RESEARCH ARTICLE :

Knowledge 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-structured interview schedule was used to collect data from 100 orange nursery growers from 5 villages which were selected by proportionate random sampling. The statistical methods such as frequencies, percentage, mean, standard deviation, correlation and multiple regression analysis were used. The data of research study show that age was negatively correlated and education, land holding, extension contact, area under orange nursery cultivation and social participation were from found to be positively and significantly related with knowledge of orange root stock. Multiple regression analysis indicated that from all selected nine variables, four variables namely education, annual income, area under orange nursery cultivation and extension contact were significantly contributing factors in case of knowledge of orange root stock by nursery growers.

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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 is 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. On 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. The study was conducted with following objectives :

– To study the extent of knowledge of orange nursery growers.
– To study the relationship between selected characteristics of orange nursery growers with knowledge 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 were selected. The exploratory design of social research was used for the study the data were collected by visiting the respondent personal with the help of pre-structured interview schedule. The statistical methods and test such as frequencies, percentage, mean, standard deviation, correlation and multiple regression were used to the analys were used to the data.

OBSERVATIONS AND ANALYSIS

The findings of the present study as well as relevant discussion have been presented under following heads :

Knowledge level of the respondents :
Distribution of respondents was done according to the knowledge possessed by them about orange rootstock which have been furnished in Table 1.

Knowledge of orange rootstock by orange nursery growers :
It is observed in Table 1 that cent per cent of the

Table 1 : Distribution of the nursery growers according to their practice wise knowledge about orange rootstock		(n=100)	
Sr. No.	Orange rootstock practices	Extent of knowledge	
		Frequency	Percentage
Selection of rootstock			
1.	Selection of proper rootstock (Jamberi or Rangpur lime)	100	100.00
2.	Proper time of selecting fruit for extraction of seeds (Sept. end to Oct. first week)	100	100.00
3.	Method used for extraction of seeds (squeezing)	100	100.00
Seed treatment			
1.	Proper chemical used (copper oxychloride)	89	89.00
2.	Dose of chemical (2.5 g/kg of seed)	82	82.00
Seeds sowing on seed beds			
1.	Time of sowing of seeds on seed bed (second fortnight of October)	100	100.00
2.	Size of seed bed (2 m × 1 m × 15 cm)	84	84.00
3.	Seed rate/ seed bed (50 g / seed bed)	84	84.00
4.	FYM application (5 kg/seed bed)	100	100.00
5.	N : P: K application (10 g : 20 g : 10 g / seed bed)	87	87.00
6.	Spacing (10 cm apart)	87	87.00
7.	Fungicide application (Carbendazim)	75	75.00
8.	Dose of fungicide (15 g/seed bed)	75	75.50
9.	Irrigation requirement (4 to 5 days interval)	100	100.00
10.	Intercultural operations (two weeding)	100	100.00
11.	Pesticide used for control of leaf miner (Propanophos)	76	76.00
12.	Time of nitrogen application (one month after germination)	100	100.00
Transplanting of seedlings in the nursery beds			
1.	Time of transplanting the seedlings in the nursery beds (July)	100	100.00
2.	Spacing (30 cm × 20 cm)	86	86.00
3.	Solution used for dipping seedling (Propex super + COC + water)	75	75.00
4.	Dose of solution required (1 ml propex super + 3 g COC + 1 lit. water)	65	65.00
5.	Irrigation requirement (4 to 5 days of interval)	100	100.00
6.	Intercultural operations (weeding, mulching)	100	100.00
7.	Height of seedlings at the time of budding (40 to 50 cm)	100	100.00
8.	Thickness of seedlings at the time of budding (pencil size)	100	100.00
9.	Time of budding (November to December)	100	100.00
10.	Materials used for budding (polythene strip, algae, budding knife)	100	100.00
11.	Time of transplanting the budded seedlings in main field (June)	100	100.00

nursery growers were found to have knowledge about selection of Jamberi or Rangpur lime rootstock, time for selecting fruit for extraction of seeds (September end to October first week), squeezing method used for extraction of seeds, time of sowing of seed on seed beds (second fortnight of October), application of FYM (5 kg/bed), irrigation interval (4 to 5 days), intercultural operations (two weeding), proper time of nitrogen application (one month after germination), transplanting of young seedlings in nursery beds (in the month of July), irrigation interval during seedling stage (4 to 5 days), intercultural operations carried out in nursery beds (weeding, mulching), proper height and thickness of seedling at the time of budding, budding time (November to December), materials used for budding (polythene strip, algae, budding knife) and transplanting the budded seedlings in main field (month of June).

