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Effect of different date of sowing on vegetative growth of okra cv. Arka Anamika

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Abstract

The present investigation entitled, "The effect of date of sowing on establishment and performance of okra (*Abelmoschus esculentus* (L.) Moench) cv. Arka Anamika" was carried out at the Horticulture Research Farm, Department of Applied Plant Science (Horticulture), Babasaheb Bhimrao Ambedkar University, Lucknow during 2013 in summer season. The experiment was laid out in randomized block design (RBD) with 07 treatments and three replications. The seedlings are transplanted as ten days interval. The result revealed that the highest vegetative growth characters like plant height (143.38 cm), stem diameter (140.44 mm), number of branches per plant (7.23), number of leaves per plant (22.87), length of fruit (17.18 cm) and diameter of fruit (144.33 mm) were recorded in treatment T₃ (14 March).

Keywords: Sowing, vegetative growth, different date, okra

Introduction

The term vegetables is usually applied to edible plants which store up reserve food in roots, stem, leaves, fruits and are eaten raw as salad or cooked. Vegetables are important protective food and highly beneficial for the maintenance of health and prevention of diseases. Vegetables play a vital role in crop diversification, employment generation and socio-economic upliftment of the farming society. India is now, the second largest producer of vegetables in the world next to China with a total production of 146554 thousand million tonnes from 8495 thousand hectare area and grown in 2.8% of total cultivated land and share 13.38% of world production with a productivity of 14.9 tonnes per hectare (Indian Horticulture data base 2012). Fresh okra fruits are important and used as vegetables in India, Brazil, West Africa and many other countries. Grubben, 1997^[3], reported that 100 g consumable unripe bhindi fruit contain 10.4 g dry matter, 3100 Calorie energy, 1.8 g Protein, 90 mg Calcium, 1.0 mg Iron, 0.1 mg Carotene, 0.07 mg Thiamine, 0.08 mg Riboflavin, 0.08 mg Niacin, 18 mg Vitamin C. Okra has multiple uses the extract from Bhindi fruit and stem is use after cleaning cane juice in preparation of jaggery. The dry seeds of okra contain 14-23 per cent edible oil and 21-25 per cent protein (Thamburaj and Singh, 2005)^[9]. The refined oil may be used as substitute for common edible oils especially cotton seed oil. The seed cake is also used as an animal feed.

Method and Materials

The experiment was conducted at Horticulture Research Farm of the Department of Applied Plant Science (Horticulture), Babasaheb Bhimrao Ambedkar University, Lucknow (U.P.) in well leveled field having proper drainage. The Farm is about 10 km. away from Lucknow Railway Station in south east direction on Lucknow- Rae Bareli Road. Geographically, Lucknow is situated at an elevation of 111 meter above from the mean sea level (MSL) in the subtropical tract of Central U.P. at 76.0° to 78.0° East longitude and 18.60° to 20.20° North latitude. Lucknow is characterized by subtropical climate with hot dry summer and cold winter. This region receives an average annual rainfall of 750 mm during the monsoon with some scattered showers in winter brought by the North East monsoon. The soil type of the experimental site was saline alkaline (P^H 6.5-7.7), low in organic matter, nitrogen, phosphorus and potash. Experiment was laid out in RBD with 7 treatments takes on the based of different sowing dates such as the seedlings are transplanted as ten days interval. T₁ was planted 22nd February 2013, T₂ was planted 4th March 2013, T₃ was planted 14th March 2013, T₄ was planted 24th March 2013, T₅ was planted 4th April 2013, T₆ was planted 14th April 2013 and T₇

was planted 24th April 2013. After every sowing, irrigation was done for proper establishment of plants. Sowing was done in the evening hours at spacing of 0.45 m x 0.30 m. The gross plot size was 1.8 m x 1.35 m and irrigation. The okra variety was used in the experiment "Arka anamika". The okra variety was used in the experiment "Arka anamika". Seed are sowing at seven days interval each treatment in morning hours

Result and Discussions

Plant height

Table 1 showed that the treatment T₃ (14 March) had significant effect on plant height at different date of sowing of okra plant. The plants under treatment T₃ had the maximum (43.38 cm) height at maturity 5 May 2013. It might be due to proper growth of plant under temperature 31.5 °C, proper soil moisture and good air movement etc. This result was also supported by the works of Incalcaterra *et al.* (2000) [5].

The present study pertaining that date of sowing i.e. T₃ (14 March) had the maximum (43.38 cm) under treatment of proper temperature. The similar result was also found by Yadav and Dhankar (1999) [10].

Plant stem diameter

The data pertaining to diameter are presented in table 1. According to statistical analysis of variance data showed that date of sowing had significant effect on diameter of okra. According to the mean value of the experimental results maximum T₃ (140.44 mm) diameter was noted under 14 March sowing. The experimental findings showed that the treatment T₃ increase the basal diameter of 50 days after sowing was statistically significant. The increase in diameter was might be due to proper temperature (31.5 °C), soil moisture and intercultural operation. The similar result was also reported by Bajpai *et al.* (2004).

Number of branches per plant

The data regarding to different date of sowing are presented in

table 2. Statistical analysis revealed that different date of sowing had significant effect. The treatment T₃ (14 March) had better effect on number of branches (7.23) at different date of sowing on okra. It might be due to the maximum number of branches under proper temperature, soil moisture, humidity and air movement etc. The findings were also similar to work of Ijoyah and Jimba (2011) [4].

Number of leaves per plant

The data regarding to different date of sowing presented in table 2. Statistical analysis revealed that different date of sowing effect was significant. The treatment T₃ had better effect on number of leaves (22.87) at different date of sowing on okra. It might be due to the maximum number of leaves under proper temperature, humidity, soil moisture and microclimate etc. The results corroborated with the findings Amjad *et al.* (2011).

