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Technological gap in adoption of recommended cultivation practices of sweet orange growers

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Abstract

The present study was conducted on topic "Technological gap in adoption of recommended cultivation practices of Sweet orange growers" to find out technological gap. The present study was purposively conducted in Jalna district of Marathwada region in 2021-22. The study was conducted in purposively selected talukas namely Jalna, Ghansawangi and Ambad of Jalna district. The sample constituted 120 sweet orange growers from 12 villages which is 10 respondents from each village. Ex-post facto research design was used for present study. Data from the respondents were collected by personally interviewing with the help of structured and pretested interview schedule. Collected data were classified, tabulated and analyzed by using statistical methods or tools like frequency, percentage, mean, standard deviation and correlation coefficient. Among the 120 selected sweet orange growers more than half (69.17%) were having medium overall technological gap followed by 17.50 and 13.33 percent had low and high overall technological gap in adoption recommended cultivation practices of sweet orange, respectively. The composite technological gap of selected ten practices was 33.69 percent. It clearly indicates that the selected ten recommended sweet orange cultivation practices were followed by the majority of sweet orange growers (66.31%) as per the recommendations.

Keywords: Technological gap, adoption, recommended cultivation practices, sweet orange

Introduction

Citrus is one of the important fruit crops cultivate across the globe. Citrus fruit appeared on globe 7 million years ago. The ancestral species of citrus fruit apparently originate in South East Asia between China, Eastern India and the Island of pacific coast. Among the fruits, sweet orange serves as most refreshing delicious and health promoting juicy fruit and as such, they deserve a prominent place in daily diet. Sweet orange juice contains sugars, acids, mineral like calcium, phosphorus, iron and alkaline salts which plays the role of health promoting ingredients in human diet. Sweet oranges serve as the most refreshing, delicious whole some and health promoting juicy fruits and as such they deserve a prominent place in diet. Its juice is rich in vitamin 'C' and is good source of vitamin A and B. Besides vitamins, the juice contains fruits sugar, minerals like calcium, phosphorous and iron and alkaline salts which plays the vital role of health promoting ingredients in human diet. During the last three decades, India has experienced a quantum jump of more than 5-fold in production due to an increase in area and adoption of new technologies. Productivity has increased from 8.5 tones/ha to 11.50 tones/ha during the last 3 decades (1987-88 to 2017-18). According to the latest statistics, maximum productivity (21-22 tones/ha) has been recorded in Punjab and Karnataka followed by Telangana and Andhra Pradesh (17-18 tones/ha). Whereas, in some orchards in Vidarbha (Maharashtra) yield of 19- 25 tones/ha is not uncommon. This indicates the ample scope for increasing average productivity in Maharashtra. (Source: QRT report, ICAR-CCRI, Nagpur). In Marathwada region the total sweet orange area is 40,267 thousand hectares, out of which Aurangabad having highest area under sweet orange crop i.e. 21,475 thousand ha and Jalna ranks second in area of sweet orange crop i.e. 14,342 thousand ha (Source: HAPIS). As per latest data the area of sweet orange in Jalna is 20,150 ha and production are 48,755 metric tons in 2021-22 (Source: DSAO, Jalna). Therefore, the present study is carried out to know the technological gap in adoption of recommended cultivation practices sweet orange with the following objectives. Therefore, the present study was carried out to investigate with the specific objective to study the extent of technological gap in adoption of recommended sweet orange cultivation practices.

Materials and Methods

The present study was undertaken in Marathwada region of Maharashtra state during the year 2021-22 in Jalna district. Jalna district was selected purposively from Marathwada region, three talukas namely Jalna, Ghansawangi and Ambad were also selected purposively and four villages from each taluka were selected randomly for the study. From each selected village, ten sweet orange growers were selected purposively, in this way total 120 respondents were considered for the study. An Ex-post-facto research design was followed for the study. Data was collected by personally interviewing the sweet orange growers. The collected data was analyzed, classified and tabulated. Statistical tools such as frequency, percentage, mean, standard deviation, and coefficient of correlation were used to interpret findings and draw conclusions.

