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Knowledge Level of Pomegranate Growers in Tumkur District of Karnataka

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Abstract

The present study was carried out in Sira and Pavagada taluks of Tumkur districts of Karnataka state during 2021-2022 to assess the knowledge level and its association between profile characteristics of pomegranate growers. The sample size constituted 120 pomegranate growers from Tumkur district *i.e.,* 60 from each taluk. Knowledge level of pomegranate growers refers to factual information possessed by them regarding recommended cultivation practices of pomegranate. Results revealed that 38.83 per cent of Sira pomegranate growers and 48.33 per cent of Pavagada pomegranate growers belonged to medium knowledge level. Pooled data revealed that 43.33 per cent of pomegranate growers belonged to medium level of knowledge. Knowledge level was significantly associated with education, farming experience, achievement motivation, risk orientation, innovative proneness, scientific orientation, management orientation, cosmopoliteness, economic motivation and social participation at 5 per cent level of significance, while annual income, land holding, area under pomegranate, extension contact and extension participation were significant at 1 per cent level of significance.

Keywords : Knowledge level, Pomegranate growers, Association

Pomegranate (*Punica granatum*) is an important fruit crop grown in tropical and subtropical regions of India and is commonly known as Dalim, Anar and Matulum. It was originated in Iran and belongs to the family Punicaceae. In India, pomegranate occupies an area of 2,75,500 hectares with a production of 3 million metric tonnes during 2021-22. Maharashtra is the largest producer of pomegranate followed by Gujarat, Karnataka, Andhra Pradesh, Rajasthan, Tamil Nadu and Haryana. The commonly grown pomegranate varieties in India are Araktha, Bhagwa, Phule, Mridula, Jyoti, Ganesh, Vellode, Kandhari, Alandi, Dholka, Kabul, Kandhari, Muskatred, Ganesh and G-137. In Karnataka, pomegranate occupies an area of 25,690 hectares with a production of 2,55,010 tonnes and productivity of 10.39 tonnes per hectare during 2021-22. The predominant pomegranate growing districts of Karnataka are Chitradurga, Tumkur, Koppal, Bagalkot, Bijapur, Raichur, Belgaum, Bellary and Dharwad. In Tumkur district, Pomegranate is being grown on commercial scale. The area under pomegranate in Tumkur district is 4,951 ha with a production of 37,169 tonnes and productivity of 7.51 tonnes per hectare (Anonymous, 2018). Pomegranate has attracted many growers, especially those in Karnataka and Maharashtra for its wider adaptability and profitability. Karnataka is one of the progressive states of India with immense potential for development of fruit crops, as it is blessed with ten different agro-climate regions that is suitable for growing variety of fruits all-round the year. Knowledge

level of the farmers is a vital component that depicts the quality output. Hence, the present study was conducted with the following specific objectives:

1. To assess the knowledge level of pomegranate growers
2. To find out the association between personal, socio-economic, psychological and communication characteristics of pomegranate growers with their knowledge level

Methodology

The present study was carried out during 2021-2022 in Tumkur district. Tumkur was purposively selected, considering its area and production under pomegranate crop. Tumkur district has ten taluks, out of which Sira and Pavagada taluks were selected considering the highest area and production. Data was collected from 120 pomegranate growers, 60 each from Sira and Pavagada taluks. Ex-post-facto research design was followed and data was collected personally using a pre-tested interview schedule. The collected data is analyzed using frequency, percentage and chi-square test.

Results and Discussion

Component Wise Knowledge Level of Pomegranate Growers on Recommended Technologies

Knowledge Level of Pomegranate Growers on Pre-planting Technologies : The data in Table 1 shows that both Sira and Pavagada growers have cent per cent correct knowledge on soil type, type of planting material and variety to be used. Majority of Sira and Pavagada farmers have correct knowledge on time of ploughing before planting (75.00 and 76.67%), time of planting (85.00 and 83.33%) and pit size (58.33 and 50.00%), respectively. Over half of the Sira growers (53.33%) and less than one third of Pavagada growers (30.00%) had correct knowledge on spacing.

