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Constraints Faced by Farmers in Adoption of Kinnow Growing in Barnala District

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A B S T R A C T

In Punjab, India, Kinnow (*Citrus nobilis* × *Citrus deliciosa*) area and production has increased profusely in arid irrigated and sub-mountainous zones. With all viable environmental conditions present in district Barnala farmers still faced some constraints in Kinnow cultivation. Major constraints in Kinnow plantation: die-back, yield, quality, planting material, technical guidance, socio-cultural, post-harvest management. Present study was conducted with the objective to extent in adoption and perceived constraints in Kinnow cultivation. The constraints as perceived by the respondents were measured by the scores on the basis of magnitude of the problems. While analyzing overall constraints as perceived by farmers the findings revealed that absence of agro processing units WMS (Weighted Mean Score) 2.87, lack of marketing at village level with WMS of 2.84, fruits with prolong juvenile period and higher costs for orchard establishment with WMS of 2.71, continuous adoption of traditional practices for growing fruit WMS of 2.70, lack of involvement of household women in orchards WMS of 2.61, lesser priority is given to orchard plantation than other farm activities WMS of 2.61, lack of knowledge regarding packaging and grading of produce WMS of 2.56, lack of knowledge about recommended fertilizer and manure application WMS of 2.52, lack of knowledge about current advance technologies WMS of 2.47 were major constraints faced by the farmers.

Introduction

Socio-economic status can be improved through balanced diet, regular source of income. Kinnow belongs to citrus family Rutaceae. It is one of the most famous fruit grown all over the world. In India, citrus occupies 3rd position after Mango and Banana. Citrus plantation is confined within 40° North-South latitude. The citrus fruits comprising of mandarins (mainly Kinnow), sweet oranges, lime and lemons are of major economic significance in Punjab. It has become exceedingly popular with the growers and consumers in North- India because of its superb fruit quality as compare to other citrus fruits. India is the second largest producer of fruits after China, with a production of 88977 thousand million tonnes of fruits from an area of 7216 thousand hectares (Anonymous, 2017). Today fruits and vegetable farming as a diversified farming is important to generate employment round the year, supplement farm economy and to earn foreign exchange also by

enhancing the export. As well as fruits play an important role in human nutrition offer diversity indirect, ecological sustainability and fight against hunger. There are many problems associated with adoption of recommended package of practices which may be related to socioeconomic status of farmers and technological awareness which need to be addressed. It is generally stated that the living standard of people can be judged by the production as well as consumption of fruits. These problems reflect the quality of advisory services provided to the farmers. These recommended practices must be followed in totality according to the location specific problems of the area. Imbalanced use of fertilizers, hard pan issues has adversely affected the soil causing decrease in organic carbon, reduction in microbial flora and fauna of soil, increasing alkalinity of soil. The farmers due to negligence tend to apply uneven doses of fertilizer, insecticides etc. Keeping in mind all these perspectives, the study was conducted in the district Barnala, Punjab with following specific objectives includes to study the constraints faced by the farmers and analyze the extent of adoption of mandarin mainly kinnow production practices. Farmer Awerness, training about agronomy practices, irrigation supply, edaptic factors were considered in assessment of production potential and constraint in mango at Bati, Ethiopia by Hussen *et al.,* (2013)

Materials and Methods

To collect the primary data on prospects of Kinnow cultivation perceived by farmers, the respondents were selected with multistage sampling. Among fruit growing states of India, Punjab was purposively selected being emerging state in Citrus cultivation as well as direct access to the investigators. In Barnala district suitable climate is prevalent for the citrus cultivation. Three blocks viz. MehalKalan, Sehna and Barnala were selected purposively. From these blocks farmers were selected randomly, making a total of 100 respondents. The data were selected with the help of well-structured and pre-tested interview schedule. The schedule consisted major five items like input, technical guidance, socio-culture etc. The responses were obtained on three-point continuum scale in case of prospects (More bright, somewhat bright and not at all bright) and scores were given as 3, 2 and 1, respectively. After that frequency was multiplied with the score (3, 2 or 1) and total weighted score was obtained and total weighted score was divided by total respondents (100) for weighted mean score. In case of mean score which is expressed in percentage, total cumulative frequency was divided by total possible score. The data were analyzed with frequency, weighted frequency, cumulative frequency, weighted mean score, mean score expressed and rank order (Kumar *et al.,* 2016)

Results and Discussion

Constraints related to inputs

The results of present study in Table 1 regarding constraints related to input show that **'**unavailability of virus free quality seedling' ranked first constraint with weighted mean score (2.46), followed by 'lesser availability of canal water' ranked second major constraint with weighted mean score (2.15), whereas 'high prices of pesticides' were ranked third with weighted mean score (1.83). 'Unavailability of skilled labor' was ranked fourth with weighted mean score (1.48) and 'lesser availability of quality farm yard manure and vermicompost' was ranked fifth with weighted mean score (1.06). The finding of present study concluded that unavailability of virus free quality seedling and lesser availability of canal water was major input related to constraints. Unavailability of recommended seedling at

desire time might have also contributed towards low production and adoption level of Kinnow cultivation in Barnala District. The study gets support from findings of Biswas and Jamir (2015) who reported that unavailability of quality input material was a serious constraint in kitchen gardening techniques in Mokochung district of Nagaland and Sharma *et al.,* (2011) who highlighted that input constraints were serious constraint in kitchen gardening.

