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Advancement in Knowledge and Adoption of Grape Growing Farmers in Theni District of Tamilnadu

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Grape (*Vitis grape L.*) could be a temperate fruit crop and conjointly cultivated beneath tropical and climatic zone regions within the world. This study on improved grape knowledge and adoption of recommended grape practices among farmers was conducted in the Theni district of Tamil Nadu by employing a combination of purposive and proportionate random sampling methods with 120 grape growers. The data were collected with the help of a well-structured and pretested interview schedule during July to August 2020-21. The district contributes significantly to the state's area of production in grapes. The area of cultivation of grapes to the state is substantial (79.80%). In the study it was concluded that cent percent of the grape growers had correct knowledge about soil type, planting, gap-filling, recut, supporting, weeding, irrigation type, training, pruning time, bud dormancy breaking chemical, micronutrient mixtures, fertigation, shoot thinning, subcane development, training the shoots, tipping, cluster and berry thinning, mealybug control, and downy mildew control. About 60.83 per cent of the grape growers belonged to medium level of knowledge about recommended practices of grape cultivation. The results showed overall adoption of the grape growers wasmedium

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level of adoption (71.67%). This study explores the keen view of the advancement in knowledge and adoption followed by grape cultivators in Theni District.

Keywords: Grape growers; Cumbum valley; Ex-post facto; Advancement in Knowledge; and improved grape growers; and Advancement in adoption.

1. INTRODUCTION

Grape (*Vitis grape L.*) is that the most vital crop grownup within the world. Principallyit's cultivated for making wines and grapes serving at tables. In India, it is primarily grown for table use. Grape cultivation is believed to possess originated close to the Caspian Sea; however, Indians apprehend grapes since Roman times. Grape could be a temperate fruit crop and conjointly cultivated beneath tropical and climatic zone regions within the world. It belongs to the family Vitaceae. India is quickly risingjoined of the main grape-growing countries in the world. In India, it's cultivated under temperate, tropical, and sub-tropical climates over a neighborhood of 1,11,000 ha with an annual production of 1235000 million tonnesand also productivity is 11.10 MT [1].The total area underneath grapes in India is 40,000 ha, distributed principally in the geographic region, Karnataka, province, and Tamil Nadu. Maharashtra ranks initial in terms of production accounting for over 81.22 percent of total production and the highest productivity within the country [2]. Theni district grape production in Cumbum valley was 90,000 tonnes of Paneer grape and 10,000 tonnes of Thomson seedless grape. The distinctive aspect of this location is that the fruits are harvested throughout the year and grapes have been grown on the same land for many decades. Panneer Grape is a unique kind of of black grape [3]. Grape is one of the vital fruit covering a locality of 123 thousand hectares occupying 2.01 percent of the full area and also country is additionally a serious exporter of recent Grapes to the planet. The country has exported 246133.79 MT of Grapes to the world for the value of Rs.2335.24 crores/ 334.79 USD Million during the year 2018-19 [4]. Grapes are among the absolute best exchange earners among fruit crops. Cultivation of grapes creates employment opportunities for farmers, farm laborers, exporters, traders, and indirect employment to many others. In India, grapes are being cultivated on an honest range of soils right from sandy loam to saline and alkali soils. Grapes are grown across a ramification of agro-climatic zones. In Tamil Nadu, grapes are cultivated in an area of 2800 ha of which the Theni district alone accounts for 2184 ha. Major varieties grown are muscat Hamburg following Thompson seedless, shred seedless grapes major grapes growing areas are Cumbum, Uthamapalyam, Chinnamanur. The production of fruits and vegetables have vital importance as it provides three to four times more cash income per unit of land than cereals. Realizing the importance of fruit cultivation many farmers are diverting their resources towards cultivation of fruit crops in that list, grape was predominatly choosen by farmers for cultivation. There are many noval technologies available but majority of the farmers are not aware of it. This study reveales the real situation of the grape growing farmers advancement in knowledge, advancement in adoption of grape cultivation and level of perception of grape growers about improved grape cultivation technology at keen view.

2. MATERIALS AND METHODS

The study was conducted in the Theni district of Tamil Nadu during July - Aug on (2020-21). Ex-post facto design of experiment research method was used. The district contributes significantly to the state's area of production in Grapes. The cultivation of Grapes is very unique in cumbum valley of Theni District. Theni district consists of 5 taluks viz., Theni, Bodinayakanur, Periyakulam, Andipatti and Uthamapalayam. Amidst these taluks, the taluk Uthamapalayam was selected purposively since it has got the maximum area under grape cultivation. Uthamapalayam taluk has three blocks - Uthamapalayam, Chinnamanur, and Cumbum. Amidst the three blocks, the cumbum block was selected purposively keeping in mind the maximum area under grape cultivation. About 120 growers were selected by adopting random sampling method, data was collected with the help of pre-tested interview schedule and the collected data was analyzed using SPSS 16.0.

