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Research Article

Growth and Yield of Brinjal Varieties as Influenced by Different Varieties and Planting Windows

Katkar M. G.*, Kharbade S.B., Shaikh A.A., Sthool V. A., Jadhav J. D. and Dahat D.V.

Department of Agricultural Meteorology, Centre For Advanced Faculty Training (CAFT) in Agricultural Meteorology, College of Agriculture, Pune – 411 005 Maharashtra, India

*Corresponding Author E-mail: mkatkar8@gmail.com

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ABSTRACT

An experiment "Effect of weather parameters on growth, yield and insect pest infestation on brinjal varieties under different planting windows" was carried out at Faculty of Agriculture Department of Agricultural Meteorology Farm, Centre for Advanced Agricultural Meteorology, College of Agriculture, Pune during Kharif seasons of 2014 and 2015.

The experiment was laid out in split plot design with three replications. The treatment comprised of three brinjal hybrids viz.,V_1:Phule Arjun, V_2: Krishna, V_3: Panchganaga as main plot and four planting windows viz., P_1: 31st MW (30 July-5 August), P_2: 32ndMW (6-12August), P_3: 33rdMW (13-19 August) and P_4: 34thMW (20-26 August) as sub plot treatments.

Yield contributing characters viz., fruit length (7.71 and 8.16 cm) , fruit diameter (8.85 and 9.38), fruit weight plant-^{1} (4.07 and 4.30), 50% flowering (48 and 51), days to first picking (81 and 86), days to last picking (138 and 146) during 2014 to 2015 respectively, which were observed significantly higher in 31stMW(1th week of August) and was at par with 32nd MW planting windows .This was followed by 33rd MW values in all the yield attributes. The lowest values which recorded in 34th MW fourth week of August .Fruit yield (45.15.and 48.79 t ha^{-1}) was higher with 31st MW planting window during 2014 and 2015, respectively.

Keywords: *Kharif, MW, Brinjal, Planting Windows.*

INTRODUCTION

Determination of optimum planting windows is considered an important effort to have optimum yields and keep insect pest damage below economic threshold level (ETL) both quantitative and qualitative traits of crops depend on planting on the proper windows and growing season. In India higher brinjal quality with good vegetative growth in June plantings compared to August plantings has recorded.

Climatic factors are effective on the survival, development and reproductive capacity of insect pests. Their activities are mostly dependent on the environmental temperature for maintenance of life cycle.

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Prolonged periods of low or high temperatures or sudden change in them adversely affect the insect development. Different levels of humidity and rainfall, likewise, increase or reduce the population of certain insect pest species (Prasad & Logiswan, 1997). These factors affect the life cycle, propagation, and outbreaks of insects to such an extent that they are either compelled to adapt themselves to the changing climatic conditions or perish Brinjal is one of the most common vegetables in India and is extensively cultivated in *Kharif* and *Rabi* season. Timings of the management activities are crucial for the implementation of pest management tactics and cunsuming higher doses of pesticides. High yield and quality of vegetables depends on high seed quality of improved cultivars, in addition to the optimum cultural practices. Information on crop, its stages and the week by week weather during the crop season is essential for proper management of agriculture and better crop yield.

MATRIALS AND METHODS

The field experiment was conducted at Department of Agricultural Meteorology Farm, College of Agriculture, Pune during kharif seasons of 2014 and 2015. The experiment was conducted in a split plot design with three replications. The treatments were allotted randomly to each replication by keeping the gross plot size 4.5m x 3.75 m2 and net plot size 2.7 m x 2.7 m2with 90 x 75 cm spacing. There were twelve treatment combinations. The experiment was laid out in split plot design with three replications. The treatment comprised of three brinjal hybrids *viz.*, V_1: Phule Arjun V_2: Krishna, V_3: Panchganga as main plot and four planting windows *viz.*, P_1: 31MW (30 July- 3Aug), P_2 :32nd MW (6 Aug- 12 Aug),P_3: 33rd MW (13 Aug- 19 Aug) P_4: 34th MW (20 Aug- 26 Aug) as sub plot treatments.