Pod length

The data pertaining to length of fruit are presented in table 3. Statistical analysis of variance showed that the data of sowing had significant effect on fruit length. According to the mean value to the experimental results maximum (17.18 cm) fruit length was noticed in treatment T₁ (22 February) in which best temperature, proper irrigation, light penetration and proper sowing time. The results supported with the findings of Chattopadhyay *et al.* (2011) [2].

Pod diameter

The data pertaining to diameter are presented in table 3. According to statistical analysis of variance data showed that the date of sowing had significant effect of pod diameter of okra. According to the mean value of the experimental results maximum (144.33 mm) diameter was noted under treatment T₃ sowing of 14 March. The increase in diameter was might be due to proper temperature, light intensity, proper irrigation and intercultural operation. The similar result was also reported by Moniruzzaman *et al.* (2007) [6].

Table 1: The effect of date of sowing on plant height (cm) and stems diameter (mm) of okra.

Treatment	Average Plant height (cm)					Average Stem diameter (mm)				
	7 April 2013	14 April 2013	21 April 2013	28 April 2013	5 May 2013	7 April 2013	14 April 2013	21 April 2013	28 April 2013	5 May 2013
T ₁ (22 Feb)	16.60	21.20	21.20	38.32	40.63	131.67	134.65	133.51	137.92	135.70
T ₂ (4 March)	13.83	19.17	19.17	40.37	42.20	130.91	133.98	137.87	138.16	139.14
T ₃ (14 March)	16.83	26.13	26.13	40.65	43.38	132.24	134.82	138.99	139.45	140.44
T ₄ (24 March)	9.53	14.87	14.87	36.33	39.76	128.39	132.63	137.88	137.68	138.35
T ₅ (4 April)	12.57	16.30	16.30	36.03	39.01	130.84	131.17	137.54	134.72	138.64
T ₆ (14 April)	17.03	21.51	21.51	31.78	38.09	130.73	134.00	137.40	135.45	139.72
T ₇ (24 April)	15.36	18.95	18.95	27.20	31.47	131.12	133.17	136.54	137.42	139.23
S.E.M.(±)	1.496	2.672	3.763	3.021	3.779	0.937	0.832	0.786	1.250	1.069
C.D. (P=0.05)	3.14	5.62	7.91	6.35	7.94	1.97	1.75	1.65	2.63	2.25

Table 2: The effect of date of sowing on number of branches per plant and number of leaf per plant of okra

Treatment	Average Number of branches per plant					Average number of leaf per plant				
	7 April 2013	14 April 2013	21 April 2013	28 April 2013	5 May 2013	7 April 2013	14 April 2013	21 April 2013	28 April 2013	5 May 2013
T ₁ (22 Feb)	2.40	3.00	3.53	5.53	6.73	12.04	12.91	16.40	16.73	17.18
T ₂ (4 March)	1.93	3.07	3.73	4.80	6.03	13.97	14.70	15.49	15.88	16.46
T ₃ (14 March)	3.00	3.40	5.13	6.13	7.23	13.28	14.36	16.27	16.53	16.83
T ₄ (24 March)	1.47	2.40	3.93	3.33	5.87	9.95	11.90	15.21	15.09	16.00
T ₅ (4 April)	1.80	2.00	4.37	3.33	5.87	12.75	14.73	14.00	13.26	15.28
T ₆ (14 April)	2.07	2.00	3.20	3.50	5.00	11.79	14.38	15.48	16.00	15.52
T ₇ (24 April)	2.40	3.07	3.13	3.47	6.1	12.50	12.12	16.27	16.61	16.96
S.E.M.(±)	0.398	0.436	0.520	0.927	0.533	0.988	0.952	0.607	0.799	0.555
C.D. (P=0.05)	0.84	0.92	1.09	1.95	1.12	2.08	2.00	1.28	1.68	1.17

Table 3: The effect of date of sowing on pod length (cm) and pod diameter (mm) of okra

Treatment	Average Pod length (cm)					Average pod diameter (mm)				
	7 April 2013	14 April 2013	21 April 2013	28 April 2013	5 May 2013	7 April 2013	14 April 2013	21 April 2013	28 April 2013	5 May 2013
T ₁ (22 Feb)	12.04	12.91	16.40	16.73	17.18	137.69	140.39	142.71	142.89	143.07
T ₂ (4 March)	13.97	14.70	15.49	15.88	16.46	139.32	141.28	143.56	144.08	144.17
T ₃ (14 March)	13.28	14.36	16.27	16.53	16.83	140.20	143.08	144.33	144.29	144.46
T ₄ (24 March)	9.95	11.90	15.21	15.09	16.00	133.26	135.89	141.09	142.04	142.15
T ₅ (4 April)	12.75	14.73	14.00	13.26	15.28	138.36	139.66	142.94	140.22	140.78
T ₆ (14 April)	11.79	14.38	15.48	16.00	15.52	139.34	139.38	141.56	143.57	142.55
T ₇ (24 April)	12.50	12.12	16.27	16.61	16.96	138.84	137.87	143.17	143.41	140.92
S.E.M.(±)	0.988	0.952	0.607	0.799	0.555	1.670	1.393	0.893	1.111	0.844
C.D. (P=0.05)	2.08	2.00	1.28	1.68	1.17	3.51	2.93	1.88	2.34	1.77

Conclusion

From the study, it might be concluded that okra crops cv. Arka Anamika transplanted during 14 March (T₃) performed better and showed more number of branches, plant height, number of leaves, pod length and pod diameter. Thus the treatment (T₃) 14 March transplanted may be suggested for cultivation of okra cv. Arka Anamika in Lucknow condition.

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