

A close-up photograph of a breadfruit tree branch. The branch is covered with large, dark green, deeply lobed leaves. Several green, round breadfruit fruits are visible, some hanging from the branch and others partially obscured by the foliage. The background is dark and out of focus.

Breadfruit (*Artocarpus altilis*), Production in Fiji

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Ministry of Agriculture
Fiji***

Breadfruit – Introduction


- ▶ Breadfruit – Mulberry family, Moraceae.
- ▶ Originating in the South Pacific and that was eventually spread to the rest of Oceania.



- ▶ British and French navigators introduced few varieties to Caribbean islands during the late 18th century and today it is grown in some 90 countries throughout South and Southeast Asia, the Pacific Ocean, the Caribbean, Central America and Africa.



Why Breadfruit?

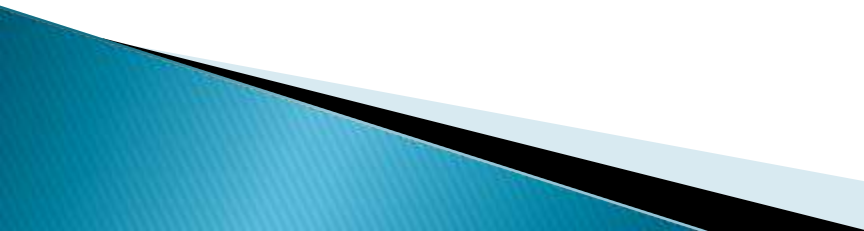
- ▶ CARBOHYDRATE 53% to 76%
 - ▶ α 1,4 glucose AMYLOSE
 - ▶ α 1,4: α 1,4,6 AMYLOPECTIN
 - ▶ α 1,2
 - ▶ FIBRE 4.9%
 - ▶ PROTEIN 1.05% to 1.3%
- 

VITAMINS (Per 100 g)

▶ Pantothenic acid	0.5 mg
▶ Vitamin B1 (thiamine)	0.2 mg
▶ Niacin	0.9 mg
▶ Vitamin B6	0.1 mg
▶ Choline	9.81 mg
▶ Vitamin C	29.1 mg
▶ Vitamin E	0.1 mg

MINERAL CONTENT OF BREADFRUIT (PER 100g)

▶ Phosphorus	30 mg
▶ Calcium	17.1 mg
▶ Sodium	2.0 mg
▶ Potassium	490.3 mg
▶ Iron	0.5 mg
▶ Magnesium	25 mg
▶ Zinc	0.1 mg
▶ Copper	0.13 mg
▶ Manganese	0.11 mg




Research & Development

- ▶ Fiji has been at the forefront of breadfruit research and development regionally and internationally.



Botanical work

- ▶ In 1966 Dominiko Koroveibau named 70 breadfruit varieties in Fiji.
 - ▶ The characterization included documentation of the morphological characteristics of the fruits, leaves, length of the male flowers, fruiting time, and the food value of each variety.
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Breadfruit Diversity



Melipodaha
Pohnpei, FSM



Lemae
Mariana Islands



Maopo
Samoa



Ulu
Hawaii



White
Seychelles



Ulu Tili
Samoa



Meison
Chuuk, FSM



Ma'afala
Samoa



Puou
Samoa



Porohiti
Society Islands



Yuley
Yap, FSM



Rotuma
Samoa



Tonono
Society Islands



Maibhid
Pohnpei, FSM



Rotuma
Society Islands



Duglug
Mariana Islands



Otea
Society Islands



Kaplak - breadnut
Papua New Guinea



Afara
Society Islands



Yap variety
Palau

Propagation Trials

An evaluation of marcotting techniques on breadfruit (*Artocarpus altilis*) variety “*Balekana ni Samoa* for improved multiplication of planting material in Fiji

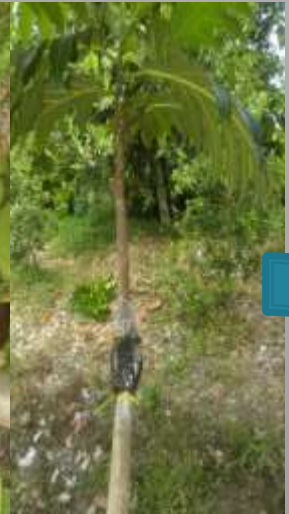
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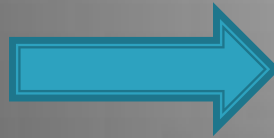
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Root suckers

