

# Guam Agricultural Experiment Station

1977

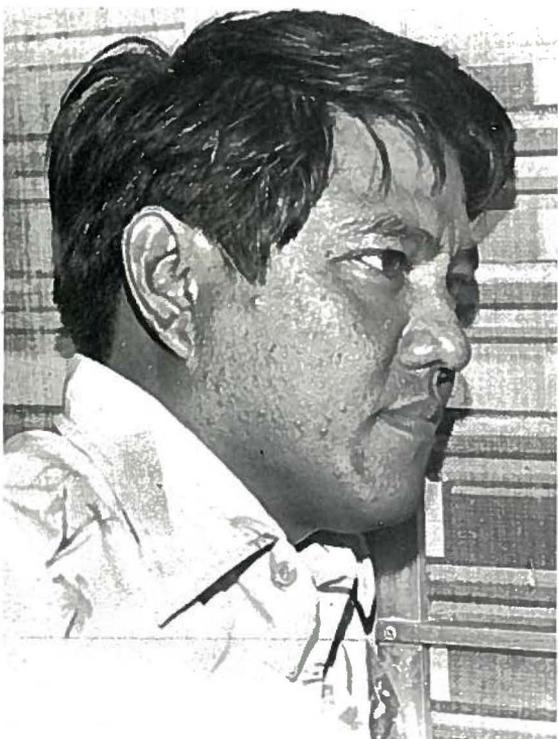


UNIVERSITY OF GUAM  
COLLEGE OF AGRICULTURE AND BUSINESS

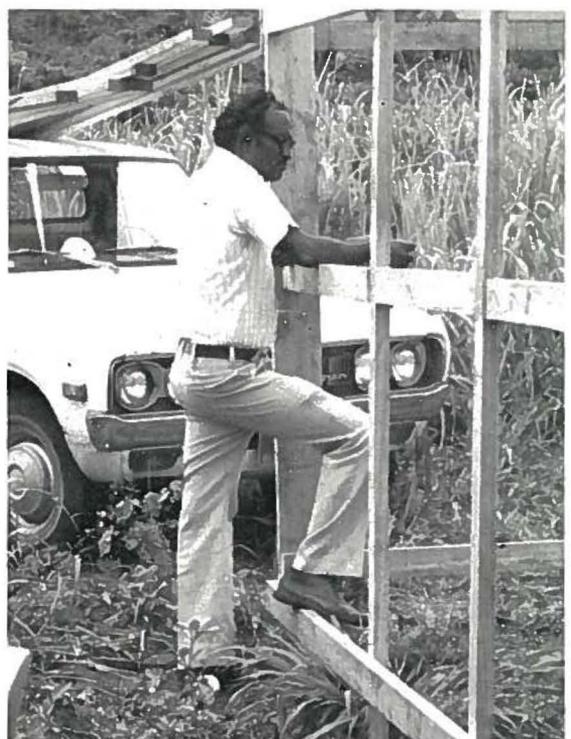
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**Guam Agricultural Experiment Station Laboratory, test fields and greenhouses, Inarajan, Guam – December 1977.**



**Dr. Wilfred P. Leon Guerrero, Director.**



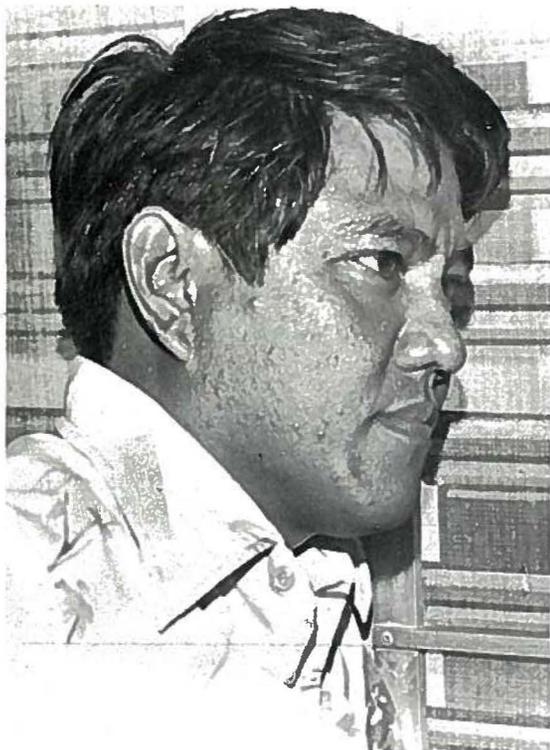
**Dr. Munniapan, Associate Director (inspecting construction).**