The data in Table 2 depicted the information on knowledge level of pomegranate growers on production technologies. Cent per cent of respondents had correct knowledge on drip irrigation. Majority of Sira and Pavagada farmers have correct knowledge on pruning (90.00 and 100.00%), FYM application

Table 1

Knowledge level of Pomegranate growers on Pre-planting Technologies

Recommended technologies	Sira pomegranate growers (n1=60)				Pavagada pomegranate growers (n2=60)				Total (n=120)			
	Correct Knowledge		Incorrect Knowledge		Correct Knowledge		Incorrect Knowledge		Correct Knowledge		Incorrect Knowledge	
	f	%	f	%	f	%	f	%	f	%	f	%
Soil type	60	100.00	0	0.00	60	100.00	0	0.00	120	100.00	0	0.00
Time of ploughing before planting	45	75.00	15	25.00	46	76.67	14	23.33	91	75.83	29	24.16
Type of planting material	60	100.00	0	0.00	60	100.00	0	0.00	120	100.00	0	0.00
Varieties	60	100.00	0	0.00	60	100.00	0	0.00	120	100.00	0	0.00
Planting in main field												
Pit size	35	58.33	25	41.66	30	50.00	30	50	65	54.17	55	45.83
Spacing	32	53.33	28	46.66	18	30.00	42	70	50	41.66	70	58.33
Plant population	30	50.00	30	50.00	20	33.33	40	66.67	50	41.66	70	58.33
Time of planting	51	85.00	9	15.00	50	83.33	10	16.66	100	83.33	20	16.67

f = frequency/number of farmers; % = percentage

TABLE 2

Knowledge level of Pomegranate growers on Production Technologies

Recommended technologies	Sira pomegranate growers (n1=60)				Pavagada pomegranate growers (n2=60)				Total (n=120)			
	Correct Knowledge		Incorrect Knowledge		Correct Knowledge		Incorrect Knowledge		Correct Knowledge		Incorrect Knowledge	
	f	%	f	%	f	%	f	%	f	%	f	%
Drip irrigation	60	100.00	0	0.00	60	100.00	00	00.00	120	100.00	0	0.00
Intercropping	25	41.67	35	58.33	20	33.33	40	66.67	45	37.50	75	62.50
Green manuring	27	45.00	33	55.00	12	20.00	48	80.00	39	32.50	81	67.50
Staking	26	43.33	34	56.67	35	58.33	25	41.67	61	50.83	59	49.17
Pruning	54	90.00	6	10.00	60	100.00	0	0.00	114	95.00	6	5.00
Bahar treatment	16	26.67	44	73.33	14	23.33	16	76.67	30	25.00	90	75.00
FYM application	38	63.33	22	36.67	45	75.00	15	25.00	83	69.17	37	30.83
Boron application	30	50.00	30	50.00	20	33.33	40	66.66	50	41.67	70	58.33
Chemical Fertilizer												
Recommended dose	40	66.67	20	33.33	45	75.00	15	25.00	85	70.83	35	29.17
Time of application	43	71.67	17	28.33	48	80.00	12	20.00	91	75.83	29	24.17
Integrated weed management	30	50.00	30	50.00	19	31.67	41	68.33	49	40.83	71	59.17

f = frequency/number of farmers; % = percentage

(63.33 and 75.00%), time of chemical fertilizer application (71.67 and 80.00%) and recommended dose of chemical fertilizers (66.67 and 75.00%), respectively.

Knowledge Level of Pomegranate Growers on Plant Protection Measures

Knowledge level on the pest and disease management practices of respondents is depicted in Table 3. Majority of Sira and Pavagada farmers have correct knowledge on sucking pest management (66.67 and 41.67%) and bacterial leaf blight disease management (71.67 and 60.00%), respectively. Majority of the respondents do not have correct knowledge on fruit borer management (66.67%), stem borer management (78.33%), shot hole borer management (87.50%), fruit rot disease management (62.50%) and wilt disease management (62.50%).

Table 4 depicts that none of the respondents have knowledge on export, storage structure and pre cooling of harvested fruits. Majority of Sira and Pavagada farmers have correct knowledge on harvesting method (83.33 and 88.33%), container used for harvesting (83.33 and 70.00%), grading and sorting (75.00 and 91.67%) and packing (70.00 and 51.66%), respectively.

