologies mid and high cost technologies, are summarized in table 1. The paddy yield obtained by farmer's practice was 1439 Kg/ acre. The yield obtained by low cost technology was 1719 Kg and that of by mid and high cost technologies was 2198 Kg and 2439 Kg respectively (Table 2).

Table 2. Production of Rice by Production Technology

Technique	Paddy yield Kg/ acre	Index
Farmers practice	1439	100
Low cost technology	1719	119.5
Mid cost technology	2198	147.5
High cost technology	2339	163.7

It is evident from table 2 that low cost technology increased yield by 19.5%, mid cost technology by 47.5% and high cost technology by 63.7%, over farmer's practice. Statistical analysis revealed that low, mid and high cost technologies significantly increased yield over farmer's practice but high cost technique was significantly proved better. Farmer's will compare additional cost and additional income from each technology. A technology which is giving maximum results from farmer's point of view is considered better (Peri, 1999).

So it is necessary to compare cost and return relationship for all production technologies. This comparison was made by using marginal cost, total revenue, and marginal revenue as depicted in table 3.

Table 3. Cost and Returns Relationship for Various Production Technologies

Technology	Total various cost	Marginal cost	Revenue cost	Marginal revenue	MRR MR*/ MC**
Farmer's practice	1525	-	7198	-	-
Low cost technology	1825	260	8596	1400	3.88
mid cost technology	2547	902	10990	2394	2365
High cost technology	3050	763	12196	1206	1.58

The marginal analysis of al technologies revealed that the net profit is highest where ratio of marginal revenue and marginal cost is equal to one. On this basis farmer's practice can be advised to add more inputs than include in high cost technology. The farmers may be advised to add more inputs till marginal rate of revenue (MRP) is equal to one (Ostuka and Hayami, 2000). The course yield of rice at the research station was averaged about 80000 Kg/ ha). This yield can be increased economically provided the inputs are added in proper mix. More over to enhance the yield, cross sectional data can be collected from the field for various levels of productivity along with corresponding inputs (Petzel and Munce, 2000). The field data can be used to work out production functions and to increase yield.

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