ARECANUT VARIETIES AND HYBRIDS RELEASED BY ICAR-CPCRI

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The increase in production was not only due to increased area under cultivation but also increased productivity contributed by superior varieties, supply of quality planting materials, better agro-techniques and plant protection measures. However, efforts are on to minimize the cultivation cost per unit area by introducing genetically superior high yielding varieties and hybrids so that net return per unit area can be increased.

1. Arecanut genetic resources

The systematic germplasm collection and their evaluation began in 1957. At present, the ICAR-CPCRI maintains 173 accessions at its regional station, Vittal. Of these, 150 indigenous eco-types collected from Gujarat, Maharashtra, Karnataka, Assam, Kerala, West Bengal, Tamil Nadu, Meghalaya, and Andaman and Nicobar group of islands of India and 23 exotic accessions introduced from Fiji, Mauritius, China, Sri Lanka, Indonesia, Saigon, Singapore, British Solomon Islands and Australia. These germpalsm collections belong to species *viz.*, *Areca catechu* L. *Areca triandra* Roxb., *Normanbya normanbyii* and *Actinorhytiscalapparia.*

2. Identification and release of varieties

Screening of the available arecanut cultivars for their performance under different ecological conditions is a promising method of obtaining ecotypes suited for different regions of our country. Since arecanut palm is more sensitive to moisture stress its cultivation is restricted to areas with well-distributed rainfall or assured irrigation facilities. Based on the comparative yield trials of indigenous and exotic accessions, promising cultivars were selected and released as varieties for commercial cultivation. The evaluation of exotic accessions and selection for high yield and its attributes, resulted in release of Mangala (VTL-3 from China), Sumangala (VTL-11 from Indonesia), Sreemangala (VTL-17 from Singapore) and Swarnamangala (VTL-12 from Vietnam). The evaluation of indigenous accessions resulted in release of the high yielding varieties, Mohitnagar (collected from West Bengal), Kahikuchi (Assam), Madhuramangala (Maharashtra) and Nalbari (Assam) .

3. Arecanut varieties released by CPCRI

3.1.Mangala: 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 nut set, initial and cumulative higher yield, quicker stabilization of production and lesser height in comparison with local South Kanara variety average yield

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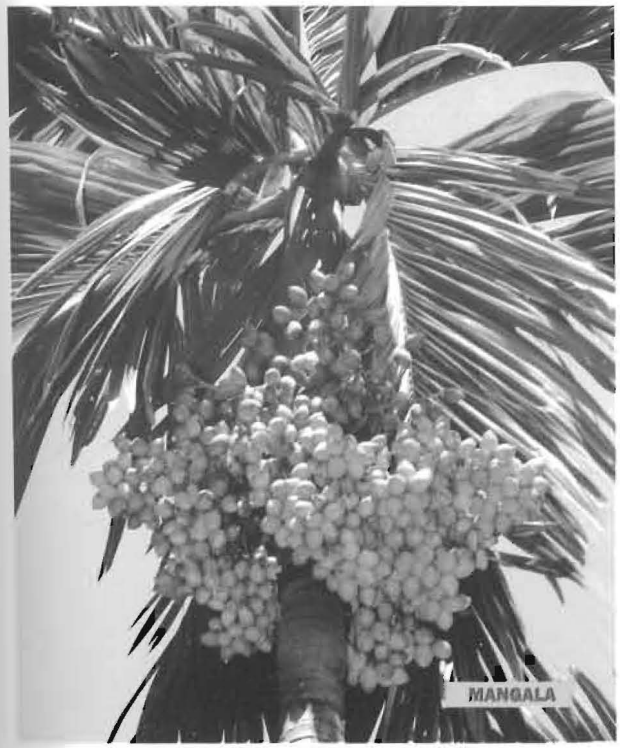
is 3.0 kg chali per palm per year. The variety was released for coastal areas of Karnataka and Kerala up to an altitude of about 800 meters above MSL in 1972 for commercial cultivation, which is characterized by partially drooping crown with well spread leaves and having more number of leaflets as compared to South Kanara Local. The leaf lets are dark green in colour with characteristic crinkling at the tip. Due to its heterozygous nature and semi tall habit, about 2 per cent of the palms develop weak stem with lanky growth. These may be located and rouged out within two years of planting.