Published by the Agricultural Experiment Station, University of Guam, Agana, Guam.  
Booklet preparation and photography - Ed Gould

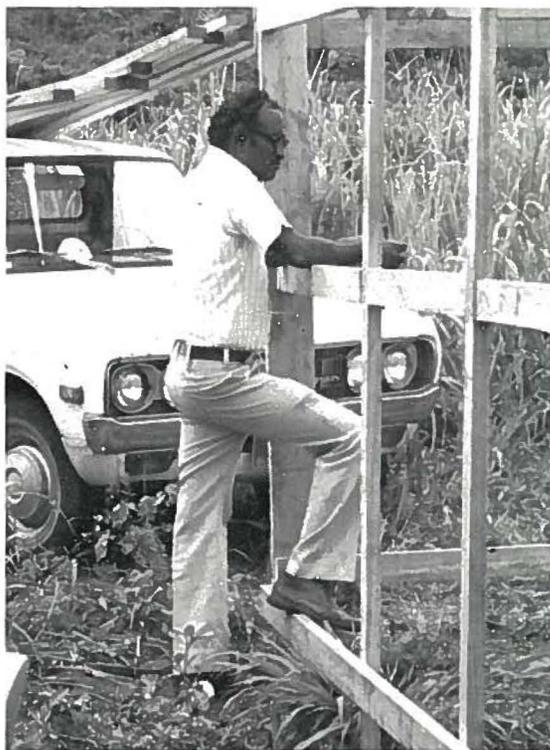
For information, contact:  
Dr. Wilfred P. Leon Guerrero, Director AES  
University of Guam  
P.O. Box EK, Agana, Guam 96910



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We hope that this publication will provide the reader with basic information about the role of the University's new Agricultural Experiment Station in Inarajan, Guam. We are very proud of this "Community Component" of the University which will serve as a foundation for expanded activity in agriculture.

## I. GUAM: THE SITUATION

### Geography and Climate

The U.S. Territory of Guam is located at lat. 13° 28'N., long. 144° 45'W., and lies approximately 6,267 miles west-southwest of San Francisco, 3,729 miles north of Sydney, 1,689 miles south of Tokyo, 2,161 miles east of Manila, and 2,260 miles southeast of Hong Kong.

The island's total land mass of slightly over 212 square miles is blessed with a tropical climate. Average monthly temperatures range from 74 degrees during the coolest months of late winter to the mid-80's in the summer and fall. Annual rainfall averages over 80 inches (could exceed 100 inches in any given year), with most of it falling during the months of July through November. An average monthly rainfall of less than 5 inches can be expected from February through April.

Two devastating typhoons have visited Guam within the past 25 years: Typhoon Karen in 1962 and Typhoon Pamela in 1976. Storms of typhoon strength (sustained winds of 75 miles an hour or more) pass through or near to Guam periodically. However, agricultural production continually seems to grow. Historically, adjustment to the tropical storm situation has been a part of life for the farmer in Guam.

### Geology and Vegetation

Two geologic provinces dominate Guam and are largely responsible for the resulting soil types found. Except for several volcanic outcrops, the northern half of the island is basically an elevated limestone plateau endowed with porous rock soils and a rich variety of mixed broad-leafed evergreens. In contrast, the southern half is largely comprised of denuded hills dominated by savanna grassland (slopes and ridges) and scattered woodlands and wet volcanic ravine forest laced with streams. Soil profiles in the south are also generally better than in the north for growing fruit and vegetables.

