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Analysis of Adoption and Constraint Perceived by Mandarin Growers in Jhalawar District of Rajasthan State, India

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A B S T R A C T

Nagpur Mandarin (*Citrus reticulata* Blanco.) being grown in large acreage of Jhalawar district. But now, the majority growers get less yield, low quality fruits and irregular fruiting from their orchards. So, the present study was conducted with the objective of studying the extent of adoption and perceived constraints in adoption of recommended mandarin growing practices. Data were collected from three blocks (Pirawa, Bhawani Mandi and Jhalarapatan) of the Jhalawar district of Rajasthan. Total 120 farmers were surveyed for this study. It was found that the extent of adoption was least in case of recommended insecticides, pesticides and fertilizers ranked at X^{th} followed by adoption irrigation management practices. Maximum adoption was in case of suitable variety of orange cv. Nagpur mandarin. Least extent of adoption was observed in case of plant protection and fertilizer applications (MPS+16.50). Drip Irrigation management (MPS+17.50) and recommended chemical and fungicide dose with MPS 25.17. The major socioeconomic constraint faced by the respondent farmers was lack of the technical knowledge with a mean score of 11.57 and lack of technical pursuance is very serious constraint by more than 75 per cent of the respondents. Similarly, the high cost of inputs, including machines was perceived as a very serious constraint by the more then2 / 3rd of the respondents. Major technological constraints were high incidence of insect-pest with MPS+72.67 followed by disease (MPS+37.52).

Introduction

India has accelerated in total annual production of horticulture crops touching over 282.million tones. Today India has the second largest producer of the fruits i.e. 89 million tones contribution nearly 10 % of the world production. In the Rajasthan, Nagpur Mandarin, confined mainly in the districts of Jhalawar, Kota and Bhilwara, however total acreage in Jhalawar district is 30000 ha under Nagpur mandarin. There are many problems associated with adoption of recommended package of practices which may be related to socioeconomic status of farmers, technological, financial, or institutional etc. which need to be addressed. These problems reflect the quality of advisory services provided to the farmers. The mandarin yield and quality may be improved economic security and support to sustainable development. These recommended practices must be followed in totality according to the location specific problems of the area. Imbalanced use of fertilizers has adversely affected the soil causing decrease in organic

carbon, reduction in microbial flora and fauna of soil, increasing alkalinity and hardening of soil. The farmers due to negligence tend to apply uneven dose of fertilizers, insecticide etc. with the expectations of obtaining higher yields. Therefore, there is need for more strict control on the over adoption of recommended package of practices related to horticultural operations like pit digging, planting methods, training, pruning, water management, stress management, control of insect and pest, harvesting, grading, packaging and storage. Keeping in mind all these perspectives, the study was conducted in the Jhalawar District in Rajasthan State with following specific objectives includes to study the socio personal status of farmers. And analyze the extent of adoption of mandarin production practices. Also to study the constraints perceived by mandarin growers.

Materials and Methods

The study was conducted in three blocks of Jhalawar viz, Pirawa, Bhawani Mandi and Jhalarapatan. Purposively as having the intensive cultivation practices of mandarin crop, three village of from each block were selected randomly. In the present study, the total 9 villages were selected. A list of mandarin growers was prepared by state government officials from each selected village to analyze the adoption and constraint faced by growers in the study area by making the total sample size 120. For the collection of data, interview schedule was developed. The responders were asked to give an opinion about the use of recommended mandarin orchard practices on the three point scale viz. always, some time and never 2, 1 and 0 were assigned, respectively.

Extent of adoption was calculated on the basis of these scores. Similarly the constraints faced by the mandarin growers were also recorded on the point continuum namely. Very serious, Serious, Somewhat Serious and the scores were assigned 2, 1 and 0 respectively. The responses on the basis of feedback were calculated accordingly.

Results and Discussion

Socio-personal status

The perusal of the data given in table 1 revealed that the majority of the respondents (59.17%) were middle age, followed by old (21.67%) and younger age (19.17%) category. As old age farmers have almost fixed mindset behavior patterns, so middle aged, and especially young farmers must be targeted for imparting skill trainings in mandarin production technologies. Sixty five per cent of the respondents were having a medium level of education followed by 29.17 per cent with low level of education. Only 5.83 per cent of the respondents were in a high level of education category. Farmers with high and medium level of education can be easily motivated for adoption of recommended practices.

