

# DEVELOPMENT OF KHINA SERIES COCONUT VARIETIES IN INDONESIA

by  
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## Introduction

A project for coconut development in Indonesia was initiated in 1972 with assistance from UNDP/FAO and Research Institute for Industrial Crops (LPTI), Bogor as the Counter-part Agency. Emphasis of research was on breeding and agronomy. Production of KHINA series of coconut varieties was an accomplishment of breeders attached to the project. They were D. V. Liyanage, H. Luntungan, A. Djisbar and T. Mankey. In the initial stages, particularly during germplasm surveys, Ch. P. Corputty and H. Sudasrip were associated.

Research on breeding included coconut germplasm surveys in Indonesia, hybridization of selected palms within selected populations and testing progenies. That involved considerable travelling, labour, patience and a barrage of criticism. The agony and joy, breeders experienced in production of KHINA series of coconut varieties are outlined in this paper.

Technical details regarding the breeding program, growth of progenies, flowering and production are given in references 1, 2 and 3.

## Germplasm Survey

A survey of coconut germplasm in selected areas of eleven provinces in Indonesia was carried out. Twenty five samples that represented a wide spectrum of populations, some exposed to selection pressure were studied in detail. They were:

*Yellow Dwarf* variety from Nias island, North Sumatra. Palms early flowering, copra per unselected nut 188 g.

*Tenga Tall cultivar* (TT) from Tenga district, North Sulawesi. Copra per-unselected nut 296 g.

*Bali Tall cultivar* (BT) from a government estate in Central Java. Copra per unselected nut 340 g.

*Palu Tall cultivar* (PT) from Palu valley in Central Sulawesi. Copra per unselected nut 354 g.

Selected TT, BT and PT populations were homogeneously high yielding under low levels of management giving about 3500 kg of copra per ha/year.

## Hybridization

Selected NYD palms in Nias island were taken as the female parents and TT, BT and PT as male. Small field laboratories were set up near selected Tall palm populations for pollen collection and a larger laboratory in Nias island. Headquarters of LPTI at Bogor was the focal point where pollen collected at three field stations were re-processed, stored and later sent to Nias island. Further, the program was directed from Bogor.

Accessibility to field stations at Nias, Tenga and Palu was difficult. For example to reach Nias islands, travelling included two hours by air from Jakarta to Medan, four hours by road from

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Medan to Sibolga in North Sumatra, overnight sea journey from Sibolga to main town in Nias and finally three hours by speed boat to reach the field station. Sea journey sectors were always risky.

Often coconut pollen sent from Bogor was not viable on reaching Nias station. Consequently, that exercise had to be repeated over and over again. Yet in spite of all these difficulties and risks, seed nuts of NYD x TT, NYD x BT and NYD x PT were produced in sufficient quantities for progeny testing.

### **KHINA Series**

Performance of the three hybrids referred to above in progeny trials was far superior to that of the respective male parents or any other coconut planting material produced in Indonesia. They were early flowering and high yielding, details given in references 2 and 3, LPTI named them as follows:

KHINA I	- NYD x TT
KHINA II	- NYD x BT
KHINA III	- NYD x PT

KHINA stands for Kelapa Hybrida in Indonesia. Khina I is planted on a large scale in commercial plantation.

### **Discussion**

Production of improved coconut varieties like KHINA I and others using indigenous germplasm was not an easy task. (When the breeding program was initiated in 1972, a certain group, supported by two influential foreign organizations was anxious to promote cultivation of imported coconut seed in Indonesia. They discouraged and criticized the breeding program, often reaching unethical scientific standards. Criticism emanating from them was so harsh and extensive that the author as leader of the breeding team experienced considerable difficulty in maintaining morale and efficiency of members of the (team). However, (inspite of these obstructions and insinuations), the team was able to concentrate and implement the breeding program successfully, eventually producing KHINA I and other coconut varieties that would be of immense value for. coconut development in Indonesia.

That would not have been possible and breeding program abandoned half way through, if not for the keen support and encouragement given by an able research administrator. He appreciated principles on which program was based and ability of breeders to deliver the goods. He accompanied frequently the author on field visits to monitor and evaluate work in progress and attended to administrative problems as necessary.

When he examined the first hybrid palm that flowered at Parungkuda Experimental Station, West Java in 1980, 34 months after planting seedlings, he was filled with joy and tears flowed down his eyes. That was late Hasman Aziz, Director of LPTI then.

## REFERENCES

1. Liyanage D. V., and Corputty Ch. P. Coconut germplasm in Indonesia. Paper presented at the Fourth Session of the FAO Technical Working Party on Coconut Production, Protection and Processing. Kingston, Jamaica (1975).
2. Liyanage D. V., Mankey T., Luntungan H., Djisbar A. and Sufiani S. Coconut Breeding in Indonesia - I. Cocos (1986), 4, 01 - 10.
3. Liyanage D. V., Luntungan H. and Mankey T. Coconut Breeding in Indonesia - II. Cocos (1987), 5, 08-18.