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Growth and Yield of Okra Varieties as Influenced by Different Varieties and Sowing Windows

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ABSTRACT

An experiment "Effect of weather parameters on growth, yield and insect pest infestation on okra varieties under different sowing 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.

Yield contributing characters viz., fruit weight per plant (149.45 and 157.83 g) number of fruits per plant (18.26 and 19.28) during both the years 2014 and 2015, respectively, which were found significantly higher in variety Phule Utkarsha over Parbhani Kranti and Arka Anamika. Fruit yield per ha (196.12 and 207.12 q/ha) was higher in Phule Utkarsha during 2014 and 2015, respectively, which were at par with Parbhani Kranti followed by Arka Anamika, while., fruit weight per plant (151.30 and 160.59 g), number of fruits per plant (18.49 and 19.62) during 2014 to 2015, respectively which were observed significantly higher in 27th MW (1st week of July). This was followed by 28th MW sowing window which was at par with the 29th MW sowing window in all the growth attributes. The lowest values were recorded in 30th MW (fourth week of July). Fruit yield per ha (198.54 and 210.73 qha-1) was higher with 27th MW sowing window during 2014 and 2015, respectively. This was followed by 28th MW sowing window which was at par with the 29th MW sowing window. The lower fruit yield recorded with 30th MW sowing window.

Keywords: *Fruit weight per plant, Number of fruits per plant, MW, Sowing windows.*

INTRODUCTION

Determination of optimum sowing date is considered an important effort to have optimum yields. Both quantitative and qualitative traits of crops depend on sowing on the proper date and growing season. In India higher productivity of okra plants with good vegetative growth in June sowings compared to August sowings has recorded. Incalcaterr et al. (2000) stated that the vigorous vegetative growth and high fruit setting were noticed in April compared to March sowings in Italy. High yield and quality of vegetables depends on high seed quality of improved cultivars, in addition to the optimum cultural practices.

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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.

MATERIAL 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 3.0 m x 2.4 m^2 and net plot size 2.4 m x 2.1 $m^2$with 30 x 15 cm spacing. There were twelve treatment combinations. The treatments comprised of four okra varieties *viz.,* V_1: Parbhani kranti, V_2: Arka Anamika and V_3: Phule Utkarsha as main plot and four sowing windows *viz.,* S_1: 27th MW (2 July-8 July), S2: 28th MW (9 July – 15 July) and S3: 29th MW (16 July -22 July) and S4: 30th MW (23 July -29 July) as sub plot treatments.

RESULTS AND DISCUSSION

1.Fruit weght (gm) per plant:

Effect of varieties:

The mean fruits weight of okra influenced periodically by different varieties during all the growth phases in *kharif* 2014 and 2015. The maximum mean fruit weight plant^{-1} (149.45 and 157.83g) of okra was observed in variety Phule Utkarsha during both the years which was significantly superior over other two varieties. The minimum mean fruit weight plant^{-1} (124.33 and 132.19 g) of okra was observed in variety Arka Anamika during both the years. This might be due better utilization of natural resources which enables the plant for better growth. These results are similar with the findings of Hussain et al. (2009) and Chattopadhyay et al. (2011).

Effect of sowing windows:

The mean fruit weight plant^{-1} of okra influenced periodically by different sowing windows during all growth phases in *kharif* 2014 and 2015. The maximum mean fruit weight plant^{-1} (151.30 and 160.59 g) of okra was observed in 27th MW sowing window during both the years, respectively, which was significantly superior over other sowing windows. The minimum mean fruit weight plant^{-1} (117.25 and 124.50 g) of okra was observed in 30th MW sowing windows during both the years, respectively. The values of fruit weight plant^{-1} (g) of okra are increased periodically from 1st picking to 8th picking in both years and thereafter decresed periodically. These results are similar with the findings of Hussain et al. (2009) and Chattopadhyay et al. (2011).

Effect of interaction:

The interaction effect between different varieties and sowing windows on number of fruits per plant of okra were significantly influenced during both the years, respectively. The significantly maximum fruit weight plant^{-1}(g) was found when Phule Utkarsha was sown on 27thMW sowing windows.

2. Number of fruits per plant:

The data regarding to number of fruits plant^{-1} of okra as influenced periodically by different varieties and sowing windows during *kharif* 2014 and 2015 are presented and the values of number of fruits plant^{-1}of okra are increased periodically from 1st picking to 8th picking in both years and thereafter decresed periodically.

Effect of varieties:

The mean number of fruits plant^{-1}of okra influenced periodically by different varieties during all the growth phases in *kharif* 2014 and 2015. The maximum mean number of fruits plant^{-1} (18.26 and 19.28) of okra was observed in variety Phule Utkarsha during both the years, respectively, which was significantly superior over other two varieties. The minimum mean number of fruits plant^{-1}(15.19 and 16.15) of okra was observed in variety Arka Anamika during both the years, respectively. This might be due better utilization of natural resources which enables the plant for better growth. These results are similar with the findings of Hussain et al. (2009) and Chattopadhyay et al. (2011).

Effect of sowing windows:

The mean number of fruits plant^{-1}of okra influenced periodically by different sowing windows during all the growth phases in *kharif* 2014 and 2015. The maximum mean number of fruits plant^{-1} (18.49 and 19.62) of okra was observed in 27th MW during both the years which was significantly superior over other sowing windows. The minimum mean number of fruits plant^{-1} (14.33 and 15.21) of okra was observed in 30 thMW during both the years. The values of number of fruits plant^{-1} of okra are increased periodically from 1st picking to 8th picking in both years, respectively and thereafter decresed periodically. These results are similar with the findings of Hussain et al. (2009) and Chattopadhyay et al. (2011).