Respondents were further categorized into small and marginal farmers based on their size of land holding and it was found that sixty percent (60.00 %) were in small farmer's category while 40 per cent were marginal category farmers. Extension contact of majority respondents (64.17%) was in medium category followed by 19.17 % of the respondents with low level of extension contact. Similarly, media exposure of the majority respondents (63.33%) was also in medium category. Although, majority of small farmers have medium level of extension contact, but still there is a need for special programmes for reaching end user's small farmers for technology transfer in Nagpur mandarin production technology.

The majority of the respondents (73.33%) were having no membership of any social

organization while 26.67 per cent were involved in membership with some organizations. More than 69.17 per cent of respondents were having small size with up to five members.

Extent of adoption I

At the vegetative phase, mandarin production techniques were categorized for adoption into variety, soil, pit, training and pruning, inter crops, application of FYM and micro nutrients, drip irrigation, fertigation, fruit drop and plant protection measures. The data given in table 2 that revealed that extensive campaigns by extension agencies had a significant impact of adoption of varieties and inter crops for additional income during the vegetative phase of the orchard. Therefore, maximum extent of adoption was found in case of variety and inter crops with mean percent score (MPS) of 100 and 82.50 with ranked as first and second respectively. Extent of adoption regarding drip irrigation at field use persists for initial 1-2 years, Soil Suitability, drip irrigation during 4-5 year age of plants, time of FYM application of FYM, causes of fruit drop, method of FYM application, control of fruit drop, importance of training and pruning ranked was third, fourth, fifth, sixth, seventh, eighth, ninth and tenth with MPS of 68.75, 63.33, 55.00, 50.83, 48.75, 37.92, 34.17 and 23.33, respectively. These results might be appeared due to the lack of awareness among farmers regarding soil suitability, time and method of application of FYM and irrigation scheduling using drip irrigation as per age of plants. Least extent of adoption was observed in case IPM schedule with 17.92, application of micro nutrients with 15.42, time of training and pruning with 13.75 and plant protection measures with 13.75, pit digging 10.00, soil testing with 9.58, time and method of pit digging with 7.92 and fertigation with 5.83 and was ranked eleventh, twelfth, thirteen (a,b), fourteen, fifteen, sixteen, seventeen, respectively.

Table.1 Socio-personal characteristic of respondents (N=120)

Variables	Characteristics	No.	%
Age	Young	23	19.17
	Middle	71	59.17
	Old	26	21.67
Education	Low(Up to Primary)	35	29.17
	Medium (Up to HS)	78	65.00
	High (Above HS)	7	5.83
Land Size	Marginal (> 2 ha.)	48	40.00
	Small (1.0-2.0 ha.)	72	60.00
Extension contact	Low	23	19.17
	Medium	77	64.17
	High	20	16.67
Media Exposure	Low	14	11.67.
	Medium	76	63.33
	High	30	25.00
Social Participation	No membership	88	73.33
	Membership of the organization	32	26.67
Family Size	Small (Up to 5)	83	69.17
	Large (>5)	37	27.50

Table.2 Extent of adoption of Nagpur mandarin growing practices at juvenile stage (N=120)

	Selected package of practices	TS	MS	MPS	Rank
Variety	Nagpur mandarin	240	2.00	100.00	I
Soil	Soil suitability	152	1.27	63.33	IV
	Soil testing	23	0.19	9.58	XV
Pit	Pit digging	24	0.20	10.00	XIV
	Time and Method of digging	19	0.16	7.92	XVI
Training and pruning	Time	33	0.28	13.75	XIIIa
	Importance	56	0.47	23.33	X
Inter crops	During juvenile phase (<5 years)	198	1.65	82.50	II
Application of FYM	Time	122	1.02	50.83	VI
	Method	91	0.76	37.92	VIII
Application of Micro Nutrients		37	0.31	15.42	XII
Drip irrigation	Initially (1-3 Year)	165	1.38	68.75	III
	Occasionally (3-5 Year)	132	1.10	55.00	V
Fertigation		14	0.12	5.83	XVII
Fruit drop	Cause of fruit drop	117	0.98	48.75	VII
	Control	82	0.68	34.17	IX
Plant Protection	IPM schedule	43	0.36	17.92	XI
	Control measures	33	0.28	13.75	XIIIb

Table.3 Extent adoption of orchard management practices during bearing stage of orchard (N=120)

