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Improved varieties to make India self-sufficient in arecanut

The present production of arecanut in the world is about 0.867 million tonnes from an area of 0.73 million ha. India ranks first in both area and production of arecanut. In India, arecanut is cultivated in 4.46 lakh ha with an annual production of 6.08 lakh tonnes. The area under arecanut in India has increased from 94,800 ha during 1956-57, to 4.46 lakh ha during 2012-13. The production for corresponding period has increased from 74,700 tonnes to 6.08 lakh tonnes. The productivity has also increased from 788 kg chali/ha to 1,363 kg/ha. The increase in pro-ductivity and production is due to development of high-yielding varieties coupled with supply of quality planting materials, better agro-techniques and plant-protection measures. Since India achieved self-sufficiency in arecanut production due to extensive research efforts of CPCRI, the strategy is to restrict area and enhance the productivity by replacing old and unproductive gardens with dwarf hybrids, empower small and marginal farmers through multiple cropping systems and intensify research efforts on alternate uses of arecanut to avoid market fluctuations.

ARECANUT industry forms the economic backbone of nearly sixteen million people in India. Evolving high-yielding improved varieties of arecanut has been successful through the introduction of indigenous and exotic types and refinement of selection procedures for mother palm, seed nuts and seedlings. Based on the comparative yield trials of indigenous and exotic accessions, promising types have been identified and released as varieties for commercial cultivation. They are Mangala, Sumangala, Sreemangala, Mohitnagar, Swarnamangala, Kahikuchi, Nalbari and Madhuramangala. Hybridization and exploitation of dwarfing genes resulted in breeding dwarf and high-yielding varieties. Dwarf hybrids with high yield potential directly benefit the growers by way of enhanced returns and reduced cost of various cultural operations like harvesting and spraying and reduced damages to palms due to sun-scorching and heavy wind. The arecanut varieties released by CPCRI and their yield potential and other characteristics are presented.

Mangala

VARIETAL WEALTH FOR PROSPERITY

Local Cultivars

South Kanara Local/Kasaragod Local: This is predominantly grown in Dakshina Kannada district of Karnataka and northern part of Kerala. It is characterised by large-sized nuts with uniform bearing and average chali yield of 2.0 kg/palm/year.

Thirthahalli: It is grown extensively in Malnad areas of Shimoga and Chickamagalur districts of Karnataka. Its tender nuts are preferred for processing. The size of nuts is smaller and oblong in shape. Its average yield is 2.40 kg chali/palm/year.

Sagar: It is mainly grown in Shimoga and Uttara Kannada districts of Karnataka. The variety is a tall type and having sturdy stem with erect bunches are the distinguishing characters. The nuts are smaller in size and round in shape. Average yield is 2.25kg chali/palm/year. Nuts are used for making both chali and tender nut processing.

Hirehalli Local: It is a tall type and mainly cultivated in maidan areas especially in Tumkur, Mandya and parts of Hassan and Bangalore districts of Karnataka. The nuts are medium-sized, round to oval shape. They are used both for tender nut processing and making chali. Average yield is 3.20 kg chali/palm/year.

High-Yielding Varieties

Mangala (VTL-3): The variety Mangala is an

introduction from China and possesses number of desirable characters such as earliness in bearing, more number of female flowers per inflorescence, higher nutset, initial and cumulative higher yield, quicker stabilization of yield and lesser height in comparison with other varieties. Average yield is 3.0 kg chali/palm/year. The variety was released for commercial cultivation in coastal areas of Karnataka and Kerala. It is characterized by partially drooping crown with well spread leaves and having more number of leaflets as compared to South Kanara Local. The leaflets are dark green in colour with characteristic crinkling at the tip.

Sumangala (VTL-11): This accession was introduced from Indonesia which showed an increase in yield of 64% over South Kanara Local. The variety was released in 1985 for all areca growing areas and in particular Coastal Karnataka and Kerala. It is a tall type partially drooping crown and flowers in 4-5 years. The colour of ripe nuts is deep yellow to orange and oblong to round in shape. The variety gives an average yield of 3.28 kg of chali/palm/year at the age of ten years.

Sreemangala (VTL-17): The cultivar introduced from Singapore showed high yield potential and recorded 59% increase in yield. The palm is tall with partially drooping crown with longer internodes and sturdy stem. It starts flowering in 4-5 years. It is high yielder with an average chali yield of 3.18 kg ripe nuts/palm/year. Ripe nuts usually oblong to round in shape with deep yellow colour. This cultivars was released in the name Sreemangala during 1985 for coastal areas of Karnataka and Kerala.

Mohitnagar (VTL-60)

Mohitnagar (VTL-60): It is an indigenous arecanut variety with high yield potential was released for commercial cultivation during 1991. The uniformity in bunches is an important feature of this variety. The bunches are well placed and nuts are loosely arranged on spikes which help in their uniform development and also enable efficient plant protection measures. Early stabilization in yield as compared to Sumangala and Sreemangala. The variety is consistently high yielder with an average chali yield of 3.67 kg per palm per year. The variety is recommended for West Bengal and Coastal areas of Karnataka and Kerala.

