Adoption Behaviour of Orange Growers (*Citrus reticulata Blanco*) in Vidarbha Region of Maharashtra

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ABSTRACT

The present investigation was carried out in the Vidharbha region of Maharashtra. Three districts, namely Nagpur, Amaravati and Wardha were purposively selected and from each district two blocks and from each block two villages were selected randomly and from each village 10 farmers were selected to make 120 samples. The results of study revealed that majority of the orange growers adopted 'Nagpur Santra' variety (88.33%), plant spacing (88.33%) followed by Bordeaux paste (88.33%) and bamboo support (78.33%). Most of the orange growers (85.83%) had not adopted seedless variety followed by ventilated corrugated box (83.33%) and more than 60 per cent orange growers did not adopt recommended herbicides dose (68.33%) for the crop followed by post harvest treatments with fungicides (63.33%) and de greening (62.50%) of oranges. The orange growers found to have medium to high levels of adoption. Size of land and extent of awareness were significantly contributing to the adoption of orange growers.

Key words : Economic-motivation, risk bearing capacity, source of credit

INTRODUCTION

Maharashtra is a major orange-producing state and has major area under orange (*Citrus reticulata Blanco*) production. In 2004-05 it has 117.3 thousand hectares area and production was 691tonnes with the productivity 5.9 metric tonnes/ha. (National Horticulture Board, 2004-05). Vidharbha is major contributor of orange production in Maharashtra having near about 76,679 ha. area with annual production of about 7.65 lakh tonnes with productivity 731tonnes/ha. Out of this 25,000 tonnes (just about 5%) can be easily exported.

The 'Nagpur Santra' is famous all over the world and fetches handsome money through export. Because of the sweet-sour appealing taste and easy peelable quality of the rind, Nagpur mandarin is the most popular fruit among all the oranges in the country. It is available throughout the year and not only delicious and refreshing to eat, but also provides vitamins, minerals and many other essential elements, which are required for human health. It is of particular interest because of high vitamin C content, *i.e.*88% and refreshing juice. Nagpur mandarin is one of the best mandarins in the world and exported to distance market like Europe, Gulf and South East Asia. During 2004-05, India exported 34.45 thousand tonnes of orange (FAOSTAT) of worth ₹ 3,487 lakh with .0076 per cent share in total export.

Although there has been a considerable increase in the area under orange orchard in last few years, but the production and quality of fruits are found dwindling because of various problems in adoption of recommended technologies. Comparative analysis of yield of orange fruit production shows that our orange fruit production per hectare is very low (9-10 tonnes/ha) compared with that of developed countries. The increase in productivity and production of orange depends mainly on the technical recommendation possessed from research and the extent of its use in production by the orange growers. Also extension programme on various technologies to be transferred with the help of different departments but there are gaps in production by the farmer on his farm. So as to boost up the orange production in the region, latest technology is being continuously developed and recommended for use for the orange grower's. Despite this, the production of orange per hectare in Vidharbha is still low. Therefore, we felt appropriate to study the adoption of recommended mandarin orange production practices with the objectives to study the adoption behaviour of orange growers and influence of socio-personal, psychological and communicational factors on adoption of improved orange production technology

METHODOLOGY

For this investigation, *ex-post-facto* research design was used. The study was carried out purposively in the Vidharbha region of Maharashtra. Three districts were selected purposively for the study from the Vidharbha region, named as Amaravati, Nagpur and Wardha. From each district two blocks and from each block two villages were selected randomly. Thus, total 6 blocks and 12 villages selected for study were having high concentration of orange production. There was not much variation in number of orange growers in each village. So, from each village 10 farmers were selected randomly

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following the criterion that selected farmers should have at least five years of experience in orange cultivation. Thus, total respondents identified for the study was 120.

Rogers and Shoemaker (1971) defined adoption as a decision to continue full use of an innovation. In this study, adoption referred to the use of selected orange cultivation practices. The extent of adoption of the orange cultivation practices was measured by means of adoption quotient.

