



Status of arecanut nurseries in selected districts of Karnataka

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(Manuscript Received: 26-03-2026, Revised: 16-06-2026, Accepted: 10-07-2026)

Abstract

Arecanut (*Areca catechu* L.) is an important commercial plantation crop of Karnataka and is predominantly propagated through seed nuts. As the crop is monoecious and highly heterozygous, the selection of superior mother palms and quality planting material is essential for successful plantation establishment. With the rapid expansion of arecanut cultivation in both traditional and non-traditional areas of Karnataka, the demand for quality seedlings has increased substantially, leading to a rise in the number of commercial nurseries. A survey was conducted during 2021-24 to assess the status and economic feasibility of arecanut seedling production in 72 commercial nurseries located in Shivamogga, Davanagere, and Chitradurga districts of Karnataka. Information on socio-economic characteristics of nursery owners and nursery management practices was collected through personal interviews. The results revealed that 78 per cent of nursery owners belonged to the young and middle-aged groups, all were educated, and 61 per cent operated on owned land. Recommended nursery practices such as mother palm selection, irrigation, weed management, and pest and disease management were only partially adopted. Economic analysis indicated that the total production cost, gross return, net return, and benefit-cost ratio for 15-month seedling production cycle were Rs. 1,07,660, Rs. 2,00,000, Rs. 92,340, and 1.86, respectively, demonstrating the profitability of commercial arecanut nurseries. Leaf spot disease (8–10%) was prevalent in Shivamogga, whereas mite (8–12%), scale, and spindle bug infestations (3–4%) were observed in Davanagere and Chitradurga. Seedling survival in farmers' fields ranged from 80–85 per cent. The study highlights the need for nursery regulation, quality control mechanisms, and capacity-building programmes to improve seedling quality, nursery profitability, and employment opportunities in arecanut-growing regions.

Keywords: Arecanut, cost economics, disease, insect pest, nursery, planting material

Introduction

Arecanut (*Areca catechu* L.) is one of the most important commercial plantation crops of India and occupies a prominent place in the religious, social, and cultural life of the country. In India, arecanut is cultivated over an area of 9.49 lakh ha with an annual production of 14.10 lakh tonnes and a productivity of 1.48 t ha⁻¹ (Anon., 2023). The crop is predominantly grown in the traditional arecanut-producing states of Karnataka, Kerala, Assam, Maharashtra, and West Bengal, as well as in the Andaman and Nicobar Islands. Karnataka is the leading producer, accounting for 6.74 lakh ha of cultivation and a production of 10.32 lakh tonnes (Anon., 2023).

The arecanut sector plays a vital role in the livelihood security of nearly 4.2 million people, directly or indirectly, across rural and urban areas. The popularity of the crop has increased substantially in recent years owing to its higher profitability and well-established marketing system. Although several improved varieties have been released, their performance varies across agro-climatic regions, necessitating the adoption of location-specific varieties for achieving higher productivity and profitability.

The rapid expansion of arecanut cultivation in both traditional and non-traditional areas has resulted in an increasing demand for elite-quality planting material. Production of quality seedlings

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through commercial nurseries has emerged as a promising enterprise, providing opportunities for entrepreneurship development, employment generation, and income enhancement. In Karnataka, both small- and large-scale commercial arecanut nurseries have emerged as a new class of agri-entrepreneurs. These nursery enterprises are capital- and labour-intensive and generate substantial employment opportunities for local communities (Patil *et al.*, 2017).

Despite the growing importance of commercial arecanut nurseries, information on their operational status, adoption of scientific nursery practices, and economic viability remains limited. Therefore, the present investigation was undertaken to assess the status and economic feasibility of arecanut seedling production in commercial nursery units of Karnataka.

Material and Methods

The present study was conducted in three major arecanut-growing districts of Karnataka, namely Shivamogga, Davanagere, and Chitradurga. A total of 72 commercial arecanut nursery units were selected for the investigation. Primary data were collected through personal interviews with nursery owners using a pre-tested structured questionnaire.

Information pertaining to socio-economic characteristics of nursery owners, including age, education, landholding status, gender, gross income, net income, and benefit-cost (B) ratio, was collected. Data on horticultural and nursery management practices such as selection of mother palms, selection of seed nuts, preparation of potting media, nursery establishment, irrigation, shade management, weed management, and pest and disease management were also recorded.

The collected data were compiled, tabulated, and analyzed using descriptive statistical tools such as frequency, percentage, and averages to assess the status of commercial arecanut nurseries. Economic feasibility was evaluated by estimating the cost of cultivation, gross returns, net returns, and benefit-cost ratio. Profitability of arecanut seedling production was assessed using standard farm management and economic analysis procedures.

Results and Discussion

The socio-economic profile of arecanut nursery owners is presented in Table 1. The majority of the nursery owners (41.66%) belonged to the middle-age group, followed by the young (36.12%) and old (22.22%) age groups. The study revealed that most respondents had completed high school education (39.88%), followed by graduation and post-graduation (29.16%). About 18.05 per cent had studied up to the pre-university level (PUC), while 13.88 per cent had primary-level education.

