Original Research Article

Measurement of Managerial Ability of Guava Growers about their Knowledge Regarding Scientific Cultivation of Guava Grower in Flood-Prone Eastern Plain Zone of Rajasthan

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A B S T R A C T

Keywords

Economic, social, cultural, physical, technological environment

Guava can be grown throughout India, According to Horticulture Statistics Division, DAC & FW in 2018-19, the total area of 276,000 hectare is dedicated to guava production in this country. Guava occupied a total area of 2657 hectare during 2014-15 and its area increased to 3850 hectares during the years 2015-16. The total production was 23075 during 2014-15, it is increased to 41354 MT during the years 2015-2016. Here, it is also clear that the total area and production under guava fruits has increased in 2015-16. Management, for the present study, has been defined as the process by which the farmer can enhance the return from the farm on a sustained basis for the attainment of family goals. Effective management is crucial for obtaining high returns from a production system on a sustained basis. There are 102 guava growing gram panchayats in Sawai Madhopur district and 54 guava growing gram panchayats in Bharatpur districts. Out of these,10-gram panchayats from Sawai Madhopur district and 5 gram panchayats from Bharatpur district, comprising a total of 15-gram panchayats were selected purposely for the study purpose based on having the highest area under guava cultivation. A comprehensive list of all the guava growers of the identified villages having guava orchards in at least 1 acre (4000 sq. mt.) from last 3 years for commercial purpose was prepared and 7 guava growers from each selected village were selected randomly. In this way, a total sample of 210 guava growers was selected randomly for the study purpose. there was no significant difference has been found among the farmers of selected districts concerning knowledge on various aspects regarding scientific cultivation of guava. Further analysis of the data shows that the knowledge of respondents of Sawai Madhopur district possessed more knowledge than the respondents of Bharatpur district.

Introduction

All enterprises are interested in increasing productivity. Agriculture being an enterprise is not an exception to this. The farmers as the manager of the enterprise are expected to bring about maximum profit with available resources. Irrespective of the economic, social, cultural, physical, and technological environment, the farmers manage a production system to get a return from it, consciously or unconsciously.

The agriculture sector grew by an average of 1.6 percent per annum in the first four years of the twelfth five-year plan (2012-17) as against the targeted 4.6 percent annual growth due to lower production. The achievement of this growth rate would be possible if the annual growth rate of horticulture is maintained at 6 to 8 percent. This is feasible and achievable. Being prominent crops after food grains and oilseeds, horticulture will be treated as a lead sector in agriculture and rural development.

Guava can be grown throughout India, According to Horticulture Statistics Division, DAC&FW in 2018-19, the total area of 276,000 hectaresis dedicated to guava production in this country. This land area represents just over a 70% increase since the early 2000s. Cultivation has also increased by around 54%. India produces 42,53,000 metrictonnes of guava annually. Out of the total cultivated area, fruits occupy 65.97 lakh hectare and 967 lakh tones production.

The major guava growing states in the country are Uttar-Pradesh, Bihar, Madhya Pradesh, Chhattisgarh, West Bengal, Orissa, Maharashtra, Gujarat, Haryana, Tamil Nadu, Jharkhand, Punjab, Karnataka, Andhra Pradesh, Telengana, Assam, Kerala, and Tripura. It is most successful in Uttar Pradesh, Punjab, Karnataka and Assam.

The Guava, botanically known as *Psidium guajava* belongs to the family of Myrtaceae. Guava is a quite hardly plant and gives assured production even with very little care. It is adaptable to various soil and climatic conditions. Guava is successfully grown up to 1500 meters above mean sea level. It can grow with an annual rainfall of about 100 mm and a temperature between 15 to 30^0C. It requires a dry atmosphere during flowering and fruiting. However, the young plants are susceptible to drought and cold. Guava grows well in high sandy loam to clay soils. However, deep, well-drained, fertile loamy soil with a pH range of 5.5 to 7.5 is considered highly suitable for guava cultivation. The high acceptability of guava is due to its high nutritive value, pleasant aroma good flavor, and availability of moderate price. This is also known as the apple of the poor man. Thus, it is an ideal fruit for nutritional security.

