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Evaluation of OFT on different spacing in okra during *Rabi* season in the Dangs

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Abstract
The On Farm Testing (OFT) on "Evaluation of different spacing in okra during *Rabi* season in the Dangs" was conducted by Krishi Vigyan Kendra, Navsari Agricultural University, Waghai on farmers field in three villages namely Ambapada, Davdahad and Khatal of Waghai taluka during the years 2013-14 to 2015-16 comprising of three different spacings tratments *viz.*, T_1 = 30 x 10 cm (Farmers practices), T_2 = 45 x 30 cm (Normal spacing) and T_3 = 30 x 30 x 60 cm (Paired row spacing). The results revealed that the okra crop sown at paired row spacing of 30 x 30 x 60 cm for resulted in higher yield of 9768 kg/ha as well as net returns of Rs. 1,04,190/ha as compared to 9572 kg/ha yield & Rs. 1,01,250/ha net income under normal spacing of 45 x 30 cm and farmer's practices of 30 x 10 cm recorded the least values for both the parameters (8513 kg/ha and Rs. 79,365/ha, respectively). So, on the basis of OFT results, it is recommended to grow okra crop at a spacing of 30 x 30 x 60 cm for obtaining higher yield & net returns.

Keywords: Okra, spacing, yield and OFT

Introduction
Okra (*Abelmoschus esculentus* L. Moench) also known as Lady's Finger or *Bhindi* is the major vegetable crop grown in certain pockets of the Dangs district especially during *Rabi* season due to which farmers also gets better monitory returns as the cultivation is restricted to small area during this period as it is considered as off season for this crop. In Gujarat, it is grown in an about 65,410 ha area with production of 7,17,254 M.T, whereas in the Dangs it is grown in an about 740 ha area and production of about 11,100 M.T. In Dangs, the farmers are doing sowing at very narrow spacing due to which requirement of seed is very higher, incidence of pest and disease is more and management practices (irrigation, fertilizer application, weeding, spraying of pesticides, harvesting, etc.) also become difficult as compared to normal or paired row spacing. In this regards, the OFT was conducted by KVK, NAU, Waghai with main objectives to increase production and decrease cost of cultivation and bring awareness among the tribal farmers of the district.

Material and Methods
The present investigation was conducted in *Rabi* season for three years during 2013-14, 2014-15 and 2015-16 by KVK, NAU, Waghai, District Dangs of Gujarat state. The treatment comprising of three different spacings *viz.*, T_1 = 30 x 10 cm (Farmers practices), T_2 = 45 x 30 cm (Normal spacing) and T_3 = 30 x 30 x 60 cm (Paired row spacing). Two farmers from each village and total six farmers were selected from the three villages namely Ambapada, Davdahad and Khatal of Waghai taluka and the total area of the OFT was 1.8 ha with 0.1 ha under each treatment/farmer. The team of KVK scientists had made survey of the village to identify the adoption gap and technological needs of farmers as well as their socio economic status. Farmers were trained to follow the practices for okra cultivation as recommended by the State Agricultural Universities and need based input materials were also provided to the farmers. The farmers followed the full package of practices like soil testing, seed treatment, ridge & furrow method of sowing, timely manures and fertilizer application, use of bio-fertilizers, weed and water management, IPM practices, etc. The yield data were collected from all the treatments during the three years and the average was worked out.

Results and Discussion

The data presented in Table-1 revealed that the paired row spacing of 30 x 30 x 60 cm in okra resulted in maximum average yield of 9768 kg/ha and was followed by normal spacing of 45 x 30 cm which recorded 9572 kg/ha yield, whereas the least production of 8513 kg/ha was obtained under farmers practices (30 x 10 cm spacing). Moreover, there was 14.7% increase in yield under T_3 as compared to farmer's practices. It was observed that potential yield can be achieved by imparting scientific knowledge to the farmers by providing the need based techniques & quality inputs. This results clearly indicated that the higher average yield in T_3 over the years as compare to farmers practice may be due to knowledge and adoption of full package of practices i.e. use of recommended dose of fertilizers through INM, bio fertilizer, vermicompost, and timely application of plant protection chemicals. Similar results were also reported by Dhemre and Desale (2010) and Aklade *et al.* (2018) in okra and also by Kalalbandi *et al.* (2006) in chilli crop [1, 2, 3].

Further for calculating cost of cultivation, gross return, net return and benefit: cost ratio, the input and output prices of commodities prevailed during the study were taken into consideration and the data as presented in Table-2 indicated that the cultivation of okra at paired row spacing gave maximum net returns of Rs.1,04,190/ha along with higher BCR of 1: 3.46 as compared to T_2 and T_1. This may be due to higher yield obtained under improved technologies as compared to local check (farmers practice). These findings are also in accordance to those obtained by Singh *et al.* (2011) in solanaceous vegetables and Shalini *et al.* (2016) in tomato [4, 5].

Table 1: Effect of different spacing's on yield (kg/ha) of okra

Year	1st Year			2nd Year		
	T_1	T_2	T_3	T_1	T_2	T_3
Highest	8610	9720	9980	8520	9650	9850
Lowest	8450	9330	9720	8210	9420	9520
Average	8503	9557	9815	8430	9570	9710
Year	**3rd Year**			**Average of three years**		
	T_1	T_2	T_3	T_1	T_2	T_3
Highest	8720	9730	9960	8617	9700	9930
Lowest	8340	9470	9590	8327	9407	9610
Average	8605	9590	9780	8513	9572	9768

Table 2: Effect of different spacing's on net returns & BCR in okra

Treatment	No .of trials	Yield (t/ha) (Ave.)	Gross Return (Rs./ha)	Cost of cultivation (Rs./ha)	Net Returns (Rs./ha)	BC Ratio
T_1: 30 x 10 cm (Farmers practices)	6	8.513	127695	48330	79365	2.64
T_2: 45 x 30 cm (Normal spacing)		9.572	143580	42330	101250	3.39
T_3: 30 x 30 x 60 cm (Paired row spacing)		9.768	146520	42330	104190	3.46

(Note: Selling price of okra @ Rs. 15.00 per kg).

Conclusion

On the basis of OFT results, it is recommended to grow okra crop at a spacing of 30 x 30 x 60 cm (paired row) for obtaining higher yield & net returns. In terms of impact of this OFT, at least 200 farmers had adopted this technology in there field around Ambapada, Davdahad and Khatal villages.

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