



Coconut Risk Management and Mitigation Manual for the Pacific Region



Compiled by R. Bourdeix, J. M. Sourisseau and J. Lin Suva, December, 2021



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Original text: English

Pacific Community Cataloguing-in-publication data

Bourdeix, R. (Roland)

Coconut risk management and mitigation manual for the Pacific region / compiled by R. Bourdeix, J. M. Sourisseau and J. Lin

- 1. Coconut Oceania.
- 2. Coconut Oceania Handbooks, manuals, etc.
- 3. Coconut Management Oceania.
- 4. Coconut industry Oceania.
- 5. Coconut products Oceania.

I. Bourdeix, R. (Roland) II. Sourisseau, J. M. III. Lin, J. IV. Title V. Pacific Community

634.6170995

AACR2

ISBN: 978-982-00-1429-9

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Prepared for publication by SPC Land Resources Division (LRD), Narere, Suva - Fiji. www.spc.int | +679 33 0733 | <u>Irdhelpdesk@spc.int</u>, and Diversiflora expertise, Montpellier, France | +33 0782824307 | roland.bourdeix@yahoo.fr.

To cite this manual:

Bourdeix, R., Sourisseau, J. M., & Lin, J. (Eds.). (2021). Coconut Risk Management and Mitigation Manual for the Pacific Region. Land Resources Division, SPC.

To cite a chapter of this manual:

Lin, J., Alasia, J. P., & Helsen, J. (2021). Risks linked to organizational and policy issues. In R. Bourdeix, J. M. Sourisseau & J. Lin, J. (Eds.). *Coconut Risk Management and Mitigation Manual for the Pacific Region* (pp 99-100). Land Resources Division, SPC.

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Compiled by R. Bourdeix ^(1, 2), J. M. Sourisseau ^{(3, 4),} and J. Lin ⁽⁵⁾

(1) CIRAD¹, UMR AGAP², F-34398 Montpellier, France.

(2) AGAP, Univ Montpellier, CIRAD, INRA³, Montpellier SupAgro, Montpellier, France.

(3) CIRAD, UMR ART-DEV, F-34398 Montpellier, France.

(4) ART-DEV⁴, CIRAD, Univ Montpellier, CNRS⁵, Université de Perpignan via Domitia.

(5) Doctoral Researcher in Research Training Group 1666 'Global Food: Transformation of Global Agri-Food Systems" University of Göttingen, Göttingen, Germany.

¹ The French Agricultural Centre for Research and International Cooperation.

² Joint Research Unit on Genetic Improvement and Adaptation of Tropical and Mediterranean Plants.

³ The French National Research Institute for Agriculture, Food and the Environment.

⁴ Joint Research Unit on Actors, Resources and Territories in Development

⁵ The French National Research Institute for Scientific Research.

C. RISKS LINKED TO PLANTING MATERIAL

By R. Bourdeix, V. Kumar and L. Perera

In the framework of this manual, planting material refers to the type of living material used to establish an agricultural field or replace it. This chapter focus mainly on coconut planting material, even if multicropping is widely practiced in the Pacific region. Another section of the manual discusses planting material and techniques for cover crops that help maintain soil fertility.

The types of planting material generally fall into one of two groups: conventional planting material and tissue-culture plantlets.

Conventional coconut planting material includes seednuts and seedlings. Seednuts can be planted directly in the fields. In this case, as shown in a recent movie produced by the CIDP project in the Cook Islands, farmers sometimes conduct selection by removing part of the palms, generally before they start to produce, but sometimes after. Seedlings are raised in a nursery that allows good care of the young palms and enables useful comparison and selection in a homogenized environment. To date, this is the only method for obtaining organic planting material.

Tissue culture is relatively new in the case of the coconut palm. Plant tissue culture is a collection of techniques used to maintain or grow plant cells, tissues or organs under sterile conditions on a nutrient culture medium of known composition. Plant tissue culture is widely used to produce clones of a plant in a method known as micropropagation. Growing plantlets in sterile containers allows them to be moved with reduced chances of transmitting diseases, pests, and pathogens. The success of tissue-culture plantlets on a commercial scale depends on the ability to transfer plants out of culture on a large scale, at low cost and with high survival rates.