Guava is the fourth most important fruit crop of Rajasthan after mango, orange, and Kinnow. Guava occupied a total area of 2657 hectares during 2014-15 and its area increased to 3850 hectares during the years 2015-16. The total production was 23075 during 2014-15, it is increased to 41354 MT during the years 2015-2016. Here, it is also clear that the total area and production under guava fruits has increased in 2015-16.

Statement of the problem

Management, for the present study, has been defined as the process by which the farmer can enhance the return from the farm on a sustained basis for the attainment of family goals. Effective management is crucial for obtaining high returns from a production system on a sustained basis. The extension workers must be made aware of the need for developing the managerial ability of the farmers.

Materials and Methods

The Rajasthan state comprises ten zones. Out of these the flood-prone eastern plain Zone (IIIb) was selected purposively. This zone consists of five districts *viz.,* Bharatpur, Dholpur, Karauli, Alwar and Sawai Madhopur. Out of these 2 districts, namely Sawai Madhopur and Bharatpur districts were selected purposively for the study purpose based on having maximum area and production of guava. There are 102 guava growing gram panchayats in Sawai Madhopur district and 54 guava growing gram panchayats in Bharatpur districts. Out of these,10-gram panchayats from Sawai Madhopur district and 5-gram panchayats from Bharatpur district, comprising a total of 15-gram panchayats were selected purposely for the study purpose based on having the highest area under guava cultivation. From the selected gram panchayats, separate lists of all the guava growing villages falling under each selected gram panchayat were prepared with the help of the concerned Patwari and Agriculture supervisor. Out of these, 20 villages from Sawai Madhopur district and 10 villages from Bharatpur district were selected by using a simple random sample technique with a proportional allocation method. In this way, a total of 30 guava growing villages were selected for the study purpose. A comprehensive list of all the guava growers of the identified villages having guava orchards in at least 1 acre (4000 sq. mt.) from the last 3 years for commercial purposes was prepared and 7 guava growers from each selected village were selected randomly. In this way, a total sample of 210 guava growers was selected randomly for the study purpose. The present study was confined to *"Ex-post facto"* research design. The literal meaning of ex-post-facto is 'from what is done afterward'. It means something done or securing after an event with a retrospective effect on the event. It is used in contradistinction to experimental. Ex-post facto research is a systematic empirical inquiry in which the investigator does not have direct control over independent variables because their manifestations have already occurred or they are inherently not manipulatable (Kerlinger, 1969).

Measurement of Managerial ability of guava growers about their knowledge regarding scientific cultivation of guava grower

In the present study, the managerial ability of guava growers has been operationalized as the ability to apply the basic principles of management in the recommended or scientific cultivation of guava orchard.

Researchers in the field have used different criteria to measure the performance of the managers. Mitechell (1979) used the teacher's rating (perception) for studying the principal's effectiveness in elementary schools. In the present study to have a reliable and valid schedule for measuring the managerial ability of guava growers about their knowledge of scientific cultivation, the following procedure was used.

The scale developed by Jadav and Popat (2004) with slight modification as suggested by experts was used to measure the managerial ability of guava growers. The pertinent literature was consulted for framing the questions for the schedule. A pilot study was also conducted at Sawai Madhopur and Bharatpur districts for getting an overview of the investigation area and for item collections.

The items of managerial ability finally arrived at were pre-tested with 30 identical respondents, not included in the samples, for this purpose the schedule was administrated to these farmers twice at an interval of 15

days. The correlation coefficient between the two scores was worked-out. The reliability coefficient of the schedule was worked-out by using the test-retest method. The value of the reliability coefficient was observed to be (0.673**) which was highly significant.

Results and Discussion

The present section is based on the survey conducted the achieving the objectives of the study.

