

Research Article

Analysis on knowledge level of recommended plant protection technologies in areca nut (*Areca catechu*) cultivation in Salem district of Tamil Nadu

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Abstract

Areca nut (*Areca catechu*) is one of the important cash crops in India. India ranks first in terms of area and production of areca nut and accounts of 54.07 per cent of its world production. The harvesting of nuts commence on the Tamil month of 'Thai' (Mid-January to Mid-February) and spread over six months in carrying out the post-harvest practices and marketing of nuts. This study was purposively conducted in Salem district 2018-2019 and occupies first position in area (2,421 hectares) of areca nut in Tamil Nadu. The Peddanackenpalyam, Valapddy, Gengavalli and Attur blocks were selected based on the 87.28 per cent of the area under areca nut in this district with a sample size of 120 areca nut farmers selected by using a proportionate random sampling technique. Most of the respondents (80.00 per cent) had knowledge level of medium to high level of knowledge on the recommended plant protection technologies in areca nut cultivation. It was mainly due to the medium to the high level of information seeking behaviour and social participation. The study revealed that the areca nut growers differed widely in their social characteristics. Most of the respondents had a medium to a high level of knowledge on recommended technologies in areca nut cultivation. This finding stressed the importance of formulating different extension strategies for different audiences by the change agency system.

Keywords: Areca nut, Disorder, Knowledge level, Pest and disease, Plant-protection

INTRODUCTION

Areca nut (*Areca catechu*) is one of the important cash crops in India and it is noted from the pre-vedic period, areca nut is extensively used in Hindu religious rites of birth, marriage, nuptial and also offered to gods for veneration in the form of tamboola it also offered to guests to mark their hospitality. And also Indian Ayurveda text refers to areca nut as traditional medicine (Krishisewa, 2017). In India, it is widely used for chewing and masti-

cation with betel leaves. The alkaloids extracted from the nuts have common medicinal properties such as astringent, antihelmintic, narcotic and vermifuge. India ranks first in terms of both area and production of areca nut and also accounts for 54.07 per cent of its world production (Food and Agriculture Organization, 2017). The major areca nut growing countries in the world are India, China, Myanmar, Indonesia, Thailand and Bangladesh. The major states growing areca nut was Karnataka, Kerala, Assam, Meghalaya, West Bengal, Mizo-

ram and Tamilnadu. In Tamilnadu total area under areca nut was 6,884 ha. in this Salem district constitutes 35 per cent of the area under areca nut cultivation.

A report on “co-operative marketing to help areca nut farmers in Salem” indicated that the quantity of nuts harvested from the trees dropped to 50 per cent due to drought in that area (Ananth, 2016). The farmers in these areas started to replant the areca nut in the farms which are affected by drought. For these reasons, the study was conducted in Salem district to know about the farmers practicing the recommended technologies and their practices for drought mitigation activities. More than 30,000 farm workers, including women, also engaged directly or indirectly in the harvesting and processing of nuts. The harvesting of nuts commence on the Tamil month of ‘Thai’ (Mid-January to Mid-February) and spread over six months in carrying out the post-harvest practices and marketing of nuts. The aim of the present study was to find out the knowledge level of recommended protection technologies of the farmers in areca nut cultivation.

MATERIALS AND METHODS

This study was purposively conducted in Salem district of Tamil Nadu. This district occupies first position in area (2,421 hectares) of areca nut in Tamil Nadu. Salem district consisted of 20 blocks, from this Peddanackenpalayam, Valapady, Gengavalli and Attur blocks were selected based on the 87.28 per cent of area under areca nut in this district. Fig. 1 shows that visual representation of study area selection. The total sample size of 120 areca nut farmers was selected by using a proportionate random sampling technique and given in Table 1. The formula used is as follows:

$$n_i = \frac{N_i}{N} \times n \quad \dots \text{Eq.1}$$

Where,

N_i = number of respondents to be selected from i^{th} block.

N = total number of respondents in the i^{th} block.

N = total number of respondents in the four blocks.

n = sample size.