Mangala

3.2. Sumangala: This accession obtained from Indonesia showed an increase in yield of 64% over South Kanara Local. In view of the substantial increase in yield, the variety was released for all areca growing areas in general and Coastal Karnataka and Kerala in particular during 1985. It is a tall type partially drooping crown. Under good management, palms flower in 4-5 years. The colour of the ripe nuts is deep yellow to orange and oblong to round in shape. The variety recorded an average yield of 3.28 kg of chali per palm per year at the age of ten years.

Sumangala

3.3. Sreemangala: The cultivar introduced from Singapore showed high yield potential and recorded 59% increase in yield over South Kanara Local. The palm is tall with partially drooping crown with longer internodes and sturdy stem. It starts flowering in 4-5 years with an average chali yield of 3.18 kg per palm per year. Ripe nuts are usually oblong to round in shape with deep yellow colour. This cultivar was released during 1985 for coastal areas of Karnataka and Kerala.

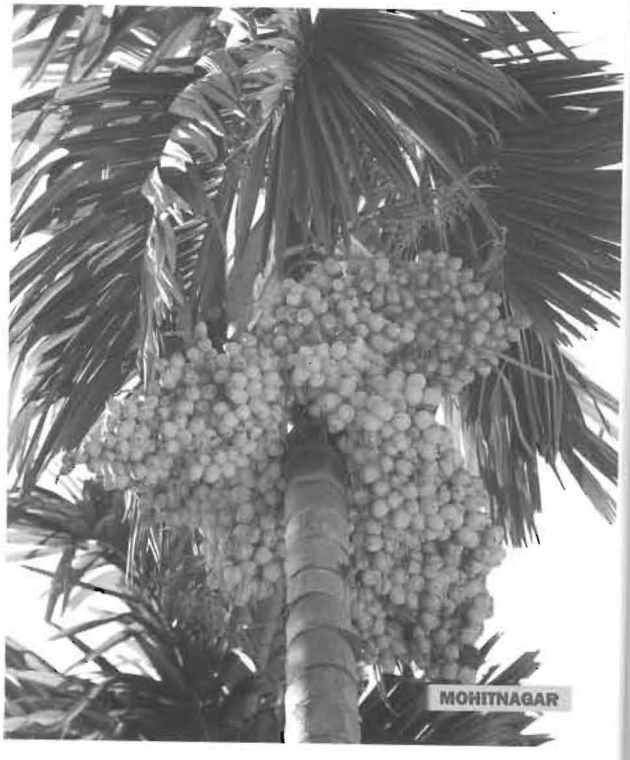
3.4. Swarnamangala: Evaluation of exotic accessions resulted in development of high yielding

Sreemangala

variety, Swarnamangala. 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 variety is 3.88 Kg dry kernel/palm/year. The cultivar Swarnamangala was released for commercial cultivation in Karnataka and Kerala during 2006.

3.5. Mohitnagar: Mohitnagar, an indigenous (Mohitnagar, West Bengal) arecanut variety with a high yield potential, was released for commercial cultivation during 1991. The important features of this variety is its greater uniformity. 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 of yield as compared to Sumangala and Sreemangala was also noticed. The variety is consistent high yielder with an average dry kernel yield of 3.67 kg per palm per year. The variety is recommended for West Bengal and Coastal areas of Karnataka and Kerala.

Swarnamangala



Mohitnagar

3.6. Kahikuchi: The variety is high yielding 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 dry kernel from fresh nuts, comes to bearing by 5th year and economic yield can be realized up to 40-45 years. The variety is consistent high yielder with an average yield of 3.70 kg dry kernel /palm/year. The variety has been recommended for commercial cultivation for Assam and north eastern region of the country during 2009.

Kahikuchi

3.7. Madhuramangala: This is suitable for both tender nut 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 or 2.95 kg dry tender processed nuts/palm/year. The variety has been recommended for commercial cultivation in Karnataka and Konkan region in 2013.