Age

The data presented in Table 1 indicated that the majority (56.20 percent) of guava growers belonged to the 36 to 50 years age group, whereas 28.60 percent of guava growers were in the above 50 years age group and only 15.20 percent of guava growers were in less than 35 years of age group.

The data in Table 1 further indicated that the majority of guava growers of Sawai Madhopur (54.30 percent) and Bharatpur district (60.00 percent) belonged to the 36 to 50 years age group, whereas 30.00 percent of guava growers of Sawai Madhopur and 25.70 percent of guava growers of Bharatpur district were above 50 years age group and only 15.70 percent guava growers of Sawai Madhopur and 14.30 percent guava growers of Bharatpur district were in less than 35 years age group.

From the results in the table, it can be concluded that the majority of guava growers in Sawai Madhopur and Bharatpur district belonged to 36 to 50 years of age, which might be since generally in the rural social system the head of the families who in the majority of the cases are either middle-aged or old aged and take the decision for their farming. In addition to this, the orchard growers had adopted the diversified

profession and their spouse had started their business at some other place.

This finding is confirmed with the findings of Patel (1990), Gorfad (1993), Chothani (1999), Jadav (2005) and Kamal (2016).

Education

The education level of the guava growers at the time of investigation was recorded by asking their education level and data were classified into four groups *viz.,* Illiterate, Primary, Secondary, and Higher education. The data concerning age are presented in Table 2.

Table 2 reveals that 43.80 percent of the guava growers were educated up to primary level, whereas 35.70 percent of them were educated up to secondary level, 10.50 percent were educated above higher secondary and college level and 3.81 percent were illiterate.

The data in Table 2, further revealed that the majority of Sawai Madhopur (43.60 percent) and Bharatpur (44.30 percent) districts guava growers were educated up to the primary level, whereas 34.30 percent of guava growers of Sawai Madhopur and 38.60 percent of guava growers of Bharatpur districts were educated up to secondary level,10.70 percent guava growers of Sawai Madhopur and 10.00 percent of guava growers of Bharatpur districts were educated above higher secondary and college level and only 11.40 percent guava growers of Sawai Madhopur and 7.10 percent guava growers of Bharatpur districts were illiterate.

The probable reason for this finding might be that the guava growers might be benefited from the existing educational facilities prevailing in the area. Hence, the majority of the guava orchard growers were educated up to the primary level followed by the

secondary level of education. Similar findings were reported by Satrola (1991), Chothani (1999), Jadav (2005), Sharma (2009) and Kamal (2016).

The managerial ability of guava growers about their knowledge regarding scientific cultivation of guava

It is quite clear from Table 3 that 69.10 percent of respondents possessed medium knowledge while 19.00 and 11.90 percent of guava growers fell under low and high knowledge, respectively.

The data in table 3, It can be described that majority of Sawai Madhopur (67.10 percent) and Bharatpur (72.90 percent) districts guava growers were possessed medium knowledge about scientific cultivation of guava. Whereas18.60 percent of guava growers of Sawai Madhopur and 20.00 percent of guava growers of Bharatpur district came under low knowledge and 14.30 percent of guava growers of Sawai Madhopur and 7.10 percent of guava growers of Bharatpur district were fell under high knowledge about recommended cultivation of guava.

Hence it can be concluded that more than two-third of guava growers had medium knowledge. The probable reason for this finding might be that the guava growers benefited from the existing government agencies situated in the study area. Hence, the majority of guava growers were in regular contact with extension personnel, who might have helped them to acquire knowledge about recommended cultivation of guava due to which they might have managed their guava orchards more efficiently, increasing their confidence which ultimately increased their managerial ability.

The extent of the managerial ability of guava growers their knowledge regarding scientific cultivation of guava

A perusal of data in Table 4 reveals that the guava growers of the study area had the highest knowledge about the "use of organic manure" (97.62 MPS) and was ranked first.

The extent of the knowledge of the farmers about "planting distance" (92.86 MPS) was ranked second by the guava growers. The least knowledge of the farmers of the study area was found about "training and Pruning recommended for guava trees" (19.05 MPS) which was on last ranked.

