Conserved coconut germplasm from

Papua New Guinea

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Papua New Guinea is a country in Oceania, occupying the eastern half of the island of New Guinea and numerous offshore islands (the western portion of the island is part of Indonesian provinces of Papua and West Papua). It is located in the southwestern Pacific Ocean, in a region defined since the early 19th century as Melanesia. It is one of the most diverse countries on Earth, with over 850 indigenous languages and at least as many traditional societies, out of a population just under 6 millions.

The PNG Cocoa and Coconut Research Institute established in 1986 is the research arm of the cocoa and coconut industries in the country. The Stewart Research Station of CCRI, located at Murunas in Madang Province, conducts breeding and evaluation studies, as well as agronomy and entomology research. CIRAD has played an important role in the establishment of this research centre providing staff, training, technical assistance and funding. In the 1970s, a number of exotic coconut populations were brought into PNG, initially as planting material. Local populations believe that large but fewer nuts involve less labour while still giving similar copra yield to that from palms with smaller but more numerous nuts.

In 1998, the Memorandum of Understanding (MoU) establishing the International Coconut Genebank for the South Pacific (ICG-SP) in Papua New Guinea was signed between PNG and IPGRI/COGENT, with the FAO as trustee. The Stewart Research Station hosts the ICG-SP for the conservation, evaluation and use of important germplasm from the South Pacific region. Substantial progress has been made on the establishment of the ICG including land clearing, renovation of the embryo culture laboratory, training local staff, establishment of local and Dwarf accessions. There are currently 41 local Tall, six local Dwarfs and five exotic Dwarf populations in the ICG that are being characterized.

Reference

Osborne T. 2005. Research on coconut genetic resources in the South Pacific. In: Batugal P, Ramanatha Rao V, Oliver J, editors. 2005. Coconut Genetic Resources. International Plant Genetic Resources Institute – Regional Office for Asia, the Pacific and Oceania (IPGRI-APO), Serdang, Selangor DE, Malaysia. pp. 513-523. Available from: URL: http://www.cogentnetwork.org/index.php?page=books

Karkar Tall (KKT)

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Conservation

Karkar Tall (KKT) is conserved at the Central Plantation Crops Research Institute (CPCRI) in Kasaragod (Kerala), India. This variety is represented by 12 accessions in 10 different conservation sites around the world.

History

Karkar Tall is a cultivar of Papua New Guinea, growing on soils dominated by volcanic ash deposits with high base and organic matter. It was introduced to the germplasm collection at CPCRI in 1972. This cultivar from the Karkar Island of Madang on the north coast of Papua New Guinea is described by Ohler (1984) to be high yielding and precocious with large nuts.

Identification

Karkar Tall attains a height of 6.8-9.8 m 24 years after planting. The palm is robust in appearance, with an average girth of 92 cm. The palm has a medium-sized bole. The average length of 10 internodes is 45 cm. The circular crown has 32 leaves which are long with strong petioles. The leaflets are also long and broad. The palm comes to flowering 6.5 years after planting. The inflorescences are long with strong peduncles. The inflorescence carries about 28-37 spikelets which are also long. The average number of female flowers in an inflorescence is 22, ranging from 12-32 flowers. Fruit set is about 36%. The palm is generally cross-pollinated. The fruits are very large with a thick strong shell and a thick layer of endosperm. The fruits are oval-shaped and greenish yellow in colour.

Yield and production

Karkar Tall generally starts fruiting 95 months after planting. The palm is a regular bearer producing 9-10 bunches per year. The annual nut yield is 51 fruits per palm, varying from 32 to 74 fruits per palm. The fruits are large-sized with 26-36% husk to whole fruit weight. The husked nut weighs around 1000g and produces 220g copra per nut. The oil content of copra is 64.3%. The estimated copra and oil yield, under rain-fed conditions, is 2 t per ha per year and 1.3 t per ha per year, respectively. In Madang Province, Karkar Tall gave an average yield of 86 fruits per palm per year. The fruits were large with 38% of husk. The average weight of the husked nut was about 1407g, with a range of 994-2080g.

Other information

This cultivar is susceptible to leaf spot damage caused by *Drechslera incurvata*. Among cultivars tested in Jamaica, Karkar Tall was found less resistant to lethal yellowing. This cultivar can be exploited for tender nut production on a commercial scale as the quantity (795 ml per nut) and quality of the tender nut water are high (sugar content of 6.9g/100 ml). In India and Fiji, Karkar Tall has been evaluated for yield performance. In Papua New Guinea, it is being characterized and utilized for developing superior Dwarf x Tall and Tall x Tall hybrids.

References

Been BO. 1981. Observations on field resistance to lethal yellowing in coconut varieties and hybrids in Jamaica. Oléagineux 36:9-11.

Ohler JG. 1984. Coconut: Tree of life. FAO plant production and protection paper No. 57. FAO, Rome, Italy.

Ovasuru T, Tan GY, Bridgland LA. 1993. Coconut germplasm collection in Papua New Guinea. In: Nair MK, Khan HH, Gopalasundaram P, Bhaskara Rao EVV, editors. Advances in Coconut Research and Development. Oxford & IBH Publishing Co. New Delhi, India. pp. 33-41.

Ratnambal MJ. 1999. Varieties suitable for tender coconut. Indian Coconut Journal 30:64-67.

