https://doi.org/10.56572/gjoee.2024.37.2.0026 Gujarat Journal of Extension Education Vol. 37 : Issue 2 : June 24

ADOPTION OF SCIENTIFIC CULTIVATION PRACTICES AND INNOVATIVENESS OF HOMESTEADS GROWERS

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ABSTRACT

Kerala is well known for homestead cultivation. The tropical climate and fertile soils of Kerala provide an ideal condition for the cultivation of a wide range of vegetables, making it an integral component in the homesteads of Kerala. In a land hungry state like Kerala, homestead vegetable production is essential for achieving self-sufficiency in food production. But, for raising overall productivity in homesteads, adoption of scientific practices is crucial. In this context, a study has been conducted to understand the extent of adoption of various scientific cultivation practices in vegetables, recommended by Kerala Agricultural University, among the homesteads of Kollam district in Kerala. Bitter gourd and ivy gourd were the crops selected for analyzing the adoption rate. The results revealed that all the homestead farmers adopted covering of fruits in bittergourd. For practices like varieties, seed treatments and application of farmyard manures, the same trend was visible. In ivygourd, it was found that farmers were correctly following the size of planting materials, followed by weeding and pruning practices. Seasonal consideration for cultivation and application of plant protection chemicals were the practices noticed with low adoption in general. It was also observed that the innovativeness of respondents was low to medium.

Keywords *: adoption, correlation, homesteads, innovativeness, scientific cultivation*

INTRODUCTION

Kerala has a distinct homestead farming system with diverse structural and functional characteristics (Andrews and Kannan, 2016). Homestead farming focuses on the close surrounds of the home, distinguishing it from other forms of cultivation. Efficient utilization of available resources is also possible in homestead farming. Adopting multitier and intercropping in homesteads can maximise the utilisation of solar energy, soil nutrients, land and other resources in terms of time and space (Salam *et al.,* 1995). Apart from these benefits, by extending the cultivation towards homesteads can be considered as a feasible option for Kerala's peculiar conditions of land scarcity.

The awareness about safe to eat concept also fostered the proliferation of agriculture in Kerala homesteads. Depending on the available land, Kerala homesteads comprise of wide range of crop components, along with some other components like cattle and poultry etc. (Thomas, 2022). Among various crop components, vegetable gardens are an integral part of the homesteads in Kerala, offering a multitude of benefits contributing significantly to the well-being of families. Firstly, these gardens serve as a sustainable source of fresh, nutritious produce. By growing a variety of vegetables, households can ensure a balanced diet, rich in vitamins and minerals. This self-sufficiency reduces the dependency on external markets and fosters a sense of food security within the community. Moreover, vegetable gardens promote economic sustainability. Surplus produce can be sold locally, providing an additional source of income for families. This economic benefit empowers individuals and enhances the overall financial stability of the farm families.

According to John (2014) homestead farming, like commercial agriculture, is subject to constraints such as land-use changes, pest and disease attacks, climate change challenges, and so on, which affect production and farm profitability. In addition, some studies also reported the gap in knowledge and adoption of scientific cultivation practices among the homestead growers (Chandran and Podikunju, 2018). As a means to get safe farm products, majority of the homesteads follow organic farming practices (Jaslam *et al*., 2017). Even though the use of homesteads for cultivation is a common practice in Kerala, the adoption of new technologies in homesteads has been rather low. Some farmers are even reluctant to use fertilizers also. All of these factors can lead to a large disparity between the actual and potential yields

(Tankodara *et al.,* 2021). New technologies can only benefit farmers if they are effectively implemented in their field (Singh *et al*., 2020). The adoption of scientific cultivation practices in homesteads is crucial for several reasons. Adopting scientific cultivation practices in homesteads can lead to increased economic returns for farmers. Improved efficiency and productivity result in higher yields, ultimately boosting income levels. In this context, an attempt was made to identify the extent of adoption of various scientific cultivation practices in vegetables among the homestead growers of Kollam district. The study also focused on understanding the innovativeness of homestead growers along with the factors affecting their innovativeness. As the innovativeness of farmers plays a vital role in the adoption of advanced technologies in practical situation, the results would help the extension workers and policy makers to frame new techniques and strategies for improving the adoption and innovativeness of farmers. Thus, productivity and profitability from homestead cultivation can be enhanced.

