

Sugarcane Based Intercropping in Selected Areas of Rajshahi Sugar Mills Zone

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ABSTRACT

A study was undertaken in five villages of Paba and Godagari thanas of Rajshahi district under Rajshahi Sugar Mills Zone in 1992-93 to find out the farmers existing production practices of different intercropping systems with sugarcane and their comparative economic performances. The highest percentage area under intercropping was found in less than 0.2 ha farm lands category. Among nine intercrop combinations sugarcane + mustard was the most common intercrop combination. Sugarcane produced the highest yield with leguminous crops but the land equivalent ratio was the highest in the three crop combinations. Intercropping vegetable crops with sugarcane was found the best sugarcane based intercropping in respect to net benefit.

INTRODUCTION

Sugarcane is grown as the principal cash crop in the North-West part of Bangladesh. Since Jute has lost its market and importance, sugarcane become the major cash crop in the greater districts of Rajshahi, Pabna, Rangpur, Dinajpur, Bogra, Kushtia, Faridpur, Mymensingh, Dhaka and Barisal (Anon. 1978). It is a biennial crop mainly competes with cereal and winter crops (SRTI, Annual Report, 1983; 1986). Sugarcane is planted at adequate row spacing and this inter-rows space practically remains vacant, and unutilized during its early growth stage which extends nearly four months from the date of planting. Intercropping is an excellent technique to increase total yield, higher monetary return, greater resource utilization and fulfill the diversified need of the farmers (Single *et al.* 1986). The traditional cane growers of Bangladesh grow various wintercrops viz. mustard, potato, onion, garlic, tomato, cabbage, chickpea, lentil, coriander etc. as intercrops with sugarcane. Sugarcane Research and Training Institute (SRTI) has recommended several intercrops with sugarcane after intensive studies at research station, and at farmers field (SRTI Annual Report, 1979, 1983). But much less effort has been given to implement the recommendation of SRTI or even to select the most suitable intercrop combination(s) to be practiced

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by the farmers in a particular agro-climatic and edaphic conditions. Therefore, this study was undertaken in five villages under Rajshahi Sugar Mills (RJSM) zone with the following objectives :

- i) To identify the suitable intercrop combination with sugarcane to be practiced by the farmers of RJSM zone.
- ii) To determine the crop production technologies practiced by farmers and recommended appropriate technology for higher net benefit.

MATERIALS AND METHODS

The study was conducted in an area consisting of five villages of Paba and Godagari Thanas under RJSM zone during January 1993. Out of five villages four were under Gangatic floodplain and one was under high Barind tract soils. A purposive sample of 50 farmers from different farm categories who grew sugarcane as sole as well as sugarcane with different winter crops were selected. Information about intercropping was recorded from the heads of each household through an interview schedule prepared in Bangla. The information in the schedule covered identification of different intercrop combinations, their production practices and economic performance. The collected data were analysed, LER was computed following Willey (1979) and the equivalent yield was calculated on the basis of prevailing market price of sugarcane and particular crop in question.

RESULTS AND DISCUSSION

The area under intercropping with sugarcane at different farm categories have been presented in the Table 1. It was observed that the average area under intercropping decreased with the increase of farm size. This indicates that the small farmers devote proportionately more of their land to intercropping probably in order to achieve high productivity from small area of land and as an insurance against the crop failure. On the other hand, the large farmers devote proportionately less amount of land to intercropping perhaps for their unwillingness to provide intensive management. These findings are also in agreement with that of Zaman (1990).

Table 1. Area under intercropping with sugarcane according to farm size.

Farm category (ha)	No. of respondents	Average farm size (ha)	Average area under intercropping with sugarcane (ha)	Percentage area under intercropping with sugarcane
0.00-0.2	7	0.20	0.09	43.7
0.21-0.5	6	0.48	0.10	21.3
0.51-1.0	16	0.99	0.11	11.6
1.10-2.0	13	1.92	0.14	7.1
Above 2.0	8	3.70	0.20	5.4

There were nine different kinds of intercrop combinations with sugarcane observed in the sampled households. The study was carried out in five villages including one village namely Alimgonj under high barind tract where normal rabi crop cultivation is difficult due to moisture stress after harvesting of transplanted aman. As the farmers of this village have no irrigation facilities that is why they are practicing only chickpea, potato, coriander, tomato and a few other crops as intercrop with sugarcane. Among the intercrops, the highest frequency was observed with sugarcane + mustard. Sugarcane + lentil and sugarcane + potato combinations came as second and third largest respectively (Table 2). This trend was observed both in percentage area under these combinations as well the percentage farmer's practicing these combinations. This indicates that sugarcane is a good compatible crop for intercropping. Maximum farmers (more than 93%) responded that they grew those crops as intercrop with sugarcane (Table 2).