The method used by Sengupta (1967) was followed for measuring adoption by the farmers in respect of the orange production practices. For ascertaining the adoption level of respondents, a list of main and sub-practices of orange production technology was prepared and 19 practices including their sub-practices were selected. For each item one score was earmarked for adoption and no marks were given for the non-adoption of the practice. The raw score was converted into the adoption quotient by using the following formula:

$$\text{Adoption quotients} = \frac{\text{Adoption score obtained by the respondent}}{\text{Maximum obtainable adoption score}} \times 100$$

The respondents were categorized into low, medium and high level of adoption on the basis of mean±S.D. An interview schedule was developed for data collection and appropriate statistical tools like frequency, percentage and ranking techniques were used for analysis of data.

RESULTS AND DISCUSSION

The salient findings of the study are presented and discussed below:

Practice-wise adoption of orange production technology by orange growers

The practice wise adoption of orange production technology by the orange growers is presented in the Table 1.

It could be observed from the data in Table 1 that equal majority of the orange growers adopted 'Nagpur Santra' variety (88.33%), plant spacing (88.33%) followed by Bordeaux paste (88.33%) and bamboo support (78.33%). Adoption of 'Nagpur Santra' is high may be due to its demand is more for export and adoption plant spacing is due to having more awareness and extension contacts. More than three-fourths orange growers adopted drip irrigation system (76.67%) and nearly three-fourths orange growers adopted bahar

treatment. It may be because government provides subsidy for its adoption. And growers know the significance of bahar treatment and they may be frequently contacting nearby research station and agriculture assistant for information. More than 65 per cent orange growers adopted harvesting time and methods (67.5%), recommended pesticides dose (66.67%) and equal number of orange growers adopted recommended doses of NPK (65.0%) and duster for dusting (65.0%) of orange crops. Most of the orange growers (85.83%) not adopted seedless variety followed by ventilated corrugated box (83.33%) and more than 60 per cent orange growers not adopted recommended herbicides dose (68.33%) for the crop followed by post-harvest treatments with fungicides (63.33%) and de-greening (62.50%) of oranges. Orange growers not adopted the seedless variety may due to its package of practices not communicated properly and other varieties may be more in demand. One of the reasons for not adopting the packaging material and post-harvest treatment of oranges is may be due to pre-harvest contract for sales of oranges.

Table 1: Distribution of orange growers according to their practice -wise of adoption orange production technology

n = 120

Practices	Adopted		Not adopted	
'Nagpur Santra' variety	106	88.33	14	11.67
Kinnow mandarin	53	44.17	67	55.83
Seedless variety	17	14.17	103	85.83
Recommended NPK doses/plant/year	78	65.00	42	35.00
Plant spacing	106	88.33	14	11.67
Recommended concentration of				
Fungicide	63	52.50	57	47.50
Pesticides	80	66.67	40	33.33
Herbicides	38	31.67	82	68.33
Duster for dusting of chemical	78	65.00	42	35.00
Bordeaux paste	100	83.33	20	16.67
Growth regulator	66	55.00	54	45.00
Drip irrigation	92	76.67	28	23.33
Post-harvest treatment with fungicides	44	36.67	76	63.33
Micro-nutrient	77	64.17	43	35.83
De-greening	45	37.50	75	62.50
Training and pruning	76	63.33	44	36.67
Bahar treatment	89	74.17	31	25.83
Ventilated corrugated box for packaging	20	16.67	100	83.33
Bamboo support to plant during bearing	94	78.33	26	21.67
Fruit drop management	64	53.33	56	46.67
Harvesting time and method	81	67.5	39	32.5

Extent of adoption

The overall adoption of the orange production technology by the orange growers is presented in the Table 2.

Table 2: Distribution of the respondent according to their overall adoption

Category	Frequency	Percentage
Low adoption	18	15
Medium adoption	65	62.5
High adoption	27	22.5
Total	120	100

It could be observed from Table 2 that majority of the respondents (62.5%) had medium adoption followed by high (22.5%) and low (15.0 %).

