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Effects of different sowing methods and weed management on yield of Brinjal (*Solanum melongena* L.) crop

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Abstract
The experiment was carried out in the Botanical Garden, D.A.V College, Abohar, Punjab during August 2018. The experiment was conducted on the "Effects of different sowing methods and weed management on yield of Brinjal (*Solanum melongena* L.) crop".The parameters which were taken into observation during the experiment were Average plant height, Average number of branches, Average fruit weight and Total yield. It was concluded that the maximum plant height was obtained in T_2 (two hoeing) i.e 60.40 cm in ridges beds and in flat beds, maximum plant height was recorded in T_2 (two hoeing) i.e 57.02 cm, Number of branches were recorded maximum in T_1 (one hoeing) i.e 12.22 in flat beds and in ridges, maximum number of branches were highest in T_1 (one hoeing) i.e 12.67. Average fruit weight was maximum in T_2 in flat beds i.e 180.09g and in ridges it was maximum in T_2i.e 207.24, Total yield was maximum in T_2i.e 267 qtl in flat beds and in ridges, it was maximum in T_2i.e 322 qtl.

Keywords: Sowing, Brinjal, Weight, Ridges.

Introduction
Brinjal or eggplant (*Solanum melongena* L.) is an important solanaceous crop of sub tropics and tropics. The flower is star shaped, white to purple with yellow stamen and five lobed corolla. The name brinjal is popular in subcontinents and derived from Arabic and Sanskrit whereas the name eggplant has been derived from the shape of the fruit of some varieties, which are white and resemble in shape to hen eggs. Eggplant is major fruit vegetable with annual world production of around 31 million tonnes. Leading producer are china (17 million tonnes), India (8 million tonnes), Egypt (1.0 million tonnes), Turkey (0.9 million tonnes), Japan and Italy (0.4 million tonnes each). (www.wikipedia.com) [1] In India, Orissa, West Bengal and Bihar rank first, second and third respectively in eggplant production. The other important eggplant states in India are Karnataka, Maharashtra, Gujarat, Madhya Pradesh and Andhra Pradesh. (Dhaliwal, 2012) [2] Basically, eggplant crop is long warm season crop that requires an ideal temperature range of 20^0 C to 28^0C for its cultivation. The crop is susceptible to severe conditions. Usually, late varieties can withstand low temperature than earlier yielding ones. Nutrient drain by virtue of weeds in the crop production especially in the organic system is very critical leading to drastic reduction in the crop yield. Among the various kind of pests, the yield reduction in brinjal due to weed alone range from 49-90%. (Maheswari and Arthanari 2018) [3]

Materials and Methods
The experiment was carried out in the Botanical Garden, D.A.V College, Abohar, Punjab during August 2018. The experiment was conducted in 6 different plots with each plot having dimensions of 6×10 m. Land was prepared by spade and khurpa. The transplanting was done manually and plant to plant spacing was 60 × 60 cm and row to row spacing was 75 × 75cm. Urea and DAP (170.69g : 280.76g) fertilizers were applied in all plots after transplanting and finally urea (280.76g) was applied just before flowering.Five plants were selected at random and their respective heights were measured with the help of measuring scale from the soil surface to the highest leaf of the plant at interval of 15 days. The number of branches per plant

was counted from five randomly selected plants. The readings were taken at interval of 15 days. Total number of fruit produced per plant was counted for five plants per plot selected randomly in each treatment and weighed on weighing machine for fruit weight and fruit weight was calculated. Yield per acre was calculated in quintals.

Treatments

On flat beds

T_1 - One hoeing (After one month)
T_2 - Two hoeing (At interval of one month)
T_3 - No hoeing

On ridges

T_1 - One hoeing (After one month)
T_2 - Two hoeing (At interval of one month)
T_3 - No hoeing

Results and Discussions

Plant height (cm)

It has been observed that maximum plant height in T_2 (two hoeing) was (60.40) at 90 DAS and also minimum plant height in T_3 (no hoeing) was (45.68) at 90 DAS. Banjare *et al.* (2014) [4] conducted an experiment to evaluate the effect of weed management practices on crop growth and yield of winter season Brinjal (*SOLANUM MELONGENA* L.). There were 12 treatments included pendimethalin (Extra) (0.64 kg/ha) pre-transplanting + one hand weeding at 40 DAT + pendimethalin (Extra) (0.64 kg/ha) at 45 DAT was the best result and has highest plant height (85.36cm).

Number of branches per plant

It was observed that maximum no. of branches was observed in T_1 (one hoeing) in flat beds i.e 12.22 followed by T_2 i.e 11.45 at 90 DAS and in ridges, it was observed that maximum no. of branches was recorded in T_1 (one hoeing) i.e 12.67 followed by T_2 i.e 12.48 at 90 DAS. Singh *et al.* (2017) [5] studied the effect of different weed management practices on growth and yield of Brinjal at vegetable research farm, Punjab Agricultural University, Ludhiana. There were 15 treatments including hand weeding, mulching, pre transplanting treatments with trifluralin (0.240 kg/ha and 0.300 kg/ha), pendimethalin (0.56 kg/ha and 0.75 kg/ha), oxyfluorfen (0.15 kg/ha and 0.20 kg/ha) and post-transplanting treatment with paraquat (1.0 kg/ha) and un-weeded check. The result showed that maximum no. of branches was observed in black mulch (25.6).

