

RESEARCH ARTICLE

Off season cultivation of cucurbits under polytunnel with plastic and straw mulch

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ABSTRACT

A field experiment was carried out in two consecutive Rabi seasons to study the effect of different mulch for off season cultivation of vegetables particularly cucurbits. The result showed that poly tunnel was the best treatment and with the help of poly tunnel cucurbits can be grown successfully winter season. The highest yield of cucurbits was found i.e.136.84 q/ha from the crop grown under polytunnel with the highest BC ratio i.e.1; 1.94. Hence, for off season cultivation of cucurbits farmers can adopt polytunnel.

Keywords: Off season cultivation, protected cultivation, mulching, vegetables, cucurbits

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INTRODUCTION

Cucurbits are widely grown vegetables having wide adaptability. Production potential of cucurbits is huge on river beds and in sandy soil. Several cucurbits produce high quality crops under protective condition and but all cucurbits are grown as field crop in normal season. Cucurbits is very versatile crop so it may be grown in pots on the roofs of house in rural areas and urban house holds, in the Kitchen garden and in commercial field as well. It is cultivated in summer and rainy in North India and as winter crop in south India. Cucurbits have great potential as foreign exchange earner vegetable. As a group of crops acceptable to almost all consumers most of the cucurbits are cooked and processed as juice, candies (Melon and Pumpkins) used as dessert. Apart from its importance in food, cucurbit are used in skin care e.g. cucumber, as bath sponge e.g. Luffa musical instruments e.g. bottle gourd, pumpkin as pots e.g. bottle gourd. Almost all parts of our country particularly Bihar grow this crop as major crop during summer and rainy season. Besides ,these preparation there are lots of delicacies are prepared from curbits. Important sweet like perwal ki mithai stuffed with kyoya is very popular in Bihar, UP and West Bengal. People also prepare non- vegetarian items from cucurbits. All though farmer enjoys its versatile nature of growth but yield is not up to mark. This crop is grown successfully in winter season under protective condition that will fetch highest returns to the growers. It was found that there is considerable gap between technology transferred at farmer's field and technology developed at any govt. centre like SAUs , Krishi Vigyan Kendra. Considering the importance of cucurbits in respect of national and international markets. This OFT was opted with following important objectives:

1. To study the earliness of the crop
2. To study the environmental control done by polytunnel
3. To study the economics.
4. To enhance the profitability of farmers

MATERIALS AND METHODS

This on farm trial "Off season cultivation of vegetables particularly cucurbits under poly tunnel and the use of different mulch was conducted on farmer's field of Bhagalpur district, Bihar through Krishi Vigyan Kendra during two consecutive winter seasons. This OFT was conducted with view to transfer the technology and bridge the gap between the technology developed and technology adopted by the farmers. The trial was conducted at different villages at 20 farmers field of Bhagalpur district Jichho, Sardho, Amba etc. Four treatments were considered

Farmers Practice	:	Traditional cultivation
Technology Option – 1	:	Cultivation under poly tunnel
Technology Option – 2	:	Black polythene as mulch
Technology Option – 3	:	Straw as mulch

The experiment was carried out in Randomised Block Design. These farmers were selected to conduct OFT of off season cultivation of vegetables particularly by cucurbits based on vegetable growing areas of Bhagalpur and farmer's assessment on the basis of their zeal to work on hand situation. The return obtained from the produce of crop under polytunnel, crop under mulch, crop in open field condition and crop grown in normal season were compared. The trials were regularly monitored and appropriate data were collected which were further analysed for drawing the inferences. Since this oft was conducted with certain objectives. Farmer's cooperation was appreciable. Polytunnel is low cost structure; the most important it is farmers friendly. Every village has basbhitti means bamboo is their own input. Total cost of making poly tunnel is Rs 200 to 250 including bamboo. White plastic with 50 micron thickness is able to control the temperature by 4 to 5 degree Celsius. It is viable production practices of vegetables when temperature is below optimum and early production is desired. Covers protect plants and soil from high intensity of lights, rainfall, hail, and also against insect borne viruses. Covers improves the plant uniformity, fruit quality extend the harvest season and increase the total yield.