With respect to the pooled data, majority of the pomegranate growers have correct knowledge on pruning (95.00%), time of ploughing before planting (91.00%), harvesting method used (85.83%), time of planting (83.33%), grading and sorting (83.33%), container used for harvesting fruits (76.67%), time (75.83%) and dose of chemical fertilizer application (70.83%), FYM application (69.17%) and bacterial leaf blight disease management (65.83%). The above practices are comparatively easy; in addition, the farming experience of the farmers might have enhanced their knowledge on the above practices. Further, being a horticultural commercial crop, its response is found to be moderately high with the

The Mysore Journal of Agricultural Sciences

TABLE 3

Knowledge level of Pomegranate growers on Plant Protection Measures

Recommended technologies	Sira pomegranate growers (n1=60)				Pavagada pomegranate growers (n2=60)				Total (n=120)			
	Correct Knowledge		Incorrect Knowledge		Correct Knowledge		Incorrect Knowledge		Correct Knowledge		Incorrect Knowledge	
	f	%	f	%	f	%	f	%	f	%	f	%
Pest Management												
Fruit borer	25	41.67	35	58.33	15	25.00	45	75	40	33.33	80	66.67
Stem borer	14	23.33	46	76.67	12	20.00	48	80.00	26	21.67	94	78.33
Shot hole borer	10	16.67	50	83.33	5	8.33	55	91.67	15	12.50	105	87.50
Sucking pest	40	66.67	20	33.33	25	41.67	35	58.3	65	54.17	55	45.83
Disease Management												
Fruit rot	25	41.67	35	58.33	20	33.33	40	66.67	45	37.50	75	62.50
Bacterial leaf blight	43	71.67	17	28.33	36	60.00	24	40.00	79	65.83	41	34.17
Wilt disease	25	41.67	35	58.33	20	33.33	40	66.67	45	37.50	75	62.50

f = frequency/number of farmers; % = percentage

TABLE 4

Knowledge level of Pomegranate growers on Harvesting & Post Harvesting Practices

Recommended technologies	Sira pomegranate growers (n1=60)				Pavagada pomegranate growers (n2=60)				Total (n=120)			
	Correct Knowledge		Incorrect Knowledge		Correct Knowledge		Incorrect Knowledge		Correct Knowledge		Incorrect Knowledge	
	f	%	f	%	f	%	f	%	f	%	f	%
Harvesting												
Harvesting method	50	83.33	10	16.67	53	88.33	7	11.67	103	85.83	17	14.17
Container used for harvesting	50	83.33	10	16.67	42	70.00	18	30.00	92	76.67	28	23.33
Precooling of harvested fruits	0	0.00	60	100.00	0	0.00	60	100.00	0	0.00	120	100.00
Storage structure	0	0.00	60	100.00	0	0.00	60	100.00	0	0.00	120	100.00
Grading and sorting	45	75.00	15	25.00	55	91.67	5	8.33	100	83.33	20	16.67
Packing	42	70.00	18	30.00	39	51.67	29	48.33	73	60.83	47	39.17
Marketing	60	100.00	0	0.00	60	100.00	0	0.00	120	100	0	0.00

f = frequency/number of farmers; % = percentage

application of chemical fertilizer. Thus, they might have gained more knowledge on recommended dose and time of application of the chemical fertilizers. Growers are always interested in economic benefit, thereby they might have gained high knowledge on harvesting method and containers used for harvesting.

Further, graded and sorted fruits will fetch good price, therefore growers also have high level of knowledge on this technology. Severe infestation of bacterial blight disease in pomegranate crop might have encouraged the farmers to acquire high level of knowledge about the disease and its management. Everyone in the study area is following pit method of planting but the recommended pit size is followed by only half of the respondents. This might be due to the traditional nature of practice being followed by their ancestors. Even though every respondent is growing Bhagwa variety, only half or less than half of them are maintaining the recommended spacing because of lack of knowledge. Proportionately the plant population is also modified. Inter cropping will fetch them extra income, so they have moderate level of knowledge on it. As majority of them have high level of farming experience majority of the respondents might have possessed knowledge on FYM application, boron application, weed management, fruit borer and sucking pest management, wilt disease etc.

