INDIAN JOURNAL OF ARID HORTICULTURE
2008, Vol. 3 (1) : 60-61

SHORT COMMUNICATION

Off season cultivation of summer squash under polythene low tunnels

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Mostly cucurbitaceous vegetables are grown in the main season, which is always less profitable, because of markets are flooded with lot of vegetables at that time. The prices of same vegetables are higher during the off-season. It is difficult to grow cucurbits in winter season because of low temperature and frost injury and thereby adverse effect on growth and fruit setting. Polythene low tunnel technology for production of summer squash, musk melon and water melon is very common in Israel (Singh et al. 2001). This technology is suitable for northern plains where the might temperature during winter season (December-January) goes below 5°C (Singh and Sirohi, 2006). The high temperature inside low tunnels make the crop period short, when it is needed to expedite the crop growth and protect the plants from natural disasters like hails injury, cold winds and advance the crop by 45-60 days then their normal season. This low-cost technology for off-season cultivation of cucurbits is very simple and highly profitable for vegetable growers. For the development and evaluation of the technology a field experiment was conducted at farmer's field in the command area of Chhitoli irrigation project under RWSRP to find out the suitable sowing time of summer squash under polythene low tunnels for off-season cultivation.

The field experiment was carried out at farmer's field of Jai Singh Pura and Bhagatpura Village of Chhitoli project area of Virat Nagar, Jaipur, Rajasthan during 2004-05 & 2006-07. The soil of the experimental plot was loamy sand in texture having P^H 7.7, EC 0.21 d S/m, organic carbon 0.19 percent, available N, P_2O_5 and K_2O was 191.4, 31.2 and 177.0 kg/ha, respectively. The experiment was laid out in randomized block design comprising five treatments of different sowing dates viz. 10th Dec., 20th Dec., 10th Jan. and 20th Jan. with four replications in 3.0 x 2.0 m^2 plots with a spacing of 1.5 x 0.5 m. After sowing of seeds in prepared beds 6mm galvanized iron arches (hoops) were fixed manually at a distance of 1.5 m to support the polythene of tunnels. The width of hoops was kept 45-60 cm with a height of 45-60 cm above the level of beds for covering polythene and making a low tunnel over the plants. Transparent non-perforated 40 micron UV polythene sheet was used which partly reflected infrared radiation to keep higher temperature of low tunnels than out side. For comparison side by side traditional method was also followed by using saccharum (Sarkanda) on north side of the beds. Summer squash variety Chandrika F_1 hybrid was taken as test crop and sowing was done on different dates. All the improved agricultural practices were followed through out the crop season. In the month of February when atmospheric temperature rose polythene sheets were removed from low tunnels. Growth and yield attributing characters were recorded of five randomly selected plants from each plot. Yield data were recorded for statistical interpretation.

A perusal of three years pooled data (Table – 1, 2) revealed that sowing dates had significant effect on growth, fruit set and yield of summer squash under low tunnels. The maximum vine length (86.75 cm) and fruit set (69.75%) were recorded under 10th December sowing. The minimum fruit drop (30.25%) was observed in 20th December sowing which was statistically at par with 10th December sown crop.

The maximum number of marketable fruits per plant (28.5) and weight per fruit (101.5 g) were also recorded under 10th December sowing which were statistically at par with 20th December sown crop. The incidence of fruit fly (5.8) was found least under 10th December sown crop, while it was highest under last date of sowing i.e. 20th January. Days taken to first harvest reduced with the advancement in sowing dates.

The maximum marketable fruit yield (358.39 q/ha) of summer squash was found when crop was sown on 10th December under polythene low tunnels which was statistically at par with 20th December sown crop. The maximum net return of Rs. 151196.00 and B:C ratio of 1:2.51 was also found with 10th December sown crop under low tunnels. The minimum net return (Rs. 8745.00) and B:C ratio (1:1.07) was observed under farmer's practice. The increase in growth, yield and yield attributing characters might be due to high temperature inside low tunnels make the crop period short, when it is needed to expedite the crop growth by creating an ideal microclimatic condition at the plant

Table 1. Effect of sowing dates on growth, fruit set and yield of summer squash (*Cucurbita pepo* L.)

Sowing dates	vine length (cm)	Fruit set (%)	Fruit drop (%)	Days to first harvest	No. of marketable fruits/plant	weight per fruit (g)	Fruit yield (q/ha)	Incidence of fruit fly
10th Dec.	86.75	69.75	31.50	67.50	28.50	101.5	375.00	5.8 (13.8)
20th Dec.	80.00	65.25	30.25	68.25	28.50	99.2	366.66	6.0 (14.1)
30th Dec.	72.25	60.25	36.25	64.25	23.75	88.7	303.33	8.8 (17.1)
10th Jan.	67.25	54.75	38.75	57.75	19.50	89.0	198.33	13.8 (21.7)
20th Jan.	63.00	48.25	47.25	57.00	14.75	82.0	161.99	16.3 (23.7)
SEm±	0.55	0.65	0.55	0.97	0.64	0.9	4.54	0.38
CD at 5%	1.71	2.02	1.71	2.99	1.97	2.9	14.01	1.18
CV (%)	1.50	2.20	3.01	3.09	5.57	2.0	3.23	4.23

Table 2. Effect of sowing dates on growth, fruit set and yield of summer squash (*Cucurbita pepo* L.)

Sowing dates	Fruit yield (q/ha)				Gross Income (Rs./ha)	Cost of Production (Rs./ha)	Net return (Rs./ha)	B : C Ratio
	2004-05	2005-06	2006-07	Pooled mean				
10th Dec.	346.00	354.17	375.00	358.39	250873	99677	151196	1:2.51
20th Dec.	342.00	350.00	366.66	352.88	247016	99677	147339	1:2.47
30th Dec.	262.50	287.50	303.33	284.44	199108	99677	99431	1:1.99
10th Jan.	219.25	212.50	198.33	210.02	147014	99677	47337	1:1.47
20th Jan.	159.50	154.17	161.66	158.44	110908	99677	11231	1:1.11
SEm±	0.82	9.13	4.54	7.31				
CD at 5%	2.53	28.13	14.01	23.86				
CV (%)	6.62	6.72	3.23	4.64				
Farmer's practice				173.76	121632	112887	8745	1:1.07

Sale price @ Rs. 7/- per kg.

environment. Singh *et al.* (2004) also found an advancement in growing season of summer squash under plastic tunnels. These results are also in conformity with the findings of Singh *et al.* (2005) and Singh (2007).

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