For planting material, the main risks are linked to diversity and genetic value. Farmers may be advised or forced to use a planting material with low genetic value and/or lack of diversity. The large-scale planting of a unique variety may result in the disappearance of many traditional varieties and an increased risk of major epidemics that can destroy the harvests or even the whole plantations.

Under the framework of the CIDP project, thirty participants from fifteen countries and territories in the Pacific region joined a dedicated meeting held from 17- 20th April 2018 in Nadi, Fiji. Participants agreed that the situation in Pacific countries regarding planting material is highly variable. This ranges from situations where: 1) no seedlings are provided to farmers by any institution; 2) seednuts are provided free to farmers with or without financial incentives for replanting; 3) international import of Dwarf x Tall hybrids seedlings are cultivated in vitro at 10 USD per unit (Solomon Islands); to 4) selling of special Dwarf at 100 USD per seedling (Hawai'i). All participants agreed on the 24 regional technical recommendations, of which some concern planting material.

Given the emerging risks to the coconut industry and need for large scale replanting, the group recommended that more dedicated resources be focused on coconut planting material, seed systems, and plantation management. In small island developing states, at least one research and one extension officer should be dedicated to coconuts. Larger countries should consider the establishment of separate coconut units within their Ministries with a team focussed on

coconuts. Recognising both the disparities and the commonalities between these situations, the group agreed on the following six recommendations.

- 1. National Agricultural Services should allow farmers a primary role in making their own varietal choices and consider advising against farmers growing only a single coconut variety (Tall, Dwarf, Hybrid, or other). At the national level, agricultural services and other stakeholders should provide farmers with a range of at least six different coconut varieties, including Tall, Dwarf, Compact Dwarf, Hybrid, and eventually composite varieties; and explain to farmers the specificity of each variety regarding environmental adaptation and cultural practices. To reduce overall risk, farmers should be encouraged to plant more than one variety. Local stakeholders (men and women farmers, private enterprises, NGOs and CSOs) should be encouraged to become more involved in supplying quality germplasm. Farmers and other stakeholders should be taught how to autonomously produce quality seedlings of hybrids and other varieties, using the Polymotu concept or any other acceptedmethod.
- 2. In order to better assess and to boost the coconut value chain, the group recommends agricultural services create and/or strengthen national coconut farmer's databases and create well-documented coconut parent palm databases using the method and datasheets recently developed by R. Bourdeix, V. Kumar and V. Mataora. These databases should be conceived and implemented to link with other existing farmer's databases. They should also integrate with Geographical Information Systems.
- **3.** The meeting noted that nothing can replace well-designed, regular and sustainable **breeding programs** conducted by well-trained professionals. Expertise is needed to assess the coconut breeding programs and gene banks presently existing in the Pacific region; to help developing local skills; to create new programs and to facilitate international collaboration between these programs. SPC could play a crucial role in the process by ensuring safe germplasm exchanges between countries.
- **4.** The suggestion of organizing a **coconut variety contest** should be encouraged at local, national and regional level, in order to increase awareness of the diversity existing within the countries and the region. Such contests could be integrated in yearly cultural events organized in most PICTs (such as **Aloha festival** in Hawai'i of **Teuila festival** in Samoa).
- 5. The new concept of **delocalized community-based coconut collection** should be tested in the Cook Islands as a CIDP-funded activity, and should be extended to other countries. Each coconut palm planted in a public place should be from a variety perfectly identified; its identity and its localization (latitude and longitude, date of planting) should be recorded in a database available online. If the Ministry applies this advice, after ten years Cook Islands will probably have the largest coconut gene bank in the world – without devoting any dedicated land to this activity.
- **6. Vanuatu** should play a leading regional role as a training centre for technical activities related to coconut breeding and germplasm conservation. Fiji could also develop a good regional breeding research centre.

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