OBJECTIVES

(1) To identify the extent of adoption of scientific vegetable cultivation practices by homestead growers

(2) To measure the innovativeness of homestead growers and the factors influencing their innovativeness

METHODOLOGY

The study was conducted in Kollam district which was selected purposively. On the basis of the maximum vegetable production in the selected district, two Agro Ecological Units (AEUs) were selected purposively with an intention to select the better representative sample of homestead vegetable cultivators for the present investigation. In consultation with officials and other resource persons, a total of six panchayaths, within the selected AEUs with highest vegetable production were selected (three from each units). A list of homestead farmers was prepared and selected twenty farmers randomly from each selected panchayats. Thus, a total of 120 homesteads were selected for conducting the present study.

To understand the extent of adoption of various scientific practices in vegetable cultivation, two crops (bittergourd and ivy gourd) were selected for the present analysis. A list of various scientific cultivation practices for the selected crops were enlisted, as per the recommendation of Kerala Agricultural University (KAU). Each practice was rated on a three-point continuum, ranging from 'adopt', 'partially adopt' and 'not adopt' with respective weightage of 3, 2, and 1. Based on the response of the growers, total adoption score for each practice was calculated separately and on the basis of adoption score those practices were ranked. Based on when he/she would like to adopt some improved practices in vegetable cultivation, the innovativeness of homestead growers was identified. A three-point continuum was used and as per the score obtained, respondents were grouped in to three categories. Furthermore, a correlation analysis was also conducted to identify the factors influencing the innovativeness of homestead farmers.

RESULTS AND DISCUSSION

A study was conducted to analyze the extent of adoption of scientific practices in homesteads and the innovativeness of the homestead growers. The results were arranged under three subheadings as follows

Extent of adoption of scientific farming practices for the selected vegetables

To comprehend the extent to which respondents adopted the scientific cultivation practices for the selected crops in homesteads, adoption scores were computed for different cultivation practices and the findings were presented in Table 1.

It can be concluded from the Table (1) that all the homestead vegetable growers, who added bitter gourd in their homesteads, ranked covering of fruits with polythene cover or paper (Adoption Score (AS) 360) as the widely adopted practice followed by KAU recommended varieties (AS 353). The results also showed that majority of the farmers were retaining three plants per pit while growing bitter gourd (AS 350) and before sowing, for better germination, seeds were soaked in water for 24 hrs (AS 340). Application of recommended basal dosage of FYM (AS 330) and maintaining a spacing of 2 X 2 m in the field (AS 319) were the other practices that were regularly adopted by the homestead vegetable growers. From the figures (Table 1), it was clear that, most of the farmers were not using any flowering hormones (AS 120) and they were not considering the season for cultivating bitter gourd (AS 168). The adoption of fungicides against major diseases like downy mildew (AS 180) was also noted to be low. Most of the homestead growers considered vegetable garden as a source for getting safe to eat vegetables for their family. Making income from their homesteads were only secondary for these farmers. Majority of the respondents preferred organic cultivation practices and were not interested in employing chemical fungicides or other hormone treatments. This might be the reason for lower adoption of fungicides and flowering hormones. These results were in line with that of Singh *et al.* (2020), who found that most of the KVK benefitted farmers (42%) fell into the category of not adopted for recommended use of growth

Table 1: Adoption scores of respondents on recommended practices in bitter gourd cultivation

(n= 120)

Sr. No.	Cultivation practices – Bitter gourd	Adoption score	Rank
1	Spacing is 2m × 2 m	319	6
2	Varieties are Preethi, Priyanka, Priya and Arka Harit	353	2
3	January –March and Sept- December are the ideal seasons	168	12
4	Seed rate is 5-6 Kg/ ha	252	7
5	Soaking of seeds for 24 hrs in water for better germination	340	4
6	Retain 3 plants/ pit	350	3
7	Tie a pebble at the end of a long piece of string to the flower end to weigh down the fruit and keep it from curling.	250	8
8	Farmyard Manure (FYM) at 20-25 t /ha as basal dose	330	5
9	35 kg N and full dose of P (25) and K (25) as basal dose and top dressing of N fertilizer in split doses at fortnightly interval	220	9
10	Spraying vines with flowering hormones at 6-8 leave stage to increase female flowers (GA- 25-100ppm)	120	13
11	Spraying 0.2 per cent Mancozeb against Downey mildew	180	11
12	Introduction of beehives in the field to ensure good pollination	190	10
13	Covering of fruits with polythene cover or paper	360	1

regulators. Since the respondents were not following certain season, this indicated a significant demand of bitter gourd for household purpose. This result was similar to that of Basheer (2016), who found that among the recommended scientific practices by KAU, five practices were found to have high adoption rate among the commercial bitter gourd farmers in Thiruvananthapuram districts.