Constraints related to technical guidance

Data presented of present study in the Table 2 it is clear that among constraints related to technical lack of knowledge about recommended fertilizer and manure application' ranked first constraint with weighted mean score (2.52), followed by 'lack of knowledge about current advance technologies' ranked second with weighted mean score (2.47). 'lack of knowledge regarding major pests and diseases identification' and 'lesser knowledge regarding critical stage of irrigation' were ranked third and fourth with weighted mean score (2.36) and (2.34), respectively. Fifth constraint is management of insect-pest at economic threshold level (ETL) with weighted mean score (2.32) followed by lack of knowledge about soil testing and hard pan issues with weighted mean score (1.96). All these constraints could be minimize by providing training and also by distributing the literature regarding the technical know-how to the farmers as it requires specialized skills in certain operations. The present study revealed that lack of knowledge about recommended fertilizer and manure application and lack of knowledge about current advance technologies were serious constraints. Findings are in agreement with the Samantaray *et al.,* (2009) who reported that lack of advance technologies as major constraint in vegetable production faced by tribal vegetable growers.

Constraints related socio-culture

Table 3 narrate constraints of present study related to production that 'continuous adoption of traditional practices for growing fruit' ranked first constraint with highest weighted mean score (2.70), followed by 'lack of involvement of household women in fruit plants' ranked second with weighted mean score (2.61). 'Farmers tendency of non-practice until other farmers in the vicinity opt for orchard plantation' and lack of interest among rural youth and farmers was ranked third and fourth with weighted mean score (2.45, 1.77), respectively. The least point is fear of theft of orchard produce with weighted mean score (1.33). The present study also revealed that continuous adoption of traditional practices for growing fruit was major constraint and lack of involvement of household women in fruit plants increased the input cost. These findings are in conformity with study of Sharma *et al.,* (2011) who reported that farmer are growing vegetables by traditional methods and farm women showed less interest in the gardening.

Constraints related to post-harvest

Findings of the present study (Table 4) revealed that constraints related to technical guidance among which 'absence of agro-processing units' was considered the most serious constraint by farmers and ranked first with weighted mean score (2.87), followed by 'lack of marketing at village level' ranked second with weighted means score (2.84).

'Lack of knowledge regarding packaging and grading of produce and lack of storage system for surplus produce' was ranked third and fourth with weighted mean score (2.56, 1.46) respectively, followed by 'lack of transport facilities and disposal of produce' ranking fifth constraint with weighted mean score (1.15).

Table.1 Constraints related to inputs (n=100)

S. NO	Constraints	Constraints level	Frequency	Weighted frequency	Cumulative frequency	Weighted mean score	Mean score expressed in %	Rank order
1	Unavailability of virus free quality seedling	High	67	201	201	2.46	82.00	I
		Medium	12	24	225			
		Low	21	21	246			
2	Lesser availability of canal water	High	31	93	93	2.15	71.67	II
		Medium	53	106	199			
		Low	16	16	215			
3	Higher prices of pesticides	High	32	96	96	1.83	61.00	II
		Medium	19	38	134			
		Low	49	49	183			
4	Unavailability of Skilled labor	High	11	33	33	1.48	49.33	IV
		Medium	26	52	85			
		Low	63	63	148			
5	Lesser availability of quality farm yard manure and vermicompost	High	0	0	0	1.06	35.33	V
		Medium	6	12	12			
		Low	94	94	106			

Table.2 Constraints related to technical guidance (n=100)

S. NO	Constraints	Constraints level	Frequency	Weighted frequency	Cumulative frequency	Weighted mean score	Mean score expressed in %	Rank order
1	Lack of knowledge about recommended fertilizer and manure application	High	70	210	210	2.52	84.00	I
		Medium	12	24	234			
		Low	18	18	252			
2	Lack of knowledge about current advance technologies	High	64	192	192	2.47	82.33	II
		Medium	19	38	230			
		Low	17	17	247			
3	Lack of knowledge regarding major pests and diseases identification	High	62	186	186	2.36	78.67	III
		Medium	12	24	210			
		Low	26	26	236			
4	Lesser knowledge regarding critical stage of irrigation	High	57	171	171	2.34	78.00	IV
		Medium	20	40	211			
		Low	23	23	234			
5	Management of insect-pest at economic threshold level (ETL)	High	62	186	186	2.32	77.33	V
		Medium	8	16	202			
		Low	30	30	232			
6	Lack of knowledge about hard pan issues	High	9	27	27	1.96	65.33	VI
		Medium	68	136	163			
		Low	33	33	196			