3. RESULTS AND DISCUSSION

3.1 Advanced Technical Knowledge in Grape Cultivation by the Grape Growing Farmers

From Table 1, it can be concluded that cent percent of the grape growers had correct knowledge about soil type, planting, gap-filling,

recut, supporting, weeding, irrigation type, training, pruning time, bud dormancy breaking chemical, micronutrient mixtures, fertigation, shoot thinning, subcane development, training the shoots, tipping, Cluster and berry thinning, mealy bug control, and downy mildew control. About 97.50 per cent of grape growers had knowledge on powdery mildew control, Flea beetles control (96.67%),Quantity of filling material FYM and Superphosphate (95.83%), Anthracnose (94.17%), (93.33%) Thirips control measures, (92.50%). Foliar sprays, (91.67%)- Mode of propagation, (90.83%)- Quality improvement in Muscat Hamburg To get uniform ripening, (85.83%)-Variety, (85.83%)- Field preparation/spacing 3 x 2 m for Muscat Hamburg, (85.83%)-Pruning stage five to seven bud level for Muscat Hamburg (83.33%)-Nematode control, (80.00%) Mite control measures recall information gathered from a variety of sources. In addition, a considerable number of respondents sought advice from various sources such as friends, family, and neighbors. These sources may have passed on the information to other producers as a result. Farmers tended to prefer to contact successful farmers and learn as much as they could. Training in excellent grape farming techniques is required to have the right understanding of the planting season, dormant chemical buds, and the management of numerous pests and diseases of grapes. Almost all of the people who responded said they had grown grapes before. The grape needs special attention and rigorous adherence to certain practices. Almost majority of the responders had prior grape-growing experience. Grapes require specific attention and strict adherence to certain procedures, which may have compelled them to learn about all of the scientifically suggested training methods. Almost all orchards demonstrated the various recommended training techniques to their contractual farmers.

The data in Table 2 indicated that about three-fifth (60.83%) of the grape growers belonged to a medium level of knowledge about recommended practices of grape cultivation with a mean score of 18.72, whereas 17.50 and21.67 percent of the grape growers belonged to low and high knowledge levels, respectively.

Grape cultivation requires an understanding of specific cultivation practices. Grapes are a unique crop that must be cultivated systematically to yield a profit. Grape growers were possibly self-driven on specific cultivation techniques. Grape growers may have been motivated to learn more about grape growing scientific know-how through formal and non-formal information sources available in the study area, grape farmers' extension participation, educational activities organized by Grape Research Station - Theni, Department of Horticulture, KVK, grape grower's association, and paid extension service. Through, which may have grape growers' comprehensive know-how, level been moved on a periodic base. Similar findings were reported by Sainath [5] Siddaraju [6,1] on grape crops in the Bangalore district and Bijapur district of karnataka.

3.2 Advancement in Grape Growers' Level of Adoption of Various Grape Cultivation Techniques

The results described in Table 3 revealed that cent percent of the grape growers adopted accurate type of soil type, season of planting, gap filling, recut, supporting of casurina stickes, weeding, irrigation type (drip irrigation), bud dormancy breaking, manganese mixtures, fertigation, shoot thinning, sub cane development, training the shoots, tipping, cluster and berry thinning , mealybug control, downy mildew control. About (95.83%) respondents adopted Material used for filling trenches FYM and Super phosphate, (91.67%) Respondents adopted powdery mildew control, (90.83%) Respondents adopted foliar spray, (87.50%) of grape growers adopted Mode of propogation Dogridge rootstocks and also wedge grafting, (87.50%) respondents followed right Anthrocnose control measures, (85.00%) grape growing members followed Thirips control measures, ,83.33% Variety (Muscat hamburg), (82.50%) Quantity of filling material FYM 20 T/acre Super phosphate 1 T/acre, (80.83%) To get uniform ripening in Muscat, spray the bunches with 0.2% Potassium chloride (2 g/l) at 20th day after berry set, (80.00%) Pruning stage five to seven bud level for Muscat Hamburg, (79.17%) Flea beetle control, (75.00%) Mite control, (74.17%) Nematode control following respectively. This is also a crucial task for future operational decision-making. To determine advanced grape cultivation practices, grape farmers usually approach other and progressive grape growers for better understanding and trustworthiness. Suggested rootstock, grafting method, and grafting period are adopted and almost all of the respondents had grape-growing experience, with most of them currently doing so. Furthermore, it was discovered that over (87.5)%

