

Original Research Article

Cauliflower Intercropping with Autumn Sugarcane for Increasing the Farmers Income in Western U.P., India

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ABSTRACT

Sugarcane is the main crop of the western Uttar Pradesh covering with 60-65 percent of total area. Most of the farmers were growing sugarcane as sole crop and got average yield 800-850q/ha with the Rs 1.81 lakhs/ha/year net return, the income of farmers are not good. Keeping in view cauliflower intercropping with autumn sugarcane was promoted through transfer of technology with different activities. Yadva and Verma (1984) support for transfer of technology. In this system Pusa Snowball K-1 nursery was sown in First week of September in low tunnel poly-house and after twenty five days field prepared and sugarcane crop was sown through improved trench planting method at the row to row distance 90 cm in trench and cauliflower nursery transplanted on raised bed between two rows of sugarcane at the distance of 45x30 cm. The recommended dose of fertilizer was uses as basal doses (Half dose of N₂ and Full doses of P₂O₅ & K₂O) on the soil testing based. Remaining N₂ was used as top dressing in two spilt doses. After that time to time cultural practices like weeding irrigation and plant protection activities were conducted as per needs time to time. In the month of February cauliflower crop harvested and sold. After harvesting of cauliflower crop all cultural practices like- digging, weeding and irrigation completed in sugarcane crop. In this technology cauliflower yield got 232qt/ha and Sugarcane average yield 870qt/ha. The net return was Rs 3.86 lacs/ha and in net return in sole crop was Rs 1.81 lakh/ha. Results revealed that Cauliflower inter cropping increasing the income in comparison to sole crop of sugarcane.

Keywords

Autumn
sugarcane,
Cauliflower, Pusa
Snowball K-1,
Intercropping

Introduction

Sugarcane is the main commercial crop grown by most farmers of the western U.P. About 60-65% is covered by this crop. Farmers are growing sugarcane in autumn, spring and late spring seasons just after wheat harvesting. In autumn season, sugarcane is sown in the months of Sept-Oct. Most of the farmers are choosing autumn sugarcane as their sole crop and they are getting 800-850

qt/ha by using improved trench method. But, due to increasing Labour and inputs cost, cost of cultivation has increased resulting in farmers not getting good returns. The size of land holding is also decreasing day by day in India, which is caused by division and subdivision of land holding. Vegetable production has a potential of enhancing farmer's income. It depends on several factors like availability of resources, management and market availability.

Keeping this issue in view, the present study was conducted as “Cauliflower intercropping with sugarcane in autumn season” (Bakhsh *et al.*, 2004) because nowadays due to good demands of vegetables in markets, farmers can get good returns using vegetable intercropping in autumn season.

The Uttar Pradesh, Bihar, Punjab, Haryana, Uttarakhand, Madhya Pradesh, Rajasthan, West Bengal, Jharkhand, Assam and other north and north eastern state are come in subtropical belt. Among states Uttar Pradesh is the main cane growing state in the country allocating about 2.2 million ha area (43.7%) for cane cultivation and Maharashtra second cane cultivation state with 19.6% cane area. In Uttar Pradesh Western Uttar Pradesh is major sugar cane grower with about 60% area covering of sugarcane.

Small sugarcane growers need not wait until the harvest of sole crop to obtain financial returns. Intercropping of important short duration crop (Cauliflower) with sugarcane through utilization of the present limited land resources would help to sustain sugarcane cultivation and provide interim return to small and marginal farmers.

In Western Uttar Pradesh farmers transplanted autumn sugar cane in month of September-October. In the Western Uttar Pradesh sugarcane is normally planted in autumn September-October, this planting of sugarcane in variably yields 20-25%. Cauliflower cane grow as intercrop. Because there is higher demand of vegetables in the market in whole year. Since the consumption of vegetable is increasing as faster rate in modern time as these are supplementary item in human diet.

Present Government of Indian is also focusing target of increasing farmer's income by 2022 and taking various steps to achieve

this objective. The cauliflower intercropping with autumn is also one step towards increasing income of farmers.

