



Farmer participatory approach for planting material production

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Introduction

Cultivation of high yielding improved varieties is one of the important strategies to enhance productivity of coconut to make it a remunerative crop. Though a large number of improved varieties and hybrids of coconut have been released by different research institutes, field level adoption of these varieties is very low due to various reasons (Thamban and Venugopalan, 2002).

Lack of availability of quality seedlings continues to be a major problem faced by farmers in adopting the improved varieties. Coconut is a long duration crop with a long juvenile period spanning 7 to 10 years and a long productive period of above 50 years. Hence, use of quality planting materials is very important in realizing high productivity. There is high demand for seedlings of the released improved

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varieties and hybrids from growers. Of late, growers are showing keen interest in cultivating dwarf varieties of coconut also mainly to overcome the problems experienced due to lack of availability of skilled palm climbers and high wage rate.

Gap between demand and supply of quality coconut seedlings

For a sustainable growth of coconut sector, it is recommended to have tall, dwarf and hybrid varieties cultivated in the ratio of 60:20:20. However, the field level scenario indicates a different story; tall cultivars constitute more than 90 per cent of coconut palm population. While the national average productivity of coconut is 6966 kg copra per ha, in Kerala (which accounts for 36 per cent of coconut production in the country) the productivity is much less, i.e., only 5152 kg copra per ha. Predominance of senile and unproductive genetically inferior local tall palm population is a major constraint in improving productivity of coconut in major coconut growing tracts like Kerala.

Massive programmes for replacing old and unhealthy palms are necessary to increase productivity and make coconut cultivation profitable. Replacing old palms will require enormous quantity of seedlings.



The average annual requirement of coconut seedlings is estimated at 15 million. However, production and supply of coconut seedlings by the public sector research and developmental agencies including ICAR-CPCRI, State Agri./Horticulture Departments and Coconut Development Board is only 4.2 million seedlings per year thus revealing a huge gap between demand and supply. Intermediaries have been hugely benefitted by the situation who supplies inferior/spurious planting materials to farmers thus adversely affecting sustainable growth of coconut sector.

Strategies for augmenting planting material production

Both long term and short term strategies are required to overcome the challenges in production

and distribution of quality coconut seedlings to meet the demand from coconut growers. The important long term strategy to meet the growing demand for coconut seedlings is to establish new seed gardens in suitable locations in different coconut growing tracts. Besides, rejuvenation of existing seed gardens and replanting with planting material of newly released varieties for different agro-ecological zones also needs much attention. Utilisation of superior genetic resources of coconut available in farmers' gardens is the most important short term strategy to meet the demand for coconut seedlings.

Farmer participatory approach for planting material production

Farmer participatory seedling production initiatives are to be promoted to meet the planting material requirement utilizing the locally available resources/mother palms. However, it has to be ensured that utmost care is taken to locate and identify the superior mother palms of locally adapted coconut varieties in farmer's garden. Identification of superior mother palms with farmer participation and its validation by seedling progeny testing as well as molecular markers assumes much significance. Such initiatives will empower local farming community for mother palm selection, controlled pollination for seednut production, community management of nursery and seedling selection.

This can set in a movement that will result in the establishment of highly productive palms leading higher productivity in coconut. Coconut Producers' Societies (CPS), the grass root level collective of coconut growers facilitated by Coconut Development Board, and trained youths under the 'Friends of Coconut Trees' (FoCT) programme can play a significant role in the accelerated production and distribution of quality hybrid coconut seedlings. The process can be technically supported by research organizations such as ICAR-CPCRI.