### Population

Guam's young (median age below 16 years) multicultural population of nearly 100,000 is primarily concentrated in the central and northern parts of the island. The Chamorros of today are U.S. citizens, but with ethnic ties that include American, Filipino, Asian, South Seas, Oriental and European influences. The native Chamorro language is widely spoken, although practically everyone is fluent in English.

The economic base depends upon the U.S. Military and tourism. The largest employer is the Government of Guam with U.S. Civil Service and the private sector following. Most consumer goods are imported with over 90% of our food supply coming from off-island.



Homeconomics Class, Agriculture School in Piti, 1926.

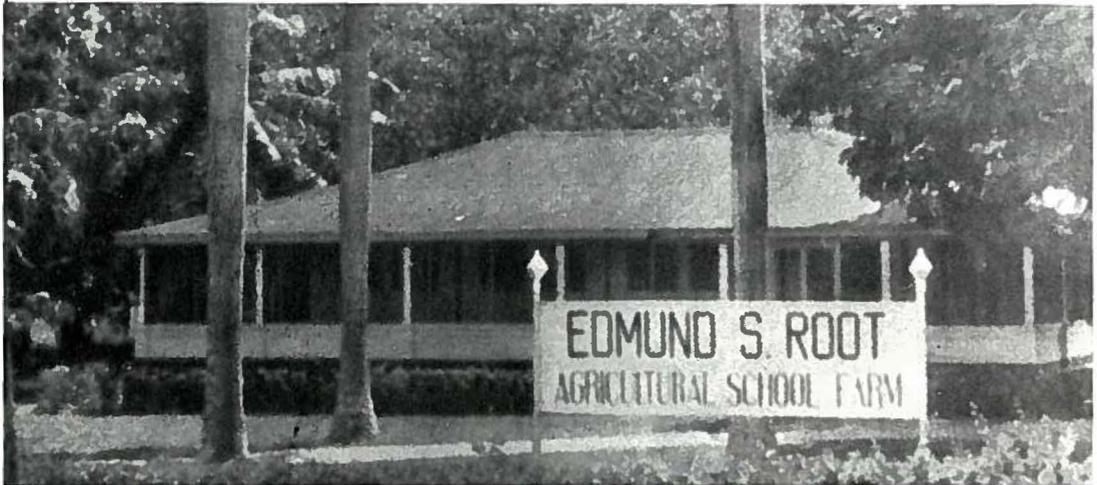
## II. THE UNIVERSITY OF GUAM-A LAND GRANT INSTITUTION

For over 100 years, the land-grant institutions of the United States have served to fulfill two vital public purposes: To provide the skills and knowledge necessary for the development of a dynamic, economically sound society, and to expand opportunity for higher education to thousands of young people.

President Abraham Lincoln in 1862 signed the "Morrill-Nelson Land-Grant Act" which gave birth to the nation's land-grant universities. Under the provisions of this law, grants of federal land were offered to each State which would agree to establish at least one college with an emphasis on agriculture, home economics and the mechanical arts. It was the nation's first attempt to provide higher educational opportunities for all citizens. Today, there is at least one land-grant college or university in each of the 50 States, the District of Columbia, Puerto Rico, the Virgin Islands and Guam.

The University of Guam appointed its first Dean/Director Dr. Wilfred P. Leon Guerrero to head its land-grant program in November, 1973. On March 6, 1974, the Board of Regents of the University approved a resolution creating the College of Agriculture and Life Sciences (now the College of Agriculture and Business) which embraces the main features of the land-grant program at the University of Guam. Its goal is to serve the agricultural sector of the economy as well as other disciplines through Resident Instruction, Research and Extension in the Territory of Guam and the surrounding Pacific regions.