of grape farmers used dog ridge as a rootstock, which has the benefits of drought resistance, salt tolerance, and nematode tolerance. The pandal and Y trellis methods are the most popular and frequently used because training is a unique practice in grape cultivation that permits viticulturists to sustain the vine's stature and spread while facilitating operations like pruning, intercultural, spraying, and harvesting increasingly convenient. Even though the research area received a significant quantity of rainfall, dry spells were discovered to occur occasionally in this location. As a result, more focus is placed on conserving available water, and farmers are willing to use water-saving techniques to irrigate their orchards. To tackle this, the government is subsidizing drip irrigation. Drip irrigation also aids in the integration of fertigation practices and helps to reduce salinity concerns. One hundred percent of the respondents said they had pruned their plants at the right time. It is done to focus the vine's growth activity in the parts left after pruning and to stimulate the fruitful buds to bloom.

The results presented in Table 4 revealed that more than two-thirds (71.67%) of respondents have a medium level of adoption in the mean score of 52.65, about 17.50 per cent of the grape growing farmers are at the low level of adoption and few (10.83%) of the respondents have a high level of adoption. Knowledge of the individual as it is the basis for any individual to think of pros and cons in deciding to adopt or reject a practice, hence the reason for more number of the grape growers to fall under medium-level adoption category was medium knowledge possessed by a majority of the respondents.Similar findings were reported by Sainath [5] Siddaraju [6,7,8] on grape crops in the Bangalore district, and [2] Knowledge and adoption of improved grape cultivation practices in Haryana.

Table 1. Distribution of respondents according to the Advancement in technical knowledge of Grape growers (n=120)

Sl. No	Advanced technical Grape cultivation practices	Knowledge			
		Correct	Percent	Incorrect	Percent
1.	Soil type Well-drained rich loamy soil	120	100.00	0	0
2.	Variety (Muscat Hamburg (Panneer) is the major variety grown in Theni District)	103	85.83	17	14.17
3.	Mode of propagation Dog ridge rootstocks/ wedge grafting	110	91.67	10	8.33
4.	Season of planting January 0 February	120	100.00	0	0
5.	Field preparation/spacing 3 x 2 m for Muscat Hamburg	103	85.83	17	14.17
6.	Trench/pit size	95	79.17	25	20.83
7.	The material used for filling trenches FYM and Superphosphate	102	85.00	18	15.00
8.	Quantity of filling material FYM 0 20 T/acre Superphosphate 0 1 T/acre	115	95.83	5	4.17
9.	Chemical fertilizers 0.5+0.4+1.3 NPK/grapevine	109	90.83	11	9.17
10.	Gap filling	120	100.00	0	0
11.	Recut	120	100.00	0	0
12.	Supporting Casurina sticks	120	100.00	0	0
13.	Weeding	120	100.00	0	0
14.	irrigation type Drip irrigation	120	100.00	0	0
15.	Training pandal or ‘’Y’’ trellis	120	100.00	0	0

16.	Pruning Time Summer crop December January Winter crop May June	120	100.00	0	0
17.	Pruning stage five to seven bud level for Muscat Hamburg	103	85.83	17	14.17
18.	Bud dormancy breaking chemical Hydrogen cyanamide	120	100.00	0	0
19.	Mn mixtures	120	100.00	0	0
20.	Foliar spray	111	92.50	9	7.50
21.	Fertigation	120	100.00	0	0
22.	Special viticultural practices				
A.	Shoot thinning	120	100.00	0	0
B.	Sub cane development	120	100.00	0	0
C.	Training the shoots	120	100.00	0	0
D.	Tipping	120	100.00	0	0
E.	Cluster and berry thinning	120	100.00	0	0
23.	Plant protection				
A.	Flea beetles Imidacloprid 17.8% SL 4ml/10 l. Cyantraniliprole 10.26% OD 7ml/10 l.	116	96.67	4	3.33
B.	Thrips Cyantraniliprole 10.26 OD 7ml/10l. Emamectin benzoate 5 SG 4g/10l. Fipronil 80WG 1.5g/10l.	112	93.33	8	6.67
C.	Mealybug Spray Buprofezin 25 % SC @ 1.0 ml/l. or Methomyl 40 SP 1.25g/l.	120	100.00	0	0
D.	Mite Spray Abamectin 1.9 EC 0.75 ml/l of water	96	80.00	24	20.00
E.	Nematodes 60 g of carbofuran 3G or 20g of per vine	100	83.33	20	16.67
F.	Powdery mildew Spray wettable sulphur @ 0.3% or dust sulphur @ 6 012 kg/ha	117	97.50	3	2.50
G.	Downy mildew Spray *Pseudomonas fluorescens* @ 20 g/l on 25th and 45th days after pruning followed by spraying of azoxystrobin @ 1 ml/l	120	100.00	0	0
H.	Anthracnose Spray carbendazim 50% WP @ 0.5 g/l or iprodione 50% WP @ 102 kg/ha or kitazin 48% EC @ 2 ml/l	113	94.17	7	5.83
24.	Quality improvement in Muscat Hamburg To get uniform ripening in Muscat, spray the bunches with 0.2% Potassium chloride (2 g /l) on the 20th day after the berry set	109	90.83	11	9.17
25.	Harvest Time of harvest	110	91.67	10	8.33