Swarnamangala (VTL 12): Evaluation of exotic accessions and selection for economic traits resulted in development of high yield potential variety VTL-12 (Saigon). It is a tall high yielding variety with homogeneous population. The bunches are well spaced. Nuts are bigger and heavier with high recovery of chali/dry kernel (26.40 %). Average yield of this palm is 3.88 kg chali/palm/year. It is recommended for cultivation in irrigated and rainfed areas of Karnataka and Kerala.

Swarnamangala (VTL 12)

Kahikuchi (VTL 64): The Variety posses high-yielding nature with medium thick stem, longer internodes, partially drooping crown, homogeneous population, regular bearer, consistent in yield, bunches are well placed on the stem, orange colour, bold and round shaped nuts, high recovery (25.16 %) of chali from fresh nuts, comes to bearing by 5th year and economic yield can be realized up to 40-45 years depending upon the management. The variety is consistent high yielder with an average yield of 3.70 kg chali/dry kernel palm/year and 5073 kg dry kernel/ha/year. The variety has been recommended for commercial cultivation for Asom and North-Eastern region.

Kahikuchi (VTL 64)

Madhuramangala (VTL 62): The yield performance of the variety is higher than the released varieties, viz. Mangala, Sumangala, Sreemangala and traditional local types, suitable for both tendernut and ripe nut processing. Also fetches more price in the market because of its quality and marble appearance of the split nut. The average yield is 3.54 kg dry kernel/palm/year and about 4,500-5,000kg dry kernel/ha/year and 2.95kg dry tender processed nuts/palm/year and about 3,800-4,500kg dry tender processed nuts/ha/year. The variety has been recommended for commercial cultivation in Karnataka and Konkan region.

Madhuramangala (VTL 62)

Nalbari (VTL-75)

Nalbari (VTL-75): The yield performance of the variety is higher as compared all the earlier released varieties and found suitable for ripe nut processing. The variety possesses high yielding

nature, tall type with medium thick stem, longer internodes, partially drooping crown, homogeneous population, regular bearer, consistent in yield, bunches are well placed on the stem, round shaped yellow colour nuts, high recovery (25.18%) of dry kernel from fresh nuts, comes to bearing by 5th year and economic yield can be realized up to 40-45 years. The average yield is 4.15 kg chali/ dry kernel palm/year and 5600 kg dry kernel/ha/year. The variety has been recommended for release for Karnataka, North Bengal and north-eastern region.

Dwarf Hybrids

In addition to yield improvement, arecanut breeding programs are also aimed at development of dwarf arecanut varieties. Hirehalli dwarf (HD) a natural mutant identified in 1963, for its short stature is a good genetic source of arecanut improvement. Among the achievements, so far only tall varieties have been released for commercial cultivation. Though tall varieties posses high yield potential but frequently prone to wind damage and sun-scorching and also become difficult to manage. Most of the farm operations like spraying and harvesting will become easy with dwarf palms. The exploitation of dwarfing genes in breeding dwarf varieties with high yield potential was initiated to overcome the above problems. Hybrids involving Hirehalli Dwarf (HD) and released tall varieties were developed and evaluated for yield performance and dwarfness. Among the hybrids HD × Sumangala and HD × Mohitnagar were identified as superior for yield with dwarfness and recommended for release.

Hirehalli dwarf

VTLAH 1

VTLAH 1: Hirehalli Dwarf × Sumangala hybrid is dwarf in nature. Sturdy stem with super imposed nodes, reduced canopy size, well spread leaves, partial drooping crown, medium sized oval to round and yellow-orange coloured nuts, early stabilization in yield and high recovery of chali (26.45 %) are the striking features of this hybrid. The average chali yield of this hybrid is 2.54 kg/ palm/year. This hybrid has been recommended for commercial cultivation in undulating terrains and high rainfall areas of Karnataka and Kerala.

VTLAH 2: Hirehalli Dwarf × Mohitnagar hybrid is dwarf in nature. Medium thick stem with super imposed nodes, reduced canopy size, well spread leaves, drooping crown, medium sized oval nuts, early stabilization in yield and high recovery of chali (28.53 %) are the striking features of this hybrid. The average chali yield of this hybrid is 2.64 kg/palm/year and recommended for commercial cultivation for Karnataka and kerala in 2006.

VTLAH 2

SUMMARY

Selection of typical hybrid seedlings in the nursery is must. For the purpose of hybridization, parental blocks of Hirehalli dwarf and released high yielding tall varieties, *viz.* Sumangala and Mohitnagar have been established at CPCRI Regional station, Vittal and Research centre, Kidu.

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