

**RESEARCH ARTICLE :**

# Adoption of orange root stock by orange nursery growers

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**SUMMARY :** The present investigation was conducted in Warud Panchayat Samiti of Amravati district in Maharashtra state, the main objective of the study was to assess the relationship between selected characteristic of orange nursery growers about orange root stock. A pre-structure interview schedule was used to collect data from 100 orange nursery growers from 5 villages which were selected by proportionate random sampling. The statistical method such as frequencies, percentage, mean, standard deviation, correlation and multiple regression analysis of data. The research study shows that land holding, annual income, area under orange nursery cultivation, area under mother plantation and extension contact were found to be positively and significantly related with adoption of orange root stock. Multiple regression analysis indicated that from all selected nine variables, four variables namely education, land holding annual income, and extension contact were significantly contributing factors in case of adoption of orange root stock

**KEY WORDS:**

Adoption, Orange root stock, Orange nursery grower

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## BACKGROUND AND OBJECTIVES

Citrus fruits have a prominent place among popular and extensively grown tropical and sub-tropical fruits. The use of citrus fruits is very common in human consumption. Mandarins and sweet oranges are used in preparation of squashes and cordials. The most commonly used rootstocks for propagating mandarin or mantra in India are Jamberi. Jamberi is commonly used as the rootstock in Madhya Pradesh, Maharashtra and Karnataka. Recently, Rangpur lime, shown great promise as rootstock for

mandarin. Jamberi is fast growing rootstock as compared to other rootstock. Budding success of Jamberi is more than any other rootstock. In other hand Rangpur lime is slow growing rootstock. But fruit production of Rangpur lime is higher as compared to other rootstocks. This rootstocks is resistance to tristeza disease.

**Objectives :**

- To study the adoption of orange rootstock by orange nursery growers.
- To study the relationship between selected characteristics of orange nursery

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growers with adoption about orange rootstock.

## RESOURCES AND METHODS

This study was conducted in warud Panchayat Samiti of Amravati district in Vidarbha region of Maharashtra state. 5 villages were randomly selected, 100 respondents who were having orange nursery growers were selected. The exploratory design of social research was used for the study the data were collected by visiting the respondent personally with the help of pre structured interview schedule, the statistical method and

test such as frequencies, percentage, mean, standard deviation, correlation and multiple regression analysis of data.

### Adoption of orange rootstock by orange nursery growers :

It is evident from the distribution in the Table A that 100.00 per cent of the nursery growers were found fully adopted many orange rootstock practices like squeezing method used for extraction of seeds, time of sowing of seed on seed beds (second fortnight of October), FYM application/seed bed (5kg /seed bed), interculture