Results and Discussion

Extent of technological gap in adoption of recommended sweet orange cultivation practices

i) Overall technological gap in adoption recommended sweet orange cultivation practices

The data pertaining to Table 1 depicts overall technological gap of sweet orange growers about recommended cultivation practices of Sweet Orange.

Table 1: Distribution of Sweet orange growers according to the overall technological gap about recommended cultivation practices of sweet orange

Sr. No.	Category	(N=120)	
		Frequency	Percentage
1	Low (up to 25)	21	17.50
2	Medium (26 to 39)	83	69.17
3	High (40 and above)	16	13.33
	Total	120	100

The data presented in Table 1 reveals that 69.17 percent Sweet orange growers were having medium overall technological gap followed by 17.50 and 13.33 percent had low and high overall technological gap in Sweet orange recommended cultivation practices, respectively. The sweet orange is a long-term horticulture (fruit) crop, requiring consistency in knowledge acquisition and its application and management, which may be the cause of this result. Majority of sweet orange growers falls in medium technological gap category because now a days growers with change of time and

Table 3: Distribution of sweet orange growers according to practice wise technological gap in recommended cultivation practices of sweet orange (N=120)

Sr. No.	Recommended cultivation practices of sweet orange	Technological gap		
		Complete Technological gap	Partial Technological gap	No Technological gap
		Freq. (%)	Freq. (%)	Freq. (%)
I	Soil & Preparatory tillage			
1	Ploughing & Harrowing	0 (0.00)	58 (51.67)	62 (48.33)
2	Digging pits (75 × 75 × 75 cm)	3 (2.5)	42 (35.00)	75 (62.50)
3	Soil and Land	6 (5.00)	7 (05.83)	107 (89.17)
II	Planting			
4	Propagation	11 (9.16)	36 (30.00)	73 (60.83)
5	Recommended Varieties	11 (9.16)	40 (33.33)	69 (57.50)

advancement of technology and its awareness they adopt more innovation as compared to previous times This finding is similar to that finding of Chavan (2014) ^[1] and Pawar (2015) ^[2].

ii) Composite technological gap in adoption of recommended sweet orange cultivation practices

Table 2: Technological gap index of recommended sweet orange cultivation practices

Sr. No.	Cultivation Practices (Technological gap)	Technological gap index (In percentage)
I	Gap in soil and preparatory tillage	17.22
II	Gap in Plantation	23.00
III	Gap in Fertilizer application	47.91
IV	Gap in Water Management / Irrigation application	32.08
V	Gap in Interculture/Weed Management	24.79
VI	Gap in Bahar Management	25.13
VII	Gap in Plant Protection	35.78
VIII	Gap in Training & Pruning	40.20
IX	Gap In Harvesting	19.58
X	Gap in PHM (Post-Harvest Management)	71.25
XI	Composite Technological gap	33.69

Table 2 indicated that the technological gap in respect soil and preparatory tillage was 17.22 percent, 23 percent in plantation, 47.91 percent fertilizer application, 32.08 percent in water management or irrigation application, 24.79 percent in intercultural operations, 25.13 percent in bahar treatment, 35.78 percent in plant protection measures, 40.2 percent in training & pruning, 19.58 percent in harvesting, 71.25 percent in PHM (Post-Harvest Management) and Composite technological gap is 33.69 percent. Thus, it can be stated that in general highest technological gap was found in Post-Harvest Management and lowest technological gap was noted in soil & preparatory tillage. The overall technological gap joining all of the recorded practices *i.e.*, Composite technological gap was noticed 33.69 percent in adoption of recommended cultivation practices of sweet orange. This finding is supported with those of Pawar (2015) ^[3] and Emsetty (2021) ^[2].

iii) Practice wise technological gap in recommended cultivation practices of sweet orange