Over all Knowledge Level of Pomegranate Growers

Overall knowledge of Table 5 shows that Sira growers have medium level of knowledge (38.33%), followed by high (31.66%) and low level of knowledge (30.00%). While, Pavagada farmers have medium level of knowledge (48.33%), followed by high (40.00%) and low level of knowledge (11.66%). With respect to the pooled data, they had medium level of knowledge (43.33%), followed by high level of knowledge (35.83%) and low level of knowledge (20.83%). The above trend is due to medium level of extension contact and scientific orientation of pomegranate growers with horticultural officers and other private extension agency. Further, farmer's participation in extension activities has helped them to acquire the knowledge on pomegranate cultivation. These findings are in conformity with the findings of Bhosale (2003), Ghadge (2005), Jadhav (2009) and Pavan Kumar (2018).

Association between Independent Variables and Knowledge Level

In order to find out the association between independent variables and Knowledge level chi-square test was employed. From Table 6 and Fig.1, it is evident that knowledge level is non-significantly associated with age, family size and significantly associated with education, land holding, area under pomegranate, annual income, farming experience, achievement motivation, risk orientation, innovative proneness, scientific orientation, management orientation, cosmopoliteness, extension contact, extension participation, economic motivation and social participation.

Young age farmers who were progressive in nature are always eager to take risk. Old aged farmers are traditional and they do not want to change the existing

TABLE 5

Over all knowledge level of Pomegranate growers

Knowledge level	Sira growers (n1=60)		Pavagada growers (n2=60)		Total (n=120)	
	f	%	f	%	f	%
Low (<17.52)	19	30.00	24	40.00	43	35.83
Medium (17.52-20.60)	23	38.33	29	48.33	52	43.34
High (>20.60)	18	31.66	7	11.66	25	20.83

f = frequency/number of farmers; % = percentage

TABLE 6

Association between independent variables and Knowledge level

Independent variables	Chi-square value	Contingency coefficient (C)
Age	5.38 NS	0.56
Education	13.53 *	0.86
Landholding	14.83 **	0.63
Area under Pomegranate	13.41 **	0.80
Family size	6.84 NS	0.65
Annual income	14.59 **	0.77
Farming experience	12.27 *	0.84
Achievement motivation	9.16 *	0.86
Risk orientation	15.98 *	0.84
Innovative proneness	11.71 *	0.80
Scientific orientation	13.28 *	0.87
Management orientation	10.76 *	0.87
Cosmopoliteness	11.29 *	0.85
Extension contact	12.51 **	0.87
Extension participation	14.12 **	0.80
Economic motivation	12.47 *	0.78
Social participation	13.15 *	0.87

NS: Non-significant,*: Significant at 5 per cent**: Significant at1percent

practices and don't take any risk. Hence, there was non-significant association in case of age and knowledge level of pomegranate growers. The size of family was not an important variable that influences the knowledge level of pomegranate growers and therefore, family size was non-significantly associated with knowledge level.

Land holding and area under pomegranate had positive and significant association with knowledge level at 5 per cent. Farmers with better land holding will venture into commercial or horticulture crop. New commercial crop venture motivates them to acquire the knowledge on its cultivation process. Further, pomegranate being a commercial crop is grown by the farmers who are eager to know and apply on field.

Education had positive and significant association with knowledge level at 5 per cent, which indicate that education play an important role in influencing the knowledge level. Increase in the education level has encouraged farmers to have more knowledge on cultivation of pomegranate.

Annual income had significant association with knowledge level at 1 per cent, since a person with high annual income is always enthusiastic to learn the things, which help in increasing his income. Pomegranate being a commercial crop encourages them to know more and earn more.

Farming experience had significant association with the knowledge level at 5 per cent. It's true that if a grower is having more farming experience by default, he will be having more knowledge level. Further, experienced farmer seeks to understand the associated problems and its management.

Achievement motivation had significant association with the knowledge level at 5 per cent. A person with high achievement motivation will strive to accomplish more and in the process, acquire knowledge that leads to the process of achievement.

Risk orientation had significant association with the knowledge level at 5 per cent. Always a person with more knowledge and land holding will have the confidence to take more risk, as he understands the technology as well as the situation in a better way.

People who are able to take risks will strive to learn and adopt new or innovative things. This will lead to increased knowledge among such individuals and inspire them to try new technologies available in pomegranate cultivation practices. This might be the reason for significant association of innovative proneness with the knowledge level.

Scientific orientation opens the mental horizon of an individual, which act as a catalyst in changing the behaviour of pomegranate growers that result in its significant influence on knowledge level. Urge of the farmers to understand the techniques scientifically has in turn influenced their knowledge level.