The analysis of data in table.4 further reveals that the guava growers of Sawai Madhopur (99.29 MPS) district had the highest knowledge regarding "graft union" and Bharatpur (98.57 MPS) district had the highest knowledge regarding "use of organic manure" respectively. The second highest knowledge regarding "use of organic manure" by guava growers of Sawai Madhopur (97.14 MPS) and "Variety of guava for III b region" by guava growers of Bharatpur (88.57 MPS) district. The guava growers of both Sawai Madhopur (15.71 MPS) and Bharatpur (25.71 MPS) districts had the least knowledge regarding "training and Pruning recommended for guava trees".

The guava growers of Sawai Madhopur district had more knowledge (65.42 MPS) as compared to Bharatpur district (61.79 MPS) regarding "knowledge on various aspects regarding scientific cultivation of guava". However, the overall knowledge of the guava growers about the various aspects regarding the scientific cultivation of guava was to be found at 64.20 MPS.

Table.1 Distribution of guava growers according to their age group

S. No.	Category	Sawai Madhopur (n_1=140)		Bharatpur (n_2=70)		Total (n=210)	
		F	**%**	**F**	**%**	**F**	**%**
1	Young (up to 35 years)	22	15.70	10	14.30	32	15.20
2	Middle (from 36 to 50 years)	76	54.30	42	60.00	118	56.20
3	Old (above 50 years)	42	30.00	18	25.70	60	28.60
	Total	**140**	**100.00**	**70**	**100.00**	**210**	**100.00**

$\bar{x}$ = 46.73 s = 13.216

Table.2 Distribution of guava growers according to their education level

S. No.	Category	Sawai Madhopur (n_1=140)		Bharatpur (n_2=70)		Total respondents (n=210)	
		F	**%**	**F**	**%**	**F**	**%**
1.	Illiterate (unable to read or write)	16	11.40	5	7.10	21	10.00
2	Primary (up to 8th standard)	61	43.60	31	44.30	92	43.80
3	Secondary (9th to 12th standard)	48	34.30	27	38.60	75	35.70
4	Higher education (above 12th standard)	15	10.70	7	10.00	22	10.50
	Total	**140**	**100.00**	**70**	**100.00**	**210**	**100.00**

Table.3 Distribution of guava growers about their knowledge level regarding scientific cultivation of guava

S. No	Category	Sawai Madhopur (n_1=140)		Bharatpur (n_2=70)		Total (n=210)	
		F	**%**	**F**	**%**	**F**	**%**
1.	Low knowledge level (below16.44 score)	26	18.60	14	20.00	40	19.00
2	Medium knowledge level (from 16.44 to 29.78 score)	94	67.10	51	72.90	145	69.10
3	High knowledge level (above 29.78 score)	20	14.30	5	7.10	25	11.90
	Total	**140**	**100.00**	**70**	**100.00**	**210**	**100.00**

$\bar{x}$ = 23.11 s = 6.67

Table.4 Extent of the managerial ability of guava growers about their knowledge regarding scientific cultivation of guava