Table.3 Constraints related to socio-culture (n=100)

S. NO	Constraints	Constraints level	Frequency	Weighted frequency	Cumulative frequency	Weighted mean score	Mean score expressed in %	Rank order
1	Continuous adoption of traditional practices for growing fruit	High	83	249	249	2.70	90.00	I
		Medium	5	10	259			
		Low	11	11	270			
2	Lack of involvement of household women in orchards	High	68	204	204	2.61	87.00	II
		Medium	25	50	254			
		Low	7	7	261			
3	Farmers' tendency of non-practice until other farmers in the vicinity opt for orchard plantation	High	56	168	168	2.45	81.67	III
		Medium	33	66	234			
		Low	11	11	245			
4	Lack of interest among rural youth and farmers	High	25	75	75	1.77	59.00	IV
		Medium	27	54	129			
		Low	48	48	177			
5	Fear of theft of orchard produce	High	8	24	24	1.33	44.33	V
		Medium	17	34	58			
		Low	75	75	133			

Table.4 Constraints related to post-harvest (n=100)

S. NO	Constraints	Constraints level	Frequency	Weighted frequency	Cumulative frequency	Weighted mean score	Mean score expressed in %	Rank order
1	Absence of agro-processing units	High	87	261	261	2.87	95.67	I
		Medium	13	26	287			
		Low	0	0	287			
2	Lack of marketing at village level	High	86	258	258	2.84	94.67	II
		Medium	12	24	282			
		Low	2	2	284			
3	Lack of knowledge regarding packaging and grading of produce	High	52	156	156	2.56	85.33	III
		Medium	42	84	240			
		Low	16	16	256			
4	lack of storage system for surplus produce	High	4	12	12	1.46	48.67	IV
		Medium	38	76	88			
		Low	58	58	146			
5	Lack of transport facilities and disposal of produce	High	0	0	0	1.15	38.33	V
		Medium	15	30	30			
		Low	85	85	115			

Table.5 Constraints related to general problems (n=100)

S. NO	Constraints	Constraints level	Frequency	Weighted frequency	Cumulative frequency	Weighted mean score	Mean score expressed in %	Rank order
1	Prolong juvenile period and higher costs for orchard establishment	High	78	234	234	2.71	90.33	I
		Medium	15	30	264			
		Low	7	7	271			
2	Lesser priority is given to orchard plantation than other farm activities	High	74	222	222	2.61	87.00	II
		Medium	13	26	248			
		Low	13	13	261			
3	No support price	High	63	189	189	2.44	81.33	III
		Medium	18	36	225			
		Low	19	19	244			
4	Soil testing upto 200 cm for pH and EC	High	35	105	105	1.94	64.67	IV
		Medium	24	48	153			
		Low	41	41	194			
5	Problem of proper protection of local cattle grazing	High	24	72	72	1.89	63.00	V
		Medium	31	62	134			
		Low	55	55	189			

Information communication technologies (ICT) facilities can also play great role in mitigating these constraints. The present studies are agreement the findings of Kumar *et al.,* (2016) who also reported that absence of agro-processing units are the major concerns.

General constraints as perceived by respondents

An examination of results of present study in Table 5 indicate that among general constraints 'prolong juvenile period and higher costs for orchard establishment' was a major problem with weighted mean score (2.71), followed by 'lesser priority is given to orchard plantation than other farm activities' as second important constraint with weighted mean score (2.61). 'No support price' and 'soil testing for orchard' were ranked third and fourth with weighted mean scores (2.44) and (1.94), respectively. The last problem of proper protection from local grazing animals with weighted mean score (1.89).Present study also revealed that longer time taken in fruit bearing and lesser priority given to fruit plant were major general constraints faced by the respondents.

Findings are in agreement with the study of Singh *et al.,* (2010) who found that weak extension activities at village level were the major constraint in rice production technology. These findings are in line with the findings of Choudhary and Bangarwa (2013) who concluded that the constraints most perceived by the farmers in adoption were high initial cost in establishing of orchard, irregular water supply from canal, lack of proper market and lack of need based training in Kinnow production by the farmers of Sri-Ganganagar district of Rajasthan and Singh (2004) reported that inadequate training for technical skills was major constraint in mango fruit production.

The present study concluded that unavailability of virus free quality planting seedling was major constraints related to inputs while lack of knowledge about recommended fertilizer and manure application and lack of knowledge about current advance technologies were serious constraints pertaining technical. Hard pan in some areas of district barnala caused die-back of aged Kinnow crop leads to uprooting of orchards is a major constraint in relation to socio-culture, continuous adoption of traditional practices for growing fruit and lack of involvement of household women in fruit plants were important constraints. Absence of agro-processing units and lack of marketing at village level were major post-harvest constraints. Prolong juvenile period and higher costs for orchard establishment and lesser priority is given to orchard plantation than other farm activities etc. were major general constraints perceived by farmers. So, the government should address the problem of better technical support and credit facilities for wider adoption of this fruit crop.

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