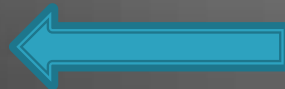


Marcotting





Tissue Culture



Distribution of germplasm to neighbouring countries



Protocol for fresh exports to New Zealand – 2000

- ▶ Focus was on controlling fruit fly.
- ▶ Worked carried out High Temperature Forced Air Treatment



Market research (2000 – 2004)

Nature Way Cooperative (Fiji) Ltd.

- ▶ 2001 Strategic Plan 2002–2006.

Grandison Gordon

- ▶ 2002 Report on Fresh Breadfruit Exports to New Zealand. South Pacific Trade Commission, New Zealand.

Grandison Gordon

- ▶ 2004 Market Potential for Fijian Breadfruit Exports to New Zealand. A report prepared for the Pacific Enterprise Development Facility/International Finance Corporation. Sydney.
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Refining the export supply chain (2003–2005)

FIJI BREADFRUIT QUALITY GUIDELINES

FOR FRESH EXPORT VARIETIES



ROT



DEEP BRUISE



SUNBURN



SURFACE BRUISE



UTO DINA

BALE KANA



BROWN STEM



MEALY BUG



STEM LENGTH



140 mm



130 mm



120 mm



110 mm



100 mm



90 mm



80 mm



SAP STAIN

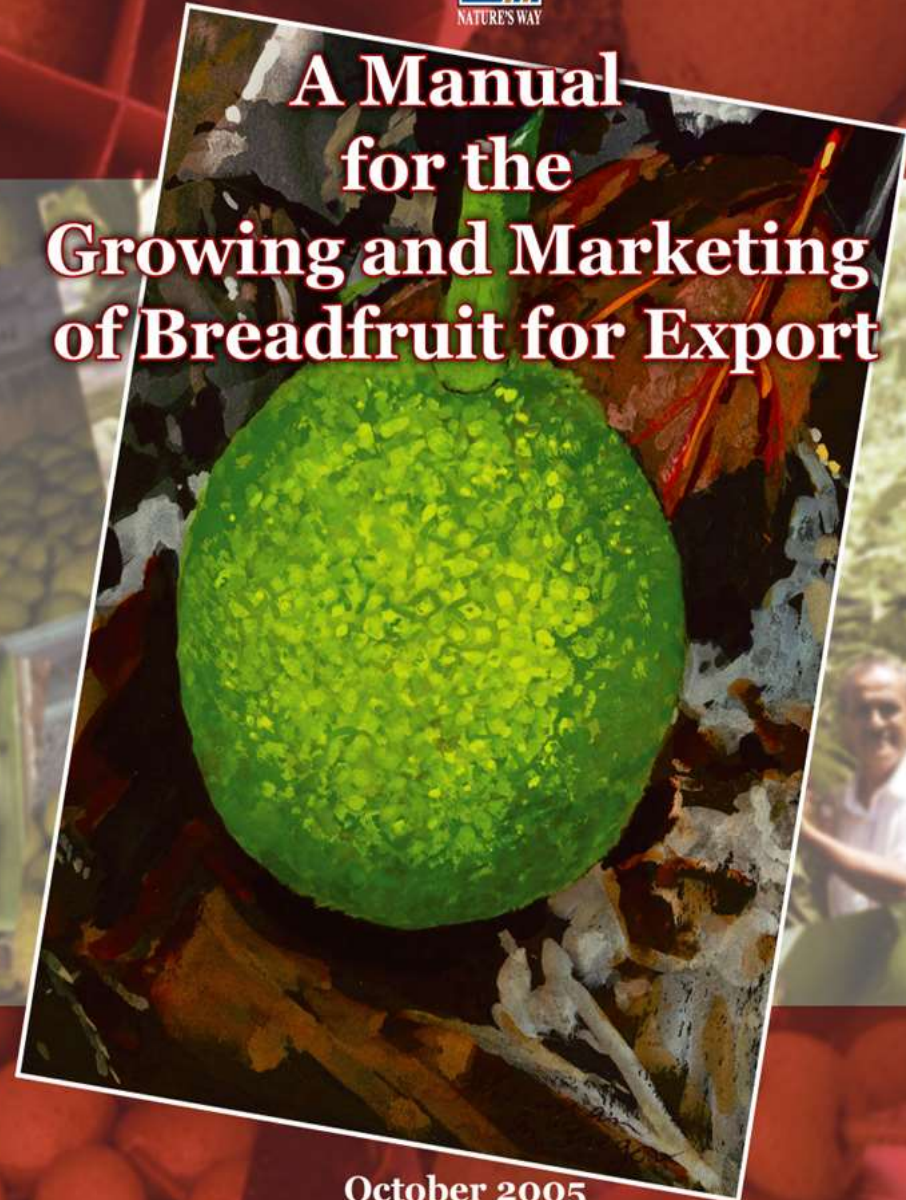


PACKAGING





A Manual for the Growing and Marketing of Breadfruit for Export



October 2005

1st National Breadfruit Conference at Legalega Research Station (2005)



First International Symposium on Breadfruit Research and Development (March 2007)



Participants from Africa (Benin, Ghana, Nigeria, Tanzania), the Seychelles, the Caribbean (Trinidad and Jamaica), Sri Lanka, and the Pacific (Fiji, Pohnpei \[Federated States of Micronesia], Hawaii, Kiribati, New Caledonia, Papua New Guinea, Samoa, Tonga, Tuvalu, and Vanuatu), and Australia.



Fiji Institute of
Agricultural Science

Fiji Institute of Agricultural Science

National Breadfruit Symposium

"Breadfruit for Economic Growth and Food Security"

May 27th, 2015


Tokatoka Resort, Nadi



Centre for
International Agricultural Research

AGRICULTURE

Production Systems

- ▶ Agroforestry program in traditional food gardens.
 - ▶ Integration of breadfruit into commercial agroforestry systems – timber and fruit trees.
