



Research Article

Adoption of recommended package of practices of sweet orange growers

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SUMMARY : This study was carried out in Aurangabad district of Marathwada region of Maharashtra during 2011 in two selected blocks. This study aims to assess knowledge and adoption level of sweet orange growers about recommended sweet orange recommended package of practices. 120 farmers were randomly selected to collect the primary data. The collected data were analyzed with the help of suitable statistical techniques to draw appropriate conclusions. The findings of this study reveal that the majority (63.33 %) of the respondents were having medium overall level of knowledge regarding recommended package of practices of sweet orange. 64.17 per cent of the respondents had medium extent of adoption regarding recommended package of practices of sweet orange. Variables were like farming experience, extension contacts, market orientation, size of orchards, experience in sweet orange cultivation, knowledge and adoption.

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KEY WORDS :

Adoption, Practices,
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BACKGROUND AND OBJECTIVES

Citrus (*Citrus sinensis*) is one of the important fruit crops grown throughout the world. The ancestral species of citrus fruit apparently originated in South East Asia between China, Eastern India and the Island of Pacific coast from which they spread to Arabia, Middle-East, Southern Europe and Mediterranean regions. The citrus fruits are produced in all tropical and subtropical areas of the world. Sweet orange belongs to the plant family Rutaceae, sub-family Aurantiaceae, which comprises 33 well known genera and 203 species. Among all the fruits produced either for export or local markets, sweet orange contributes 71 per cent of the total citrus fruit production in the world. Brazil is the largest producer of oranges followed by USA. Oranges are the second largest fruit grown and processed in the world after grapes.

Sweet orange is a domestic fruit for housewives, which is often used for pickles, jam, jellies, marmalades, etc. Various types of wines, liquors, beverages are some of the outstanding preparations of sweet orange. It recalls to all the people in the world, because of its sweet taste,

pleasant flavour and golden orange colour. In India, consumption of fruit is still considered to be a matter of luxury and not necessity. The chemical composition of sweet orange shows that it contains 56 to 92 per cent water, 5 to 8 per cent sugar, 1 to 2 per cent protein, 0.1 to 1.5 per cent glycosides, 0.8 to 1.2 per cent pentosams, 0.4 to 1.5 per cent citric acid, 0.6 to 0.9 per cent fibre, 0.6 to 0.8 per cent proteins, 0.2 to 0.5 per cent essential oils.

Keeping in view of the above facts into consideration, the present study was undertaken to find out the following objectives :

- To study the knowledge of recommended package of practices of sweet orange growers.
- To study the adoption of recommended package of practices of sweet orange growers.

RESOURCES AND METHODS

The aim of the present study was to analyze the adoption of recommended package of practices of sweet orange growers in Aurangabad district. Two talukas from Aurangabad district, Aurangabad and Paithan were selected, as there

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was comparatively large area under sweet orange cultivation. For the purpose of collection of data a list of respondents was obtained from taluka Agricultural Office, as area under sweet orange is increasing.

From Aurangabad district two talukas were selected randomly, from each taluka five villages were selected thereby making ten villages. From each village twelve sweet orange growers were selected, thereby making sample of sixty sweet orange growers from Aurangabad taluka and sixty sweet orange growers from Paithan taluka thus making a sample of one hundred twenty sweet orange growers. The name of selected villages were in Aurangabad taluka Pimpri Raja, Mlakapur, Uchalti, Garkheda and Jalgaon. In Paithan taluka Gavtanda, Balanagar, Kapusvadi, Dhorkin and Takali.

Respondants were interviewed through personal interview prior to interview, respondents were taken into confidence by revealing of the actual purpose of the study and full care was taken into consideration to develop into good report with them. For the data collection well designed and pretested interview schedule were used. Data were analyzed by the help of various statistical tools *i.e.* frequency, percentage, mean and standard deviation etc. For knowing the level of knowledge 29 multiple choice questions were prepared in consultation with the scientist of MKV and literature available to measure the level of knowledge, the list of recommended important practices was prepared and responses for the each practice was obtained in 3 point quantum as mentioned below:

Catagories	Score
No knowledge	0
Partial knowledge	1
Complete knowledge	2

All the respondents were grouped into three categories as on the basis of mean (X) and standard deviation (S.D)

$$K.I. = \text{Mean (X)} \pm \text{S.D. (Standard Deviation)}$$

Catagories	Formula
Low (Up to 14 Score)	(< Mean - S.D.)
Medium	(In between Mean \pm S.D.)
High	(> Mean+ S.D.)

