Quality Improvement in Coconut Production

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Twenty first century is a century of quality. The success of every venture will depend upon the quality standards that can be offered, be it a product, a service or any matter concerned with it. It is equally important that these set standards are offered on a sustainable basis. For a perennial crop like coconut, a one time intervention with known quality parameters can do considerable good almost for the entire life period of the crop. The term quality in this context will encompass every aspect of the coconut crop production. Starting with the very choice of variety, and in operations such as mother palm selection, nursery raising, seedling selection, plantation establishment and management, processing and marketing, scope exists for the application of quality criteria.

Selection of mother palms

The proverb 'Vithu gunam pathu gunam' (a quality seed has ten advantages) is most relevant in perennial crops like coconut which occupy the land for decades together when once planted. Utmost care is to be exercised in the selection of planting material. A plant which yields high, speaks for itself that it has the genetic potential to respond to a favourable environment which is a very vital factor in production. As such selection of seed nuts from such high yielding trees irrespective of their location will be advantageous. The yield base of such trees could be fixed at a higher level of 100 or 120 nuts instead of the present 80 nuts. If this is a group of such palms all the more better. Selection pressure inadvertedly applied by the coconut farmers has in general improved the genetic base of the native talls. To this extent it is better to use the locally adapted talls and hybrids produced using such talls as one of the parents.

In this context the personal observations of the author may be of interest to readers. In a block of 40 acres of the East Coast Tall variety of coconut grown in Thevaram of Theni District, Tamil Nadu, the percentage of ungerminated nuts was only 3% and those germinating late was 4% as against 15 and 10% respectively observed in the normal nurseries. The seedlings have uniformly 3 - 4 leaves at the age of seven months after sowing gave an out turn of over 80% quality seedlings. The parents of these mother plants were selected by Mr. Rajaram, the original owner of the garden. He adopted stringent parameters in selection of nuts, raising of seedlings and establishment of garden. The progeny performance proves the effectiveness of such an effort. There is considerable scope for establishing seed gardens having a minimum size of one ha at least for native talls exercising selection criteria at all levels. In such a garden, the quality of seed nuts can be further improved by not selecting the nuts from boarder palms, resorting to assisted pollination with pollen from high yielders and also emasculating the poor ones.

Selection of seed nuts

Selected nuts sown in nursery beds should be kept under observation and those which germinate late has to be removed immediately. These can be used for making copra. Those which produce lesser number of leaves and having poor girth at collar may be culled out early. This will help better growth of the remaining seedlings.

Studies have revealed that paying attention to quality traits of seed nuts and seedlings would

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Heritability and correlation of seedling traits

Character	Heritability	Correlation
Girth of seedling at Collar	0.76	Positive
Number of leaves	0.65	Positive
Height of seedlings	0.62	—
Speed of germination	0.69	Positive
Weight of hundred nuts	0.94	—

Source: CPCRI, Kasaragod

improve the yield of the resulting plantations in view of their high heritability and good correlation with yield as evident from the table.

Hybrid seedlings

It is a fact that there is a higher demand for hybrid seedlings. This is partly due to the short supply of the hybrids and also ignorance of the farmers about their management needs. While the hybrids yield on an average 20 - 40% more than the tall parent depending upon the parental combinations, they in general require more moisture and nutrients and are susceptible to pests particularly Rhinocerous beetle. Tender nut water and kernel quality and oil content are lower in some of the hybrids compared to tall. The parents should be chosen in such a way that the above deficiencies are minimized.

The hybrid seed production technology is yet another area which needs modifications depending upon the location of the seed garden. It is advantageous to have the hybrid seed gardens distributed in coconut growing areas for obvious reasons of easy availability of the material and low transport cost. When a hybrid seed garden is established in the coconut growing belt, the selected dwarf alone need be planted in compact blocks of any convenient size and hybrid seed production resorted to through emasculation, bagging and pollination with pollen from selected Tall. In areas where isolation barrier of 500 m all round is available Tall and Dwarf parents may be mix planted at a ratio of 1:8 and nuts from the dwarf selected. To improve the quantity of nuts further, assisted pollination may also be resorted to.

Community Nursery Programme of CDB

Coconut Development Board is implementing various schemes for the production and distribution of quality planting material with the objective to resolve the inadequate availability of planting materials. In order to make use of the farmers traditional wisdom and skill in identifying elite mother palms and in order to improve the genetic potential of palms, a decentralized community coconut nursery programme has now been introduced at grass root level to make available quality planting material to the farmers in their vicinity. The programme is implemented in association with the State Dept. of Agriculture / Horticulture and with the active participation of Panchayats, NGOs, Agro-clinics, ATMA, Farmers Groups, etc. The programme will also facilitate the production of disease tolerant seedlings which will be raised from seednuts procured from elite disease free mother palms in disease-prone areas. The nursery can be owned by an individual or by a self-help group or a Panchayat on community basis. There should be a minimum extent of 25 cents for sowing 10,000 seednuts for producing atleast 6250 seedlings per annum.

Village seed garden and nursery

The availability of quality planting material locally is a great boon to the farmers. This enables them to exercise some choice on the quality and also cut down the transport cost considerably. Establishing seed gardens and nurseries at regional levels has thus great relevance and should receive priority attention.

Quality enforcement

Quality standards, however good they may be, are of little value unless they are meticulously enforced. The present practice of selling coconut seedlings of unknown parentage even under spurious names will continue unabated doing irreparable damage to the coconut industry if immediate measures are not taken to check the same. A certification system through registration of seed gardens and nurseries and inspection to produce quality seeds and seedlings will go a long way in ensuring availability of quality planting material. Suitable legislation if found necessary may have to be thought of in this regard. The work of certification can be entrusted even to NGO's having credibility and experience in the field.

Soil quality

The productive capacity of the soil depends upon its health. A quality improvement in the soil can be achieved through a higher organic base and bio agents that could be established in the area so as to develop a self generating dynamic biological system. Efforts to recycle the crop waste, growing legumes and other green manure tree crops will generate additional organic matter in soil besides ensuring adequate soil

moisture. Applying bio agents such as Trichoderma, Azospirillum, Phospho bacterium, VAM, Pseudomonas sp. and earth worm will not only improve the health of the soil but also ensures continuous supply of nutrients. Adoption of zero tillage technology is yet another practice that will improve the quality of soil.

The response potential of coconut to management has not been adequately understood neither by the farmers nor by the scientists. The coconut palm standing at the backyard of the house where continued supply of nutrients through household wastes and moisture make it yields 120 – 150 nuts! A few yards beyond, the yield falls to 35, the state average. In the High Density Multi species experimental plot of CPCRI, Kasaragod having an extent of 1.2 ha, and the average yield of West Coast Tall has been a steady 171 nuts for the last 18 years. The pre-experimental yield of the same plot was 65 nuts. These facts are strong indicators of the yield increase that can be achieved in WCT coconut through a quality management approach.

People participation in planting material production

It is evident that there are a number of quality parameters that have direct bearing with yield which if properly networked and executed would benefit the coconut industry substantially. There are farmers who have coconut gardens raised from selected parents performing well. Such gardens could be marked out observing the norms of selection and registered as seed gardens. New seed gardens for both Talls and hybrids may be established after assessing the future seedling requirements. Public participation can be ensured if a project for the establishment of seed gardens and nurseries could be prepared and wide publicity given through media.