Sr. No.	Orange rootstock	Extent of adoption					
		Fully		Partially		Never	
		Freq.	%	Freq.	%	Freq.	%
<b>Selection of rootstock</b>							
1.	Selection of proper rootstock (Jamberi of Rangpur lime)	85	85.00	15	15.00	0	0.00
2.	Proper time of selecting fruit for extraction of seeds	94	94.00	6	6.00	0	0.00
3.	Method used for extraction of seeds (squeezing)	100	100.0	0	0.00	0	0.00
<b>Seed treatment</b>							
1.	Proper chemical used (copper oxychloride)	89	89.00	11	11.00	0	0.00
2.	Dose of chemical (2.5 g/kg of seed)	82	82.00	18	18.00		
<b>Seeds sowing on seed beds</b>							
1.	Time of sowing of seeds beds(second fortnight of October)	100	100.0	0	0.00	0	0.00
2.	Size of seed bed (2mx 1mx15cm)	84	84.00	16	16.00	0	0.00
3.	Seed rate/seed bed (50g/seed bed)	84	84.00	16	16.00	0	0.00
4.	FYM application (5g/seed bed)	100	100.0	0	0.00	0	0.00
5.	N.P:K application (100 g : 20g :10g/seed bed)	87	87.00	13	13.00	0	0.00
6.	Spacing (10 cm apart)	87	87.00	13	13.00	0	0.00
7.	Fungicide application (Carbendazine)	75	75.00	20	20.00	5	5.00
8.	Dose of fungicide (15g/seed bed)	75	75.00	20	20.00	5	5.00
9.	Irrigation requirement (4 to 5days interval)	100	100.0	0	0.00	0	0.00
10.	Intercultural operations (two weeding)	100	100.0	0	0.00	0	0.00
11.	Pesticide used for control of leaf miner (Propanophose)	76	76.00	14	14.00	10	10.0
<b>Transplanting of seedlings in the nursery beds</b>							
1.	Time of transplanting the seedlings in the nursery beds (July)	100	100.0	0	100.0	0	0.00
2.	Spacing (30 cm x20 cm)	100	100.0	0	0.00	0	0.00
3.	Solution used for dipping seedling (Propex super+COC+water)	75	75.00	15	75.00	10	10.0
4.	Dose of solution required (1 ml propex super+3 g COC+1lit water)	65	65.00	20	20.00	15	12.50
5.	Irrigation requirement (4 to 5 days of interval)	100	100.00	0	0.00	0	0.00
6.	Intercultural operations (weeding, mulching)	100	100.00	0	0.00	0	0.00
7.	Height of seedlings at the time of budding (40 to 50 cm )	85	85.00	15	15.00	0	0.00
8.	Thickness of seedling at the time of budding (Pencil size)	100	100.00	0	0.00	0	0.00
9.	Time of budding (November to December)	100	100.00	0	0.00	0	0.00
10.	Budding method (T budding)	100	100.00	0	0.00	0	0.00
11.	Materials used for budding (Polythene strip, algae ,budding knife)	100	100.00	0	0.00	0	0.00
12.	Time of transplanting the budded seedlings in main field (June)	100	100.00	0	0.00	0	0.00

Sr. No.	Category	Respondents	
		Frequency	Percentage
1.	Low	5	5.00
2.	Medium	93	93.00
3.	High	2	2.00
	Total	100	100.00

operation (two weeding), irrigation interval in seed bed (4 to 5 days), time of transplanting of young seedlings in nursery bed (month of July), spacing between two seedlings (30 cm x 20 cm), irrigation requirement of young seedlings (4 to 5 days of interval), intercultural operations (weeding, mulching) carried out in nursery bed, thickness of seedling at the time of budding, budding time (November to December), materials used for budding (Polythene strip, algae, and budding knife).

Further, it is also observed that majority of nursery growers (94.00%) fully adopted the orange rootstock practices like time for selecting fruit for extraction of seeds (September end to October first week.) and it is followed by majority of nursery growers (89.00%) fully adopted the practices like chemical use, (87.00%) N:P:K application/seed bed (10g : 20g /seed bed), followed by 84.00 per cent of nursery growers fully adopted the practices like size of seed bed (2 m x 1m x 15 cm) and (75.00%) fungicide application in seed bed (Carbendazine).

However, it is observed that the majority of nursery growers (75.00%) fully adopted the orange rootstock practices like solution used for dipping of seedlings (propex super+COC+water) and its dose required. It is followed by maximum percentage of nursery growers (85.00%) were fully adopted practices like the selection of Jamberi or Rangpur lime rootstock and 82.00% of nursery

growers fully adopted the practice like dose of chemical used for seed treatment (2.5g/kg of seed).

Table B reveals that maximum percentage of respondents (93.00%) was included under medium category of adoption of orange rootstock followed by low level of adoption (5.00%). It was interesting to (2.00%) the respondent appeared in high level of adoption.