Management orientation had significant association with the knowledge level at 5 per cent. This might be

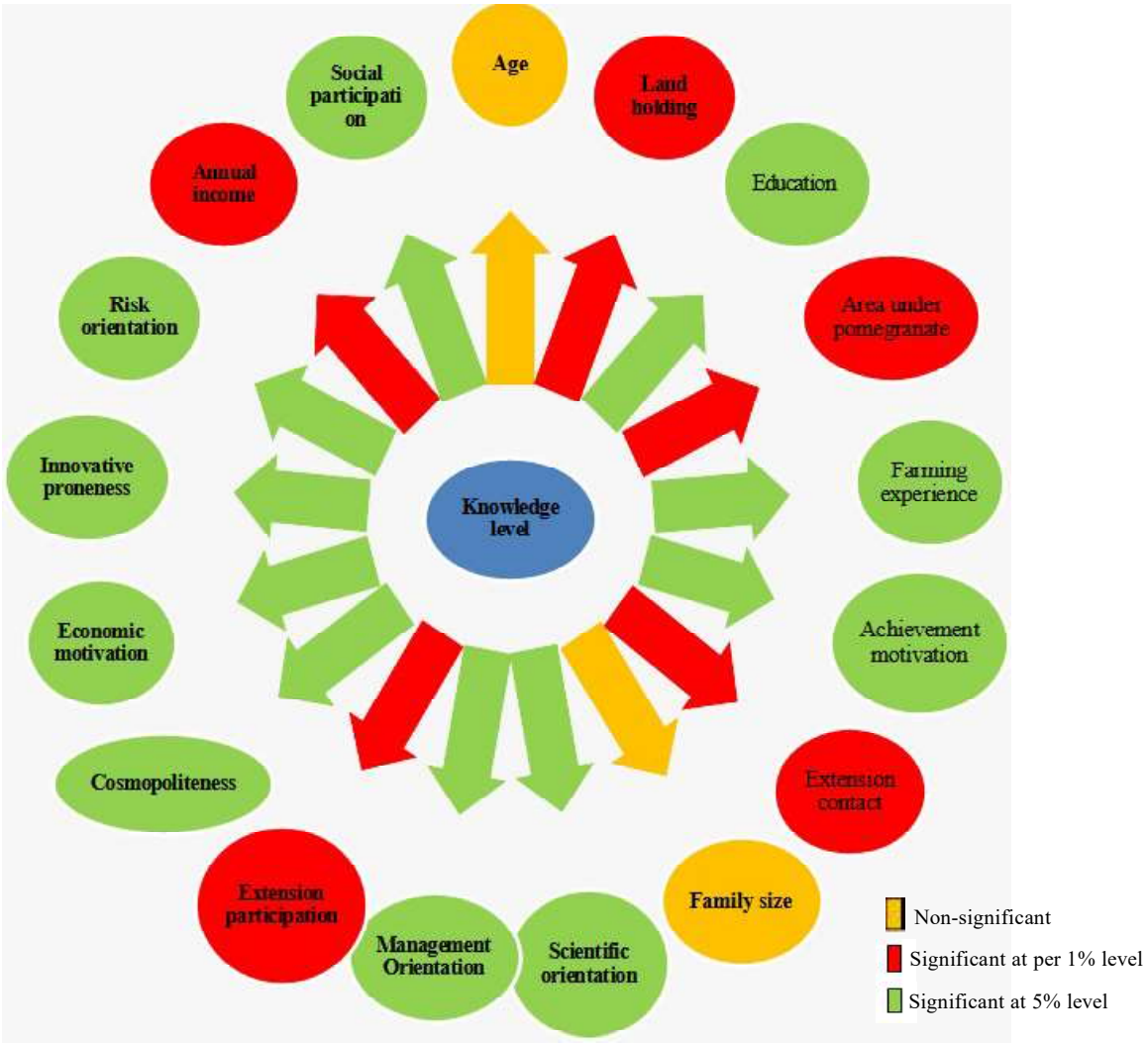

Fig. 1: Empirical model depicting association between profile characteristics of pomegranate growers and knowledge level

due to their regular role of managing farms and utilizing the available resources. To manage the things effectively, it is essential to have knowledge and hence, respondents are showing this behaviour.

