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Commercial nursery management in Arecanut: An economic analysis

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Abstract

The study was undertaken to assess the profitability of commercial arecanut nurseries in malnad and maidan regions of Karnataka. Five commercial nurseries located in these regions were selected for the purpose of study. It has been found that arecanut nurseries on 7000 sq. ft. sufficient for raising 12000 arecanut seedlings generate net returns of Rs. 1, 61,375 over a period of 15 months. The cost of raising seedlings inclusive of labour and material costs came to Rs. 1, 38,625. The cost of raising one seedling worked out to Rs. 11.55. Each seedling earns a net return of Rs.13.45 to the nursery owner. The benefit cost ratio of 2.16:1 indicated higher profitability on investment in nursery. The major constraints confronting commercial nurseries included low germination percentage, incidence of mites, unorganized marketing facility and non-availability of timely labour.

Keywords: Commercial nursery management, Arecanut cultivation, economic analysis, profitability of nurseries

Introduction

Arecanut is cultivated on 9.04 lakh ha of area in the world with a production of 12.24 lakh tons. India, Bangladesh, Indonesia, Burma, China, Thailand are the major countries growing arecanut in the world. India accounts for 49 percent of area and production of arecanut followed by Bangladesh with 18 percent of area and 8 percent of production and Indonesia with 16 percent of area and 15 percent of production. In India, it is cultivated prominently in South India comprising of Karnataka and Kerala which together accounts for 70 percent of the area and 78 percent of the production. The area and production in these two states is 3, 19,400 ha and 5, 69,400 tons, respectively. The other states growing arecanut include West Bengal, Assam, Meghalaya, Mizoram contributing the rest 30 percent of the area and 22 percent of the production. Among states, Karnataka occupies first position in terms of area and production of arecanut in India. In Karnataka, the districts Shivamogga, Chickmagalur, Dakshina Kannada and Uttara Kannada come under traditional arecanut belt. Arecanut is also cultivated in Davangere, Chitradurga and Tumkur districts considered to be non -traditional region (Kiran *et al.* 2014) [3]. Area under arecanut has witnessed rapid expansion resulting in skyrocketing demand for healthy planting material. This calls for production of planting material on commercial scale. There are few commercial nurseries in arecanut growing regions to cater to seedling requirement. There is vast scope for raising arecanut nurseries on commercial scale in maidan and malnad regions of Karnataka. In this context, the present study has been undertaken with the objective to examine the economic viability of commercial arecanut nurseries.

Methodology

The study was conducted in maidan and malnad regions of Karnataka. As the area under the crop is fast expanding in these regions, availability of healthy seedlings for new plantations is crucial. There are only few nurseries in the region to meet demand for planting material. The data pertaining to establishment of commercial nurseries starting from primary to secondary nursery were gathered from five prominent nurseries in the region. The data comprised of selection of mother palms, selection of nuts, sowing of nuts in the primary nursery and aftercare, replanting in secondary nursery and thereof. The costs, returns, marketing and constraints associated with nursery management were some of the other issues collected from the nurseries. Enterprise budgeting technique was employed to work out profitability of commercial arecanut nursery. It is the summary of costs, returns and profit associated with the enterprise. The pertinent data was collected from the sample respondents using pretested well-structured schedule.

Economics of commercial arecanut nursery management

Labour use pattern

Establishment of arecanut nursery involves two stages i.e., primary nursery and secondary nursery. November-December is the ideal months to raise primary nursery. Seed bed preparation of size 12'X40' of 6 cm height requires 5mandays of labour worth of Rs.1250. The nuts weighing 35 grams are sown within 10 days of harvest with their calyx end facing upwards. Sowing required two mandays of labour worth of Rs. 500. The bed is mulched with paddy straw/ coconut/arecanut fronds to facilitate easy germination and to conserve moisture. Mulching operation required half a manday valued at Rs. 125. Adequate moisture has to be maintained in the nursery requires frequent irrigation on every alternate day using rose can. This required 45 mandays of labour with an expenditure of Rs. 11250. Manual weeding is performed at an interval of one and half monthswith an expenditure of Rs.2500 to keep nursery free from weeds. After 90 days the seedlings are transferred to secondary nursery in polythene covers. Secondary nursery will have dimension of 50'X140'. Polythene covers are filled with soil, sand and FYM using 28 mandays of labour with an expenditure of Rs. 7000(Table 1). Shade net is erected to protect seedlings against scorching sun using four mandays of labour. Periodical plant protection care was taken up by the nursery owners to protect against pests and diseases spending about Rs. 500 towards wages. Thus, labour component to establish commercial nursery came to 96.5 mandays entailing an expenditure of Rs.24, 125.