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Experiences of ICAR-CPCRI

There are few initiatives facilitated by ICAR-CPCRI worthy of emulation for farmer participatory seedling production in coconut.



i. Farmer participatory characterisation of coconut varieties and raising community nursery

Farmer participatory characterisation of coconut varieties was conducted under COGENT/IPGRI sponsored project entitled 'Developing coconut based income generating technologies on poor rural communities' implemented by ICAR-Central Plantation Crops Research Institute, Kasaragod in two localities viz., Pallikkara village in Kasaragod District, Kerala State and Ariyankuppam village in Pondichery (Thamban *et al.*, 2007). PRA tools such as transect walk, resource mapping, matrix ranking and focused group discussion were employed to analyse the land use, local agro-ecology and problems and opportunities in the coconut community and to characterize and evaluate the coconut varieties found in their community. As many as 12 diverse coconut types, six each in two localities, were identified and their significant characteristics documented. Seed nuts were collected from the identified mother palms of the elite coconut ecotypes in these two localities and community nurseries were raised. Quality seedlings were selected and distributed to the farmers under the project.

ii. Farmer's participatory approach and implementation

a) Decentralized coconut seedling production as an initiative of Local Self Government (LSG) Under a unique scheme implemented by Madikkai grama panchayat in Kasaragod District of Kerala state, farmer participatory approach was successfully employed for the production of quality coconut seedlings with technical support from ICAR-CPCRI. Under the scheme, members of five selected women self help groups from the panchayat were trained at ICAR-

CPCRI on nursery techniques of coconut including mother palm selection, seed nut collection, sowing and management of seedlings in nursery. Mother palms were identified in coconut farmers' gardens within the panchayat and 8,000 seed nuts were collected and sown in eight nurseries. About 5000 quality seedlings were raised in these nurseries managed by self help groups. Periodical monitoring for the proper management of nurseries was done by the monitoring team consisting of scientists from ICAR-CPCRI, extension personnel from the local Krishibhavan, people's representatives and Women SHG representatives was constituted to ensure production of quality seedlings. Training for members of self help group, field visit by scientists and other technical support for implementing the scheme were provided as part of extension activities of ICAR-CPCRI. Funds for implementing the programme was mobilized from the plan of the panchayat for the year 2011-12 and the scheme was linked to NREGS for providing the labour component required for nursery management. The coconut seedlings raised under the scheme were distributed to the farmers on 5th June 2012, World Environment Day at Madikkai. Sustenance of such local initiatives needs continuous support from coconut research and development agencies apart from the involvement of local self governments.

b) Raising mother palms and seed gardens in farmers plots

Another approach to planting material production is through equipping individual farmer for taking up propagation of improved varieties. ICAR-CPCRI, Kasaragod successfully initiated establishment of seed gardens with mother palms of improved varieties. In one such initiative, a progressive farmer from Kasaragod district with 1.5 ha land planted seven improved varieties. This garden named as Mooladkkam seed garden can produce planting materials in seven improved selections and three hybrids. In this model only the technical support and the planting material is provided from ICAR-CPCRI. Entire cost, including that of planting material, is borne by the farmer. Cultivation of crops like pineapple, papaya, and yams help the farmer to

recoup the initial expenditure.

c) Raising mother palms and seed gardens in land under public sector institutions

Major constraint in establishing seed gardens in public sector is the non-availability of land. Coconut planting material production requires large area for planting mother palms of improved varieties. One hectare land, that can accommodate 175 palms, can produce approximately 5000 quality seedlings. Various departments under government have land that can be utilized for establishing mother palms of improved varieties that will serve as source material for future. Innovative thinking of ICAR-CPCRI and Government of Kerala has resulted in establishment of coconut mother garden in open prison in Thiruvanthapuram. Such innovations and collaborations hold the key to take the planting material production to the next higher levels.

d) Farmer participatory decentralized coconut seedling production as an initiative of state agriculture department in collaboration with FPOs and CPCRI