Male participation in arecanut seedling production was predominant (83.33%), whereas female participation accounted for 16.67 per cent, indicating the involvement of women in nursery enterprises and their contribution to household income and economic empowerment.

Table 1. Profile of nurserymen involved in the production of arecanut seedlings

Age	Frequency	Per cent (%)
Young (Below 30 Years)	26	36.12
Middle (30-50 Years)	30	41.66
Old (above 50 Years)	16	22.22
Education		
Primary	10	13.88
High school	28	39.88
PUC	13	18.05
Degree & Post Graduation	21	29.16
Land holding (Acre)		
Nil (0.00)	28	38.88
Marginal (0.1-2.5)	24	33.33
Small (2.6-5.0)	11	15.27
Medium (5.1-10.0)	9	12.50
Gender		
Male	60	83.33
Female	12	16.67

With respect to landholding and arecanut cultivation, 38.88 per cent of the nursery owners did not possess arecanut orchards and procured seed nuts from surrounding areas for seedling production. This practice is a matter of concern, as the use of seed nuts from unknown or unselected sources may adversely affect seedling quality and

uniformity. Among the nursery owners who cultivated arecanut, 33.33 per cent were marginal farmers, followed by medium farmers (12.50%), while the lowest proportion belonged to the small-farmer category (15.27%). These findings are in accordance with the observations reported by Sheshagiri *et al.* (2014).

The adoption of scientific management practices in arecanut nurseries is presented in Table 2. Most of the commercial nurseries surveyed

utilized old mother gardens (30–50 years old) as the source of seed nuts, contrary to the recommended age of 15–25 years. The use of older mother palms may result in lower seed vigour and reduced yield, which could be a major reason for the lower germination percentage and poor seedling vigour observed in the nurseries (Balasimha *et al.*, 2004). For successful seedling production, compact bunches bearing a higher number of nuts should be selected. Seed nuts with a higher kernel content,

Table 2. Adoption of scientific management practices by arecanut nurseries

Sl. No	Particulars	Recommended management practices	Practices followed by nurseries
1	Selection of mother palm		
	a. Age of palm	15-25 year	30-50 year
	b. Internodal length	Shorter length (< 30 cm)	Shorter length (< 30 cm)
	c. Bearing habit	Regular bearer	Regular bearer
	d. No. of leaves/palm	More than 12	Not Followed
	e. Period of harvesting	November- December	November- January
	f. Early bearing tendency	Followed	Followed
	g. Fresh bunch yield (kg)	Higher (10-12 kg)	Medium (8-10 kg)
	h. Free from pest & disease	Followed	Followed
2	Selection of nuts		
	a. Position of nuts in bunches	Centre of the bunch	Not Followed
	b. Fruit bunch character	Compact bunches	Compact bunches
	c. No. of nuts/ bunches	Higher	Not Followed
	d. Nut weight (g)	>25 g	Not Followed
	e. Nut character	Higher kernel with thin husk	Not Followed
	f. Putting the nuts in water tank for float test	Floating nuts should be selected	Occasionally Followed
3	Nursery activities		
	a. Poly bag size	25 X 15 cm	Not Followed
	b. Potting mixture (Soil: FYM: Sand)	3:1:1 potting mixture	3:1:0; 3:1.5:1 4:1:1; Only soil
	c. Use of bio- inoculants to potting mixture	Followed	Occasionally Followed
	d. Method of sowing	Nuts sown directly to poly bag (80 % germination)	Nuts sown to primary nursery and followed by secondary nursery
	e. Shade management	50 per cent	Not Followed
	f. Shifting of poly bags in nursery	Three months interval for ideal stem girth and avoid penetration of roots to soil	Not Followed
	g. Management of Pest & diseases	Followed	Followed
	h. Seedlings ready for selling	12-18 months old	6-12 months old 12-24 months old > 24 months old

thin husk, and a nut weight exceeding 25 g are recommended for sowing. Direct sowing in polybags filled with the recommended potting mixture (soil:FYM:sand in 3:1:1 ratio) and maintaining the seedlings under 50 per cent shade can enhance germination and promote the production of healthy planting material. These findings are in agreement with the reports of Nagarajappa *et al.* (2021) and Satish Naik *et al.* (2024). Adoption of these scientific nursery management practices can significantly improve germination percentage, thereby reducing the cost of production and increasing profit per seedling. In the nurseries surveyed in Shivamogga district, leaf spot disease incidence ranged from 8–10 per cent. In contrast, nurseries in Davanagere and Chitradurga districts recorded infestations of mites (8–12%), scales, and spindle bugs (3–4%). Poorly growing and weak seedlings were routinely culled from the nurseries. However, it was observed that some nurserymen are currently marketing 2–4-year-old seedlings, which may face establishment problems after transplanting in the main field.