Ratnambal MJ, Niral V, Krishnan M, Ravi Kumar N. 2000. Coconut Descriptors-II, Central Plantation Crops Research Institute, Kasaragod, India.

Karkar Tall (KKT)

Madang Brown Dwarf (MBD) in Côte d'Ivoire

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Conservation

Madang Brown Dwarf (MBD) is conserved in 5 countries with 11 accessions totaling 520 palms. It was sent from Papua New Guinea to Côte d'Ivoire in 1977, and then reproduced and sent to Vanuatu, Thailand, Tanzania and Ghana. The introductions from Côte d'Ivoire to Thailand were made using coconut embryos extracted from fruits and cultured in vitro. It was the first time that this technique was used for the international exchange of a coconut variety.

History

Madang Brown Dwarf, from the town of Madang in Papua New Guinea, is the first brown Dwarf to be introduced into Africa. Because of its polymorphic habits, it is also described in its native country in the previous pages. Although the fronds are long and supple, they do not display the dishevelled appearance seen, for example, in Malayan Dwarfs. They bear quite a large number of leaflets for a Dwarf. The inflorescence peduncle is highly developed. Along with the Tahitian Red Dwarf, MBD is the only one with the smallest number of spikelets per inflorescence in Côte d'Ivoire. Occasionally, inflorescences producing a very large number of female flowers (almost 200) are emitted, but they almost all abort and only give a few fruits per bunch. Very young fruits are almost green when eventually turn dark brown.

Identification

No coconut palm is as polymorphic as the Madang Brown Dwarf. It is almost enough to discourage anyone from attempting to identify coconut varieties. The first seednuts were collected in Papua New Guinea and sent to Côte d'Ivoire in 1977. They were planted there and started bearing three years later. In Papua New Guinea and Vanuatu, the MBD produces large, almost round fruits with a thin husk on rich volcanic soils. In Vanuatu, the meat weighs 407g which amounts to 40% of total fruit weight without free water. In Côte d'Ivoire, on sandy soils, the same Dwarf produces small elongated fruits with a thick husk. Their meat only weighs 152g on average and accounts for 33% of total fruit weight without free water. It is quite surprising that, in Côte d'Ivoire, although the fruits are small in size, the number of fruits produced remains high. This looks like an adaptive behaviour. It seems that this variety changes its fruit shape and weight according to environmental factors.

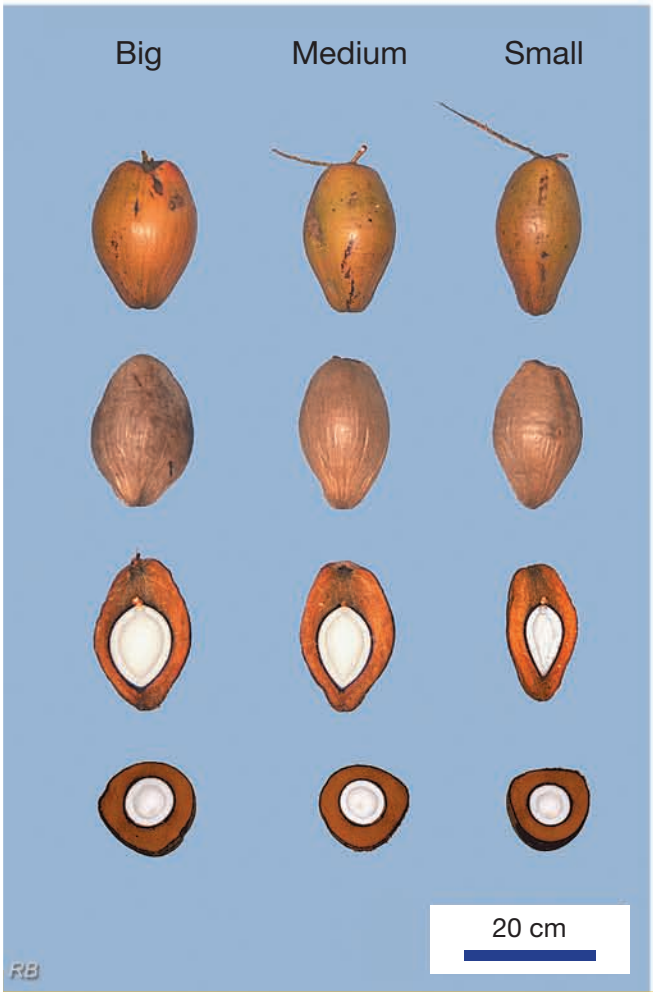
Yield and production

In Africa, flowering began 28 months after planting, on average, which is very early even for a Dwarf. The Malayan Yellow Dwarf which serves as control in the observation plot only flowered five months later. In Côte d'Ivoire, the MBD produces from 50 to 120 fruits per palm per year, with an average of 94 fruits on mature palms.

Other information

Although the MBD was only introduced quite recently in genetic improvement programmes, it has attracted the attention of researchers. In Côte d'Ivoire and Vanuatu, it has been crossed with numerous Dwarf and Tall types. It has been introduced into Ghana and Tanzania to assess its tolerance to lethal yellowing disease.

Reference

N'Cho YP, Le Saint JP, Sangare A. 1988. Les cocotiers Nains à Port Bouët (Côte d'Ivoire). III. Nain Brun Nouvelle-Guinée, Nain Vert Thaïlande, Nain Rouge Polynésie. Oléagineux 43:55-66.

Madang Brown Dwarf (MBD)