It could be concluded that majority of the respondents belongs medium to high level of adoption category. This reflects the fact that medium to high level of adoption may be due to high awareness among the orange growers, and their active and frequent contact with extension agencies and information source utilization. Our findings were supported by the findings of Singh (1990) and Chikhale *et. al.* (1996).

Relationship of profile characteristic with extent of adoption and its influence on adoption correlation analysis

The correlation analysis was performed between the profile characteristics and adoption. The results are presented in the Table 3.

Table 3: Correlation of profile characteristics with extent of adoption

Independent variable	Correlation coefficient "r" value
Age	-0.151
Education	0.462**
Size of land	0.414**
Family size	-0.35[NS]
Labour availability	0.418**
Occupation	0.258**
Source of credit	-0.29[NS]
Annual income	0.328**
Economic motivation	0.286**
Experience in orange cultivation	-0.44[NS]
Social participation	0.361**
Extension contact	0,457**
Mass media exposure	0.380**
Risk bearing capacity	0.431**
Socio-economic status	0.366**
Information source utilization	0.467**
Infra structure facilities	-0.066[NS]
Awareness	0.528**

Out of 18 independent variables studied, 13 namely education, size of land, labour availability, occupation, annual income, economic motivation, social participation, extension contact, mass media exposure, risk-bearing capacity, socio-economic status, information source utilization and awareness, were found to be significantly and positively correlated with the adoption at 1 per cent level of probability Table 3. Five variables, namely age, family size, source of credit, experience in orange cultivation and infrastructure facilities, had shown non-significant association with adoption. The results were confirmed by the findings of Chikhale *et al* (1998).

Regression analysis

Multiple regression analysis was performed to find out the extent of contribution of each variable towards adoption. The results presented in Table 4.

Table 4: Regression of profile characteristic with extent of adoption

Independent variable	Standardize coefficients Beta	"t" value
Age	0.038	0.423
Education	0.095	0.473
Size of land	0.316	2.713**
Family size	-0.098	-1.048
Labour availability	0.279	1.676
Occupation	- 0.071	- 0.605
Source of credit	0.008	0.089
Annual income	- 0.187	-1.014
Economic motivation	0.029	0.292
Experience in orange farming	- 0.088	- 0.965
Social participation	0.075	0.501
Extension contact	0.135	0.846
Mass media exposure	0.038	0.257
Risk bearing capacity	0.014	0.114
Socio-economic status	- 0.143	- 0.792
Source of credit	0.029	0.209
Infrastructure facilities	- 0.052	- 0.664
Awareness	0.350	3.783**

** P=0.01; F value = 5.029; R^2 = 0.713

The data depicted in the Table 4 showed that F value was significant at 1per cent level probability. The R^2 value was 0.713, which indicated that 71.30 per cent variation in the adoption was explained by the 18 independent variables selected for the study.

It could be seen from the above table that only land holding and awareness had positive and significant contribution in the adoption at 1 per cent level of significance.

The strength of contribution of these variables could be explained, as one unit change in the land and awareness would bring an increase of 0.316 and 0.350 units change in adoption, respectively.

CONCLUSION

The findings of the study has led to the conclusion that the adoption of recommended production practices by the orange growers was medium to high may be owing to high awareness among the orange growers, and their active and frequent contact with extension agencies and information source utilization. Education, size of land, labour availability, occupation, annual income, economic motivation, social participation, extension contact, mass media exposure, risk bearing capacity, socio-economic status, information source utilization and awareness were found significantly and positively correlated with the adoption. Size of land and awareness significantly contributed to the adoption of orange cultivation practices. For getting the maximum production and increasing the productivity in the area, there is need to adopt a complete package of practices recommended by the institute and also communicate the reason for not adopting the practices, so that necessary refinement could be done for development of appropriate technologies suitable to their condition for better results.

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