6	Method of plantation (Pit method)	0 (0.00)	0 (00.00)	120 (100)
7	Planting season (June-July)	4 (03.33)	69 (57.50)	47 (39.17)
8	Spacing & No. of plants (6 × 6 m, 277 plants/ha)	5 (4.17)	69 (57.50)	46 (38.33)
III	Fertilizer management /application			
9	FYM or Compost (50 kg)	26 (21.67)	66 (55.00)	28 (23.33)
10	Before or at the time of planting	3 (2.5)	108 (90.00)	9 (7.50)
11	first year	10 (8.33)	96 (80.00)	14 (11.67)
12	NPK dose (800:400:400 gm/tree/year)	0 (0.00)	73 (60.83)	47 (39.17)
13	Growth regulator (2,4,5-T @15 ppm NAA @ 15 ppm)	76 (63.33)	2 (01.67)	42 (35.00)
IV	Water Management /Irrigation Application			
14	According to season difference between two time of application of irrigation (in heavy soil)	11 (09.17)	86 (71.67)	23 (19.17)
15	Method of drainage if water accumulates in orchard (Digging trenches)	25 (20.83)	0 (00.00)	95 (79.17)
16	Method of irrigation	0 (0.00)	73 (60.83)	47 (39.17)
V	Weed Management /Interculture			
17	Herbicides used in sweet orange crop	0 (0.00)	64 (53.33)	56 (46.67)
18	Other methods of weed management	0 (0.00)	54 (45.00)	66 (55.00)
VI	Bahar Management			
19	Start of bahar treatment	0 (0.00)	60 (50.00)	60 (50.00)
20	Days of water Stress in medium soil	0 (0.00)	61 (50.83)	59 (49.17)
21	Time of water stress	0 (0.00)	60 (50.00)	60 (50)
VII	Pest & Disease Management			
22	Leaf-eating caterpillars	1 (08.83)	112 (93.33)	7 (5.833)
23	Leaf borer	2 (1.66)	72 (60.00)	46 (38.33)
24	Aphids	4 (3.333)	67 (55.83)	49 (40.83)
25	Psylla	1 (0.833)	74 (61.67)	45 (37.50)
26	Fruit Sucking Moth	4 (3.333)	71 (59.17)	45 (37.50)
27	Greening	2 (1.667)	77 (64.17)	41 (34.17)
28	Tristeza	3 (2.50)	72 (60.00)	45 (37.50)
29	Gummosis	4 (3.333)	100 (83.33)	16 (13.33)
VIII	Training & Pruning			
30		19 (15.83)	58 (48.33)	43 (35.83)
31		20 (15.83)	57 (47.50)	43 (35.83)
IX	Harvesting			
32	Harvesting	0 (0.00)	33 (27.50)	87 (72.50)
33	Harvesting as per Bahar	0 (0.00)	61 (50.83)	59 (49.17)

It can be seen from Table 3 that under majority of sweet orange growers 48.33 percent and 51.67 percent of no and partial technological gap found in ploughing and harrowing, respectively. Regarding digging of pits, 62.50, 35.00 and

02.50 percent of no, partial and complete technological gap found in sweet orange grower, respectively in adoption of these practices. Regarding soil and land selection 89.17, 05.83 and 05.00 percent of no, partial and complete technological