26.	Post-harvest of grapes Bunches packed in wooden/cardboard boxes/bamboo/stacked baskets using paper shreds	120	100.00	0	0

Table 2. Overall advanced knowledge level of the grape growers about recommended practices of grape cultivation (n =120)

Sl. No	Knowledge	Criteria	Frequency	Percentage	Mean knowledge score
1	Low	16.49	21	17.50	15.52
2	Medium	16.49 - 20.94	73	60.83	18.52
3	High	20.94	26	21.67	21.85
			120	**100.00**	

Mean 18.72; S.D. = 2.23

Table 3. Grape growers' Advancement of adoption of relevant suggested grape cultivation (n=120)

Sl.No.	Advancement level of adoption in grape growers	Adoption			
		Adopted	Percent	Not adopted	Percent
1.	Soil type Well-drained rich loamy soil	120	100.00	0	0
2.	Variety Muscat Hamburg (Paneer) is the major variety grown in Theni Dt	100	83.33	20	16.67
3.	Mode of propagation Dog ridge rootstocks/ wedge grafting	105	87.50	15	12.50
4.	Season of planting January February	120	100.00	0	0
5.	Field preparation /spacing 3 x 2 m for Muscat Hamburg	98	81.67	22	18.33
6.	Trench/pit size	95	79.17	25	20.83
7.	The material used for filling trenches FYM and Superphosphate	115	95.83	5	4.17
8.	Quantity of filling material FYM 0 20 T/acre Superphosphate 1 T/acre	99	82.50	21	17.50
9.	Chemical fertilizers 0.5+0.4+1.3 NPK/grapevine	102	85.00	18	15.00
10.	Gap filling	120	100.00	0	0
11.	Recut	120	100.00	0	0
12.	Supporting Casuarina sticks	120	100.00	0	0
13.	Weeding	120	100.00	0	0
14.	irrigation type Drip irrigation	120	100.00	0	0
15.	Pruning Time Summer crop December January Winter crop May June	120	100.00	0	0
16.	Training pandal or ‘‘Y’’ trellis	120	100.00	0	0

17.	Pruning stage five to seven bud level for Muscat Hamburg	96	80.00	24	20.00
18.	Bud dormancy breaking chemical Hydrogen cyanamide	120	100.00	0	0
19.	Mn mixtures	120	100.00	0	0
20.	Foliar spray	109	90.83	11	9.17
21.	Fertigation	120	100.00	0	0
22.	Special viticulture practices				
A.	Shoot thinning	120	100.00	0	0
B.	Sub cane development	120	100.00	0	0
C.	Training the shoots	120	100.00	0	0
D.	Tipping	120	100.00	0	0
E.	Cluster and berry thinning	120	100.00	0	0
23.	Plant protection				
A.	Flea beetles Imidacloprid 17.8% SL 4ml/10 l. Cyantraniliprole 10.26% OD 7ml/10 l.	95	79.17	25	20.83
B.	Thrips Cyantraniliprole 10.26 OD 7ml/10l. Emamectin benzoate 5 SG 4g/10l. Fipronil 80WG 1.5g/10l.	102	85.00	18	15.00
C.	Mealybug Spray Buprofezin 25 % SC @ 1.0 ml/l. or Methomyl 40 SP 1.25g/l.	120	100.00	0	0
D.	Mite Spray Abamectin 1.9 EC 0.75 ml/l of water	90	75.00	30	25.00
E.	Nematodes- 60 g of carbofuran 3G or 20g of per vine	89	74.17	31	25.83
F.	Powdery mildew Spray wetable sulphur @ 0.3% or dust sulphur @ 6 012 kg/ha	110	91.67	10	8.33
G.	Downy mildew Spray *Pseudomonas fluorescens* @ 20 g/l on 25th and 45th days after pruning followed by spraying of azoxystrobin @ 1 ml/l	120	100.00	0	0
H.	Anthracnose Spray carbendazim 50% WP @ 0.5 g/l or iprodione 50% WP @ 102 kg/ha or kitazin 48% EC @ 2 ml/l	105	87.50	15	12.50
24.	Quality improvement to get uniform ripening in Muscat, spray the bunches with 0.2% Potassium chloride (2 g/l) on the 20th day after the berry set	97	80.83	23	19.17
25.	Harvest Time of harvest	100	83.33	20	16.67
26.	Post-harvest of grapes Bunches packed in wooden/cardboard boxes/bamboo/ stacked baskets using paper shreds	120	100.00	0	0