Material costs

The various materials are required for nursery establishment *viz*., nuts, sand, FYM, red soil, polythene covers, shade material and mulching material. About three tractor loads of sand, four loads of FYM and 28 tractor loads of red earth is required to raise 12,000 seedlingsin polythene cover. Cost of FYM was estimated to be Rs. 14000 at Rs.3500/load. Expenditure on sand and red earth came to Rs. 6000 and Rs. 14000, respectively. About 20,000 nuts worth of Rs. 50,000 were sown on the nursery bed each nut priced at Rs. 2.50. Polythene covers were used to transfer three months old seedlings from primary nursery to secondary nursery. The expenditure on polythene covers came to Rs.7000@ Re.0.5 per cover. An expenditure of Rs. 21000 was incurred on shading material of dimension 50'X140' (7000 sq. ft.) at Rs. 3 per sq. ft. About Rs.2500 was spent towards mulching material. The total expenditure on account of materials was estimated to be Rs.1, 14,500.

The total cost required for establishment of nursery on an area of 7000 sq. ft. inclusive of both labour and material components came to Rs.1, 38,625.Though, 20,000 nuts were sown on seed bed, only 60 percent of nuts germinated. Seedlings will be ready for sale after 15 months. The income obtained from the sale of 12000 seedlings (60% germination) at the rate of Rs. 25 came to Rs. 3 lakhs. The net profit after deducting total cost of producing seedling came to Rs.1, 61,375. The net returns realized per seedling was Rs. 13.45. The B: C ratio worked out to 2.16:1 indicating higher profitability on investment in arecanut nursery. This demonstrates economic viability of investment on areca nursery. The extension agencies should disseminate this vital information to prospective investors.

Marketing of arecanut seedlings

Direct marketing of seedlings takes place between nursery owner and arecanut growers without involvement of middlemen. It is being sold at an average price of Rs. 25. The cost of seedlings with all miscellaneous expenses incurred towards procurement comes to Rs. 28.50 for a farmer located within the radius of 50 km from nursery. This can be further reduced if nurseries are nearer to arecanut growers. Usually seedlings are transported by tractors on payment of transportation cost on per kilometer basis. The owners of transport vehicles charge heavily to the farmers willing to procure seedlings from distant nurseries. The transportation cost on an average works out to Rs. 2.5 per seedling. Besides, farmers incur Re. 0.90/seedling towards loading and unloading. The seedlings lost during the transit period would be around 1 percent and cost on account of this works out to be Re. 0.10/seedling. The arecanut growers should take adequate care while transporting seedlings to avoid damage during transit which adds to the cost of seedlings. As no middlemen are involved in marketing of seedlings, the owner of the nursery gets 100 percent of what the farmer pays for the seedling. Demand for arecanut seedlings are increasing due to replacement of paddy area by arecanut in most of the paddy growing belts of southern and central regions of Karnataka (KR Patil *et al*., 2013) [2].

Management of nurseries

As evident in Table 2, nursery owners select mother palms aged 40-45 years as against the recommendation of 15-25 years. Perhaps this could be the reason as to why percentage of germination is very low. Nuts weighing about 35 grams should be selected for nursery. Majority of nursery owners were found following this. The nuts have to be dipped in water and select those nuts which float vertically with calyx end upwards for achieving higher germination percentage. It was found nursery owners did not follow this practice. This could be another reason for getting low percentage of germination (60%). If the above scientific practices are adopted by nursery owners, higher germination percentage can be obtained resulting in reduced cost and higher profits per seedling. Pot mixture with red earth, FYM and sand in the proportion of 7:3:2 is recommended for producing vigorous seedlings in secondary nursery. Contrary to this, nursery owners were found to use these ingredients in disproportionate manner due to cost considerations leading to less vigorous seedlings.

Constraints in commercial nursery management

The constraints expressed by owners of commercial nursery are discussed below

Poor germination: Farmers are unable to achieve desired germination percentage. At present germination percentage is hovering around 60 percent. The low percentage of germination is on account of sowing nuts very closely without leaving any space in between. Nuts have to be sown 5 cm apart in primary nursery. Nursery owners did not follow this. The nuts have to be immersed in water and

select those nuts which float vertically with calyx end pointing upwards. Such nuts possess healthy endosperm to germinate into vigorous seedlings. Those nuts which float horizontally should be discarded. But farmers do not adopt this method for selection of nuts and sow all the nuts which lead to poor germination. This is attributed to poor technical knowledge regarding selection of healthy nuts.

Incidence of pests: Mite incidence is commonly observed in nursery stage. It causes damage to young leaves by sucking sap resulting in unhealthy seedlings.

Disproportionate mixing of soil ingredients: Soil ingredients such as red earth, well decomposed farm yard manure and sand should be mixed in the proportion of 7:3:2 and filled into polythene bags. But farmers tend to add more of soil rather than FYM and sand due to cost considerations. This is likely to affect the growth of seedlings in secondary nursery.