The teacher-made knowledge test was employed

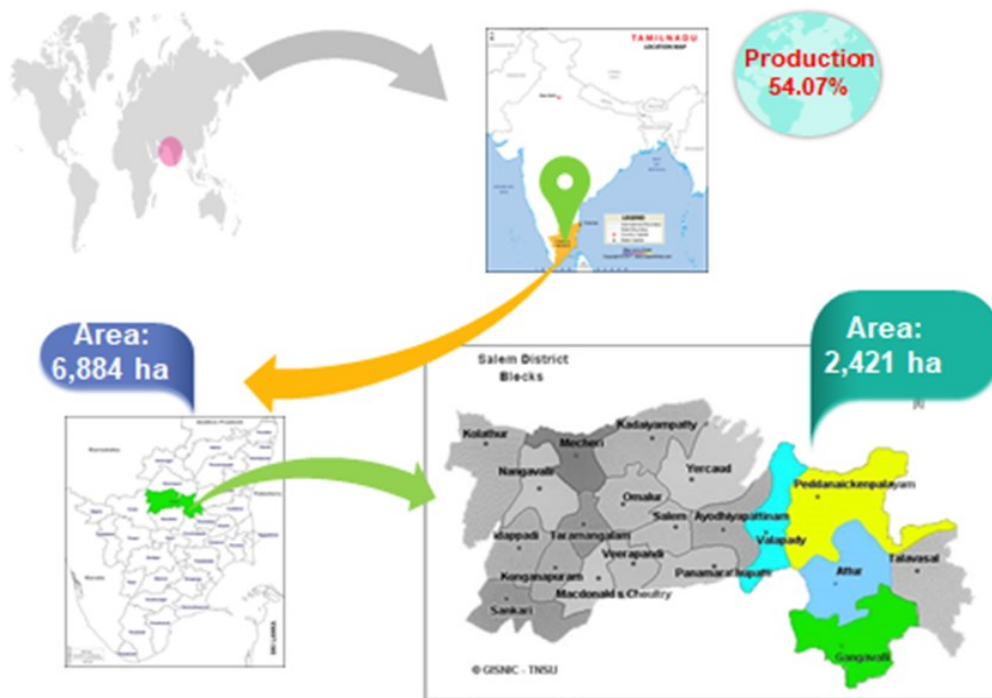


Fig. 1. Map showing the study area of Salem district in Tamil Nadu.

Table 1. Distribution of areca nut growers in the selected blocks.

District	Blocks	Number of areca nut growers	No. of respondents selected
Salem	Peddanackenpalayam	1050	52
	Valapady	715	36
	Gengavalli	420	21
	Attur	220	11
	Total	2405	120

Source: Assistant Director of Horticulture office Peddanackenpalayam, Valapady, Gengavalli, Attur

among the advisory committee members to frame the interview schedule. Data was collected with the help of a well-structured interview schedule and pre-tested in a non-sampling area. The data gathered were quantified and tabulated for statistical analysis. The Percentage analyses were used for analysis and interpretation of data.

RESULTS AND DISCUSSION

In this article, knowledge denotes the respondent's level of understanding of improved plant protection technologies in the areca nut cultivation. To measure respondents' knowledge level, they were asked straight questions regarding symptoms and management practices of plant protection technologies.

Overall knowledge level on plant protection technologies

The overall knowledge level of respondents is important to know the understandability of respondents in the view of recommended plant protection technologies. The dichotomized responses are analyzed by cumulative frequency method to categorize their knowledge level into low, medium and high category. Fig. 2 shows that most of the respondents (80.00 per

cent) had a knowledge level of medium to a high level of knowledge on the recommended plant protection technologies in areca nut cultivation. This knowledge level of the respondents is due to the majority of the respondents had a medium to a high level of information seeking behaviour and social participation (Jaganathan and Nagaraja, 2015 and Jergin *et al.*, 2018).

I. Knowledge on symptoms and control measure of pest attack

The present study inferred from Table 2 that 93.33 and 57.50 per cent of respondents had knowledge of the attack of mite's infestation and control measure for a mite infestation, respectively (Vinayak, 2014 and Jergin *et al.*, 2018). Half of the respondents (50.83 per cent) had knowledge of spindle bug infestation and 31.67 per cent of them had knowledge of the control measure on spindle bug infestation. The majority of the respondents (90.83 per cent) had knowledge on the symptoms of inflorescence caterpillar and slightly more than half of the respondents (52.50 per cent) had knowledge on the control measure of inflorescence caterpillar (Lakshmisha, 2000). Most of the respondents (71.67 per cent) had knowledge of symptoms of nematode

Table 2. Distribution of respondents on the knowledge level of recommended practices of symptoms of pest attack and management practices in areca nut.