Cosmopoliteness nature shows that regular visit of growers outside the village for various reasons, during which they might contact the extension personnel and acquire knowledge. Further, movement of individual helps him to meet different people outside the village and discuss with outsiders/ experts enhances their knowledge level.

Extension contact provides opportunity for farmers to exchange new information with horticultural officers, private agency extension officers regarding pomegranate cultivation practices. Further, extension participation in various extension activities like demonstrations, meetings, trainings, field day etc., influences on their knowhow. These activities enable them to understand new and recommended cultivation practices that help in increasing the knowledge level.

Person with high economic motivation will always strive to find the ways and means to improve his economy. Knowledge on recommended cultivation practices of pomegranate results in increased return. Hence, economic motivation is significantly associated with the knowledge level of pomegranate growers.

The Mysore Journal of Agricultural Sciences

A person participates in social activities, wherein he meets and interacts with people. Further, it is an opportunity and best source to increase their knowledge level. Hence, social participation is directly proportionate to increase the knowledge level of pomegranate growers. Similar results were reported by Vinay Kumar *et al.* (2009), Pottappa *et al.* (2014), Sundresha *et al.* (2020) and Pradeep Kumar (2021).

The present study was carried out in Sira and Pavagada taluks of Tumkur districts of Karnataka state during 2021-2022 to assess the knowledge level of pomegranate growers and also to find out the association between knowledge level of pomegranate growers and their profile characteristics. Results revealed that 43.33 per cent of pomegranate growers possessed medium knowledge level. Majority of the growers regularly contacted the extension personnel and actively participated in the extension activities for increasing their knowledge. In spite of this, over one third of the respondents had low level of knowledge because of their remote location that hindered the extension personnel to conduct more activities. Further, intensifying the extension activities helps in improving the knowledge level that leads to reduced technological and yield gap. Being a commercial crop, pomegranate helps to increase farmer's returns through improved knowledge on recommended cultivation practices.

REFERENCES

ANONYMOUS, 2018, Horticultural statistics at a glance 2021, Ministry of Agricultural and Farmer's Welfare, pp. : 152.

BHOSALE SHAHU SADASHIV, 2003, Knowledge and adoption of post-harvest technology by the pomegranate growers in Sangola Tahsil of Solapur district. *M.Sc.(Agri.) Thesis* (Unpub.), Mahatma Phule Krishi Vidyapeeth, Rahuri.

GHADGE, S. N., 2005, Knowledge and adoption of recommended practices of control of oily spot disease on pomegranate in Solapur district. *M.Sc. (Agri.) Thesis* (Unpub.), Mahatma Phule Krishi Vidyapeeth, Rahuri.

JADHAV, B. A., 2009, An analysis of technological gap in papaya cultivation in Bidar and Gulbarga districts of North Karnataka. *M. Sc. (Agri.) Thesis*, (Unpub.), *Univ. Agric. Sci.,* Dharwad.

PAVAN KUMAR, P., 2018, An analysis of adoption level and economic performance of pomegranate growers in Tumkur district of Karnataka. *M.Sc. (Agri) Thesis* (Unpub.), Univ. Agric. Sci., Bangalore.

POTTAPPA, K., KRISHNAMURTHY, B. AND NARAYANAGOWDA, K., 2014, Knowledge level of potato growers in Chickballapur district. *Mysore J. Agric. Sci.,* **45** (1) : 95 - 98.

PRADEEP KUMAR, 2021, An analysis of knowledge level, yield gap and extent of adoption of good agronomic practices in coconut cultivation among farmers of Ramanagara district. *M.Sc.(Agri) Thesis* (Unpub.), University of Agricultural Sciences, Bangalore.

SUNDRESHA, B. R., NANJAPPA, D., VINAY KUMAR, R. AND LAKSHMINARAYAN, M. T., 2020, A study on knowledge level of Ginger growers on improved cultivation practices in Hassan district. *International Journal of Current Microbiology and Applied Sciences,* **9** (7) : 3014 - 3021.

VINAY KUMAR, R., NATIKAR, K. V., NATARAJU, M. S., PANKAJA, H. K. AND DHANANJAYA, B., 2009, Knowledge level of rose growers in Karnataka, *Mysore J. Agric. Sci.,* **43** (2) : 340 - 343.