

slowly establishing itself in the taste of Americans. But I am not convinced that these things are comparable. Consider the millions of dollars that have gone into the advertising of any manufactured product with the almost complete lack of any put into attempts to push the chayote and you become aware that a comparison is impossible. I venture the statement that more money was spent in advertising instant postum than was expended by the Government in the introduction of new foreign plants for the whole country during the past 32 years.

It is slowly and tediously that a new vegetable such as the chayote must work its way into the good graces of a people and earn its right to be classed as an established table vegetable on their menus.

A dealer in one of our big cities found himself burdened with a large shipment of chayotes which he could not sell under their strange name but when he called them "Trellis Squashes" he sold them readily.

Perhaps people hesitate to buy a vegetable the name of which they don't know how to pronounce.

## RESEARCH IN TROPICAL HORTICULTURE AT THE UNIVERSITY OF MIAMI

ARTHUR L. STAHL, S. J. LYNCH,  
MARGARET J. MUSTARD  
*University of Miami*  
Coral Gables, Florida

Ever since the establishment of the University of Miami, its trustees and officials have been cognizant of the important role that agriculture, and especially horticulture, plays in the economic and aesthetic life of the South Florida area and tropical America. Even though they have been over-busy in building up a material as well as a first-class scholastic institution, they have not lost sight of the fact that teaching and research in tropical agriculture are important contributions of a university so situated climatically and geographically as is the University of Miami.

There is no place in the United States better situated to undertake the establishing of a well-rounded educational center for research and teaching in tropical agriculture than the University of Miami. Miami is 600 miles farther south than San Diego and approximately 80 miles from the Tropic of Cancer. It is 280 miles farther south than Cairo, Egypt, and has the same lati-

tude of Central India and Arabia. It is so located that it is easily accessible by boat, rail, and air to all the tropical American countries.

Dr. Wilson Popenoe, who is an expert on tropical and subtropical fruits, has this to say concerning research on tropical fruits: "The thickly populated countries of the temperate zone must look more and more to the tropics to supplement their own food resources by direct supplies made possible in ever-increasing measure by ever-improving means of transportation. Many fruits of the tropics, not all of them so important, yet all valuable in degrees in the dietary of the race, must be grown in ever increasing quantities, not only to supply temperate zone markets, but also, and even more important, to enable the native populations of the tropics to obtain abundantly and cheaply this most wholesome source of human energy."

Some of the staff of the University of Miami have already made valuable contributions to horticulture. Dr. Walter M. Buswell, curator of the herbarium, assisted by Mr. Roy C. Woodbury, has built up a splendid herbarium of tropical and subtropical

horticultural plants of the American tropics. It is housed in the New Botany Building and is being extended to include those plants from other countries of the Caribbean area as well as those of South Florida.

Dr. W. T. Swingle and Mr. Frank Venning have done a fine piece of work in unscrambling some of the confusion which has existed regarding the accurate determination of species of the many plants which have been introduced into South Florida. Specific information has also been determined which makes it possible to estimate the value of these plants as possible root stocks, scions, or breeding material. At the present time plots are being set up in which these relatives of citrus are to be used as root stocks for our commercial citrus varieties.

Dr. Taylor Alexander, Chairman of the Department of Botany, has conducted research for the past three years on developing varieties of food plants which would produce during the extreme summer period in South Florida. Progress has been made particularly with tomatoes and corn. Over one hundred varieties of various vegetables have been tried in the natural soils of this area as well as in the field of hydroponics. Under this head such phases as best nutrient soil solutions, insecticides, and fungicides as well as the light requirements are being investigated. This project is being continued and expanded.

Dr. J. J. Ochse, Professor of Applied Tropical Botany, came from Java where he was in charge of the Agricultural Experiment Station. He is an international figure in the horticultural field, being an authority on tropical and subtropical plants. He is author of many bulletins and several books on tropical and subtropical fruits and vegetables. Dr. Osche is teaching several courses in tropical horticulture, as well as conducting research on propagation and pollination of tropical fruits and culture of new vegetables for the tropics.

Dr. M. J. Dijkman, Associate Professor

in Tropical Botany, has recently come to the University of Miami from the Dutch East Indies where he was associated with agricultural research and extension. His specialty is plant breeding of tropicals, which subject he will teach and is also planning research along this line.

Mr. Frank J. Remoldi, who is professor of Ornamental Horticulture, is teaching ornamentals and landscape gardening. He is also doing research along the line of propagation and nutrient requirements for tropical ornamentals.

Plant research on the tropical and subtropical fruits, especially with regard to their commercial adaptability to South Florida and contiguous areas offers a field of work that is almost endless. We have planned to approach these problems with a high degree of selection. Several research agencies such as the Subtropical Experiment Station of the University of Florida and the United States Department of Agriculture have already contributed much to solving the many problems facing the grower of tropical and subtropical fruits. The field is so vast that there need be no duplications in efforts. We are concerned specifically with tropical and subtropical horticulture. We have already established projects in which the results of field studies can be closely coordinated with the handling, packaging, processing, storing, nutritive values, and by-products of the same fruit. In short, the aim or end result of every field experiment is a finished food product ready for sale as it leaves the laboratory, or pilot plant. Our aim is to find new and better food products from tropical and subtropical fruits and vegetables and to find ways of producing and handling these tropical crops more economically.

