

# Sri Lanka

---

## Genebank

Coconut Research Institute (CRISL)  
Bandirippuwa Estate  
Lunuwila, 61150  
Sri Lanka  
Phone: (94-31) 2255300 / 2255890  
Fax: (94-31) 2257391  
Email: director@cri.lk

---

## Contact

Country member of COGENT  
Dr C. Jayasekara  
Director  
Coconut Research Institute (CRISL)  
Bandirippuwa Estate  
Lunuwila, 61150  
Sri Lanka  
Phone: (94-31) 2255300 / 2255890  
Fax: (94-31) 2257391  
Email: director@cri.lk

---

Sri Lanka is an island country in South Asia, located about 31 km off the southern coast of India. It is home to around 20 million people. Coconut is the most widespread plantation crop in Sri Lanka, occupying 20% of the cultivated land area. The total extent under coconut cultivation is approximately 443,000 ha. Coconut is essentially a smallholder crop, with 80% of smallholdings ranging from 2-4 ha. Coconut is also grown in home gardens. Of the total production, 70% is being consumed locally and the balance available for coconut-based processing industries. Per capita consumption of coconut in Sri Lanka is about 115 nuts per annum, making it one of the highest per capita coconut consuming countries in the world.

The most widely grown coconut cultivar is the ordinary Tall. The coconut breeding programme has been in operation since the inception of the Coconut Research Institute (CRISL) in 1929. Genetic improvement of coconut varieties commenced in early 1940's by crossing selected Sri Lanka Tall to produce the improved cultivars Tall x Tall (CRIC 60). Subsequently, a production programme was also initiated concomitantly which produced the Dwarf x Tall hybrid (CRIC 61), first introduced in 1965. The first isolated seed garden for mass production of the improved cultivar CRIC 60 was established in 1955.

A systematic coconut germplasm conservation programme was initiated in Sri Lanka in 1984 and over a 16-year period, 90 distinct phenotypes and various ecotypes have been collected and conserved *ex situ* in CRISL genebanks. Based on random sampling, seven representative accessions were collected from seven target provinces. In the process of biased sampling, special emphasis was made on drought tolerance. A total of 20 accessions from drought prone areas that withstood severe droughts and three introduced populations were collected. Both materials collected as random and biased samples were established in a third germplasm repository consisting of 16 accessions. Both maintenance and data collection of the duplicate genebanks that were established during 1989-90 were carried out successfully and data submitted for inclusion in COGENT's Coconut Genetic Resources Database was also updated until 2002.

The coconut biotechnology programme was initiated at CRISL in early 1970's. The Tissue Culture Research Programme was also developed as a successful embryo culture technique for germination of Dikiri Coconut, a high-priced soft endosperm coconut.

## Reference

Samarajeewa AD, Bandaranayake CK, Ranasinghe CS, Everard JMDT, Weerakoon LK, Fernando WMU, Senarathne S. 2005. Status of coconut genetic resources research in Sri Lanka. In: Batugal P, Ramanatha Rao V, Oliver J, editors. Coconut Genetic Resources. International Plant Genetic Resources Institute – Regional Office for Asia, the Pacific and Oceania (IPGRI-APO), Serdang, Selangor DE, Malaysia. pp. 581-595. Available from: URL: <http://www.cogentnetwork.org/index.php?page=books>

## King Coconut (RTB)

Ratnambal MJ, Niral V, Krishnan M

### Conservation

King Coconut (RTB) is conserved at the Central Plantation Crops Research Institute (CPCRI) in Kasaragod (Kerala), India. This variety is found in India, Sri Lanka, Tanzania and Jamaica. It is represented by about six accessions in the Coconut Genetic Resources Database.

### History

King Coconut was introduced into the germplasm collection at CPCRI in Kasaragod in 1960. This variety is also referred to as Rath Thembili. It is believed to have originated in Sri Lanka and resembles the Malayan Dwarf type 'Puyoh'. The fruit is valued for its sweet nut water and culinary use.

### Identification

King Coconut is a comparatively short-statured palm attaining a height of about 3.5 m 22 years after planting. In Sri Lanka, it is referred to as a semi-Tall variety. The stem is slender and has a girth of about 72 cm. There is no bole and the crown is circular. The leaves are short with strong petioles. The leaflets are not long and rather broad. The inflorescence, which is medium-sized with a strong stalk, carries about 20-40 spikelets. The spikelets are moderately long and carry at least one female flower per spikelet. Therefore, the number of female flowers per inflorescence is quite high (36 on average). The palm is highly self-pollinated. No inter-spadix overlapping of male and female phases is observed. The fruits are small with thin husk. The proportion of husk to whole fruit weight is around 32-37%. The fruits are yellow red in colour and oblong in shape with a characteristic button at the distal end of the nut. Inside the fruit, the nut is also small and oblong in shape.