To measure the extent of adoption, the list of recommended important practice were obtained into three point quantum as maintained below:

Catagories	Score
Not adopted	0
Partially adopted	1
Fully adopted	2

The possible adoption score that a respondent could

obtain would from 0 to 33. On the basis of total adoption score, the adoption index was calculated using the following formula:

$$\text{Adoption index (A.I.)} = \frac{\text{Obtained score}}{\text{Maximum possible score}} \times 100$$

Level of adoption	Adoption index
1. Low (Mean - S.D.)	Up to 24 score
2. Medium (Mean)	25 to 32 score
3. High (Mean + S.D.)	Above 33 score

OBSERVATIONS AND ANALYSIS

The results obtained from the present investigation have been discussed in the following sub heads:

Overall level of knowledge of sweet orange growers about recommended package of practices:

The data presented in Table 1 indicated that It was observed from results that considerable 63.33 per cent of the respondents had medium level of knowledge while near about 20.83 per cent and 15.84 per cent of the respondents had low and high level of knowledge, respectively about recommended package of practices of sweet orange cultivation. Probable reason could be that the farmers might have not taken benefit of schemes from which adequate training and follow up could be provided to the sweet orange growers. The findings are in line with Anchule (1996), Manvar (1999), Narker (1999) and Ghodeswar (2006).

Practice wise level of knowledge of sweet orange growers:

The data presented in Table 2 revealed that majority of 96.66 per cent of the respondents were having knowledge about famous variety of sweet orange in Marathwada region followed by 95.83 per cent of the respondents were having knowledge about use of planting material and harvesting of mrig bahar.

Again it can be seen from the Table 2 that majority 95.00 per cent of the respondents were known to take care in transportation of the fruit within time, 94.16 per cent of the respondents were having knowledge about harvesting of the Ambia bahar followed by 93.33 per cent of the respondents were having knowledge about training and pruning sweet orange stem and 90.83 per cent of the respondents possessed knowledge about selection of soil. 88.33 per cent of the respondents having knowledge about selection of important bahar in a year followed by 82.50 per cent of the respondents were had knowledge about planting month of sweet orange and majority 76.66 per cent of the respondents were having knowledge of selection root stock for budding followed by majority of the respondents had knowledge about doing preparatory tillage of sweet orange orchard followed by

Table 1 : Distribution of sweet orange growers according their overall knowledge level

Sr. No.	Knowledge level	Frequency	Percentage
1.	Low (up to 14)	25	20.83
2.	Medium (15 to 21 years)	76	63.33
3.	High (22 and above)	19	15.84
	Total	120	100.00

considerable 65.83 per cent of the respondents were having knowledge about keeping recommended space between two plants. Also it is found that 62.50 per cent of the respondents were having knowledge about interval between two successive irrigations. It is also seen that most (60.00 %) of the respondents were having knowledge about climate required for sweet orange fruit crop followed by nearly half 51.66 per cent of the respondents were having knowledge about intercropping in sweet orange orchard.

Overall level of adoption sweet orange growers about recommended package of practices:

The data presented in Table 3 show that considerable 64.17 per cent of the sweet orange growers had medium level of adoption of recommended package of practices while one fifth 20.08 per cent of the respondents had low adoption and 15.00 per cent had high level of adoption. The reasons are various socio-economic, psychological factors like education, land holding, irrigation facility economics constraints. The findings in line with Jawale and Nachne (1993), Deshmukh

Table 2 : Practicewise knowledge of the respondents about recommended package of practices of sweet orange