I Knowledge on symptoms and control measure of pest attack			
S.no	Technology	Number	Per cent
1	Symptoms of mite infestation	112	93.33
2	Control measure for mite	69	57.50
3	Symptoms of spindle bug infestation	61	50.83
4	Control measure for spindle bug	38	31.67
5	Symptoms of Inflorescence caterpillar infestation	109	90.83
6	Control measure for Inflorescence caterpillar	63	52.50
7	Symptoms of Nematode infestation	86	71.67
8	Control measure for Nematode	61	50.83
9	Symptoms of scale infestation	87	72.50
10	Control measure for scale	53	44.17
11	Symptoms of mealy bug infestation	43	35.83
12	Control measure for Mealy bug	19	15.83
13	Symptoms of areca nut borer infestation	101	84.17
14	Control measure for areca nut borer	38	31.67
15	Symptoms of snails infestation	46	38.33
16	Control measure for snails	3	2.50
17	Symptoms of root grub infestation	120	100.00
18	Control measure for root grub	116	96.67
19	Symptoms of pentatomid bug infestation	41	34.17
20	Control measure for pentatomid bug	21	17.50

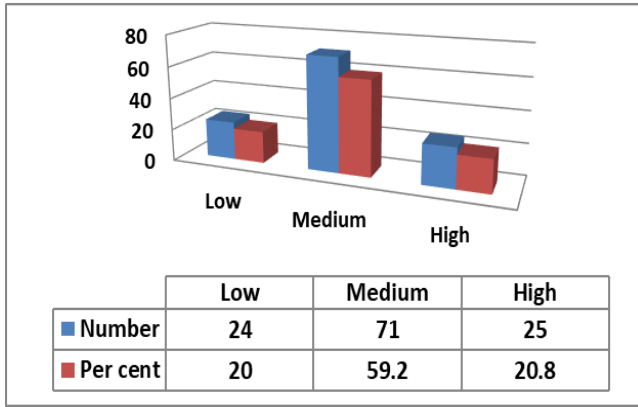


Fig. 2. Overall knowledge level of respondents on plant protection technologies.

attack and half of the respondents (50.83 per cent) had knowledge on control measure on nematode infestation. Regarding scale attack, 72.50 and 44.17 per cent of respondents had knowledge on symptom on scale attack and control measure respectively. In mealybug pest, 35.83 and 15.83 per cent of respondents had knowledge on mealy bug infestation and control measure. The areca nut borer infestation and control measure was known by 84.17 and 31.67 per cent of respondents. The knowledge on snail infestation and control measure was by 38.33 and 2.50 per cent respondents only (Sajeev *et al.*, 2018). The root grub infestation in areca nut cultivation was known by cent percent of respondents and management practices by 96.67 per cent of respondents, respectively. The Pentatomid bug infestation and control measure knowledge was known by 34.17 and 17.50 per cent of respondents respectively (Babanna, 2002).

II. Knowledge of disease attack and control measure

It was observed from the above table 3 that 70.83 per cent of respondents had knowledge of the bud rot disease and 23.33 per cent of respondents had knowledge of bud rot disease management (Sajeev *et al.*, 2018). Cent per cent of the farmers had knowledge of the foot rot symptoms and 97.50 per cent of them had knowledge on the control measure of foot rot disease (Badhe and Tambat, 2009). The yellow leaf disease symptoms were known by cent percent of respondents and 98.33 per cent of respondents known management practices of yellow leaf disease. Regarding the leaf spot disease, 95.00 and 43.33 per cent of farmers had knowledge of the leaf spot symptoms and control measures. Half of the respondents had knowledge of the inflorescence dieback symptoms (50.83 per cent) and management practices (50.00 per cent), respectively. Half of the respondents (50.00 per cent) had knowledge of bacterial leaf stripe symptoms but only 11.67 per cent of respondents had knowledge of bacterial leaf stripe management (Nagappa *et al.*, 2016).

III. Knowledge on disorders and management practices

Table 4 reveals that the nut crack disorder symptoms and management practices knowledge was known by 94.17 and 25.84 per cent of respondents, respectively. Cent per cent of respondents had knowledge of stem breaking symptoms and 99.17 per cent of them had knowledge of stem breaking management practices (Aneani *et al.*, 2013 and Bellary *et al.*, 2010). The band/

Table 3. Distribution of respondents on knowledge level of recommended practices of symptoms of disease attack and management practices in areca nut.

