

## Studies on economic returns of sugarcane based intercropping system

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### ABSTRACT

A field experiment was conducted at Marathwada Agricultural University, Parbhani for two crop seasons *i.e.* 2002-04 and 2003-05 to find out the feasible, remunerative intercrop in intercropping system with preseasonal sugarcane. The results indicated that the gross monetary returns was higher in sugarcane + potato system, during both the years and in pooled analysis. However the highest NMR was recorded in sugarcane + Wheat system (44128 Rs./ha) in pooled analysis. Among the intercropping systems, sugarcane with wheat was more remunerative in respect of net returns and benefit:cost ratio.

**Key words :** Intercropping, remunerative, GMR, NMR, B:C ratio

### INTRODUCTION

The cost of production of sugarcane is increasing every year. The increase in cost of production was mainly on account of increase in the price of key inputs such as fertilizers, irrigation water, insecticides and human labour charges. The increasing cost of production of sugarcane and reduced profit margin has compelled farmers to think about the cropping systems which are economically feasible. Fortunately sugarcane provides considerable scope for intercropping with short duration crops and thus improves over all productivity and profitability of the cane growers. Keeping this in view a field experiment was conducted to find out the suitable and profitable intercrops in sugarcane at Marathwada Agricultural University, Parbhani.

### MATERIALS AND METHODS

The field investigation was undertaken on medium black soil at Department of Agronomy farm, College of Agriculture, Marathwada Agricultural University, Parbhani as autumn sugarcane in 2002-04 and 2003-05 with object to find out remunerative and compatible intercrops in sugarcane. The treatments comprising of four intercropping systems *viz.*, sugarcane + potato, sugarcane + mustard, sugarcane + wheat and sugarcane + cowpea along with sole crop of sugarcane. All other cultural operations and plant protection measures were given as per recommendation and need of the component crops.

The economic analysis *viz.*, GMR, NMR and B:C ratio were carried out based on cost of cultivation, cane yield and intercrop yield. The gross monetary returns (Rs/ha) accrued due to different treatments were worked

out by considering market prices during the experimental year.

Net monetary returns (NMR) in Rs/ha of each treatment =

Gross monetary returns (GMR) of treatment – cost of cultivation of treatment

$$\text{B:C ratio} = \frac{\text{GMR of a treatment}}{\text{Cost of cultivation}}$$

### RESULTS AND DISCUSSION

The results obtained from the present investigation are summarized below :

#### Gross monetary returns (GMR):

During first year of experiment the maximum gross monetary return was obtained from sugarcane + potato (Rs. 86881/ha) followed by sugarcane + wheat (79969 Rs./ha), while lowest gross return was observed in sole sugarcane (Table 1). The intercrop have contributed to increase the returns. Similar trend as that of first year was recorded in second year. The sugarcane + potato (Rs. 83182/ha) and sugarcane + wheat (Rs. 78333/ha) recorded significantly higher gross monetary returns than rest of the cropping system. The lowest gross monetary return was noticed in sole sugarcane.

In pooled analysis sugarcane + potato intercropping system (Rs. 85032/ha) and sugarcane + wheat intercropping system (Rs 79151/ha) recorded significantly more gross monetary returns than sugarcane + mustard (Rs. 70784/ha) and sole sugarcane (Rs. 62150 /ha). However, later both systems were at par with sugarcane + cowpea (Rs. 73522/ha). Similar results of increased

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**Table 1 : Effect of intercropping systems on economic returns of sugarcane system**

Treatments	Gross monetary returns (Rs/ha)			Net monetary returns (Rs/ha)			B:C ratio	
	2002-04	2003-05	Pooled	2002-04	2003-05	Pooled	2002-04	2003-05
Cropping system								
Sugarcane + Potato	86881	83182	85032	43307	39630	41418	1.993:1	1.90:1
Sugarcane + wheat	79969	78333	79151	44909	43348	44128	2.28:1	2.23:1
Sugarcane + mustard	67736	73833	70784	34818	40848	37833	2.05:1	2.23:1
Sugarcane + cowpea	71295	75750	73522	35938	40376	38157	2.01:1	2.14:1
Sole sugarcane	66050	64250	62150	36367	34567	35467	2.22:1	2.16:1
S.E.±	2211	1921	4244	2211	1924	2538	--	--
C.D. (P=0.05)	6394	5557	12872	6394	5563	7690	--	--
Mean	74385	75070	74128	39068	39754	39411	1:2.10	1:2.14

Rates : Sugarcane = Rs. 750/ton, Potato = Rs. 650/q, Mustard = Rs. 1430/q, Wheat = Rs. 828/q, Cowpea = Rs. 1350/q

GMR by intercropping system of sugarcane + soybean were reported by Roodagi *et al.* (2000).

#### Net monetary returns:

The NMR obtained from sugarcane + wheat (Rs. 44909/ha), sugarcane + potato (Rs. 43307/ha) was at par with each other and found significantly superior over rest of the cropping system during first year of experimentation (Table 1). During second year, sugarcane + wheat (Rs. 43348/ha) recorded significantly higher NMR than sole sugarcane.

The pooled analysis indicated that higher NMR was obtained from sugarcane + wheat (Rs. 44128/ha) followed by sugarcane + potato (Rs. 41418/ha) which were at par with each other and found significantly superior over sole sugarcane. The results are in conformity with Jadhav *et al.* (2002) and Singh *et al.* (2003).

#### Benefit:cost ratio:

Among different intercropping systems, the maximum B:C ratio was obtained from sugarcane + wheat (2.28:1) during first year, while during second year sugarcane + wheat (2.23 : 1) and sugarcane + mustard (2.23:1) recorded similar B:C ratio. The B:C ratio for sole sugarcane was 2.22 : 1 and 2.16:1 during first and second year of experimentation, respectively. Similar results of higher B : C ratio due to intercropping were reported by Nigade *et al.* (2004) and Marimuthu *et al.* (2003).

#### Conclusion:

Based on the results in both the years of experimentation and also in pooled analysis, it can be concluded that sugarcane + wheat and sugarcane + potato are the highly remunerative intercropping systems than sole sugarcane.

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