Effect of interaction:

The interaction effect between different varieties and sowing windows on number of fruits per plant of okra were significantly influenced during both the years. The significantly more number of fruits plant^{-1} was found when Phule Utkarsha was sown on 27thMW sowing window.

Table 1: Fruit weight (gm) per plant and numbr of fruits per plant as influenced by different treatments

Treatment	Fruit weight per plant			Number of fruits per plant		
	2014	2015	Pooled	2014	2015	Pooled
A) Main plot: Varieties						
V_1:Parbhani Kranti	131.61	140.40	138.20	16.08	17.15	16.89
V_2:Arka Anamika	124.33	132.19	130.22	15.19	16.15	15.91
V_3:Phule Utkarsha	149.45	157.83	155.74	18.26	19.28	19.03
S. Em±	3.18	3.63	3.51	0.39	0.44	0.43
C.D. at 5%	12.47	14.23	13.79	1.52	1.74	1.68
B) Sub plot: Sowing windows						
S_1: 27thMW	151.30	160.59	158.27	18.49	19.62	19.34
S_2: 28th MW	142.11	150.93	148.72	17.36	18.44	18.17
S_3: 29th MW	129.88	137.88	135.88	15.87	16.85	16.60
S_4: 30th MW	117.25	124.50	122.69	14.33	15.21	14.99
S. Em±	3.70	3.92	3.87	0.45	0.48	0.47
C.D. at 5%	10.98	11.65	11.49	1.34	1.42	1.40
Mean	135.13	143.47	141.39	16.51	17.53	17.28
C) Interaction (A × B)						
V_1S_1	138.35	147.42	145.15	16.90	18.01	17.74
V_1S_2	143.29	153.00	150.57	17.51	18.69	18.40
V_1S_3	133.96	142.90	140.66	16.37	17.46	17.19
V_1S_4	110.85	118.29	116.43	13.54	14.45	14.23
V_2S_1	141.05	150.04	147.80	17.23	18.33	18.06
V_2S_2	129.34	137.44	135.42	15.80	16.79	16.55
V_2S_3	119.68	127.08	125.23	14.62	15.53	15.30
V_2S_4	107.26	114.18	112.45	13.10	13.95	13.74
V_3S_1	174.50	184.30	181.85	21.32	22.52	22.22
V_3S_2	153.71	162.34	160.18	18.78	19.84	19.57
V_3S_3	135.98	143.66	141.74	16.61	17.55	17.32
V_3S_4	133.63	141.02	139.18	16.33	17.23	17.00
S. Em±	6.36	7.25	7.03	0.78	0.89	0.86
C.D. at 5%	24.95	28.47	27.58	3.05	3.48	3.37

3.Fruit yield (q/ha):

The data regarding to fruit yield of okra as influenced periodically by different varieties and sowing windows

Effect of varieties:

The mean fruit yield of okra influenced periodically by different varieties during all the growth phases in *kharif* 2014 and 2015. The maximum mean fruit yield of 196.12 (q/ha) and 207.12 (q/ha) was observed in variety Phule Utkarsha followed by Parbhani Kranti 172.2 (q/ha) and 184.2(q/ha) during both the years, respectively. The minimum mean fruit yield of 163.16 (q/ha) and 173.46 (q/ha) was observed in variety Arka Anamika during both the years, respectively.

Effect of sowing windows:

The mean fruit yield of okra influenced periodically by different sowing windows during all growth phases in *kharif* 2014 and 2015. The maximum mean fruit yield 198.54 and 210.73 (q/ha) was observed in 27thMW during both the years,respectively, which was significantly superior over other sowing windows. The minimum mean fruit yield of 153.86 qtl and 163.37 (q/ha) was observed in 27th MW during both the years, respectively. 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 also to crop exposed to better climatic conditions particularly APAR, LUE and photoperiod which resulted in higher photosynthetic rate and consequently reflects in superiority in growth attributes and dry matter accumulation which results in higher yield. These results are in conformity with the findings of Sonu et al. (2013), Elhag and Afra (2014) and Bake et al. (2017).

Effect of interaction:

The interaction effect between different varieties and sowing windows on fruit yield per of okra were significant during both the years.The significantly better yield ha^{-1}was found when Phule Utkarsha was sown on 27thMW sowing window.

CONCLUSION

Yield contributing characters *viz.*, fruit weight per plant (149.45 and 157.83 g) number of fruits per plant (18.26 and 19.28) during both the years 2014 and 2015, respectively, which were found significantly higher in variety Phule Utkarsha over Parbhani Kranti and Arka Anamika. Fruit yield per ha (196.12 and 207.12 q/ha) was higher in Phule Utkarsha during 2014 and 2015, respectively, which were at par with Parbhani Kranti followed by Arka Anamika, while., fruit weight per plant (151.30 and 160.59 g), number of fruits per plant (18.49 and 19.62) during 2014 to 2015, respectively which were observed significantly higher in 27th MW (1th week of July). This was followed by 28th MW sowing window which was at par with the 29th MW sowing window in all the growth attributes. The lowest values were recorded in 30th MW (fourth week of July). Fruit yield per ha (198.54 and 210.73 qha-1) was higher with 27th MW sowing window during 2014 and 2015, respectively. This was followed by 28th MW sowing window which was at par with the 29th MW sowing window. The lower fruit yield recorded with 30th MW sowing window.

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