Table 2: Adoption scores of respondents on recommended practices in ivy gourd cultivation (n=120)

Sr. No.	Cultivation practices – Ivy gourd	Adoption score	Rank
1	Spacing is 4 x 3 m	255	5
2	Use variety Sulabha	220	6
3	Grown in May – June and Septmber- October	130	8
4	Stem cuttings with 3-4 nodes and having 30-40 cm length is used as planting material	360	1
5	FYM at the rate of 25 kg /pit is given two doses	260	4
6	The ratio of female and male plant population in the field should be 10:1	200	7
7	Pruning of vines once fruiting is completed	280	3
8	Weeding and light hoeing is practiced during the early phase of plant vine growth	290	2

From the figures in the above Table (2), it was clear that, in case of ivy gourd, most commonly adopted practices were selection of planting material (AS 360) followed by weeding and light hoeing which was practiced during the early phase of plant vine growth (AS 290). Most of the homestead growers, who cultivated ivygourd in their unit, used stem cuttings with 3-4 nodes and having 30-40 cm length as planting material. Homestead cultivation enables the most efficient use of land available. Since ivy gourd is a perennial trailing crop, using the interspace to cultivate other crops was usual in homesteads, particularly during the early stages of vine growth. This could be the reason for doing weeding and mild hoeing during these periods. The next widely used practices with highest adoption rate was pruning of vines once fruiting is completed (AS 280). Homestead growers followed pruning after completing the fruiting period and this might be for making better use of space and improving the productivity for the next season. Since organic farming was practiced in majority of the homesteads, applying FYM is a usual practice among farmers. This might have contributed to the high adoption score for FYM application (AS 260).

The least adopted practices were growing crop only in the recommended season (AS 130), maintaining a 10:1 female and male plant population in the field (AS 200) and use KAU variety Sulabha (AS 220). According to the report of Chandran and Podikunju (2018), less than one fourth (18%) of the homestead grower had knowledge about KAU variety 'Sulabha' and only thirteen per cent knew about cultivating season for ivy gourd. Knowledge pertains to the expertise or skill that is possessed or acquired by an individual (Abhishek *et al.,* 2023). The lack of knowledge about these practices might have resulted in low adoption rate. Moreover, the lack of availability of planting materials of the KAU variety also might have contributed to this result. Since ivy gourd is a perennial crop and the yield loss due to biotic and abiotic factors were found to be less for ivy gourd as compared with the other annual vegetable crops, most of the homestead growers devoted less attention to follow scientific practices in ivy gourd.

For ensuring maximum productivity from units, adoption of scientific cultivation practices were important. From the above-mentioned results (Table 1 and Table 2), it can be inferred that majority of the farmers adopted KAU varieties in case of bitter gourd. But with respect to ivy gourd the adoption of KAU variety was found to be low. In bitter gourd, most of the growers were regularly adopting proper seed treatments, plant density per pit and organic manures whereas in ivy gourd, majority of the growers were regularly doing weeding and pruning practices on right time, applying recommended dose of FYM and maintaining recommended spacing between the crops. In general, it was evident that, seasonal consideration for cultivation, as well as the application of plant protection agents and growth hormones, were identified as low adoption practices in homesteads. Majority of homestead growers preferred bio pesticides, botanicals and organic manures and avoided use of chemicals as maximum as possible. The farmers who were using chemical pesticides and fungicides reported that they choose pesticides that have short persistence and harvesting is done only one week after pesticide spray. A comprehensive strategy for nutrient management, irrigation, crop management and intercropping are crucial for achieving inclusive development and doubling the income from homesteads (Josephrajkumar *et al.*, 2018). But the results revealed that, still there was a gap in adopting some scientific practices in selected crops among homesteads. Thus, additional effort is required from various extension agencies to promote and encourage scientific cultivation in homesteads. More focus should be given to those practices with little or low rate of adoption.