Table 2. Efficiency of intercropping of different winter crops with sugarcane in farmers field.

Combinations observed in order of prevalence	Percentage area of respondent under the combination	Percentage farmers using this combination	Yield of sugarcane (t/ha)	Yield of intercrop (t/ha)	LER
Sugarcane + Mustard	52.6	54.2	39.7	0.50	1.51
Sugarcane + Lentil	17.6	18.3	44.0	0.45	1.51
Sugarcane + Potato	10.2	8.0	43.9	7.50	1.42
Sugarcane + Onion	4.9	4.3	42.0	6.00	1.50
Sugarcane + Tomato	3.6	3.8	42.0	19.50	1.40
Sugarcane + Garlic	3.6	3.8	41.6	3.60	1.34
Sugarcane + Chickpea	3.1	3.3	44.6	0.48	1.46
Sugarcane + Coriander	2.3	2.2	40.1	0.35	1.27
Sugarcane + Potato + Onion	2.1	2.2	40.9	6.00+	1.73
Sole Sugarcane	—	—	46.5	5.10	1.00

They also replied that they grow intercrops to get an interim income and for their own consumption. Most of the intercrops except mustard were grown in line while the mustard was broadcasted. The highest acreage was occupied by mustard intercropping. Haque and Yasin (1984) reported that 55% acreage was occupied by mustard. The yield of sugarcane along with intercrops was quite encouraging. The highest yield of sugarcane was obtained from the sugarcane + chickpea

combination. This might have been due to less competition for nutrient by chickpea, and it can fix atmospheric nitrogen which might be utilized by sugarcane. The lowest yield of sugarcane was obtained from sugarcane + mustard combination which might be due to the fact that mustard is a quick growing profusely branching exhaustive crop and uptake large amount of nutrients and moisture from the soil, and caused damage to sugarcane crop. Rathi *et al.* (1974) reported that due to high competition with sugarcane for nutrient, moisture and space at early stage of sugarcane, intercropping of mustard in general shows an adverse effect on emergence, tillering, millable cane production and finally yield. SRTI recommended irrigation after harvesting of mustard in sugarcane + mustard combination, but very few farmer are applying irrigation.

In respect of land use efficiency, sugarcane + potato + seedling onion combination was found to be the best combination. It is practiced by the farmers in flood plain areas where potato is harvested earlier and then onion seedlings are planted between two sugarcane rows. Besides among other combinations, mustard, lentil, onion were found to be good intercrops with sugarcane.

Table 3. Economic performance of different intercrops with sugarcane.

Combinations	Gross return (Tk/ha)			Total cost of cultivation (Tk/ha)	Net benefit (Tk/ha)
	Sugarcane	Intercrop	Total (Tk/ha)		
Sugarcane + Mustard	31776	7650	39426	28432	10,994
Sugarcane + Lentil	35208	8100	43308	27104	16,204
Sugarcane + Potato	35088	37500	72388	31671	40,917
Sugarcane + Onion	33600	48000	81600	29135	52,465
Sugarcane + Tomato	33584	97500	131084	33891	97,193
Sugarcane + Garlic	33304	54000	87304	29673	57,631
Sugarcane + Chickpea	35696	7200	42896	26814	16,082
Sugarcane + Coriander	32080	4900	36980	27830	9,150
Sugarcane + Potato + Onion	32688	30000+	103488	34961	68,527
		40800			
Sole Sugarcane	37200	—	37200	22081	15,119

The Table 3 shows the economic performance of different intercrops with sugarcane. Economic performance of all intercrops shows much higher benefit than sugarcane sole cropping. Although from agronomic point of view these crops were not much successful but economically profitable. The profitability of different crops

with sugarcane also reported elsewhere (Imam, *et al.* 1982; Kanwar, 1975; Raheja, 1976).

Farmers are the best innovators and users of their resources. But there are limitations in using the technology in respect of profitability. If farmers could be equipped with all sorts of knowledge of production practices they would be more benefitted.

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