The University of Guam became a member of these land-grant institutions on June 23, 1972 with the passage of the Educational Amendments Act of 1972-P.L. 92-318. The Federal Government contributed a \$3,000,000 endowment to the University of Guam, instead of granting land to Guam. Besides this annual interest, the land-grant program is also eligible to receive additional federal funds of approximately \$500,000 annually for research and extension education on a matching basis, and approximately \$200,000 for the development of resident instructional programs on a non-matching basis. Hence, the UOG land-grant program operates on a budget of approximately one million dollars annually to foster its research, extension and instructional programs.



**First Agricultural School and Experiment Station - Piti, Guam 1932.**

### III. THE AGRICULTURAL EXPERIMENT STATION

The Agricultural Experiment Station Laboratory occupies 10.4 acres of land which was formerly owned by Ton Geronimo Meno, who was a well-known farmer himself. It is located in the southern village of Inarajan. The property has traditionally been utilized for farming. Root crops have been the most dominant with taro heading the list. It is believed that even in ancient times the land was used for farming purposes.

The ancient Chamorros lived on root crops and fishing. When the first Chamorros came to Guam they brought no livestock or domestic animals--not even dogs. Breadfruit was perhaps the most versatile crop for the Chamorros. They ate the fruit, made tapa cloth from the inner bark of the tree, and made glue and chalking materials from the milk of the tree. It is estimated that 100,000 to 150,000 healthy Chamorros lived on Guam before the Spaniards came, and they were able to eat well from the land and the sea without importing any food. Food crops grown in ancient Guam were:

Coconuts	Rice	Plantains
Sugarcane	Taro	Breadfruit
Federico nuts	Yams	

The Spanish introduced the following crops:

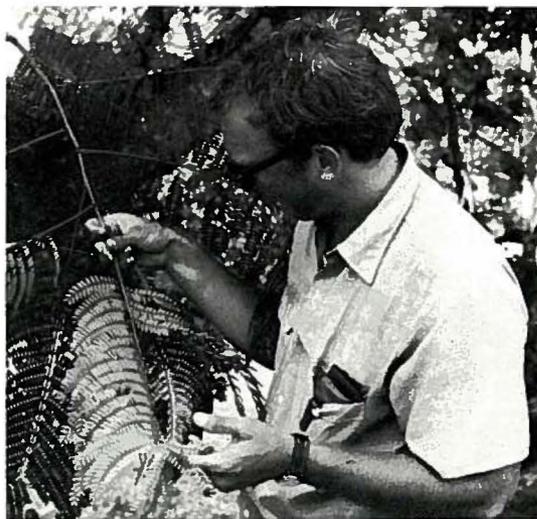
Corn	Papaya
Sweet potatoes	Flame tree
Mendioca (tapioca)	Mangoes
Candlebush (ringworm bush)	Citrus
Coffee and Cocoa	Peppers
Tangantangan	

Bananas were also growing in Guam before Magellan discovered the island and the Chamorros were the only Pacific islanders that grew rice. In more recent times, strawberries were introduced in 1909. JAK fruit was introduced from the Philippines in 1909 and Manila bananas were introduced in 1910. Records show that as early as 1911 (66 years ago) Guam had a fair which was called the "GUAM INDUSTRIAL FAIR". It was a four-day event and it included exhibits of fruit, vegetables and livestock, handicrafts and many commercial display items. Before World War II (1941) over 2,400 families in Guam derived their living principally from agricultural pursuits such as copra, fresh vegetables, poultry and livestock. Today the number is about 300 families. Also in 1941 over 15,000 acres of land were under cultivation; 12,500 acres were in coconuts. Today less than 1,000 acres are being cultivated. Corn was the principal cultivated crop at that time.

The first "Agriculture School" for Guam was located in Piti. It was called the "Edmund S. Root Agricultural School Farm," named after the incumbent Governor in 1932. The previous Governor (Governor Bradley) created the school, but Governor Root implemented the concept. It is said that one of the reasons for starting the school was the fact that during the depression (1929) Guam realized her largest agricultural harvest ever. Enthusiasm was high for increased agricultural activity.



Dr. Jeff Demeterio inspecting Atomic Measuring equipment.



