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Yield Performance of Advanced Sugarcane Growers of Joypurhat Sugar Mills Area

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ABSTRACT

Yield performance of STP and conventional planted sugarcane were studied among randomly selected 47 advanced sugarcane growers of Joypurhat sugar mills areas with a view to find out the relationship between yield performance and certain individual characteristics such as age, education, farm size, annual income, extension contact, and organizational participation. Results revealed that age has a negative and other five factors have a positive relations with yield performance of both STP and conventional cane, but the data was not significant. However, yield of STP cane was found much higher than conventionally planted cane.

INTRODUCTION

Although sugarcane is one of the major cash-cum-industrial crop of Bangladesh, the yield of this crop is very low, only 41.6 TCH (BBS, 1989). Sugarcane Research and Training Institute has developed a new planting technique called Spaced Transplanting (STP) technology of sugarcane cultivation which can produce upto 162 TCH (Ali *et al.*, 1989). For its higher productive capacity, it was adopted by many advanced cane growers. But there are many social, personal and economic factors which are responsible for achieving the target production range. Rogers (1962) described four essential elements in the analysis of diffusion of innovation. 1) The innovation, 2) its communication from one individual to another 3) in a social system 4) over time. Beal and Sibley (1967) reported a significnt and negative relationship between age and adoption, while positive relationship between education and adoption. They also found positive relationship between extension contact and adoption. However, Hossain (1983) rejected the relationship between age and adoption. Reports have also been published elsewhere on relationship between farm size, income etc and adoption (Hossain, 1983; Hoque, 1984; Rogers, 1962). Therefore, the study was undertaken to findout the yield performance of both STP and conventional cane, and to findout the relationship between yield performance with some selected social, personal and economic parameters of some advanced cane growers.

MATERIALS AND METHODS

The population of this study consisted of all the advanced sugarcane growers of Joypurhat Sugar Mills. Random sampling was done from the list of advanced cane growers supplied by sugar mills. Sampling was done from 6 subzones as shown in the Table 1. A pretested questionnaire was used to collect the information. The data was collected from March to April 1990.

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Table 1. Sampling areas of advanced cane growers.

Name of subzone	Number of farmers
Joypurhat	15
Jamalganj	5
Panchbibi	10
Charkai	6
Fulbari	5
Mangalbari	6

Dependent variable : The yield performance of STP and conventional cane. It refers to the yield of STP cane and yield of conventional cane produced by an individual farmer and expressed as ton cane per hectare (TCH).

Independent variables : Many independent variables are responsible for the production. But in this survey only six factors were studied such as :

a) Age of the farmer : Age of the advanced sugarcane farmer is defined as the period of time in years from his birth to the time of interview.

b) Education : The development of desirable knowledge, skill and attitudes of individual farmer, and was measured by the number of schooling years.

c) Farm size : The farm size was measured in terms of hectare by using the formula :

$$\text{Farm size} = F^1 + F^2 + 1/2\,(F^3 + F^4)$$

Where, F^1 = cultivated area owned by the farmer,

F^2 = Cultivated area taken as lease by the farmer,

F^3 = Cultivated area taken from other on borga system,

F^4 = Cultivated area given to others on borga system.

d) Annual income : Income of an advanced cane growers was measured in taka earned by agriculture and other sources such as business, service etc.

e) Extension contact : Extension contact of a respondent was defined as his extent of exposure to different teaching method for the production technology of sugarcane.

f) Organizational participation : The organization is defined as an association of persons which had a name, a regular set of officers, and at least one face to face meeting in a year. Participation is defined as an individual taking part in an organization. To measure the variables the following scales were followed :

1. No participation = 0
2. Participation as ordinary member = 1
3. Participation as executive member = 2

If an advanced grower had memberships in two or more organizations, his scores were computed by adding the scores obtained from each organization according to the categories of his membership.

Statistical analysis

Data was compiled, tabulated and analised with statistical measures. For exploring the relationship between the yield performance of sugarcane and the selected characteristics, Chi-square (x^2) test was used to explain null hypothesis.

RESULTS AND DISCUSSION

The results obtained were computed and arranged systematically according to independent variables and presented in the Tables 2 and 3. Age group was classified in three categories. Young upto 35 years, middle aged between 36 to 50 years, and old above 50 years. The actual age range was 22 to 72 and the frequencies of young, middle aged and old were 25, 18 and 4 respectively with a standard deviation of 8.7. Education was explained as upto primary, secondary, higher secondary and bachelor degree or above level. The frequencies were 9, 19, 13 and 6 with a standard deviation of 4.9. As the study was conducted in advanced growers level, the farm size was explained differently than the explanation given by BBS. It was explained as small farm upto 2.4 ha of land and big farm above 4.8 ha of land. The actual range was 0.5 to 20 ha. Frequencies of small, medium and big farms were 16, 18 and 13 with a standard deviation of 2.1. According to the annual income of the advanced cane growers, the farmers were classified in three groups. Low income group upto taka 40,000 medium income group taka 40,001 to taka 80,000 and high income group above taka 80,000 per year. The actual range was 25,000 to 2,20,000 and the number of farmers of low, medium and high income groups were 12, 16 and 19 with standard deviation of 2.9. Farmers were also classified in three groups according to the frequencies of extension contacts per month. Low contact 1 to 3, medium contact 4 to 10 and high contact 11 and above contacts per month. According to above categories the number of farmers were 13, 27 and 7 respectively with a standard deviation of 8.4 and a range of 1 to 20. Organizational participation was measured as four groups. No participation, low participation with 1 to 2 scores, medium prticipation with 3 to 4 scores and high participation for 5 and above scores. The actual score range was 0 to 7 and the number of farmer according to the above categories were 13, 18, 9 and 7 respectively with a standard deviation of 4.2.