RESULTS AND DISCUSSION

During the initial survey it was found that majority of farmers were not aware from high intensity of lights about this technology so they were not satisfied. First of all we have conducted on and off campus training, make them aware about protected cultivation , a film was developed on making of polytunnel .The film was shown on polytunnel. We demonstrated the technology through OFT on farmer's field. KVK developed series of polytunnels on the farmer's field for mass effect and to farmers of other villages. This structure is useful for low temperature areas. The crops remain under protected condition during hail and storm period.

Data yield and yield attributing characters of different cucurbits grown under different condition for three years were collected and analysed and technology wise. "Net return" and "B:C ratio" was determined. The data were presented in Table – 1.

The data presented in table – 1 reveals that the demonstrated technology polytunnel is the best and crop grown under polytunnel fetched highest return (Rs 1,26,366.00), Rs. 126360/ha with highest B:C ratio 1:1.94 at farmers field followed by crop mulched by straw (Rs. 99122/ha) with 1:1.64 followed by crop grown under normal condition 93936 with B:C 1:1.59.

Farmers' economic point of view, crop grown under polytunnel fetch more net return. Fruit weight was highest found in treatment no 1 i.e. polythene as mulch. this is due to temperature increased by 4-5 degree celcius that is ideal for physical growth of the plants . During experiment it was found that crop under plastic mulch showed larger leaf size, short internodes, in covered condition emitted carbon dioxide helpful in increasing temperature. Due to covered condition diffusion of gases are less So they are fully utilised. All these factors are congenial factor for faster photosynthesis rate. Development of colour of fruit is better so it fetch more prices in the market. Thus, opening a better pathway for their livelihood security as well as enhancing the net return of cucurbits by growing as early/off season crops. Our farmers small and marginal farmer so, profitability is the farmers goal. Due to protected condition crop longevity is better than open field condition.

Table 1: Yield attributing characters and B:C ratio

Technology Options	Data related problem address	Yield attributing characters		Yield (Q/ha)	Net return (Rs./ha)	B:C ratio
		Fruit weight	Fruit size			
Farmers' Practices	7.29	351.70	15.28	109.14	93936	1:1.59
Tech. Opt. – 1	9.23	377.50	17.44	136.84	126366	1:1.94
Tech. Opt. – 2	7.84	332.90	16.00	113.88	90132	1:1.20
Tech. Opt. – 3	8.06	341.00	13.46	118.03	99122	1:1.64
SE _M ±	0.1306	10.8013	0.3583	1.934		
CD 5%	0.3789	31.3402	1.04	5.613		

Net return and technology index yield and net return of crop under this trials yield and net return of crop grown under normal season were compared to estimate the net return gaps which were categorized into technology and technology adoption gap. The adoption of technology in on farm trials was studied through technology index which shows the feasibility of valued technology in the farmers filed. The lower the value of the technology index more is the feasibility of demonstrated technology i.e. cultivation under polytunnel for adoption.

The result of trials have brought a significant impact on farmer's face this can be visualized that they have started growing seedlings under polytunnel of different crops grown in summer season. Most of the farmers from Jichho village have picked their crops like cucumber bottle gourd and luffa in first week of March and sold their produce at higher rate of Rs. 20/Kg P/Kg. This trial attracted the neighbouring farmers because most of the trials are given on roadside. After demonstration in month of December many of farmer's from different villages they have adopted this trial by own

CONCLUSION

This technology is very beneficial for small and marginal farmers particularly for those residing in peri-urban areas. Due to rapid urbanization cultivable area is shrinking. So, protected cultivation is taken as the best alternative. It is imperative that off-season vegetable production under protected condition can be taken up as the best alternative of land use system and also for the use of natural and other resources more efficiently and eco- friendly. Protected cultivation of vegetables offers distinct advantage of quality, productivity and favorable market price to the growers. Vegetable growers can sustainably and substantially increase their income by growing vegetables in off season under protected condition .Polythene have proved extremely useful for vegetable growers. This technology was transferred to DHO Bhagalpur. He has spread this technology in large scale.

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