Materials and Methods

To keeping in view of the increasing income of farmers this study was carried out during 2017-18 in district Saharanpur of western Uttar Pradesh. For this study 36 farmers were selected from 6 villages covering two blocks i.e. Baliakhedi and Devband. Cauliflower (Variety - Pusa Snowball K-1) nursery was raising in the First week of September under low tunnel poly house. Sugarcane was planted through improved trench method in furrows at 90 cm apart keeping three budded sets as 30 cm row length in the third week of September. Ahmed *et al.*, (1997) promoted double row intercropping. Sugarcane fertilized N₂ 180kg/ha, ½ N₂ at planting as based dressing + 1/2 in two equal split doses as top dressing after harvesting of cauliflower at proper moisture while intercrop are given one third of total N+ full doses of P₂O₅ and K₂O at their transplanting on second week of October just after sugarcane planting and remaining half N is top dressed after 30 day of trans planting. Cauliflower Nursery transplanted at the distance of 45x30 cm between two rows of sugarcane on raised bed. Alam *et al.*, (2000) supported. After that cultural practices done as per need time to time. Observations are given below.

Results and Discussion

In table No. 2 data shows that sowing time and method of sugarcane planted were same. Seed requirement of sugarcane with cauliflower inter cropping is 75q/ha and it is also 75q/ha in sole crop but cost of cultivation with intercropping became Rs. 1.65 lakh/ha and Rs 0.98 lakh/ha is in sole crop. Its increase 68.36% in comparison to sole crop. Production of sugarcane is

870qt/ha in intercropping cauliflower yield 232 qt/ha. Sugarcane yield in sole crop was 930qt/ha.

Total return in Cauliflower intercropping is Rs 5.51 Lakhs/ha and Rs 2.79 Lakhs/ha in sole crop. The total return is 1.97% is excess in comparison to sole crop of sugarcane. The net return is more (Rs 2.72 Lakhs) in comparison to sole crop of sugarcane (Rs 2.79 Lakhs) Ahmed *et al.*, (1997) supported

the intercropping system. The benefit cost rate on 2.33 is significant higher in comparison to sole crop (1.84) (Ali and Abedullah, 2002). Data of net return revealed that cauliflower intercropping with spring sugarcane play the significant role toward doubling the income of the farmers. Residual of cauliflower also increased the organic matter in the soil and increased the sustainability of the soil.

Table.1 Details of Cauliflower intercropping with autumn sugarcane

Name of crop	Variety	Row to row distance (cm)	Sowing duration	Plat to plant distance (cm)	Seed rate/ha	Application of fertilizers (kg/ha)		
						N	P	K
Sugarcane (Main crop)	Co-0238	90	3 rd week of September	30	75 qt	180	60	50
Cauliflower (Intercropping)	Pusa Snowball K-1	45	2 nd week of October	30	350g	80	40	40

Table.2 Cauliflower intercropping with autumn sugarcane

S. No.	Detail	Cabbage intercropping with spring sugarcane	Sole crop of sugarcane
1	Main crop	Sugarcane (Co-0238)	Sugarcane(Co-0238)
2	Intercrop	Cauliflower (Pusa Snowball K-1)	-
3	Sowing time	Sugarcane-3 rd week of September Cauliflower-2 nd week of October	Sugarcane-3 rd week of September -
4	Seed rate	Sugarcane-75qt/ha Cauliflower-350gm/ha	Sugarcane-75qt/ha -
5	Cost of Cultivation	Rs.- 1.65 Lakh/ha	Rs-0.98 Lakh/ha
6	Mill able	228	234
7	Production-	Sugarcane-870qt/ha Cauliflower - 232qt/ha	Sugarcane-930qt/ha -
8	Total Return-	Sugarcane-2.61 Lakhs Cauliflower- 2.90 Lakhs-5.51	Rs-2.79Lakhs -
9	Net Return	Rs-3.86Lakhs	Rs-1.81 Lakhs
10	CB Ratio	1:2.33	1:1.84

Note:- Sugarcane @Rs 300/qt, Cauliflower @Rs 1250/qt

Lithourgidis *et al.*, (2011) also supported the present investigation. Cauliflowers intercropping with autumn sugarcane also

promote the maximum utilization of inputs, soil and water etc.

On the Object side, it is concluded in the present investigation cauliflower inter cropping with autumn sugar cane data proves that Cauliflower intercropping with autumn sugarcane plantation is profitable (Rs3.86 Lakhs) in comparison to sole crop of sugarcane cultivation (Rs-1.81Lakhs) ,the B:C ratio was also Higher (2.33) in intercropping of cauliflower in comparison to the sole crop (1.84) and increase the sustainability of soil. Thus Cauliflower intercropping with autumn sugarcane is recommended for increasing the income of the farmers (Ali and Abedullah, 2002). Autumn plantation of sugar cane should be promoted for increasing income of farmers. With this system inputs and natural resources like soil and water also proper utilized. The input use efficiency also increased.

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