Table 4. The overall advancement adoption of the grape growers about recommended practices of grape cultivation (n =120)

Sl. No	Adoption	Criteria	Frequency	Percentage	Mean Adoption score
1	Low	45.27	21	17.50	42.38
2	Medium	45.27 to 60.03	86	71.67	53.36
3	High	60.03	13	10.83	64.54
			120	**100.00**	

Mean =52.65; S.D. = 7.38

4. CONCLUSION

Grape growers have a moderate level of knowledge about advanced grape cultivation techniques. The study further revealed that overall adoption of improved practices of grape cultivation was of medium level of adoption level. This study explores the keen view of the advancement in knowledge and adoption followed by grape cultivators of the Theni District. The study indicated a vast gap in adoption of key practices such as fertilizer application, organic manure application, filling material application, pruning time, training methods, as they are not being followed by many, as per the recommendation there is a need to have a consortium of progressive grape growers, scientists from different institutes, representatives of grape grower associations and lead input providers to tackle the genuine problems of grape growers in an organized manner and develop the appropriate strategy for grape production For higher adoption of grape cultivation, information sources like extension contact and mass media exposure should be increased, technical guidance through training should be given time to time, government should give financial help to the grape growers, also grape-based information communication technology assistance like mobile apps, pre shooted method demonstration video and etc., to gives clear about technical know-how to grape growing farmers and that motivates the farmer for higher adoption of novel technology. Though all the users have a very good mobile wireless connection, 67.78 per cent of the users alluded that uzhavan app has to be available in offline mode also [9].

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Dasharath Dodamani GR, Pennobaliswamy S, Mahantesh, Gajanand P. Knowledge and Adoption Level of Thompson Seedless Grape Growers of Bijapur District of Karnataka, India. Int. J. Curr. Microbiol. App. Sci. 2018;7(01):2202-2209.
2. Kumar, Ramesh, Afzal Ahmad, RK Dular, Devender Chahal. Knowledge and adoption of improved grape cultivation practices in haryana, india." Agricultural Science Digest-A Research Journal. 2015; 35 (1):31-35
3. Jebapreetha D. Adoption of Recommended Grape Cultivation Practices International J. of Exten. Edu. 2015;XI:105-109.
   ISSN: 2319-7188.
4. APEDA. Manual for Export of Grapes, New Delhi. 2020;31-35.
5. Sainath S. A study on adoption behavior and motivational pattern of grape cultivation in Bangalore district of Karnataka. M.Sc. (Agri) Thesis (Unpub.) Univ. Agril. Sci. Bangalore; 1982.
6. Siddaraju GC. Impact analysis of Grape Development Scheme on beneficiaries and non-beneficiaries with respect to their knowledge and adoption of improved farm technology. M.Sc. (Agri.) Thesis, (Unpub.) Univ. Agric. Sci., Bangalore.; 1992.
7. Govinda Gowda V. Adoption analysis of sustainable grape cultivation practices adopted by Bangalore Blue and Thompson Seedless growers in Bijapur and Bangalore rural districts in Karnataka. Ph.D. Thesis, (Unpub.) Univ. Agric. Sci., Bangalore; 2002.
8. Gotyal SH. Backward and forward linkages of grape production in Karnataka. Ph.D. Thesis (Unpub.), Univ. Agric. Sci., Dharwad; 2007.
9. Aravindh Kumar S, Karthikeyan C, Rajasekaran R, Pangayar Selvi R. Revealing the constraints faced by the “uzhavan app” users in tamil nadu to operate uzhavan application (farmers and

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