S. No.	Statements	Sawai Madhopur (n₁=140)		Bharatpur (n₂=70)		Total (n=210)	
		MPS	Rank	MPS	Rank	MPS	Rank
1	Use of organic manure	97.14	II	98.57	I	97.62	I
2	Planting distance	96.43	III	85.71	IV	92.86	II
3	Recommendation for irrigation	94.29	IV	70.00	XIII	86.19	V
4	Graft union above the ground level	99.29	I	78.57	VIII	92.38	III
5	Weeding operations	80.00	XII	60.00	XX	73.33	XV
6	Graft plants should be Irrigated	92.86	V	87.14	III	90.95	IV
7	Harvesting of fruits	85.71	X	74.29	XI	81.90	VII
8	Uses of green manure	73.57	XVI	58.57	XXII	68.57	XIX
9	Pre-monsoon ploughing	76.43	XIV	65.71	XIV	72.86	XVI
10	Major micronutrients	77.14	XIII	74.29	XI	76.19	XIII
11	Variety of guava for III b region	72.86	XVII	88.57	II	78.10	XII
12	Commercial propagation method	72.14	XVIII	82.86	VI	75.71	XIV
13	Size of the pit for guava planting	88.57	VIII	75.71	X	84.29	VI
14	Pest attack at the time of newly branch	90.00	VII	60.00	XX	80.00	VIII
15	Control mealy bug by ploughing	87.86	IX	61.43	XIX	79.05	X
16	Manure and fertilizers applied	91.43	VI	54.29	XXIV	79.05	X
17	Recommended for irrigation interval	75.71	XV	62.86	XVII	71.43	XVII
18	Numbers of irrigation	81.43	XI	77.14	IX	80.00	VIII
19	Taken Intercropping	63.57	XX	84.29	V	70.48	XVIII
20	Attack of fruit fly	56.43	XXV	82.86	VI	65.24	XXI
21	Flowers wrinkled and dropped due to attack of mealy bug	62.86	XXI	55.71	XXIII	60.48	XXIII
22	Used of pesticide for mealy bug	60.00	XXIII	65.71	XIV	61.90	XXII
23	Control of pest by physical measures	58.57	XXIV	62.86	XVII	60.00	XXIV
24	Pest causes of fruit dropping	66.43	XIX	64.29	XVI	65.71	XX
25	Pest causes for drying of the stem	60.71	XXII	42.86	XXXI	54.76	XXV
26	Use of pesticide to control guava stem borer	50.00	XXVII	54.29	XXIV	51.43	XXVI
27	Use of pesticide to control fruit fly	41.43	XXIX	47.14	XXVIII	43.33	XXX

28	Guava tree stage at which affected by wilt disease	35.71	XXXI	41.43	XXXII	37.62	XXXII
29	Spraying of NAA to reducing fruit drop	39.29	XXX	54.29	XXIV	44.29	XXVIII
30	Apiculture helps in pollination in trees	44.29	XXVIII	44.29	XXX	44.29	XXVIII
31	Variety could withstand drought conditions	51.43	XXVI	51.43	XXVII	51.43	XXVI
32	Season of anthracnose disease affects the plant	35.00	XXXII	47.14	XXVIII	39.05	XXXI
33	Average production of guava per tree	30.00	XXXIII	37.14	XXXIII	32.38	XXXIII
34	**Treatment with wax emulsion during storage of guava**	27.86	XXXIV	22.86	XXXVI	26.19	XXXIV
35	Spray of Urea solution on guava tree in rainy season	22.86	XXXV	24.29	XXXV	23.33	XXXV
36	Training and Pruning recommended for guava trees	15.71	XXXVI	25.71	XXXIV	19.05	XXXVI
	Overall MPS	**65.42**		**61.79**		**64.20**	

MPS = Mean Per cent Score, n = Sample size

Table.5 District wise comparison of guava growers about their knowledge regarding scientific cultivation of guava

S. No	Category of sample	Mean	S.D.	'Z' value
1.	Guava growers of Sawai Madhopur district	23.55	6.80	1.37 NS
2.	Guava growers of Bharatpur district	22.24	6.36	

NS = Non significant

District wise Comparison of guava growers about their knowledge regarding scientific cultivation of guava

To find out the significance of the difference between the guava growers of selected districts concerning the knowledge possessed by them, the 'Z' test was applied. For this purpose, the following null hypotheses were tested and the results of which are presented in Table 5.

Table 5 shows that the calculated value of 'Z' (1.37 NS) is less than its tabulated value at 5 percent level of significance. It infers that there was no significant difference among the farmers of selected districts concerning knowledge on various aspects regarding scientific cultivation of guava. Further analysis of the data in table 5 shows that the knowledge of respondents of Sawai Madhopur district possessed more knowledge than the respondents of Bharatpur district.

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