We have set up a Tropical Food Research Center consisting of an Experimental Farm and a Food Laboratory. This unit is located on the South Campus of the University of Miami, formerly the Richmond Navy Air Base, which is 10 miles south of

the Main Campus in Coral Gables. The Campus consists of 2080 acres of which 350 acres have been set aside for plot experiments. Present plans call for the development of 15 ten-acre plots during the next several years. The ground will be broken on the central plots within the month. The plot planting of 10 acres to each fruit will be on a large enough scale to simulate commercial plantings. Protective housing for propagation material and irrigation for all blocks are being provided. Access roads will surround each block for ease of work, and will make inspection easy to the public.

In order to keep the field studies within reasonable bounds, the work will be confined principally to fruits of commercial importance such as avocados, Persian limes, mangos, papayas, pineapples, and some of the little-known introduced fruits which show promise of becoming of commercial value such as lychee, guava, sapodilla, white sapote, yellow sapote, and the annonas. The experimental work will be in the field of nutrition including both major and minor plant nutrients, varieties, propagation, plant breeding, root stock studies, and improvement of cultural methods including harvesting methods.

The Food Laboratory is also located on the South Campus. In the hospital building are located a number of offices, a food preparation laboratory, a food packaging laboratory, a bacteriological laboratory, and two large chemical laboratories equipped for bio-chemical and food composition research. We also have a large food processing room in which research of pilot plant proportion can be set up. It is tiled throughout and well-equipped with such things as stainless steel steam blanchers, steam jacketed kettles, peelers, grinders, and other food processing equipment. We also have several cold storage rooms with controlled temperatures and humidities in which we are conducting our storage and consumer package investigations. We have two fast freezing boxes and a large sub-zero freezing storage room for bulk storage. Our build-

ings are exceptionally large and will allow for ample expansion as additional space is required.

There are many technical and specific problems in the pure science field that need to be investigated, which phases of the work will be given to graduate students. These can be either in the field or laboratory. Graduate work will be given in several fields under the heading of tropical horticulture. Even though we are in the beginning, primarily interested in research, it is the plan to add additional classes each year and thus build up a splendid educational center in tropical agriculture.

As mentioned above, it is our intention to coordinate our field and laboratory work as closely as possible. Since the work is now just being initiated on the plots themselves, it will be several years before results will be obtained with regard to mature crops. However, cooperative investigations will be conducted in the meantime on already-established groves. Research is already in progress on the packaging, processing, preservation, nutritive value, and by-products of commercial crops as are now grown in this area. We know that this information will be of value to the grower, packer, and will provide additional information pertaining to the preservation and utilization of their existing crops, and will also provide valuable leads as to variety, selection, and cultural practices.

We are fortunate in having the Fairchild Tropical Gardens and the United States Plant Introduction Garden so close at hand. They have done a splendid job of introducing tropicals from all over the world and have found ways and means of growing many of these under our climatic and soil conditions. After proving that a fruit will produce well here, there is a big gap between the growing of several plants to growing a commercial-sized planting. Composition and nutrient values must be obtained and ways of handling, packaging and processing, as well as by-products, must be investigated. We recognize the excellent

work which is already being conducted in this and related fields by such organizations as the Subtropical Experiment Station, the Bureau of Plant Industry of the United States Department of Agriculture, and other state, federal, and private institutions. The field of research in tropical horticulture is endless.

There are many problems which confront us due to the numerous fruits and vegetables which are adaptable to this area and

the vast difference of this region to those of any other in the United States. We shall not solve all of the problems we now see in the many years ahead and with each year there will be new problems appearing constantly. We do hope, however, that we can take our stand along side the other research groups and have a large share in the building of new industries and in creating better living for this fruitful area.

## NOTES ON THE PROPAGATION OF THE SYMPODIAL OR CLUMP TYPE OF BAMBOOS

MILTON COBIN  
*Fairchild Tropical Garden*  
Coconut Grove, Fla.

The Bamboos botanically reputed to be the oldest living grasses of our world flora play a major role in the plant life and economy of the Orient, India, Asia and parts of Latin America. It is estimated at present that there are in the neighborhood of one thousand described species and varieties of Bamboo. (5).

The flowering and fruiting of Bamboos is a somewhat rare phenomena in most species of these grasses. In many species accurate data on flowering and fruiting periods are not available. Records of other species indicate that it is common to have intervals of thirty, fifty or seventy years or more transpire between one blooming period and the succeeding flowering period.

Altho a small number of the known bamboo species have been introduced into Florida they have nevertheless been extremely slow in coming into the prominence they deserve in the Florida landscape.

In South Florida one sees a scattered specimen or group of specimens of several different species of bamboos attesting to

the adaptability of a number of these majestic grasses to our soil and climatic conditions.

The largest collection of exotic bamboos to be seen in Florida is located at the U. S. Plant Introduction Garden, Coconut Grove, Florida, of the U. S. D. A. These introduced bamboos have proven to be among the best wind resistant exotics ever grown in Florida.

The rare flowering and fruiting habit of bamboos requires that vegetative propagation be resorted to for the production of these bamboos.

It might be of interest to mention here that wide variation in vegetative character and habit has been noted in several species of bamboos grown from seedlings. Such seedling variation can be readily noticed by inspection of *Bambusa tulda* Roxb. and *Dendrocalamus strictus* Nees. grown in Florida that were raised from imported seed.

Of three separate seed introductions of *Bambusa tulda* introduced by the Bureau of Plant Industry and at present being grown in Puerto Rico B. P. I. No. 22002 introduced by Dr. David Fairchild in 1907 from India is of exceptional economic importance and