Dr. Larry Stevens working on Flame Tree looper eradication.

Groundbreaking ceremonies for the current lab facility occurred on November 6, 1975. The Agricultural Experiment Station was built at a cost of approximately \$273,000 and more than \$55,000 has been invested in laboratory equipment.

The Agricultural Experiment Station is the Research (Hatch Act) component of the Land Grant programs and, as such, is primarily involved in obtaining specific fundamental knowledge which is needed to develop practical solutions to problems facing agriculture and the consumer on Guam. Research emphasis was placed on solving agricultural problems, as well as investigating potential alternative crops and methods to further enhance agricultural development on Guam.



**Dr. Milwant S. Sandhu - Pomology**



**Dr. Chin-Tian Lee - Horticulture.**

Professionals, lay people and farmers agreed that highest priority be given to research dealing with food production and marketing. Also there seemed to be a consensus that vegetable crops be given early attention.

The initial team of scientists was primarily concerned with research on the production, economics, and marketing of horticultural crops.

The team consisted of a plant scientist, an entomologist, and a soils scientist. The plant scientist was employed during most of fiscal year '75 and had conducted variety trials on Chinese cabbage, head cabbage, and eggplant even though land, equipment and field labor were not adequate. Additionally, a biologist conducted research on the coconut crab.

The Agricultural Experiment Station at present is staffed in four different disciplines, namely: Entomology, Horticulture, Pomology and Soils. Soon it will be staffed with an Animal Scientist, Plant Pathologist, Agricultural Engineer, Agricultural Marketing Specialist and possibly a Plant Breeder.

Currently over a dozen research projects financed by Cooperative State Research Service, United States Department of Agriculture are in operation. In addition, two Regional Research Projects, one on biological control of insects and the other on trickle irrigation are also in operation.

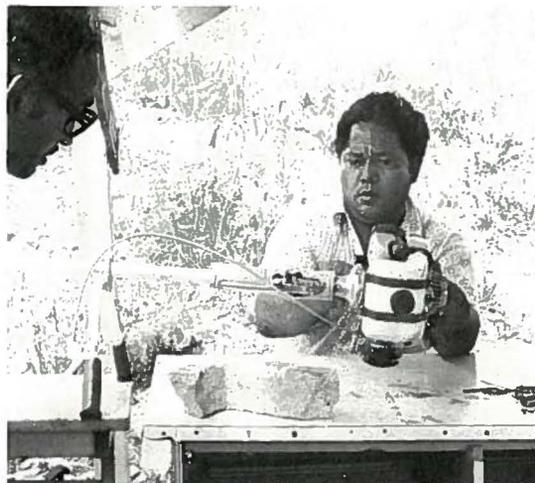


**Yvonne Jarque - Chemist (soils).**



**Marilou Baccay - Chemist (soils).**

These Regional Research Projects are financed 100% by the Federal Government. The recent approval of the Regional Research Project W-128 on trickle irrigation helped us in paving the way for recruiting an Agricultural Engineer and we hope to have that position filled in the near future. Under Regional Research Projects, the staff of the Guam Agricultural Experiment Station will work closely with the research staff of other Land Grant Universities in the Western Region of the United States.

