EFFECT OF FARMER FIELD SCHOOLS ON SUGAR CANE PRODUCTIVITY IN MALAKAND AGENCY

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ABSTRACT

Farmer field schools (FFS) are always aimed to help farmers to discover and learn about field ecology and integrated crop management. A study for sugarcane crop was conducted in 4 FFS villages namely Zoormandai, Baghicha, Sarogai and Haji Gulzada Kalay of Malakand Agency during 2004-05. From each FFS, 10 farmers were selected on the basis of equal allocation making sample size of 40. The research was based on primary as well as secondary data. Primary data were collected from farmers while secondary data were taken from Agriculture Extension Department, Dargai, Malakand Agency. Extensive interview schedule was designed and each farmer was interviewed personally. The study was based on comparison of cost, yield and income of sugarcane with and without FFS. Paired t-test and statistical package for social scientists (SPSS) were used for analysis. Results of this study show that Best Agricultural Practices (BAP) has brought a positive change in the attitude of farmers of the project area through FFS approach. In sugarcane 77.5% of the respondents were between the age of 20 to 40 years, 25% of the respondents had education of primary level, 20% middle, 20% matric level, 22% at intermediate level and 12.5% at graduate level. Average land holding size was 8 acres, while 80% of the respondents were satisfied with FFS approach. Cost of fertilizer, crop protection and herbicide was reduced by 59.25%, 13.9%, and 1.04% respectively while sugarcane yield was increased by 3469.5 kg acre^{-1}.

Keywords: Agriculture, Agro-Ecosystem Analysis, Extension Education, Malakand Agency, Sugarcane

INTRODUCTION

Extension methods are effective means of communication to provide knowledge and skills, so that the learner may see, hear, and do the things conveyed by extension worker. Furthermore, extension methods stimulate adult youth male and female for action. The Farmer Field Schools (FFS) model aims to help farmers to discover and learn about field ecology and integrated crop management. On the basis of this knowledge, farmers become independent, confident decision makers and experts in their own fields (Fliert and Vande-Fliert 1993). The training is 'hand on' and is carried out almost entirely in the field. The four major principles within the training courses are:
(1) Grow a healthy crop (2) Observe field weekly (3) Conserve natural enemies of crop pest and (4) Understand ecology and become experts in their own fields.

A corner stone of the FFS methodology is Agro-Ecosystem Analysis (AESA). This involves regular (usually weekly) observations of the crop. Participants work in sub groups of 4 or 5 and learn how to make and record detailed observations of growth stage of the crop, insect pest and beneficial numbers of insect and weeds and disease levels, weather conditions, soil condition and overall plant health. The farmers then take management decisions based on these observations. An important aspect of FFS is helping and encouraging farmers to conduct their own experiments and to test the ecological crop management methods. A common exercise is comparing through Agro Eco System Analysis. Farmers pay particular attention to pest (including diseases and weeds) and natural enemy population and general plant health. At the end of the season they record yield and calculate input cost and profit margin. The objectives of this study were to examine the change in productivity of the sugarcane, determine increase in per acre yield of the crop, find out reduction in per acre input cost, assess increase in profit margin per acre and formulate recommendations based on the study findings.

MATERIALS AND METHODS

The study was conducted in Malakand Agency having two Tehsils i.e. Sama Ranizai and Swat Ranizai during 2004-05. Main crop of Swat Ranizai is rice, while that of Sama Ranizai is sugarcane and tomato. The area was selected due to the establishment of FFS by Malakand Rural Development Project (MRDP) through a specific project Best Agriculture Practices (BAP) on sugarcane. Malakand district comprises of almost a little over100 villages. It was not possible to entertain all the villages. Therefore, on the basis of equal allocation, four villages growing sugarcane crop were studied which were Baghicha, Sarogai, Zoormandai and Haji Gulzada Kalay.

A list of all FFS participants was obtained from sugarcane FFS villages. From each FFS on the basis of equal allocation 10 farmers were selected purposely on education basis. The total numbers of the respondents were 40. This research was based on primary data as well as secondary data. The primary data were collected from the farmers and secondary data was obtained from Agriculture Extension Department Dargai, Malakand Agency.

Interview schedule was designed in such a way to collect complete and correct information. It was pre-tested to check validity and reliability and to add and omit the relevant and irrelevant questions respectively. Each respondent was personally interviewed. During the interview the purpose of the study was also explained to the respondents.