Thus, it could be concluded that maximum percentage of respondents found to be in medium category level of adoption level

## **OBSERVATIONS AND ANALYSIS**

The results obtained from the present study as well as discussions have been summarized under following heads:

### **Relational analysis :**

The Correlation of selected characteristics of orange nursery growers with adoption of orange root stock were calculated and illustrated. Table 1 revealed that the independent variable *viz.*, land holding, annual income, and area under orange nursery cultivation, area under mother plantation and extension contact were positively and significantly correlated with adoption of orange root stock however age, education, Experience in orange

Sr. No.	Correlates	'r' value
1.	Age	0.049 <sup>NS</sup>
2.	Education	0.159 <sup>NS</sup>
3.	Land holding	0.358**
4.	Annual income	0.439**
5.	Area under orange nursery cultivation	0.258**
6.	Area under mother plantation	0.237*
7.	Experience in orange nursery cultivation	0.041 <sup>NS</sup>
8.	Social participation	0.149 <sup>NS</sup>
9.	Extension contact	0.209*

\* and \*\* indicate significance of values at P=0.05 and 0.01, respectively level of probability  
NS = Non-significant

**Table 2 : Multiple regression of independent variables with adoption of orange rootstock**

Sr. No.	Variables	Regression co-efficient	S.E.±	't' values
1.	Age	-0.0153 <sup>NS</sup>	0.0843	0.1811
2.	Education	0.354951*	0.1502	2.3630
3.	Land holding	0.66563**	0.2110	3.1546
4.	Annual income	4.136418**	1.2753	3.2433
5.	Area under orange nursery cultivation	0.408556 <sup>NS</sup>	1.4509	0.2815
6.	Area under mother plantation	-0.40818 <sup>NS</sup>	1.1492	0.3551
7.	Experience in orange nursery cultivation	1.929808 <sup>NS</sup>	1.3186	1.4635
8.	Social participation	-0.53887 <sup>NS</sup>	1.0863	0.4960
9.	Extension contact	0.50256*	0.2234	2.2491

R<sup>2</sup> = 0.5959

\* and \*\* indicate significance of value at P=0.05 and 0.01, respectively level of probability

NS=Non-significant

nursery cultivation, social participation could not established any relationship with adoption of orange rootstock. This finding are in line with finding of Jadhav (2011); Phuse *et al.* (2007); Rombade *et al.* (2011) and Mehta and Sonawane (2012).

### Multiple regression analysis :

Multiple regression analysis was calculated to know the combine effect of all independent variable in explaining the dependent variable.

It is observed from Table 2 that co-efficient of determination was 0.5959 meaning that 59.59 % variation in adoption of orange root stock was explained by the set of selected nine independent variable the unexplained variable of 40.41% may be attributed to the factor not included in the study further it is revealed that four variable namely education, land holding, annual income and extension contact were found to be have contributed significantly and positively with adoption of orange root stock, the regression coefficient of these variable were 0.354, 0.665, 4.136 and 0.502, respectively.

### Conclusion :

Adoption the characteristics of respondents *viz.*, education, land holding, annual income, area under orange nursery cultivation, area under mother plantation and extension contact had positive and significant relationship with adoption of orange rootstock. However, age, experience in orange nursery cultivation, social

participation did not show significant relationship with adoption of orange rootstock.

The findings of regression analysis revealed that education, land holding, annual income and extension contact had contributed significantly towards the variation in the adoption of orange rootstock. There for it would be concluded that these variables has emerged as an influencing factors in adoption of orange rootstock.

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### REFERENCES

- Jadhav, R.M.** ( 2011). Knowledge and adoption orange root stock by orange grower. M.Sc. ( Ag) Thesis, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola (M.S.) India.
- Mehta, B.M.** and Sonawane, Madhuri (2012). Characteristic and adoption behaviour of mango growers in Valsad district of Gujarat. *Agric. Update*, 7(1/2):37-41.
- Phuse, A.P.**, Vitonde, A.K. and Thipse, C.D. (2007) . Adoption of recommended Mandarin orange production practices. *Indian Res. J. Ext. Edu.*, 7 (2&3).
- Rombade, B.D.**, Sadatal, S.S., Aagle, S.B. and Pinjari, S.S. (2011). Adoption of recommended package of practices of kagzilime by the growers. *Internat. J. Agric. Sci.*, 7(2):412-414.

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