### Yield and production

This variety starts flowering 61 months after planting. The palm is a regular bearer and produces 7-10 bunches annually. In Sri Lanka this cultivar is reported to be seasonal in fruiting and produces 18 bunches per palm per year. The average annual nut yield is about 52 nuts per tree under rain-fed conditions. The husked nut weighs around 300g with approximately 125g copra per nut. The oil content of the copra is 66.3%. In Sri Lanka, the husked nut weighs an average of 398g, producing 141g copra per nut with an oil content of 65.6% in the copra.

### Other information

King Coconut is generally, susceptible to drought. It is highly resistant to lethal yellowing in Jamaica but susceptible to the disease in Tanzania. It is susceptible to the burrowing nematode, *Radopholus similis*. In Sri Lanka, this variety has been crossed with Sri Lanka Green Dwarf and San Ramon Tall in different combinations. The hybrids appeared to be a failure as the nut water quality was poor. The progeny of the cross between King Coconut and Sri Lanka Green Dwarf was less hardy but flowered early and produced large bunches with medium-sized fruits. In Sri Lanka, a research programme was initiated to identify King Coconut palms with desirable characters in order to develop improved strains of King Coconut.

### References

- Been BO. 1981. Observations on field resistance to lethal yellowing in coconut varieties and hybrids in Jamaica. *Oleagineux* 36:9-11.
- Ratnambal MJ, Niral V, Krishnan M, Ravi Kumar N. 2000. Coconut Descriptors Part II, Central Plantation Crops Research Institute, Kasaragod, India.

King Coconut (RTB)



# Sri Lanka Green Dwarf (PGD)

*Bourdeix R, Fernando WMU, Everard JMDT*

## Conservation

The Sri Lanka Green Dwarf (PGD) is represented by 12 accessions totalling 755 palms according to the 2002 Coconut Genetic Resources Database.

## History

From Sri Lanka, PGD was introduced into Côte d'Ivoire, India and Jamaica before the 1980s. From Côte d'Ivoire, it was subsequently sent to Ghana, Tanzania, Philippines and VietNam.

## Identification

Along with the Madang Brown Dwarf, the Sri Lanka Green Dwarf is without any doubt one of the most polymorphic. In Africa, the fruits weigh 375 and 461g on average in two neighbouring plots. The small, pointed nuts weigh 172 to 251g in Côte d'Ivoire and 285g in Sri Lanka. It seems that PGD is quite polymorphic. When planted under more favourable conditions, it produces rounder, fuller fruits. For instance, in the Philippines, fruit weight is estimated at between 745 and 796g. In VietNam, the weight could even reach 1240g. There are a few Green Dwarfs that strongly resemble the PGD. In India, the Chowgat Green Dwarf has a very similar appearance; it is probably the same variety, but that hypothesis needs to be confirmed by a molecular DNA analysis. In the Pacific, especially in Micronesia, some Green Dwarfs look like the Sri Lanka Green Dwarf. The islanders use them to produce toddy, sweet sap extracted by incising the young inflorescence of the palm. These Green Dwarfs are appreciated for their slow growth. It is said that even an old man can produce his own toddy without taking the risk of climbing. Sugar, syrup, sauces, vinegar and alcohols are produced from toddy.

## Yield and production

At first glance, the Sri Lanka Green Dwarf is not a very attractive variety. When planted on poor soils, it produces small greyish-green fruits, which are narrow and not particularly well filled, are susceptible to insect attacks, and which epidermis becomes creased and wrinkled on ripening. Yet this variety has a characteristic that makes it valuable; it is resistant to one of the most terrible scourges currently devastating the coconut plantations in Ghana, the lethal yellowing. In the 1980s, around 20 coconut varieties were introduced into Ghana from Côte d'Ivoire to test their resistance to the disease. PGD performed the best. Under good conditions, this Dwarf starts bearing three years after planting. It produces 50-100 fruits per palm per year, but fruit size and composition vary considerably depending on growing conditions.

## Other information

This variety has attracted the interest of researchers in several countries. In Sri Lanka, it has been crossed with various Tall types. Its hybrid with the Sri Lanka Tall (Ambakelle) is distributed to growers under the reference CRIC65. In Ghana, there are plans to plant its hybrid with the Vanuatu Tall in zones devastated by lethal yellowing. In Côte d'Ivoire, this Dwarf has been crossed with various Tall and Dwarf types.

## References

- Liyanage DV. 1958. Varieties and forms of the coconut palm grown in Ceylon. *Ceylon Coconut Quarterly* 9:3-4:1-10.
- Le Saint JP, de Nucé de Lamothe M, Sangare A. 1983. Les cocotiers Nains à Port Bouët (Côte d'Ivoire). II. Nain Vert Sri Lanka et complément d'information sur les Nains Jaune et Rouge Malaisie, Nain Vert Guinée Equatoriale, Nain Rouge Cameroun. *Oléagineux* 38:595-606.

# Sri Lanka Green Dwarf (PGD)