Labour: Nursery management is labour intensive warranting nearly 100 mandays of labour. The labour is scarce and expensive in areas where nurseries are located. Labour component is the major item in seedling production. Non availability of labour results in improper management during critical stages of seedling growth. The nursery owners have to travel long distances to fetch labour paying higher wages.

Unorganized marketing: Due to lack of organized marketing facilities, commercial nurseries find it difficult to market seedlings. Any delay in marketing results in loss to the owner. There has been no organized marketing facility for marketing of seedlings. This prevents prospective entrepreneurs to establish commercial nurseries on large scale.

Lack of awareness among arecanut growers about source of seed/planting material

Farmers find it difficult to locate the source of seedlings as there is no publicity regarding place of availability of seedlings nor extension agencies make efforts to disseminate such information. The farmers of maidan areas intending to establish arecanut garden have to travel to remote malnad regions for seed/planting material. All the above will add to the cost of seedling .Inability of state department of horticulture to supply quality seedlings in required numbers will add fuel to the fire to the woes of arecanut farmers.

Table 1: Economics of commercial arecanut nursery

I. Labour			
SI. No.	**Particulars**	**Quantity (mandays)**	**Value (Rs.)**
1	Bed preparation of size 12'X40'	5	1250
2	Incorporation of sand and sowing of nuts	2	500
3	Mulching with paddy straw	0.5	125
4	Irrigation	45	11250
5	Filling of polythene covers with soil and FYM and transfer of seedlings to polythene covers	28	7000
6	Erection of Shade net	4	1000
7	Plant protection	2	500
8	Weeding	10	2500
	Total	96.5	24125
II. Materials			
1	Sand @ Rs.2000/tractor load	3	6000
2	FYM @ Rs. 3500/ tractor load	4	14000
3	Nuts @ Rs.2.5/nut	20000	50000
4	Polythene covers @ Re. 0.5 /cover	14000	7000
5	Mud @ Rs. 500/tractor load	28	14000
6	Shading material @ 50'X140' @ Rs. 3 per sqft		21000
7	Paddy straw for mulching		2500
	Total		1,14,500
III.	Total cost (Labour +material)		1,38,625
IV.	Cost per seedling		11.55
V.	Gross returns	12000 seedlings @ Rs.25 each	3,00,000
VI	Net returns		1,61,375
VII	Net returns per seedling		13.45
VIII	B:C ratio		2.16

Table 2: Adoption of Scientific management practices by nursery owners

SI. No.	Particulars	Scientific practices	Practices followed by nursery owners
1.	Selection of mother palm a) Age b) Inter-nodal length c) No. of leaves in crown region d) Bearing habit	 15-25 years old Shorter internodes Large number Regular bearer.	 40-45 years Shorter internodes Large number Regular bearer
2.	Selection of nuts a) Position of nuts in the bunch b) Size of nuts c) Water treatment for selection of nuts	 Center of bunch Weighing > 35 grams Nuts floating vertically with calyx end facing upwards on water surface should be selected	 Not followed Weighing > 35 grams Not followed
3.	Spacing between nuts in primary nursery	5 cm apart	Not followed
4.	Pot mixture	Red earth, FYM and Sand in the proportion of 7:3:2	Disproportionately mix red earth, sand and FYM

Conclusion

In India arecanut is prominently cultivated in states of Karnataka and Kerala which together accounts for 70 percent of area and 78 percent of production of arecanut. Karnataka state is witnessing area expansion under arecanut at an exponential rate. In order to keep pace with area expansion, corresponding increase in production of arecanut seedlings is essential. But unfortunately there are few commercial nurseries not being able to meet the demand of prospective arecanut growers. It is in this context a study was initiated to enquire into economics of arecanut nurseries. The per seedling cost of production is Rs. 11.55 and the net returns is Rs. 13.45. The cost of procurement of seedling inclusive of transportation and miscellaneous expenses came to Rs. 28.50. The arecanut grower purchases seedling at Rs. 25 from nursery owner and expends Rs. 3.50 towards transportation and other miscellaneous expenses. The study indicated that there is no organized marketing facility for marketing of seedlings. The major constraints as expressed by the nursery owners were low germination percentage, incidence of mites, lack of knowledge about pot mixture, scarcity of labour and lack of awareness among arecanut growers regarding source of planting material. Further, it has been observed that the commercial nurseries are not adopting scientific management practices leading to lower germination percentage and profitability. In this regard, Department of Horticulture should take initiative in training prospective entrepreneurs coming forward to establish commercial nurseries in scientific management. State department can also undertake arecanut seedling production and supply to growers at affordable rates. The message indicating that commercial nursery is highly profitable should be disseminated by extension agencies to encourage prospective entrepreneurs.

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