	Selected package of practices	TS	MS	MPS	Rank
Manure (FYM)	Dose	87	0.36	36.25	IV
	Method of application	65	0.27	27.08	Va
Fertilizer	Dose	47	0.20	19.58	VIa
	Method of application	34	0.14	14.17	IX
Plant protection	IPM schedule	32	0.13	13.33	X
	Control measures	43	0.18	17.92	VII
Plant care after fruit harvest	Use of Bordeaux paste	31	0.13	12.92	XIa
	Removal the dry sticks	65	0.27	27.08	Vb
	Use of PP measures	46	0.19	19.17	VI
Harvesting	By hand	240	2.00	100.00	I
	By clipper	0	0.00	0.00	XIIIa
Selling	Standing crop	47	0.20	19.58	VIb
	Local market	98	0.41	40.83	III
	Distant market	31	0.13	12.92	XIb
Grading	-	37	0.15	15.42	VIII
Packaging	Plastic Crates	151	0.63	62.92	II
	CFB Boxes	0	0.00	0.00	XIIIb
	Wooden boxes	7	0.03	2.92	XII

Table.4 Major constraints in mandarin cultivation as perceived by the growers (N=120)

Constraints	Degree of constraints						TS	MS	MPS	Rank
	Very Serious		Serious		Least serious					
A. Socio economic constraints										
Lack of awareness	63	52.50	47	39.17	10	8.33	167	1.39	69.58	I
Cheating pesticide dealers	27	22.50	78	65.00	15	12.50	145	1.21	60.42	II
High cost of labour	32	26.67	77	64.17	11	9.17	137	1.14	57.08	IV
High cost inputs	17	14.17	21	17.50	82	68.33	143	1.19	59.58	III
B.Technological constraints										
High incidence of insect pests	81	67.50	26	21.67	13	10.83	198	0.83	82.50	I
Citrus die back	43	35.33	39	32.50	38	31.67	163	1.36	67.92	II
Lack of knowledge about recommended practices	72	60.00	35	29.17	13	10.83	149	1.24	62.08	III
Non-availability of trained labour	37	30.83	67	55.83	16	13.33	127	1.06	52.92	IV
C. Institutional constraints										
Lack of technical communication	78	65.00	33	27.50	9	7.50	148	1.23	61.67	I
Lack of proper installation of irrigation system	66	55.00	65	30.83	17	14.17	128	1.07	53.33	II
Lack of mechanization	48	40.00	65	54.17	7	5.83	121	1.01	50.42	III

These finding are supported by the findings of Bhople *et al.,* (1996), Mohammad and Punjabi (1997) and Mohammad (2000).

Extent of adoption II

During bearing stage of orchards, the orchard management practices were itemized of dose and method of application of FYM and fertilizers, IPM schedule and control measures of disease and insect, plant care after harvest the fruits, harvesting, selling, grading and packaging. The data given in table 3 that revealed that extension agencies had a significant impact of adoption of management practices for higher yield with good quality fruits, therefore, maximum extent adoption was found in case of harvesting by hand and packaging in plastic crates with MPS 100 and 62.92 with ranked as first and second, respectively.

The least extent of adoption regarding selling of fruits at local market, dose of FYM, method of application of FYM and removal of dry sticks after harvest the fruit, use of plant protection measures, grading of fruits, method of application of fertilizers, use of IPM schedule, use of Bordeaux paste and selling of fruits at distant market ranked were third, fourth, fifth, sixth, seventh, eighth, ninth, tenth, eleventh, twelfth, thirteenth with MSP 40.83, 36.25, 27.08, 27.08, 19.17, 17.92, 15.42, 14.17, 13.33, 12.92, 12.92a, 0.00 (a,b),

respectively. The results might be due to the lack of awareness among farmers regarding packaging of fruit in CFB boxes, harvesting of fruit by clipper, use of IPM schedule to control of disease and pests, method of application of fertilizers and FYM application, removal of dry sticks after harvest the fruits and use of PP measures. The present findings are duly supported by Poonia (2002) and Meena (2004).

Major constraints

Socio economic constraints

The responses were recorded and rank was assigned accordingly. The major constraints as perceived by mandarin grower are given in table 4. Among socio- economic constraints lack of awareness was observed as a most serious constraint with MSP 69.58 and this was ranked first followed by cheating pesticide dealers, high cost of inputs and high cost of labour with MSP 69.58,59.58 and 57.08 and ranks assigned were second, third and fourth, respectively.

Technological constraints

Among the technological constraints, high incidence of insect pest was observed as most serious constraints are given in table 4 and this was ranked as first with MSP 82.50 followed by citrus die back, lack of knowledge about package of practices and non-availability of trained labour with MSP 67.92, 62.80 and 52.92, and order of ranks assigned were second, third and fourth, respectively.

Regarding Institutional Constraints, it was revealed that lack of technical communication was observed most serious constraints and was ranked as first with MPS 61.67 followed by lack of proper installation drip irrigation system with MPS 53.33 and lack of mechanization with MPS 50.42 and ranked as second and third, respectively.

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