Madhuramangala

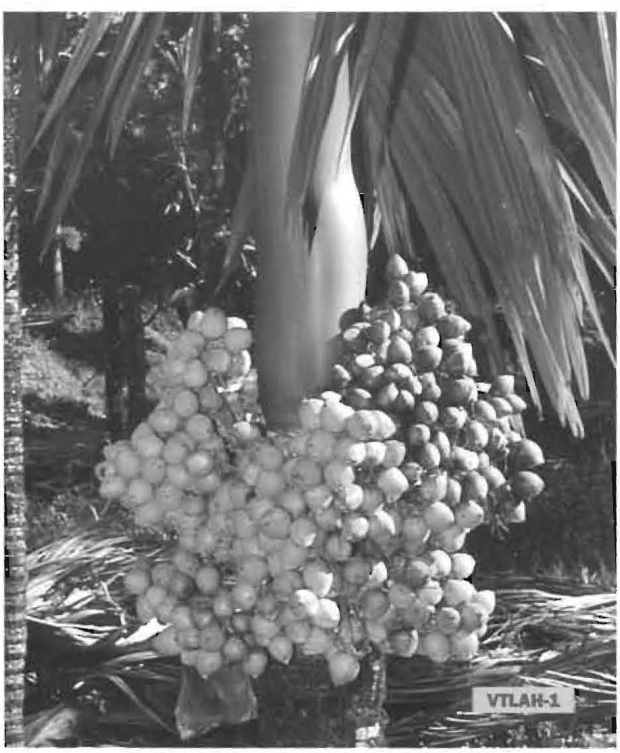
3.8. Nalbari: The variety is tall type with medium thick stem, longer internodes, partially drooping crown, homogeneous population, regular bearer, consistent in yield, bunches are well placed on the stem, round shaped yellow colour nuts, high recovery (25.18%) of dry kernel from fresh nuts, comes to bearing by 5th year and economic yield can be realized up to 40-45 years. The average yield is 4.15 kg dry kernel/ palm/year. The variety has been recommended for Karnataka, North Bengal and north eastern region during 2013.

Nalbari

4. Dwarf hybrids

Though tall varieties possesses high yield potential, they are frequently prone to wind damage and sun-scorching. Besides, the tall palms hinder various operations like spraying and harvesting, which are quite labour intensive and cumbersome. Arecanut breeding programs in addition to yield improvement are also aimed at development of dwarf arecanut varieties/ hybrids. Hirehalli Dwarf (HD) a natural mutant identified in 1963, for its short stature is a good genetic source for arecanut improvement. Dwarf hybrids with high yield potential will directly benefit the growers by way of enhanced returns and reduced cost (40%) of various cultural operations like harvesting, spraying and also without causing much damages to palms due to sun-scorching and heavy wind and gives mechanical support to stem. Therefore, the exploitation of dwarfing genes in breeding dwarf varieties with high yield potential was initiated. Hybrids involving Hirehalli Dwarf (HD) and released tall varieties as parents, developed and evaluated for yield performance and dwarfness. Among the hybrids HD x Sumangala and HD x Mohitnagar were identified as superior for yield with dwarfness and recommended for commercial cultivation as VTLAH-1 and VTLAH-2, respectively.

4.1. VTLAH-1: Hirehalli Dwarf x 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 dry kernel (26.45%) are the striking features of this hybrid. The average dry kernel 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 in 2006.



VTLAH-1

4.2. VTLAH-2: It is a dwarf hybrid between Hirehalli Dwarf x Mohitnagar. Striking features of this hybrid includes 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 dry kernel (28.53%). The average dry kernel yield of this hybrid is 2.64 kg/palm/year and recommended for commercial cultivation in Karnataka and Kerala during the year 2006.

VTLAH-2

The performance of this hybrid was studied at Vittal and Hirehalli by planting comparative yield evaluation trials along with their parents. At Vittal and Hirehalli the percent increase in chali yield over SK local cultivar was 17.33% and 22.67%, respectively. Also it has registered 164% increase in yield over parent Hirehalli Dwarf.

To produce VTLAH-1 and VTLAH-2 dwarf hybrids, crossing is suggested between Hirehalli Dwarf and Sumangala and Hirehalli Dwarf and Mohitnagar, respectively. 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 its Regional Station (Vittal) and Research Centre (Kidu) of ICAR-CPCRI.

The performance of varieties/hybrids and cultivars will vary depending upon agro-climatic conditions, where they are grown and the attention given to them by the grower. Under good management conditions, by following the recommended package of practices the potentiality of above varieties and hybrids can be exploited to the maximum extent.

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