The study focused at comparison of cost, yield and income of sugarcane with and with out Farmer Fields Schools (FFS). For this purpose paired sample difference or paired t-test was applied. The comparison was made for the crop to test whether the difference was significant for cost, yield, and income before & after FFS. The collected data were analyzed after sorting, with help of statistical package for social scientists (SPSS). The averages and percentage were worked out for each category separately. An interview schedule provided in annexure 1 was used to collect data on production and cost.

RESULTS AND DISCUSSION

Age Level of the Respondents

It has been shown in different researches conducted on various social problems, that age plays an important role in dissemination, adoption and diffusion of any innovation. In other words adoption and diffusion of invention are positively correlated with age. Younger is the person more is the adoptability and acceptability. Consequently upon which diffusion rate is accelerated. Similarly, young farmers adopt and accept new technology quicker than the old farmers. For example, in Indian Tamal Nado State, Bamboo tube well technology was introduced and adopted by majority of the young farmers (80%) (Crishan, 1982). In sugarcane 77.5% of the respondents were between the age group of 20–40 years, maximum (42.5%) respondents were in the age group of 30-40 years as shown in Table I below.

Education

Education is considered to play a vital role in human resource development. It influences the pace of development by providing skills, knowledge and problem solving techniques. Educational level of the respondents helps in judging the quality of human resources and developing stage of society as it broadens the vision of the community. Education is an important factor which has a positive influence on human behavior either directly or indirectly. Educated people are expected to have more favorable attitude towards agricultural skills, knowledge and information as compared to uneducated ones (Hassan, 1991). Therefore, it was necessary to collect the data about this aspect to visualize the picture of educational level.

The sample respondents were one major category, namely literate. The literate respondents were further classified as primary, middle, matric, intermediate and graduate. Number of respondents belonging to each of the above stated categories is presented in the Table II, which shows that 25% of respondents had education of primary level, 20% of middle, 20% of matriculate level and only 35% of the respondents had their education level of above matric.

Land holdings

Table III shows that the total land for sugarcane growers was found to be 378 acres out of which 331 acres are irrigated and 47 acres are unirrigated which makes 87.5% irrigated and 12.43% unirrigated respectively.

Input cost before FFS

Table IV shows the total input cost for sugarcane crop production and protection before FFS was Rs.21392.25. Before FFS the average cost for seed was Rs.6425 (30.03%), fertilizer cost was Rs.6722.5 (31.42%), crop protection cost was Rs.784.5 (3.67%), FYM cost was Rs.7025 (32.84%) and that of herbicide was Rs. 435.25 (2.03%). These results of crop production and herbicide cost are in confirmity with the findings of Gyali and Salokhe (1997) and Ciszinszky (1981).

Input cost after FFS

Table V shows the total input cost of sugarcane crop production and protection after FFS was Rs.25581.72. While the average cost of seed was Rs.8750 (34.2%), fertilizer cost was Rs.4240 (16.5%), crop protection cost was Rs.200 (0.78%), FYM cost was Rs.12000 (46.9%) and herbicide cost was 391.72(1.5%). These results of fertilizer for sugarcane are in conformity with the studies of Orlando and Zambello (1980). Mangan (1997) reported similar results while the outcome of fertilizer cost and use are also in conformation with the findings of Csizinsky (1981).

The difference before farmer field school and after farmer field school (FFS) for crop production and protection the total input cost for sugar cane were Rs.4190 while average cost for seed was Rs.2325.8 (55.52%), for fertilizer, Rs.-2482.5 (59.25%) for crop protection was Rs.-584.5 (13.9%), for FYM was Rs.4975 (14.79%) and for herbicide it was Rs.-43.53 (1.04%) (Table VI).

Before farmer field school the seed rate for Sugar cane surveyed was found to be 2570 kg $acre^{-1}$. After farmer field school the farmer of sugar cane growers were able to plant their crops at seed rate of 3500 kg $acre.^{-1}$ Sugar cane production based on paired t-test showed a significant enhancement in seed rate with a difference of 930 kg $acre^{-1}$. The

results of plant population are also in conformity with that of Lesin (1954) (Table VII).

Before farmer field school the farmer in study area for sugarcane obtained yield 17830.5 kg acre^{-1} with net income of Rs.44575. After farmer field schools the farmers were able to obtain the sugarcane yield of 21300 kg $^{-1}$ acre with a net income of Rs.53250. Statistical analysis of the data for sugarcane showed a significant enhancement both for yield and income with a difference in yield 3469.5 kg acre^{-1} and in income Rs 8675 (Table VIII). These results of high yield in sugarcane are in conformation with the finding s of Loesin *et al.* (2000).

The FFS approach caused significant difference for sugarcane using paired t-test (Table IX).