RESULTS AND DISCUSSION

1. Fruit weight (gm) per plant:

Effect of varieties

The mean fruit weight of brinjal influenced periodically by different hybrids during all growth phases in *kharif* 2014 and 2015. The highest mean fruit weight (3.83 and 4.09 kg) of brinjal was observed in hybrids Phule Arjun during both the years which was significantly superior over other two hybrids. The lowest mean fruit weight (3.43 and 3.49 kg) of brinjal was observed in hybrids Panchaganga during both the years. This might be due inherent genetic potential of hybrids and better utilization of natural resources which enabled the plant for better fruit weight.

Effect of planting windows

The mean fruit weight of brinjal influenced periodically by different planting windows during all the growth phases in *kharif* 2014 and 2015. The highest mean fruit weight (4.07 and 4.30 kg) of brinjal was observed in 31st MW during both the years which was significantly superior over other planting windows. The lowest mean fruit weight (3.15 and 3.24 kg) of brinjal was observed in 34thMW during both the years i.e. 2014 and 2015.

Effect of interaction

The interaction effects between different hybrids and planting windows on fruit weight of brinjal were found significant during both the years. These results are similar with the findings of Theodosy et al. (2014) and Islam et al. (2004).

2. Fruit diameter (cm)

Effect of hybrids

The mean fruit diameter of brinjal influenced periodically by different hybrids during all growth phases in *kharif* 2014 and 2015. The highest mean fruit diameter (8.34 and 8.89 cm) of brinjal was observed in hybrids Phule Arjun during both the years which was significantly superior over other two hybrids. The lowest mean fruit diameter (7.46 and 7.61 cm) of brinjal was observed in hybrids Panchaganga during both the years. This might be due inherent genetic potential of hybrids and better utilization of natural resources which enabled the plant for better fruit diameter.

Effect of planting windows

The mean fruit diameter of brinjal influenced periodically by different planting windows during all the growth phases in *kharif* 2014

and 2015. The highest mean fruit diameter (8.85 and 9.38 cm) of brinjal was observed in 31st MW during both the years which was significantly superior over other planting windows. The lowest mean fruit diameter (6.86 and 7.05 cm) of brinjal was observed in 34thMW during both the years i.e. 2014 and 2015.

Effect of interaction

The interaction effects between different hybrids and planting windows on fruit diameter of brinjal were found significant during both the years. These results are similar with the findings of Theodosy et al. (2014) and Islam et al. (2004.

3. Fruit length (cm)

Effect of hybrids

The mean fruit length of brinjal influenced periodically by different hybrids during all growth phases in *kharif* 2014 and 2015. The highest mean fruit length (7.26 and 7.74 cm) of brinjal was observed in hybrids Phule Arjun during both the years which was significantly superior over other two hybrids. The lowest mean fruit length (6.50 and 6.62 cm) of brinjal was observed in hybrids Panchaganga during both the years. This might be due to inherent genetic potential hybrids and better utilization of natural resources which enabled the plant for better fruit length.

Effect of planting windows

The mean fruit length of brinjal influenced periodically by different planting windows during all the growth phases in *kharif* 2014 and 2015. The highest mean fruit length (7.71and 8.16 cm) of brinjal was observed in 31st MW during both the years which was significantly superior over other planting windows. The lowest mean fruit length (5.97 and 6.13 cm) of brinjal was observed in 34thMW during both the years i.e. 2014 and 2015.

Effect of interaction

The interaction effect between different hybrids and planting windows on fruit length of brinjal were found significant during both the years. These results are similar with the findings of Theodosy *et al.* (2014) and Islam et al. (2004).

4. Fruit yield (t)

Effect of hybrids

The mean fruit yield of brinjal influenced periodically by different hybrids during all growth phases in *kharif* 2014 and 2015. The highest mean brinjal fruit yield of (42.56 and 46.29 ton/ha) was observed in hybrids Phule Arjun during both the years 2014 and 2015,respectively Which was significantly superior over other two hybrids. The lowest mean brinjal fruit yield of (38.06 and 39.58 ton/ha) brinjal was observed in hybrids Panchaganga during both the years.

Effect of planting windows

The mean fruit yield per plot^{-1} of brinjal influenced periodically by different planting windows during all growth phases in *kharif* 2014 and 2015. The highest mean brinjal fruit yield of (45.15 and 48.79 ton/ha) was observed in 31st MW during both the years which was significantly superior over other planting windows.The lowest mean brinjal fruit yield of (34.97 and 36.68 ton/ha) was observed in 34th MW during both the years. The pooled data of fruit yield in three hybrids as Phule Arjun, Krishna and Panchganga ranged between (38.82 and 44.42 ton/ha) at harvest. This might be due to higher values of *APAR*, LUE, dry matter accumulation and leaf area. Increased yield in earlier planting was due to favorable weather conditions like post athensis period coincides with relative low temperature.These results are in conformity with the findings of Singh et al. (1966), Islam et al. (2004) and Theodosy et al. (2014).