Distribution of respondents based on their innovativeness

Innovativeness is defined as the extent to which an individual is relatively early in adopting new ideas compared to other members of the social system. The homestead cultivators were categorized into three groups based on their innovativeness, as given below.

Table 3: Distribution of respondents based on their innovativeness (n=120)

Sr. No	Category	Frequency (N=120)	Percentage
1	**Low**	59	49.00
2	**Medium**	50	42.00
3	**High**	11	9.00

From the above Table (3), it was clear that nearly half of the homestead growers (49%) had exhibited low innovativeness followed by medium innovativeness (42%). The per cent of farmers with high innovativeness was found to be very low (9%). Since majority of the homestead farmers belonged to middle and old age group in Kollam district, which may impede their inclination towards new ideas, led to low level innovativeness. According to the findings of Kumari and Vasantha (2017), innovativeness was positively correlated with adoption of technologies in homesteads of Bihar. In this context, as a significant portion of the respondents in the study area showed low to moderate levels of innovativeness, the study highlights the requirement for expanded extension programs designed to enhance farmers' innovativeness in this region. The results are in line with the findings of Abhishek et al. (2023), Dodiya et al. (2023), Bora et al. (2023).

(a) **Factors influencing innovativeness of homestead vegetable growers**

An attempt was made to identify the factors that influence innovativeness of homestead farmers. A correlation analysis was conducted for finding out the relationship between innovativeness and selected profile characteristics (Table 4).

Table 4: Relationship between innovativeness and selected profile characteristics of homestead growers

(n=120)

Sr. No.	Profile characteristics	Correlation coefficient
X_1	**Age**	-0.275**
X_2	**Education**	0.462**
X_3	**Occupational status**	0.080
X_4	**Market orientation**	0.032
X_5	**Training**	0.053
X_6	**Experience in vegetable cultivation**	-0.242**
X_7	**Extension agency contact**	0.585**
X_8	**Economic motivation**	0.188*
X_9	**Family labour utilization**	0.125
X_{10}	**Information seeking behaviour**	0.505**
X_{11}	**Risk orientation**	0.199*
X_{12}	**Social participation**	0.343**

*Significant at 5 percent level

** Significant at 1 per cent level

From Table 4, it was clear that the innovativeness of homestead growers were positively related to economic motivation and risk orientation of the homestead growers at 5 per cent level of significance and education, extension agency contact, information seeking behaviour and social participation at 1 per cent level of significance. Educated farmers generally have a progressive viewpoint. The probable reason for the results could be that the respondents were frequently participating in various extension as well as social activities and were exposed to different information sources. This might have contributed a better insight about the new idea and can significantly influence their innovativeness (Jalu *et al.,* 2022). From the figures (Table 4), it was also evident that the desire to improve the economic condition and the ability to take up risk also significantly influence the innovativeness of homestead growers.

The results also highlighted that age of homestead growers and their experience in vegetable cultivation were negatively correlated with innovativeness at 1 per cent level of significance. Experience could enhance the capacity to effectively utilize resources such as labor, materials, and finances. Practical experience also might contribute to the capacity development and the problem-solving skills, thus enhancing the managerial ability of the individual (Gulkari and Dohat, 2022). Thus, as age and experience in agriculture increases, farmers might gain more confidence and expertise on the usually following practices and might exhibit hesitation to follow new methods.

CONCLUSION

It is clear that advancement in technology has a significant influence on the agriculture development. Development of technology is not an end but only a means to ensure sustainable production. While considering the agrarian situation of Kerala, homestead cultivation is a viable option for achieving self-sufficiency in food production. Since vegetables had a significant role in the human diet, it resulted in considerable market demand. In this context, an increasing production in vegetables ultimately results in financial and nutritional security for the farm families. Since the adoption of some scientific practices was found to be low, new strategies are needed for improving the existing conditions of homesteads. More effort is required to instill a positive attitude towards the scientific cultivation practices and improving the innovativeness among the homestead growers. It will help to strengthen the existing homesteads.

ACKNOWLEDGEMENT

The authors would like to thank the respondents from Kerala for providing the relevant information for the study and the Department of Agricultural Extension, COA Vellayani, Kerala Agricultural University for providing facilities for carrying out this research.