Further, majority of nursery growers (89.00 %) were having knowledge about chemical used for seed treatment (copper oxychloride), followed by 87.00 per cent nursery growers were having knowledge about N:P:K application / seed bed (10 g : 20g : 10 g / seed bed) and spacing in between two rows (10 cm apart). Majority of nursery growers (84.00 %) were having

knowledge about size of seed bed (2 m × 1m × 15 cm), seed rate / seed bed (50 g / seed bed), fungicide application (Carbendazim), spacing in seedling (30 cm × 20 cm) followed by 82.00 per cent of nursery growers were having knowledge about dose of chemical used for seed treatment (2.5 g/kg of seed). It is observed that 75.00 per cent of nursery growers were having knowledge about dose of fungicide application (15 g/seed bed) and 75.00 per cent of nursery growers were having knowledge about solution used for dipping seedlings (Propex super + COC + water). Fifty per cent of nursery growers were having knowledge about pesticide used for control of leaf minor (Propanophos) and only 65.00 per cent of nursery growers were having knowledge about the dose of solution required for dipping seedlings.

Relational analysis :

The correlation of selected characteristics of orange nursery growers with knowledge of orange root stock were calculated and illustrated. Table 2 revealed that the independent variable *viz.,* education, land holding, area under orange nursery cultivation, social participation and extension contact were positively and significantly correlated with knowledge of orange root stock eccept

Table 2 : Relationship between of selected characteristic of orange nursery growers with knowledge of orange root stock

Sr. No.	Correlates	'r' value
1.	Age	-0.222[*]
2.	Education	0.528
3.	Land holding	0.119[**]
4.	Annual income	0.184[NS]
5.	Area under orange nursery cultivation	0.209[*]
6.	Area under mother plantation	0.118[NS]
7.	Experience in orange nursery cultivation	-0.190[NS]
8.	Social participation	0.207[*]
9.	Extension contact	0.459[**]

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

Table 3 : Multiple regression of independent variables with knowledge of orange rootstock

Sr. No.	Variables	Regression co-efficient	S.E.	't' values
1.	Age	0.00044[NS]	0.07679	0.00572
2.	Education	0.9926[**]	0.2186	4.5396
3.	Land holding	-0.2032[NS]	0.5013	0.4053
4.	Annual income	2.1101[*]	0.9426	2.2385
5.	Area under orange nursery cultivation	2.699[*]	1.320	2.0437
6.	Area under mother plantation	-1.2070[NS]	1.0460	1.1538
7.	Experience in orange nursery cultivation	1.5410[NS]	1.2002	1.2839
8.	Social participation	-0.3044[NS]	0.9888	0.3078
9.	Extension contact	1.23945[*]	0.3217	3.8527

$R^2 = 0.5631$ * and ** indicate significance of values at P=0.05 and 0.01, respectively   NS=Non-significant

age which was negatively and significantly related with knowledge. However, annual income, area under mother plantation and experience in orange nursery cultivation could not established any relationship with knowledge of orange rootstock. The findings are in line with finding of Manvar *et al.* (2003), Jadhav (2006) and Rathod (2013).

Multiple regression analysis was calculated to know the combine effect of all independent variable in explaining the dependent variable. It is observed from Table 3 that co-efficient of determination was 0.5631 meaning that 56.31 per cent variation in knowledge of orange root stock was explained by the set of selected nine independent variable, the unexplained variable of 43.69 per cent may be attributed to the factor not included in the study. Further it is revealed that four variable namely education, annul income, area under orange nursery cultivation and extension contact were found to be have contributed significantly and positively with knowledge of orange root stock the regression co-efficient of these variable 0.992, 2.110, 2.699 and 1.239, respectively. Similar work related to the present topic was also done by Jadhav *et al.* (2011) Mandal *et al.* (2011).

Conclusion :

The result shows that education, land holding, area under orange nursery cultivation, social participation and extension contact were positively and significantly correlated except age which was negatively and significantly correlated with knowledge of orange root stock.

Multiple regression analysis indicated that from the all the selected nine variable, four variables namely education, annual income, area under orange nursery cultivation and extension contact were significantly contributing factor in case of knowledge of orange root stock.

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