II Knowledge on disease attack and control measure			
S.no	Technology	Number	Per cent
1	Symptoms of bud rot/mahali	85	70.83
2	Control measure for bud rot/mahali	28	23.33
3	Symptoms of foot rot/anabe	120	100.00
4	Control measure for foot rot/anabe	117	97.50
5	Symptoms of yellow leaf disease	120	100.00
6	Control measure for yellow leaf disease	118	98.33
7	Symptoms of leaf spot	114	95.00
8	Control measure for leaf spot	52	43.33
9	Symptoms of inflorescence dieback	61	50.83
10.	Control measure for inflorescence dieback	60	50.00
11.	Symptoms of bacterial leaf stripe	60	50.00
12.	Control measure for bacterial leaf stripe	14	11.67

Table 4. Distribution of respondents on knowledge level of recommended practices of symptoms of disorders and management practices in areca nut.

III Knowledge on disorders and management practices			
S.no	Technology	Number	Per cent
1	Symptoms of nut crack	113	94.17
2	Control measure for nut crack	31	25.83
3	Symptoms of Stem breaking	120	100.00
4	Control measure for Stem breaking	119	99.17
5	Symptoms of Band/Hidimundige	98	81.67
6	Control measure for Band/Hidimundige	100	83.33

hidimundige symptoms and management practices were known by 81.67 and 83.33 per cent of respondents, respectively.

Conclusion

It was concluded that the majority of the farmers in Salem district, Tamilnadu state had knowledge of the pest symptoms on mite infestation, caterpillar infestation and root grub infestations. In disease symptoms, cent per cent of respondents had knowledge on the foot rot and leaf disease followed by disorders on stem breaking and band. The farmers had more knowledge on the pest attack, disease symptoms and disorders than control measure. This level of knowledge on the plant protection technologies was influenced by the medium to high level of information seeking behavior of the respondents. Future trainings are also needed from the state departments to enhance the improved package of practices to the farmers on plant protection measures.

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Conflict of interest

The authors declare that they have no conflict of interest.

REFERENCES

- Ananth, M. K. (2016). Co-operative marketing to help areca nut farmers in Salem. *The Hindu*, p. 2.
- Aneani, F. & Ofori-Frimpong, K. (2013). An analysis of yield gap and some factors of cocoa (*Theobroma cacao*) yields in Ghana. *Sustainable Agriculture Research*, 2 (526-2016-37857).
- Babanna, T. (2002). Information source consultancy and training needs of farmers in areca nut cultivation under Tungabhadra command area in Shimoga district. M.Sc. (Ag.) Thesis, University of Agricultural Science, Bangalore.
- Badhe, M. M. & Tambat, R. G. (2009). Problems experienced by the areca nut growers in areca nut cultivation. *Asian Sciences*, 4(1 & 2), 45-46.
- Bellary, S. & Patil, V. (2010). Agronomic practices adopted by Areca nut farmers in Koppa and Sringeri taluks. *Karnataka Journal of Agricultural Sciences*, 18(3), 791-793.
- Food and Agriculture Organization (2017). *FAO Statistical Year book 2017*. Rome 2017: Food and agriculture organization of the United Nations.
- Jaganathan, D. & Nagaraja, N. (2015). Perception of farmers about areca nut based multispecies cropping system. *Indian Research Journal of Extension Education*, 15(2), 49-54.
- Jergin, J., Somasundaram, S. & Velusamy, R. (2018). Personal and socio-psychological characteristics of rubber growers in Kanyakumari district of Tamil Nadu. *Indian Journal of Positive Psychology*, 9 (2), 225-228.
- Lakshmisha (2000). Impact of cashew demonstration knowledge and adoption and yield levels of farmers in Dakshina Kannada district. (M.Sc. (Ag.) Thesis), University of Agricultural Science, Bangalore.
- Nagappa, D., Sukanya, T. & Mamatha, B. (2016). Problems experienced by farmers in areca nut cultivation. *Asian Journal of Horticulture*, 11(2), 301-305.
- Sajeev, M. V. & Saroj, P. L. (2018). Socio-economic determinants and adoption of pest management practices in cashew farming: A study in Dakshina Kannada, Karnataka. *Journal of Plantation Crops*, 46(1), 66-73. doi:10.25081/jpc.2018.v46.i1.3543.
- Vinayak, N. (2014). A Study on knowledge, adoption and economic performance of areca nut growers in North Kanara District of Karnataka. (M.Sc (Ag.) Thesis), University of Agricultural Sciences, Bangalore.
- Krishisewa (2017). Retrieved from <https://www.kris-hisewa.com/articles/production-technology/61-areca-nut.html>