Sr. No.	Practices	Frequency	Percentage
1.	Knowledge about climate	72	60.00
2.	Selection of soil	109	90.83
3.	Knowledge of preparatory tillage	84	70.00
4.	Month of planting	99	82.50
5.	Pit size	59	49.16
6.	Knowledge about bud distance from soil while planting	24	20.00
7.	Spacing between two plants	79	65.83
8.	Pit filling material required	27	22.50
9.	Application of recommended fertilizer dose	5	4.16
10.	Selection of rootstock for budding	92	76.66
11.	Knowledge about planting material to use	115	95.83
12.	Knowledge about recommended plant per hectare	59	49.16
13.	Famous variety in Marathwada region	116	96.66
14.	Management of first Bahar (year)	116	96.66
15.	Selection of important Bahar in a year	106	88.33
16.	Bahar treatment	55	45.83
17.	Knowledge about harvesting of Ambia bahar	113	94.16
18.	Knowledge about harvesting of Mrug bahar	115	95.83
19.	Knowledge about intercropping	62	51.66
20.	Time interval between two successive irrigation	75	62.5
21.	Number of irrigations in year	57	47.5
22.	Type of irrigation method	115	95.83
23.	Training and pruning of stem	112	93.33
24.	Training and pruning of branches	37	30.83
25.	Knowledge about disease, where water stagnant around the stem	62	51.66
26.	Use of growth regulator	01	0.83
27.	Leaf eating caterpillar	28	23.33
28.	Spraying of fungicides	26	21.66
29.	Care to be taken to transport fruits within time	114	95.00

Table 3 : Distribution of the sweet orange growers according to their overall adoption level

Sr. No.	Adoption level	Frequency	Percentage
1.	Low (up to 24)	25	20.083
2.	Medium (25 to 32 years)	77	64.17
3.	High (33 and above)	18	15.00
	Total	120	100.00

(1995), Ahire (1997), Sutar (1997), Manvar (1999) and Ghodeswar (2006).

Practice wise Adoption of recommended package of practices of sweet orange growers:

Cultivation practices:

Variety and propagation:

It is revealed from Table 4 that all (100 %) sweet orange growers fully adopted nucellar and satgudi variety followed by considerable (62.50 %) respondents adopted rangpur rootstock at the time of budding while 35.80 per cent of the respondents were not adopted rangpur root stock at time of budding while, meagre 1.66 per cent of the respondents partially adopted rangpur rootstock for budding.

Majority 95.00 per cent of the respondents partially adopted in keeping bud part 15-20 cm above the soil at the time of planting followed by meagre 4.16 per cent of the respondents adopted fully while, 0.83 per cent of the respondents not adopted keeping the bud part 15-20 cm above the soil.

Soil and planting:

It is revealed from Table 4 that majority 91.67 per cent of the respondents had fully adopted medium soil for plantation of sweet orange crop followed by 6.67 per cent of the respondents adopted medium soil for plantation and meagre 1.67 per cent of the respondents not adopted medium soil for plantation of sweet orange crop. It is also seen that majority 73.30 per cent of the respondents partially adopted pit size 60 x 60 cm followed by nearly one fifth 23.30 per cent of the respondents fully adopted the recommended pit size while meagre 3.33 per cent of the respondents had not adopted the recommended pit size for sweet orange crop. As regards to plant population per hectare majority 90.00 per cent of the respondents partially adopted followed by 10.00 per cent of the respondents had fully adopted the recommended plants of sweet orange crop. Also seen that considerable 65.00 per cent of the respondents had not adopted the recommended material in pit for sweet orange crop and near about one fourth 34.16 per cent of the respondents had partially adopted the recommended filling material in the pit and meagre 0.83 per cent of the respondents adopted fully the recommended filling material in the pit for sweet orange crop. It is also seen that majority 85.80 per cent of the respondents had partially

adopted the recommended planting distance while near about one fifth 14.16 per cent of the respondents fully adopted the maintenance of recommended planting distance. It is also observed that 95.80 per cent of the respondents fully adopted recommended planting time (June-July) while meagre 4.16 per cent of the respondents partially adopted planting time of sweet orange crop.

Training and pruning:

It is revealed from Table 4 that majority 95.00 per cent of the respondents fully adopted to keep one stem per plant while training and pruning while meagre 1.66 per cent of the respondents partially adopted and 3.33 per cent of the respondents had not adopted to keep one stem per plant while, training and pruning nearly half 48.33 per cent, 26.67 per cent and one fourth 25.00 per cent of the respondents were adopted partially, fully adoption and non adoption of 4-6 branches per plant, while training and pruning at each crop. As regards Bordeaux mixture application considerable 59.17 per cent of the respondents fully adopted while significant 38.33 per cent the respondents had not adopted the use of Bordeaux mixture after training and pruning, while meagre 2.50 per cent of the respondents partially adopted use of Bordeaux mixture after training and pruning of sweet orange crop.