 - ▶ Integration of breadfruit into commercial orchards with intercropping (linear or square).
- 



Market and Market Opportunities

- ▶ Local municipal market



Exports

- ▶ New Zealand
- ▶ Australia
- ▶ USA



Processing

► Breadfruit Flour Processing



Value-added Products





- The US gluten free existing and market demand projections.
- Agroforestry benefits of breadfruit
- Food security and health benefits of breadfruit
- Entrepreneurial opportunities from breadfruit, processing and by



Future R & D

- ▶ Additional Planting Materials to Scale up Production (Tissue culture, root suckers, marcotting)



Explore commercial viability of sea freight exports by developing postharvest protocols

- ▶ Preliminary research so far conducted show that storage at non chilling temp. 12 degrees Celsius inhibit ripening with rot development the limiting factor. Av post harvest life was about 21 days.

- ▶ Systematic studies on the effect on rot development at low temperature of fungicides that are currently acceptable in NZ and Australia. (Range of concentrations and dip times at a range of temperature is required).
- ▶ Research is required to determine the extent of sugar accumulation during low temperature storage.



Breadfruit - crop of the future!

- ▶ Ability of breadfruit to secure food energy from the atmosphere, thanks to large leaves and canopy >> also relatively undemanding of soil
- ▶ High tolerance to climate extremes
- ▶ Well suited to inter-cropping
- ▶ High yielding in biomas that can be converted to high quality gluten free flour & paste products



Tree of Bread

“Regarding food if a man plant ten (breadfruit) trees in his life, which he can do in about an hour, he would completely fulfill his duty to his own as well as future generations”

Sir Joseph Banks 1769



Acknowledgement

- ▶ Ministry of Agriculture – Fiji
 - ▶ Pacific Breadfruit Project
 - ▶ Naturesway Cooperative
 - ▶ Secretariat of the Pacific Community
 - ▶ Fiji Institute of Agricultural Science
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▶ THANK YOU