

as Ravalien. The second block was planted in 1970 with material from Tigak in NIP and we call these Manokwari. This work at LAES has evaluated, identified and selected some trees with good nutmeg and mace quality and high yield. These have existed at LAES for a long time but they were not distributed widely because it has been very difficult to vegetatively propagate them as clones. Trees grown from seed are variable in yield and quality, bear after many years and produce 50% males which do not bear fruits. Vegetative propagation ensures purity of the material, early bearing and smaller tree size. Recent adaptive research by NARI has perfected a bud grafting technique for nutmeg, something that had not been used in the country before. Now that trees can be reproduced vegetatively, NARI released 14 selected clones in 2004 as superior planting material in the absence of any other recommended varieties of nutmeg in PNG.

### **NARI LAES Keravat released nutmeg clones**

The released clones are identified as:

- 1. KMF1,**
- 2. KMF2,**
- 3. KMF3,**
- 4. KMF4,**
- 5. KMF5,**
- 6. KMF6,**
- 7. KMF7,**
- 8. KMF8,**
- 9. KMF9,**

- 10. KMF10**
- 11. KMF11**
- 12. KMF12**
- 13. KMF13**
- 14. KMF14**

### **Quality**

1. The nutmeg and mace are of acceptable quality and are currently bought and exported in small quantities by local traders in East New Britain.
2. The clones have been identified as high yielding trees based on observation and evaluation of a total of 180 trees for over 25 years.
3. All clones are supplied as grafted seedlings. Grafting ensures that:
  - Trees are true to type.
  - Trees are small and compact (5 -10) metres compared to large tall (15–20) metres) trees produced by seedling trees. This means that they can be planted at closer spacings thus increasing production per unit land area.
  - Trees come into bearing at 3-4 years compared to 7-8 years for seedlings trees.
  - Trees give a uniform production, as all trees will come into production at roughly the same time.
  - More female or bearing trees can be planted per unit area thus increasing production and trees grown from seed produce 50% unwanted males.

## Existing planting material

1. No prior recommendations exist in PNG for nutmeg planting material.
2. LAES has distributed seeds and seedlings material to various clients over the last 20 years as a mixed batch from these selections.
3. Grafting technique was not previously used in PNG from our knowledge so prior to this release, nutmeg grown in most parts of PNG will have come from either unselected seeds or farmer's own seed selections.

## Need and Opportunity

1. Nutmeg and mace are high value, world traded spices commodities, with established market and market networks.
2. Nutmeg is a low management input crop. It is known to grow and produce well in several agro ecological zones in PNG, which includes;
  - a. Wet lowlands- Volcanic soils
  - b. Wet lowlands –Coralline soils
3. Testing is necessary before commercial cultivation in agro-ecological zones other than the above.

## NUTMEG CLONES FROM NARI LAES KERAVAT

### Introduction

Nutmeg (*Myristica fragrans*) is a small to medium size tree that produces two spices, mace and nutmeg. Nutmeg was introduced into various government stations namely Tigak New Ireland, Murua Gulf, Orimo Western, Bubia Morobe by DASF [Department of Agriculture Stock and Fisheries] in the late 1950s and the early 1960s, but German settlers planted nutmeg in the Gazelle Peninsular of East New Britain well before this. The German introductions were planted on a large scale at Ravalien plantation near Kokopo in the Gazelle.

While the origin of the German introduction is not certain, the DASF introduced 1,000 seeds from the FakFak Minokwari in West Irian, Indonesia between 1962 and 1963 and distributed them to the above DASF stations. After successful introduction from FakFak some more were obtained in 1963 to 1964 from Penang in Malaya. Most of these materials were sent to Misima, Miline Bay and a few sent to LAES Kerevat but all these died eventually due to water logging.

Work on nutmeg at LAES commenced in the early 1960s and significant resources have been put into evaluation and maintenance of the introductions over the last 50 years. At LAES Keravat today there are two blocks of nutmeg. One was planted in 1963 with material from Ravalien plantation near Kokopo. These are commonly referred to

## THE INSTITUTE

**The National Agricultural Research Institute (NARI)** was established by an Act of National Parliament of Papua New Guinea in July 1996 as a publicly funded, statutory research organisation, to conduct applied and development oriented research on food crops, alternative food and cash crops, livestock and resource management issues. Besides applied and adaptive research, NARI is responsible for providing authoritative technical, analytical and diagnostic services and up-to-date information to the entire agriculture sector in PNG. The major targets are the smallholder semi-commercial farmers in the country.

The mission of NARI is to contribute, through applied research and technical services, to the development of the agriculture sector and realization of the national goals by identifying, adapting and transferring agricultural technologies and information, so as to:

- Enhance the productivity, efficiency and sustainability of the smallholder agriculture, and
- Improve farmer income, food security and welfare of Papua New Guineans and the Nation.

The material presented in this bulletin is based on the best information available at the time of printing (December 2005)

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4. No serious pests and diseases have been noted over 26 years of cultivation at LAES, nor are there reports from elsewhere in PNG

## Distribution

1. These clones can be distributed to anywhere in PNG from LAES.
2. Grafted seedlings are now prepared on commercial scale and can be distributed on request from NARI Keravat.
3. We strongly recommend that farmers plant a mixture of at least six clones.

## Disclaimers

Nutmeg **should not** be planted in the following conditions for commercial production:

1. Altitude above 500m
2. Water logging area i.e. needs well drained soils
3. NARI is not responsible for marketing: We suggest that nutmeg is grown only in areas where market exists.
4. These clones are the best known, recommended for farmers until better clones supersede them at some future date.

Copies of the leaflet can be obtained from:

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## **NUTMEG CLONES**



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