CONCLUSIONS

Results of this study show that BAP have brought a positive change in the attitude of farmers of the project area through FFS approach. The role of FFS introduced by Malakand Rural Development Project in the development of agriculture was worth mentioning. It has brought improvements in crop yield of sugarcane and their income through vi.

FFS approach. The trainees were made aware of the FFS approach through formal and informal methods. The study is useful document for future programmes of such nature.

RECOMENDATIONS

i. BAP should spread their developmental activities for maximum participation of the entire rural masses through participatory FFS approach.

ii. Most of the public sector organizations working for FFS approach at provincial/federal level should be forced to coordinate their activities for boosting their work and reduced expenditure in this regard.

iii. Many FFS should be planned as a result of this study as it shows that most of the respondents have adopted new knowledge to the best possible extent through this approach.

iv. The FFS facilitator and coordinator should be more skilled and practical oriented so that farmers face no problems.

v. The FFS approach should be extended to other parts of the province as increase in yield and decrease in input cost was observed in the present study.

Table I ***Distribution of respondents on age level basis, 2004-05, Malakand Agency***

Age Group	No. of Respondents	% age
Below 20	-	-
21-30	14	35
31-40	17	42.5
41-50	9	22.5
51-60	-	-
Total	40	100.0

Source: Field data

Table II ***Distribution of respondents on the basis of education level.***

Education Level	No. of Farmers	% age
Primary	10	25
Middle	8	20
Matric	8	20
Intermediate	9	22.5
Graduate	5	12.5
Total	40	100

Source: Field data

Table III ***Distribution of respondents regarding distribution of land (acres)***

Major crop	Irrigated land	Un irrigated land	Total
Sugar cane	331 (87.57%)	47 (12.43%)	378

Source: Field data

Table IV ***Crop production and protection input average cost/acre i.e., seed cost (SC), fertilizer cost (FC), crop protection cost (CPS), FYM cost and herbicide cost (HC) in rupees, before FFS.***

Crop.	SC	FC	CPS	FYM Cost	HC	Total
Sugar cane	6425.00	6722.5	784.5	7025.00	435.25	21392.25
Percent Cost	30.03	31.42	3.67	32.84	2.03	

Source: Field data

Table V ***Crop production and protection input average cost i.e., seed cost (SC), fertilizer cost (FC), crop protection cost (CPS), FYM cost and herbicide cost (HC) after FFS (Rs).***

Crop.	SC	FC	CPS	FYM cost	HC	Total
Sugar cane	8750	4240	200	12000	391.72	25190
Percent cost	34.2	16.5	0.78	46.9	1.5	

Source: Field data

Table VI ***Difference of crop production and protection input average cost before and after Farmer Field School (FFS) i.e., seed cost (SC), fertilizer cost (FC), crop protection cost (CPS), FYM cost (Rs).***

Crop.	SC	FC	CPS	FYM cost	HC	Total
Sugarcane	2325.8	-2482.5	-584.5	4975	-43.53	4190
Percent cost	55.52%	59.25	13.9	14.79	1.04	

Source: Field data

Table VII ***Average seed rate(Kg) and plant population/acre before and after FFS and its difference, 2004-05 Malakand Agency***

	Before FFS	After FFS	Difference
Crop	Seed Rate	Seed Rate	Plant population
Sugar cane	2570	3500	+930

Source: Field data

Table VIII ***Increase in yield of produce (Kg) and income (Rs) of farmers.***

	Before FFS		After FFS		Difference	
Crop	Yield	Income	Yield	Income	Yield	Income
Sugar can	17830.5	44575	21300	53250	3469.5	8675

Source: Field data

Table IX ***Pairs sample t – test for sugarcane***

S. No	Paired	Mean	Df	t-calculated	Sig(2-tailed)
1	Seed rate before FFS	2570.000	39	-23.992	0.00
	Seed rate after FFS	3500.000			
2	Seed cost before FFS	650.200	39	-22.078	0.00
	Seed cost after FFS	875.000			
3	Fertilizer cost before FFS	6722.500	39	22.607	0.00
	Fertilizer cost after FFS	4240.000			
4	Crop protect cost before FFS	784.5000	39	22.112	0.00
	Crop protect cost after FFS	200.0000			
5	FYM cost before FFS	7025.000	39	-21.836	0.00
	FYM cost after FFS	12000.000			
6	Yield quantity before FFS	1830.500	39	-17.505	0.00
	Yield quantity after FFS	2308.000			
7	Yield income before FFS	44575.500	39	-17.759	0.00
	Yield income after FFS	53250.000			

Source: Field data

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