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Underexploited Tropical Plants with Promising Economic Value

Report of an Ad Hoc Panel of the Advisory
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Con resumen en español

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This report has been reviewed by a group other than the authors according to procedures approved by a Report Review Committee consisting of members of the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine.

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PANEL ON UNDEREXPLOITED TROPICAL PLANTS
WITH PROMISING ECONOMIC VALUE

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PREFACE

This is a report on plants that show promise for improving the quality of life in tropical areas. Because the countries in this zone contain most of the world's low-income populations this report is addressed to those government administrators, technical assistance personnel, and researchers in agriculture, nutrition, and related disciplines who are concerned with helping developing countries achieve a more efficient and balanced exploitation of their biological resources.

The ad hoc panel on underexploited tropical plants, which produced the report, met at Airlie, Virginia, in March 1974. The panel had the following objectives:

- To identify neglected but seemingly useful tropical plants, both wild and domesticated, that have economic potential;
- To select the plants that showed the most promise for wider exploitation throughout the tropics; and
- To indicate requirements and avenues for research to ensure that selected plants reach their fullest potential.

The 36 plants described here were selected from among 400 nominated by plant scientists around the world in response to a written inquiry. (To keep the project to manageable size, medicinal plants and timber species were excluded.) The choice reflected here is necessarily subjective, based as it is on the experience and judgment of the panel. Plants chosen for inclusion had to satisfy several criteria, the most important of which were:

- Can it be grown in the tropics?
- Does it have significant potential as a source of food, forage, or industrial raw material?
- Can it help make developing countries (or areas within them) more productive?

Other considerations were: Can the plant make a specific contribution to human nutrition? Does the plant have multiple properties enabling several useful products to be obtained from it? The plants were not judged solely by how much or how little is known about them, however. Some of the plants selected are relatively well known; others are taxonomically not yet fully described. Some are "luxury crops" that will appeal only to high-priced specialty markets; others are subsistence crops.

Since it is impossible to determine future costs and benefits of exploiting these plants in vastly dissimilar economic environments, selection could not be based on economic considerations except in the most informal and subjective manner. The task of weighing the technical details against the economics, needs, resources, and capabilities of a particular country or area is perforce left to interested, competent authorities.

The panel recognizes that some plants recommended but finally not selected for inclusion in this report may well have similar potential for exploitation. In such cases, the panel did not have, and could not obtain, enough information to support an affirmative decision.

The plants presented here should be seen as complements to, not as substitutes for, conventional tropical crops.

The report aims to provide a brief introduction to the plants selected. It is neither a textbook nor a comprehensive survey of tropical botany. For the convenience of the reader, each plant is presented in a separate chapter, arranged in the following order:

- Description of the plant and of its advantages
- Limitations and special requirements
- Research needs
- Selected readings (significant reviews, general articles)
- Research contacts and germ plasm sources (individuals or organizations known by the panelists to be involved in relevant research or to have appropriate seeds, cuttings, or rootstock).

This report does not detail how to introduce the plants to new areas. Readers should appreciate that achieving this goal may be complex and difficult. Many plants discussed in this report have defied dissemination (or domestication) for a century or more. Plant introduction cannot be divorced from plant management; a lack of horticultural knowledge or experience will frequently cause a plant introduction to fail. Differences in elevation, soil type, temperature, day length, and rainfall present other complications. Sometimes newly introduced plants prove to be too aggressive and become weeds. Even if all these problems are overcome, the plant will be successful only if a market exists or can be created for its products.

The information in this book is only a starting point for what may prove to be laborious and troublesome projects. Addresses of knowledgeable contacts are provided so that readers may ascertain for themselves specific details that cannot be covered in a general report of this kind, but that may be critical to the successful introduction of a plant to their locality.

The panel felt that certain points on the status of tropical botany and the urgency of preserving germ plasm were so important that, although not part of the panel's formal mandate, they are discussed in Chapter 1.

The panel is indebted to the contributors (listed on page 169) and to Mary Jane Koob, who acted as administrative secretary for the meeting and for production of the report. The manuscript was edited and prepared for publication by F. R. Ruskin.

Comments on this report, especially if it has induced initiatives or further research on the species described, should be communicated to the staff officer, Dr. Noel Vietmeyer, National Academy of Sciences-National Research Council, 2101 Constitution Avenue, JH215, Washington, D.C. 20418, USA. Suggestions and information from readers about species not covered in this volume are welcome. They might be included in a later publication.

Note to the Second Edition

Demand for this report has continued strong since it first appeared in 1975. More than 20,000 requests for copies have been received. This far exceeded initial expectations and has necessitated reprinting the book three times. By late 1978, requests were still pouring in, but stocks were once more depleted. Before reprinting this time, however, the staff decided to update names and addresses of research contacts that appear throughout. Accordingly, the interest of each research contact was ascertained and, as a result, in this edition some names have been dropped, others added, and where necessary, addresses have been updated. A few minor points have been corrected and the chapter on ramie was rewritten entirely. In cases where new books or articles have appeared, their citations have been substituted for less-relevant or hard-to-find literature that was cited previously.

Since the report was published, some species have received attention from scores of researchers. The winged bean, jojoba, and guayule are notable examples. The winged bean is now cultivated in many countries where it was previously unknown. In the United States, trade in jojoba seedlings and products was already a multimillion-dollar industry by 1978, with over 1,000 hectares of jojoba planted. Mexico and Israel were also establishing jojoba plantations. Guayule was being investigated at several U.S. research institutions, including those of two large rubber companies. In Mexico, a pilot rubber-extraction factory was operating, and tires made from guayule rubber were being road tested. In November 1978, President Carter signed into law a bill that made available \$30 million for guayule research and development. These and other advances are not reflected in the current text, but many are described in the new literature now cited in the Selected Readings sections.

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