CONFLICT OF INTEREST

All authors declare that they have no conflict of interest.

REFERENCES

Abhishek, S., Vyas, H. U. and Dhandhukia, R. D. (2023) Knowledge and adoption of recommended cultivation practices of pigeon pea growers. *Guj. J. Ext. Edu.* 36(1):42-43. https://doi.org/10.56572/gjoee.2023.36.1.0007.

Abhishek, S., Vyas, H. U. and Dhandhukia, R. D. (2023). Knowledge and adoption of recommended cultivation practices of pigeon pea growers. *Guj. J. Ext. Edu.* 36(1): 42-43.

Andrews, S. S. and Kannan, E. (2016). Land Use Under Homestead in Kerala: The Status of Homestead Cultivation from a Village Study. The Institute for Social and Economic Change, Bangalore, 24p.

Basheer, N. (2016). Technology utilisation of bittergourd in Thiruvananthapuram district. M.Sc. (Agri.) Thesis, Kerala Agricultural University, Thrissur, 204p.

Bora, Pallabi and Das, Pallabi (2023) Participation of gender in paddy cultivation practices. *Guj. J. Ext. Edu.* 36(2):11-17. https://doi.org/10.56572/gjoee.2023.36.2.0003.

Chandran, V. and Podikunju, B. (2018). Knowledge level of homestead vegetable growers about vegetable production practices. *Ind. J. Ext. Educ. Rural Dev.* 26: 9-15.

Dodiya, H. D., Patel, D. B. and Patel, S. M. (2023) Technological gap in adoption of pomegranate cultivation practices by the pomegranate growers. *Guj. J. Ext. Edu.* 36(1):109-112. https://doi.org/10.56572/gjoee.2023.36.1.0021.

Gulkari, K. D. and Dohat, M. P. (2022). Entrepreneurial ability of youth farmers. *Guj. J. Ext. Edu*. 34(1): 6-8.

Jalu, S. N., Bariya, M. K. and Chandravadia, K. U. (2022). Relationship between profile of groundnut cultivators and their knowledge level on the recommended crop production technology in Saurashtra region of Gujarat. *Guj. J. Ext. Edu.* Special Issue, 46-52p.

Jaslam, P. K. M., Joseph, B., Liz J. M. and Vishnu, B. R. (2017). Land utilization under homestead in Kerala: Current status of homestead cultivation. *Int. J. Curr. Microbiol. App. Sci.* 6(11): 5391-5410.

John, J. (2014). Homestead farming in Kerala: A multi-faceted land-use system. *Rev. Agrarian Stud.* 4(1): 80-94.

Josephrajkumar, A., Mohan, C., Thomas, R. J., and Krishnakumar, V. (2018). Ecological bio engineering in coconut ecosystem to deter pests. *Indian Coconut J.* 10: 16-18.

Kumari, V. and Vasantha, R. (2017). Adoption of homestead technologies of Rajendra Agricultural University by rural women of Bihar. *Indian Res. J. Ext. Educ.* 17(2): 33-35.

Salam, M. A., Babu, K. S. and Mohanakumaran, N. (1995). Home Garden Agriculture in Kerala Revisited. Food and Nutrition Bulletin (UNU). Available at: https://archive.unu.edu/unupress/food/8F163e/8F163E07.htm.

Singh, R. K., Singh, R. P., Singh, A. K., Singh R. P., and Singh, M. (2020). Impact of KVK on adoption of improved bitter gourd cultivation technology in Gorakhpur district of Uttar Pradesh. *Indian J. Ext. Educ.* 56(2): 164-169.

Tankodara, K. D., Choudhary, M. K., Sharma, P. K., and Prajapati, K. A. (2021). Problems faced by the bitter gourd growers in adoption of recommended bitter gourd production technology. *Int. J. Curr. Microbiol. App. Sci.* 10(2): 2667 – 2670.

Thomas, C. G. (2022). Diversity of cultivated crops in Kerala. In: *Conference on" Bioresources and Commercial Utilization: Trends, Market, Supply chain, and Sustainability", Thiruvananthapuram* [On-line]. Available at: https://www.researchgate.net/publication/360577016_DIVERSITY_OF_CULTIVATE D_CROPS_IN_KERALA.

Received : March 2024 : Accepted : June 2024