Productivity in Kerala (9641 nuts/ha), which accounts for 33.5% of production in the country, is less than that of many other states. Predominance of senile and unproductive palms is one of the reasons attributed to the low productivity of coconut in Kerala. Massive programmes for replacing old and unhealthy palms are necessary to increase productivity and make coconut cultivation profitable. Replacing old palms will require enormous quantity of seedlings. Production of quality planting material in coconut is an uphill task because of difficulties in locating superior mother palms and identification of quality

seedling. In this background, an innovative initiative for farmer participatory decentralized coconut seedling production is being implemented by CPCRI in 12 districts of Kerala state with the financial support of Department of Agriculture and Farmers Welfare, Government of Kerala, since the year 2017. The project envisages establishing decentralized community nurseries for the production and distribution of coconut seedlings including hybrids

by utilizing elite mother palms available in farmers' coconut gardens. Involvement of FPOs in coconut sector and Krishi Bhavans, the grass root level office of Department of Agriculture, will help in managing community nurseries and distribution of seedlings. Further their involvement will facilitate the participatory evaluation of performance of these seedlings in the farmer's field even after the project period.

Another important aspect of the project is developing expertise and skill in quality planting material production of coconut. Extension personnel and coconut farmers are trained in various steps involved in planting material production, so that decentralized planting material production becomes a reality. The project also envisage developing a network with adequate facilities for planting material production and distribution in different parts of the state. Identification of superior mother palms with farmer participation and its validation by seedling progeny testing as well as molecular markers forms focal point of this project. More than 7000 mother palms have been identified, about 56000 seednuts

have been collected and 30 community nurseries have been established under the project across the state in 12 districts. The real impact of the project will be in empowering local farming community for mother palm selection and geo-tagging, seed production, community management of nursery and quality planting material production. This along with established infrastructure as envisaged in the project will result in the establishment of productive dwarf/semi-tall coconut plantations leading to improvement of coconut productivity as well as higher returns to coconut growers.



Stakeholder synergy

Public sector agencies including Coconut Development Board and State Agri/Horticulture Departments are having programmes for procuring seednuts from farmers' gardens. Recently in Kerala, State Department of Agriculture has implemented 'Kerasamrudhi' scheme which envisaged identifying mother palms of dwarf coconut varieties in farmers



garden and collecting seednuts. To ensure quality of planting material, the criteria fixed for identification of mother palms have to be scrupulously followed in decentralized initiatives and pressure to achieve the physical target should in no way dilute the scientific procedures to be followed in selecting mother palms. Inventory with GPS based photo tags of available mother palms in farmer's garden can be prepared by all agencies involved in coconut planting material production. To achieve this, convergence and coordination of efforts of research, development and extension agencies in coconut sector and farmer organizations are needed. Convergence of efforts of agencies and farmer organizations is highly relevant to augment seedling production in the root (wilt) disease prevalent tracts. Selection and identification of disease-free mother palms in 'disease hotspots' should be given more emphasis rather than large scale procurement of seed nuts from other areas. For achieving this, a farmer participatory approach is to be followed with technical support from research institutions like ICAR-CPCRI.

Farmer participatory coconut breeding

There is a growing recognition that research on coconut crop improvement needs to focus on location and trait specific varietal development in which farmers are to be included as an important stakeholder. Perception of coconut farmers about

the traits of preferred varieties has to be taken into cognizance for streamlining coconut breeding programmes. The 'National Workshop on Planting Material Production In Coconut -Issues And Strategies' conducted at ICAR-CPCRI, Kasaragod on 10th February 2015 has recommended that farmer participatory approaches have to be followed for developing location specific coconut varieties. Thrust should be given for developing varieties for rainfed areas, for low level of external input use, for tender nut purpose and production of neera.

Conclusion

Making available quality seedlings for replacing the old, senile and unproductive palms and for new planting is crucial to enhance productivity and income from coconut farming. Public sector institutions alone can't meet the demand for coconut seedlings and hence farmer participatory decentralized approach for production and distribution of quality coconut seedlings assumes much significance. Research and development agencies in coconut sector including ICAR-CPCRI, State Agri./Horticulture Universities, CDB and State Department of Agriculture/Horticulture need to support the Farmer Producer Organizations to effectively manage the community nurseries for the decentralized production and distribution of quality coconut seedlings. ■

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