From these above individual characteristics, it was clearly expressed that the farmers were categorically belongs to the group of innovators and early adopters (Table 2). According to independent variables, average yield performance of STP and conventional cane were arranged, and shown in the Table 3. Young group produced better yield than other groups. It was due to their interests, energies, innovativeness and other related factors. However, the results were not statistically significant. The similar

Table 2. Distribution of advanced cane growers according to the individual characteristics.

Individual	Character	Number of Farmers (N)	%	Standard Deviation (SD)
Age	Young (upto 35 years)	25	53.2	
	Middle Aged (36-50 years)	18	38.3	8.7
	Old (51-75 years)	4	8.5	
Education	Primary	9	19.2	
	Secondary	19	40.4	4.9
	Higher Secondary	13	27.7	
	Degree and above	6	12.8	
Farm Size	Small Farm (upto 2.4 ha)	16	34.0	
	Medium Farm (2.5-4.8 ha)	18	38.3	2.1
	Big Farm (above 4.8 ha)	13	27.7	
Annual Income	Low Income (upto Tk. 40,000)	12	25.5	
	Medium Income (Tk. 40,001-80,000)	16	34.0	2.9
	High Income (above Tk. 80,000)	19	40.4	
Extension Contact	Low (1-3)	13	27.7	
	Medium (4-10)	27	57.5	8.4
	High (above 10)	7	14.9	
Organizational Participation	No Participation	13	27.7	
	Low Participation (1-2 Scores)	18	38.3	
	Medium Participation (3-4 Scores)	9	19.2	4.2
	High Participation (5 and above)	7	14.9	

findings were observed by Hossain (1983). Highly educated farmers, such as degree or master degree level farmers produced the best yield, than primary and secondary level farmers. Thus it is proved that education has a positive impact on yield performance, and closely supports the report of Beal and Sibley (1967). Farm size has no significant effect on yield performance, although small farm owner produced better yield which confirms the reports of Hossain (1981) and Sobhan (1975). Similarly annual income, extension contact and organisational participation had no significant effect on yield performance of STP as well as conventional cane. However a numerically higher yield was obtained from high and medium income and extension exposure group. These

Table 3. Distribution of advanced cane growers according to their independent variables and yield performance of STP and conventional cane.

Independent variables		Number of Farmers (N)	Average Yield of cane (TCH)		x^2
			STP	Conventional	
Age	Young	25	122.9	88.4	
	Middle aged	18	119.4	73.2	0.68
	Old	4	109.4	76.2	
Education	Primary	9	103.0	71.4	
	Secondary	19	120.3	74.9	
	Higher secondary	13	125.6	81.8	0.74
	Bachelor degree & above	6	160.4	94.1	
Farm Size	Small farm	16	124.4	83.6	
	Medium farm	18	118.7	75.9	0.62
	Big farm	13	118.3	67.8	
Annual Income	Low income	12	105.3	72.6	
	Medium income	16	126.1	79.6	0.42
	High income	19	125.5	75.8	
Extension Contact	Low contact	13	114.0	73.0	
	Medium contact	27	123.4	75.9	0.33
	High contact	7	121.5	83.8	
Organizational Participation	No participation	13	112.1	77.6	
	Low participation	18	125.3	79.2	
	Medium participation	9	122.4	73.2	0.84
	High participation	7	121.6	70.4	

agreed with the reports of Hoque (1984) and Rogers (1982). They reported that annual income and organisational participation have significantly influenced adoption. On the otherhand farmers having low organisational participation produced better yield than no participation and high participation group, which expressed that farmers having high organizational participation, were busy for otherwise and give less time to the farm. These findings were rational and closely supported the findings of Saha (1988), who found age, farm size, income and organizational participation had no significant influence on the performance of contact farmers.

The average yield range of STP cane was 109.4 TCH to 160.4 TCH and that of conventional cane was 71.4 TCH to 94.1 TCH. An approximately double yield was produced from STP cane than conventional, from the same area of land. Hence the technology STP was found more suitable for advanced cane growers in spite of their variation in independent characters, such as age, education, farm size, annual income, extention exposure and organizational participation (Table 3). Although some variation is present within their independent characters i.e. age had a negative and other five

factors had positive relations with yield performance of both STP and conventional cane but those were not significant. Thus we can conclude that yield of STP cane much higher than that of conventionally planted cane.

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