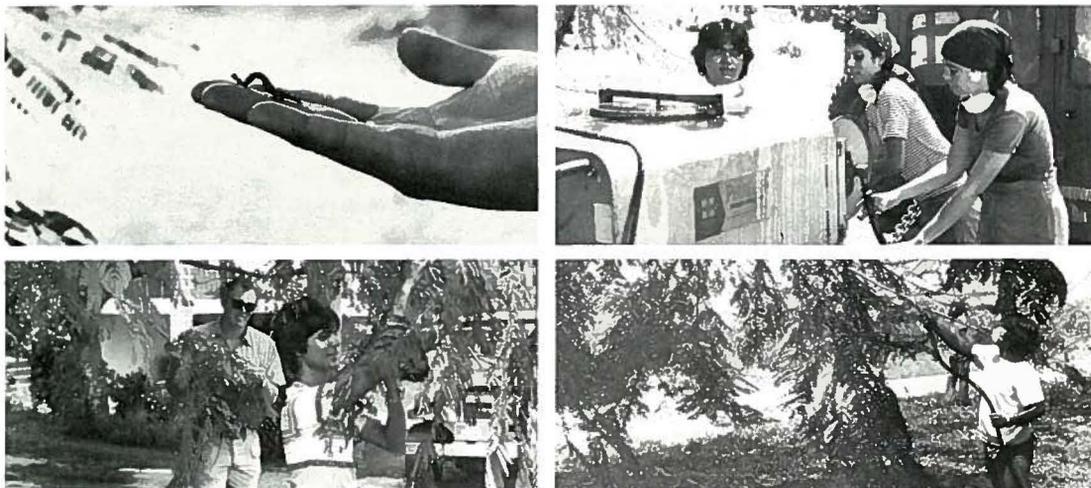


**Dr. Munniapan talks with Francisco Manglona during construction.**



**Kenny Querry and Paul Naputi construct temporary Pomology seedling shelter.**

Also, there are 50 acres to be developed by AES in the Ija area of Inarajan. The Experiment Station maintains several additional experimental plots in other parts of the island. Usually these plots are leased for a period of time from individual farmers. This provides an excellent showcase for work in the farmer's own "backyard."



**Dr. Larry Stevens and Entomology crew work on Flame tree looper eradication project.**

#### **IV. AGRICULTURAL EXPERIMENT STATION STAFF**

##### **Administration**

Director/Dean: Dr. Wilfred P. Leon Guerrero  
Associate Director/Associate Dean: Dr. R. Muniappan  
Assistant Director: Edith Blankenfeld  
Secretaries: Ruth Aguon  
Pacita Mendiola Elizabeth Flores  
Program Coordinator: Edith Leon Guerrero

##### **Research Staff**

Dr. Jefren Demeterio - Assistant Professor, Soils  
Mr. Silas Ed Gould - Assistant Professor, Media Specialist  
Dr. Chin-Tian Lee - Assistant Professor, Horticulture  
Dr. Milwant S. Sandhu - Assistant Professor, Pomology  
Dr. Larry M. Stevens - Assistant Professor, Entomology

##### **Chemists**

Yovonne Jarque  
Marilou Baccay

## **Gardeners, Maintenance Workers and Labor**

Kenny Querry

Juan Cruz

Fred L. G. Taitague

Ramon Concepcion

Francisco Manglona

Jaime Salas

Rosalie Shook

Paul Naputi

## **Biological Aides**

Frank Cruz

Thomas Blas

Larry Rhoden

## **General Helpers**

Sandra De La Garza

Joseph Duenas

Lucy Quitugua

## **V. HATCH PROJECTS**

The following is a current listing of on-going projects:

1. Varietal Selection for Improvement of Chinese Cabbage Grown on Guam.
2. Improvement of the Watermelon and Eggplant Varieties Grown on Guam.
3. Initial Soil Fertility Survey of Guam Agricultural Soils.
4. Studies on the Biology, Host Preference and Natural Enemies of the Philippine Lady Beetle.
5. Insect Pests of Cruciferous\* Vegetables in Guam.
6. Varietal Performance Studies on Major Vegetable Crops in Guam.
7. Changing Agricultural Patterns of Guam.
8. Studies on Marketing Potential of Certain Agricultural Products in the Guam Tourist Industry.
9. Improving the Status of Tropical Fruit Crops Through Selection, Introduction, and Breeding.
10. Enhancing Production of Short-Term Tropical Fruit Crops Through Introduction, Selection, and Cultural Practices.
11. USDA/State Program for Pesticide Impact Assessments.

## **VI. REGIONAL RESEARCH PROJECTS**

1. Environmental Improvement Through Biological Control and Pest Management.
2. Trickle Irrigation to Improve Crop Production and Water Management.

\* Cabbages, radishes, broccoli, etc.