Average fruit weight (g)

It was observed that average no. of fruit weight was highest in T_2 i.e. 180.09g at 90 DAS followed by T_1 i.e 150.02g at 90 DAS in flat beds and in ridges, average fruit weight was highest in T_2 i.e. 207.24 follwed by 160.79g. Tetteh *et al.* (2011) [6] conducted an experiment on weed management of tomato (*Solanum Lycopersicum* L.) at Department of Crop Science, College of Agriculture and Consumer Sciences, University of Ghana. There were 14 treatments including hand weeding. Hand weeding was at 3, 6 and 9 WAP. Herbicides were pendimethalin (Agristomp) at 2.0 and 3.0 1 /ha and glyphosate (Glyfos) at 2.0 and 3.0 1/ha. The results showed that Mulching recorded the highest fruit weight i.e. 792 g.

Yield per acre (q)

It has been observed that yield of T_2 (on ridges) is more than all order treatments i.e. T_1 and T_3. The yield of T_2 was 322q/ha. The maximum yield may be due to proper weed control and balance vegetative and reproductive growth. Sharma and Patel (2011) [7] studied the weed management in okra grown in kharif season under middle gujarat conditions at B.A. College of Agriculture, Anand Agricultural University, Anand (Gujarat). The experiment consisted of 10 treatments comprising pre-emergence of pendimethalin 1000 g/ha *fb*HW at 30 DAS, butachlor 1000 g/ha *fb*HW at 30 DAS and oxadiargyl 75 g/ha *fb*HW at 30DAS, post emergence of quizalofop-ethyl, cyhalofopbutyl and fenoxaprop-p-ethyl each at 75 g/ha, wheat straw10 t/ha *fb*HW at 30 DAS, in situ mulching of weeds at 30DAS, interculturing + hand weeding at 30 and 60 DAS. The results showed that highest yield (9973 kg/ha^{-1}) observed in pendimethalin 1000 kg/ha PE HW at 30 DAS.

Observations and Tables

1. Plant height (cm)

Table: On flat beds

Treatments	Days after transplanting				
	30 DAS	45 DAS	60 DAS	75 DAS	90 DAS
T_1	12.36	19.90	25.67	39.40	54.09
T_2	14.67	22.51	29.30	45.09	57.02
T_3	10.99	14.09	20.09	31.20	45.68

Table: On ridges

Treatments	Days after transplanting				
	30 DAS	45 DAS	60 DAS	75 DAS	90 DAS
T_1	14.51	21.02	28.70	42.43	57.91
T_2	17.24	24.38	32.09	45.51	60.40
T_3	11.52	17.24	22.71	34.21	48.20

2. Number of branches

Table: On flat beds

Treatments	Days after transplanting				
	30 DAS	45 DAS	60 DAS	75 DAS	90 DAS
T_1	7.91	10.61	11.31	11.52	12.22
T_2	6.25	9.71	10.90	11.10	11.45
T_3	6.05	7.90	8.70	9.23	9.70

Table: On ridges

Treatments	Days after transplanting				
	30 DAS	45 DAS	60 DAS	75 DAS	90 DAS
T_1	8.94	11.22	12.05	12.45	12.67
T_2	8.30	10.80	11.53	12.22	12.48
T_3	7.56	9.22	10.32	10.64	11.02

3. Average fruit weight (g)

Table: On flat beds

Treatment	Average fruit weight (g)
T_1	150.02
T_2	180.09
T_3	105.68

Table: On ridges

Treatment	Average fruit weight (g)
T_1	160.79
T_2	207.24
T_3	104.21

4. Yeild per hectare (q)

Table: flat beds

Treatment	Yield per hectare (qtl)
T_1	211
T_2	267
T_3	138

Table: On ridges

Treatment	Yield per hectare (qtl)
T_1	265
T_2	322
T_3	142

Conclusion

It was concluded that the maximum plant height was obtained in T_2 (two hoeing) i.e 60.40 cm in ridges beds and in flat beds, maximum plant height was recorded in T_2 (two hoeing) i.e 57.02 cm, Number of branches were recorded maximum in T_1 (one hoeing) i.e 12.22 in flat beds and in ridges, maximum number of branches were highest in T_1 (one hoeing) i.e 12.67, Average Number of fruits were maximum in T_2 in flat beds i.e 4.48 and in ridges, Average maximum number of fruits were maximum in T_2i.e 4.56, Average fruit weight was maximum in T_2 in flat beds i.e 180.09g and in ridges it was maximum in T_2i.e 207.24, Total yield was maximum in T_2i.e 267 qtl in flat beds and in ridges, it was maximum in T_2i.e 322 qtl.

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