The economics of commercial arecanut nursery production for raising 10,000 seedlings is presented in Table 3. The annual rental value of land was estimated at Rs. 5,000. A shade house structure established on 1,000 m² of land was capable of accommodating 10,000 seedlings. Healthy and well-developed seed nuts were selected for sowing, with each nut costing Rs. 3.00. The purchase of seed nuts constituted the major component of the production cost, amounting to Rs. 30,000.

For seedling production, polybags of size 25 × 15 cm were filled up to 80 per cent of their capacity with the recommended potting mixture comprising soil, farmyard manure (FYM), and sand in a ratio of 3:1:1 (POP, UHS, 2022). Healthy seed nuts were sown directly in the polybags at a depth of 5 cm, with the calyx end facing upward. Preparation of quality potting media required approximately three tractor loads of red soil (Rs. 6,000), one tractor load of FYM (Rs. 8,000), and one tractor load of sand (Rs. 7,000). The expenditure incurred on polythene bags was Rs. 10,125.

Labour was another important cost component, with approximately 25 man-days required for

nursery operations such as preparation of potting media, filling polybags, sowing of seed nuts, irrigation, weeding, and application of plant protection chemicals (Nagarajappa *et al.*, 2021). Among these activities, filling polybags with potting media and sowing of seed nuts were the most labour-intensive operations. A sprinkler irrigation system was installed at a cost of Rs. 5,000 to ensure adequate moisture for germination and seedling growth. Interest on working capital was calculated at 12 per cent per annum, amounting to Rs. 11,535.

Table: 3 Economics of production of arecanut seedling (n=10,000)

S.N	Particulars	Amount (Rupees)
1	Land rent per annum	5,000
2	Cost of arecanut for sowing (Rs. 3 per nut x 10,000)	30,000
3	Red soil (3 tractor loads) (Rs. 2000/ tractor load)	6,000
4	Farm Yard Manure (1 tractor load) (Rs. 8000/ tractor load)	8,000
5	Sand (1 Tractor load x Rs. 7000)	7,000
6	Polythene bag (75 kg x Rs. 135/kg)	10,125
7	Labours (Sowing & weeding operations) (25 no. x Rs. 284)	7,500
8	Water supply (Bore well charges)	3,800
9	Shadenet (1000m ² Including depreciation cost)	6,000
10	Installation of sprinkler irrigation	5,000
11	Plant protection measures	3,200
12	Miscellaneous charges	4,500
13	Interest on fixed expenses (12 %)	11,535
14	Total expenditure	1,07,660
15	Selling price per seedling	25
16	Gross income (Rs. 25 per seedling x 8000)(80 % seedlings ready for sale)	2,00,000
17	Net income	92,340
18	Benefit cost ratio	1.86:1

The total cost of producing 10,000 arecanut seedlings was Rs. 1,07,660. Although 10,000 seed nuts were sown directly in polybags, only 85 per cent germination was recorded. After accounting for mortality and culling of weak seedlings, approximately 8,000 healthy seedlings were

available for sale after 12 months. At a selling price of Rs. 25 per seedling, the gross income realized was Rs. 2,00,000. Consequently, the net income obtained from the nursery was Rs. 92,340. The benefit-cost (B:C) ratio was 1.86:1, indicating that arecanut nursery production is a profitable enterprise. These findings are in agreement with the reports of Nagarajappa *et al.* (2024) and Patil *et al.* (2017).

Conclusion

The present study was undertaken to assess the status and economic feasibility of arecanut seedling production in commercial nurseries of Karnataka. The economic analysis revealed that the total cost of production, gross return, net return, and benefit-cost (B) ratio for the 12–18 month production period were Rs. 1,07,660, Rs. 2,00,000, Rs. 92,340, and 1.86, respectively, indicating that commercial arecanut nursery production is a profitable enterprise.

The major constraints reported by nursery owners included low germination percentage, incidence of pests and diseases, inadequate knowledge of potting media preparation and shade management, labour scarcity, and lack of awareness regarding the selection of suitable mother palms and sources of quality planting material. The study further revealed that a majority of the commercial nurseries did not adopt the recommended scientific nursery management practices, resulting in lower germination rates and reduced seedling vigour.

Unlike fruit and spice crops, the arecanut sector lacks a dedicated nursery regulatory and monitoring mechanism to ensure quality control of planting material. Therefore, establishing an effective nursery accreditation and regulatory system is essential to promote the production and distribution of quality seedlings. State Agricultural Universities, Krishi Vigyan Kendras, extension agencies, and the Department of Horticulture should take proactive measures to create awareness, disseminate scientific knowledge, and organize capacity-building programmes for nursery entrepreneurs. Adoption of scientific nursery practices will not only improve the quality and establishment of seedlings in the main field but also

enhance nursery profitability and generate additional employment opportunities in the horticultural sector.

Acknowledgement

Authors thank Director of Research, KSNUAHS, Shivamogga, Karnataka for providing necessary facilities for the research and nursery entrepreneurs of Shivamogga, Davanagere and Chitradurga for providing the information during survey.

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