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About the Institute

The Hunt Institute for Botanical Documentation, a research division of Carnegie Mellon University, specializes in the history of botany and all aspects of plant science and serves the international scientific community through research and documentation. To this end, the Institute acquires and maintains authoritative collections of books, plant images, manuscripts, portraits and data files, and provides publications and other modes of information service. The Institute meets the reference needs of botanists, biologists, historians, conservationists, librarians, bibliographers and the public at large, especially those concerned with any aspect of the North American flora.

Hunt Institute was dedicated in 1961 as the Rachel McMasters Miller Hunt Botanical Library, an international center for bibliographical research and service in the interests of botany and horticulture, as well as a center for the study of all aspects of the history of the plant sciences. By 1971 the Library's activities had so diversified that the name was changed to Hunt Institute for Botanical Documentation. Growth in collections and research projects led to the establishment of four programmatic departments: Archives, Art, Bibliography and the Library.



Dear Doc:

Since you are the "old master" in this field, please give me your comments. Thank you Simon

[Removed from Collection 2004, Papeneo Family Papers, letter to Wilson Papeneo from Simon Malo, 1 Apr 1969] [Folder 205]



POTENTIAL IMPORTANCE OF FRUIT PRODUCTION AREAS IN COSTA RICA

SIMON E. MALO
Assistant Horticulturist

INFORME DE LA UNIVERSIDAD DE FLORIDA

Preparado para:

AGENCIA PARA EL DESARROLLO INTERNACIONAL
MINISTERIO DE AGRICULTURA Y GANADERIA
CENTRO PARA LA PROMOCION DE LAS
EXPORTACIONES Y LAS INVERSIONES

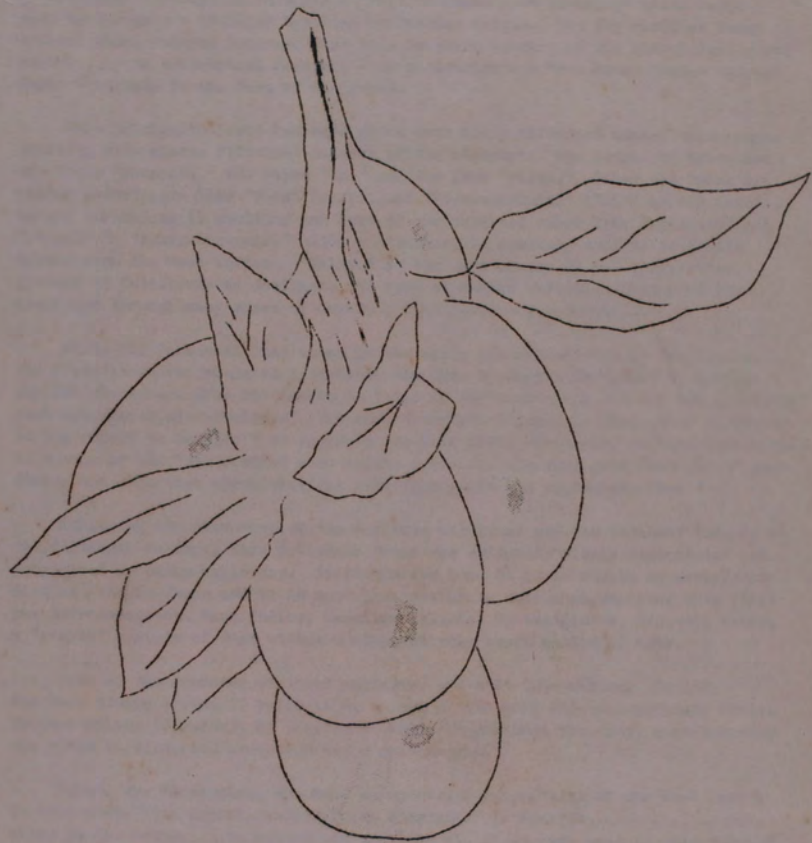
UNIVERSITY OF FLORIDA REPORT

Prepared for:

US AID MISSION TO COSTA RICA
MINISTRY OF AGRICULTURE
EXPORT-INVESTMENT
PROMOTION CENTER

SAN JOSE, COSTA RICA

THE
ROMANCE



OF
CALAVO

With my compliments,
Miss

NOTES ON THE ISLAND OF HAINAN

F. A. McCLURE

CANTON CHRISTIAN COLLEGE, CANTON, CHINA

[The body of the document contains several paragraphs of text, which are extremely faint and difficult to read. The text appears to be a preface or introductory section of a report or journal entry.]

SPROUTING AND GRAFTING FRACTIONAL PARTS OF AVOCADO EMBRYOS WITH ATTACHED COTYLEDONOUS MATERIAL

(1) SPROUTING OR GERMINATION

GROWTH responses following splitting in approximately equal parts of the avocado embryo, *Persea americana*, *P. drymifolia*, either before or after it has sprouted, and planting these fractions with attached cotyledonous material in a sawdust sprouting medium are of general scientific interest. Usually when the whole seed is planted, one sprout from the embryo takes the lead and dwarfs any secondary multiple sprouts which as a rule do not show above the ground. However, when the embryo was split into two fractions and these planted separately with attached cotyledonous material, in many cases, more than one sprout developed from each of the fractional parts of the embryo. These multiple sprouts were in many cases of equal strength. In some cases as many as eight sprouts were observed. It was desirable in the case of multiple sprouting to prune out all but one in order to secure in a reasonable length of time a plant suitable for budding. One-fourth embryos also sprouted and grew. These were secured by splitting half embryos, with cotyledonous material attached, into two portions. The application of this principle makes it possible to secure two or more plants from each avocado seed. An experiment to determine the relative vigor of plants from whole seeds and fractional embryos with attached cotyledonous material is now in progress.

(2) FRACTIONAL EMBRYO GRAFTING

The method of avocado propagation here briefly described is of general scientific interest in that it makes use of the principle of grafting a cion into either the sprouted or unsprouted fractional embryo. The seed is split in two, as reported above, and the cion is then wedge grafted into the fractional embryo with attached cotyledon at any of the three desired developmental stages: (a) immediately after splitting the unsprouted embryo; (b) after halves planted in sawdust just begin root and plumule elongation; (c)

after the development of the fractional units has progressed still further—the root is 3 inches or more, and the plumule $\frac{1}{2}$ to 1 inch or more, in length. In the last-named case, the plumule is cut back to point of union with the cotyledon. In a fourth method the whole seed is sprouted and then the developing embryo, including the plumule and tap-root which have reached the stage as indicated under (c) above, is split in half and each portion or split plumule is cut back to the point of union of the cotyledon and then grafted. The relative effectiveness of the four procedures has not been fully determined. After all the exposed cut surfaces are waxed with paraffin the completed grafts are placed horizontally with grafted embryo fraction on top, in a propagating medium, covered to a moderate depth ($1\frac{1}{2}$ to 2 inches) set in partial sunlight to provide solar heat, and watered liberally. When vigorous sprouts appear on the cion and additional roots have developed, the time varying with different experimental conditions, the grafts are transferred either to standard 12 by 6 by 6 inch cypress plant boxes or planted in the nursery row. When planted deeply, cion roots are formed in many cases.

The anatomy of the graft union and the physiology of growth are being studied. The chief difference between this and other methods of propagating the avocado, *Persea americana*, *P. drymifolia*, consists in grafting a cion into the sprouted or unsprouted fractional embryo at point of union with cotyledon, and not higher up into the developing plumule or stem. In this method the cion actually takes the place of the developing plumule. Possible advantages are bench operation in propagating, securing double the number of plants from the same number of available seeds and the production of satisfactory nursery trees in a shorter time than by the usual shield budding method. A complete report will be published later.

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