Effect of interaction

The interaction effect between different hybrids and planting windows on fruit yield plot^{-1} of brinjal were significant during both the years. The significantly better yield plot^{-1} was found when Phule Arjun was planted during 31stMW.

Table 1: Mean yield contributing character of brinjal as influenced by different treatments in 2014 and 2015

	Treatment	Fruit length (cm)			Fruit diameter (cm)			Fruit weight (kg)		
		2014	2015	Pooled	2014	2015	Pooled	2014	2015	Pooled
A.	**Hybrids (H)**									
V_1 :	Phule Arjun	7.26	7.74	7.50	8.34	8.89	8.62	3.83	4.09	3.96
V_2 :	Krishna	6.90	7.20	7.05	7.93	8.27	8.10	3.64	3.80	3.72
V_3 :	Panchganga	6.50	6.62	6.56	7.46	7.61	7.53	3.43	3.49	3.46
	S.Em. ±	0.07	0.08	0.07	0.08	0.09	0.08	0.04	0.05	0.04
	C.D. at 5%	0.26	0.32	0.29	0.30	0.37	0.33	0.15	0.19	0.17
B.	**Planting windows**									
P_1 :	31 MW (30 July - 5 August)	7.71	8.16	7.93	8.85	9.38	9.11	4.07	4.30	4.19
P_2 :	32 MW (6 August - 12 August)	7.25	7.61	7.43	8.33	8.74	8.54	3.83	4.02	3.92
P_3 :	33 MW (13 August - 19 August)	6.62	6.85	6.74	7.61	7.87	7.74	3.49	3.61	3.55
P_4 :	34 MW (20 August - 26 August)	5.97	6.13	6.05	6.86	7.05	6.95	3.15	3.24	3.20
	S.Em. ±	0.19	0.20	0.19	0.22	0.23	0.22	0.10	0.10	0.10
	C.D. at 5%	0.57	0.58	0.57	0.65	0.67	0.66	0.30	0.31	0.30
	Interaction (H x D)									
	Between levels of A									
	S.Em. ±	0.13	0.17	0.15	0.15	0.19	0.17	0.08	0.10	0.09
	C.D. at 5%	0.52	0.65	0.58	0.60	0.74	0.66	0.31	0.39	0.35
	Between levels of B									
	S.Em. ±	0.29	0.29	0.29	0.33	0.34	0.33	0.15	0.16	0.15
	C.D. at 5%	0.85	0.87	0.86	0.98	1.00	0.99	0.45	0.46	0.46
	General mean	6.89	7.19	7.04	7.91	8.26	8.09	3.64	3.79	3.71

Table 2: Mean plant yield (ton) of brinjal as influenced by different treatments 2014 and 2015

	Treatment	Yield (ton)		
		2014	2015	Pooled
A.	**Hybrids (H)**			
V_1 :	Phule Arjun	42.56	46.29	44.42
V_2 :	Krishna	40.45	43.06	41.75
V_3 :	Panchganga	38.06	39.58	38.82
	S.Em. ±	0.39	0.49	0.44
	C.D. at 5%	1.52	1.92	1.71
B.	**Planting windows (D)**			
P_1 :	31 MW (30 July - 5 August)	45.15	48.79	46.97
P_2 :	32 MW (6 August - 12 August)	42.50	45.48	43.99
P_3 :	33 MW (13 August -19 August)	38.79	40.96	39.88
P_4 :	34 MW (20 August - 26 August)	34.97	36.68	35.82
	S.Em. ±	1.12	1.17	1.14
	C.D. at 5%	3.33	3.49	3.40
	Interaction (H x D)			
	Between levels of A			
	S.Em. ±	0.77	0.98	0.87
	C.D. at 5%	3.04	3.85	3.43
	Between levels of B			
	S.Em. ±	1.68	1.76	1.72
	C.D. at 5%	4.99	5.23	5.10
	General mean	40.35	42.98	41.67

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