Fertilizer management:

It is observed from Table 4 that majority 72.50 per cent of the respondents partially adopted recommended fertilizer dose per year after five year from planting followed by near about one fifth 26.67 per cent of the respondents had not adopted while, meagre 0.83 per cent of the respondents fully adopted recommended fertilizer dose per year after five year from planting.

Majority 95.00 per cent of the respondents had not adopted recommended fertilizer dose by making soil testing followed by meagre 3.33 per cent and 1.67 per cent of the respondents partially and fully adopted fertilizer dose by making soil testing, respectively.

Irrigation management:

It is observed from Table 4 that 100.00 per cent of the respondents had fully adopted drip/double ring method of irrigation followed by half 50.00 per cent of the respondents fully adopted 6-8 days irrigation interval in summer season

Table 4 : Practicewise adoption of recommended package of practices of sweet orange growers

Sr. No.	Recommended practices	Adoption					
		Full		Partial		No	
		Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Cultivation practices							
I.	Variety and propagation						
1.	Nucellar and Satgudi variety should be planted	120	100.00	00	00	00	0.0
2.	Buding part should be kept 15-20 cm above the soil at the time of planting	05	4.16	114	95.00	01	0.83
3.	Rangpur rootstock should be used at the time of budding	75	62.50	2	1.66	43	35.80
Soil and planting							
1.	Plantation under medium soil	110	91.67	8	6.67	2	1.67
2.	60 cm x 60 size of pit should be dug	28	23.30	88	73.30	4	3.33
3.	270-300 plants should be planted per hectare	12	10.00	108	90.00	00	00
4.	Soil + 10 kg FYM + 1 kg Phosphorus + 25 g zinc, Mg, Cu + 50 g Lindane should be filled in pit	1	0.83	41	34.16	78	65.00
5.	Planting distance should be maintain 6 m x 6 m	17	14.16	103	85.80	00	00
6.	Plant should be planted in (June-July)	115	95.80	05	4.16	00	00
Training and Pruning							
1.	1 stem per plant should be kept while training and pruning	114	95.00	02	1.66	04	3.33
2.	4-6 branches should be kept while training and pruning at each plant	32	26.67	58	48.33	30	25.00
3.	Bordeaux mixture should be used after training and pruning	71	59.17	03	2.50	46	38.33
Fertilizer management							
1.	Use of recommended fertilizer dose per year after five years from planting (800 kg , 400 kg P, 400 kg K)	01	0.83	87	72.50	32	26.67
2.	Fertilizer should be used by soil testing	02	1.67	04	3.33	114	95.00
Irrigation management							
1.	Drip/Double ring method of irrigation should be used	120	100.00	00	00	00	00
2.	6-8 days irrigation interval should be in summer	60	50.00	59	49.17	01	0.83
3.	8-12 days irrigation interval should be in winter season	41	34.17	69	57.50	10.00	8.33
4.	30-45 days should be withhold water for bahar treatment	59	49.17	45	37.50	16	13.30
5.	24-30 irrigation should be given in year after five year planting	19	15.80	100	83.30	01	0.83
Preparatory tillage							
1.	2-3 ploughing for preparation of orchard	64	53.30	55	45.80	01	0.83
2.	2-3 hoeing for preparation of orchard	82	68.30	36	30.00	02	1.67
3.	Bordo paste should be sprayed for control of fungicide	74	61.67	22	18.30	24	20.00
4.	Methyl dimethon 25 per cent 100 m per 500 l should be sprayed to control of leaf eating catterpillar	14	11.67	03	2.50	103	85.80
5.	2-4-5-T 100ppm/30 ppm IBA in 10 lit of water should be sprayed to control drop of fruit	00	00	01	0.83	119	99.17

while, nearly half 49.17 per cent and meagre 0.83 per cent of the respondents partially and not adopted 68 days irrigation interval in summer season, respectively.