gap found in sweet orange grower, respectively in adoption of these practices. Regarding propagation about rootstock selection 60.83, 30.00 and 09.16 percent of no, partial and complete technological gap found in sweet orange grower, respectively in adoption of these practices. Regarding selection of recommended varieties 57.50, 33.33 and 09.16 percent of no, partial and complete technological gap found in sweet orange grower, respectively in adoption of these practices. In case of method of plantation which is pit method 100 percent of no technological gap found in sweet orange grower, respectively. In case of planting season which is June-July 39.17, 57.50 and 03.33 percent of no, partial and complete technological gap found in sweet orange grower, respectively. In case of spacing and number of plants 38.33, 57.50 and 04.17 percent of no, partial and complete technological gap found in sweet orange grower, respectively. In case of FYM or compost 23.33, 55.00 and 21.67 percent of no, partial and complete technological gap found in sweet orange grower, respectively. In case of FYM or compost quantity application 23.33, 55.00 and 21.67 percent of no, partial and complete technological gap found in sweet orange grower, respectively. In case of application of fertilizer before or at a time of planting, it was found that 07.50, 90.00 96 and 02.50 percent of no, partial and complete technological gap found in sweet orange grower, respectively. Regarding to application of fertilizer in first year 11.67, 80.00 and 08.33 percent of no, partial and complete technological gap found in sweet orange grower, respectively. In case of recommendation of NPK dose 39.17 and 60.83 percent of no and partial technological gap found, respectively. Regarding to application of growth regulator like 2,4,5-T & NAA sweet orange grower had 35.00, 01.67 and 63.33 percent had no, partial and complete technological gap, respectively. In case of application of water sweet orange grower had 19.17, 71.67 and 09.17 percent had no, partial and complete technological gap, respectively. While digging of trenches had 79.17 and 20.83 percent of no and complete technological gap, respectively. In case of method of irrigation 39.17 and 60.83 percent of no and partial technological gap found in sweet orange grower, respectively. Regarding selection of herbicide for weed control 46.67 and 53.33 percent of no and partial technological gap found in sweet orange grower, respectively. While only 55.00 and 45.00 percent of no and partial technological gap regarding other methods of weed management which are Intercropping practices, proper and timely watering (irrigation method), avoiding excess use of nitrogenous fertilizers found in sweet orange grower. When it comes to bahar management, 50.00 and 50.00 percent of no and partial technological gap about starting time of bahar treatment and time of water stress, respectively in sweet orange grower. 49.17 and 50.83 percent of no and partial technological gap regarding days of water stress in medium soil found in sweet orange grower. When it comes to adoption of control measures of Leaf eating caterpillar sweet orange grower had 93.33 percent of partial technological gap. Regarding adoption of control measures of leaf borer sweet orange grower had 60.00 and 38.33 percent of partial and no technological gap, respectively. When it comes to adoption of control measures of aphids, sweet orange grower had 55.83 and 40.83 percent of partial and no technological gap, respectively. In case of adoption of control measures of psylla, sweet orange grower had 61.67 and 37.50 percent of partial and no technological gap, respectively. Regarding

adoption of control measures of fruit sucking moth sweet orange grower had 59.17 and 37.50 percent of partial and no technological gap, respectively. In case of adoption of control measures for Greening disease, sweet orange grower had 64.17 and 34.17 percent of partial and no technological gap, respectively. While adoption of control measures for tristeza disease sweet orange 97 grower had 60.00 and 37.50 percent of partial and no technological gap, respectively. While adoption of control measures for Gummosis disease sweet orange grower had 83.33 and 13.33 percent of partial and no technological gap, respectively. In case of training and pruning practices, 48.33 and 47.50 percent of partial technological gap found in pruning practices time and keeping recommended stem height and branches number, respectively. In case of time of harvesting 27.50 and 72.50 of partial and no technological gap found in sweet orange grower, respectively. While harvesting as per bahar treatment 49.17 and 50.83 percent of no and partial technological gap found in sweet orange grower, respectively. 57.50 and 42.50 percent of partial and complete technological gap found in case of post-harvest management of sweet orange grower. Table 3 shows distribution of sweet orange growers according to practice wise technological gap in adoption of recommended cultivation practices of sweet orange.

Conclusion

It is observed that, majority Sweet orange growers i.e., 69.17 percent were having medium overall technological gap followed by 17.50 and 13.33 percent had low and high overall technological gap in Sweet orange recommended cultivation practices, respectively. Thus, it is concluded that majority of the sweet orange growers i.e. 69.17 percent had medium level of overall technological gap in adoption of recommended Sweet orange cultivation practices. The composite technological gap of selected ten practices was 33.69 percent. It clearly indicates that the selected ten recommended sweet orange cultivation practices were followed by the majority of sweet orange growers (66.31%) as per the recommendations.

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