Also observed that substantial 57.50 per cent of the respondents had partially adopted recommended irrigation interval in winter season by sweet orange growers while

significant 34.17 per cent of the respondents fully adopted irrigation interval in winter season. Also seen that 8.33 per cent of the respondents had not adopted recommended 8 to 12 days irrigation interval in winter season. It is also revealed that nearly half 49.17 per cent of the respondents fully adopted the recommended Bahar treatment while, significant 37.50 per cent of the respondents had partially adopted the recommended Bahar treatment and near about one fifth (13.30 %) of the respondents had not adopted the recommended Bahar treatment. It is also observed that majority 83.30 per cent of the respondents had partially adopted 24 to 30 irrigations per year after five year from planting followed by near about one fifth (15.80 %) of the respondents had fully adopted recommended irrigations per year after five year from planting and meagre 0.83 per cent of the respondents had not adopted the recommended irrigations per year after five years from planting.

Preparatory tillage:

It is observed from Table 4 that most (53.30 %) of the respondents fully adopted recommended preparatory tillage for land preparation for orchard of sweet orange crop, followed by nearly half 45.80 per cent of the respondents had partially adopted the recommended preparatory tillage for orchard and meagre 0.83 per cent of the respondents had not adopted recommended preparatory tillage for land preparation of the orchard. Incase of recommended insecticide majority 85.80 per cent of the respondents had not adopted and 11.67 per cent of the respondents had fully adopted the recommended insecticide for controlling leaf eating caterpillar followed by meagre 2.50 per cent of the respondents had partially adopted the recommended insecticide for leaf eating caterpillar of sweet orange crop. It is also observed that majority 99.17 per cent of the respondents not adopted recommended plant growth regulators for control of fruit drop and meagre 0.83 per cent of the respondents had partially adopted plant growth regulators for control of fruit drop.

Conclusion :

The study has clearly brought out that the majority of the respondents had medium level of knowledge (63.33 %) and 64.17 per cent of the sweet orange growers had medium level of adoption regarding recommended package of practices. Practice wise knowledge of sweet orange growers about

recommended package of practices revealed that majority of (96.00 %) of the respondents were having knowledge about famous variety of sweet orange in Marathwada region and 62.50 per cent of the respondents fully adopted Rangpur rootstock at the time of budding, also majority (97.67 %) of the respondents had fully adopted medium soil for plantation of sweet orange. 95.00 per cent of the respondents fully adopted to keep one stem per plant while training and pruning and 72.50 per cent of the respondents partially adopted recommended fertilizer dose per year after five year of planting.

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REFERENCES

- Ahire, R.D.** (1997). A study on the adoption of improved practices by grape growers. M.Sc (Ag.) Thesis, Marathwada Krishi Vidyapeeth, Parbhani, M.S. (INDIA).
- Anchule, M.M.** (1996). A study on production technology of exportable grape used by growers, M.Sc (Ag.) Thesis, Marathwada Krishi Vidyapeeth, Parbhani, M.S. (INDIA)
- Deshmukh, D.D.** (1995). A study on adoption of recommended package of practices by sweet orange growers in Parbhani district. M.Sc (Ag.) Thesis, Marathwada Krishi Vidyapeeth, Parbhani, M.S. (INDIA)
- Ghodeswar, N.A.** (2006). Knowledge and adoption of recommended pre and post harvest technology in pomegranate cultivation, M.Sc (Ag.) Thesis, Marathwada Krishi Vidyapeeth, Parbhani, M.S. (INDIA)
- Jawale, P.S. and Nachane, M.N.** (1994), Socio-personal Characteristics and Adoption of recommended practices of mango and citrus crops. *Maharashtra J. Extn. Edn.*, **13**: 139.
- Manvar, V.S.** (1999). A study on adoption of recommended package of practices of mango by mango growers in Aurangabad district. M.Sc (Ag.) Thesis, Marathwada Krishi Vidyapeeth, Parbhani, M.S. (INDIA)
- Narkar, G.H.** (1999). A study on the adoption of recommended package of practices of Kagzilime by growers in Parbhani district. M.Sc (Ag.) Thesis, Marathwada Krishi Vidyapeeth, Parbhani, M.S. (INDIA)
- Sutar, S.M.** (1997). A study on knowledge and adoption of recommended package of practices of papaya. M.Sc (Ag.) Thesis, Marathwada Krishi Vidyapeeth, Parbhani, M.S. (INDIA)