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**THE DEVELOPMENT OF APPLIED COCONUT RESEARCH IN THE PHILIPPINES**

by

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Summary

In spite of its size as the largest coconut industry and its dominant position in the World market, the Philippines has only recently established a national applied research institution, unlike many other countries, where such facilities have been available for 50 or 60 years. This situation perhaps results from the predominantly small-holder ownership of the industry, but during the 1960's the disadvantages of multi-agency involvement in uncoordinated research and the need for a major national institution was recognized with the creation of the Philippine Coconut Institute. The Institute was subsequently absorbed into the Philippine Coconut Authority as the Agricultural Research Branch (ARB) and received assistance under the FAO/UNDP Coconut Research and Development Project.

From its inception, it has developed as a practical applied research institute geared to the needs of the coconut industry and lately, more specifically, the coconut replanting programme.

Major areas of research are agronomy, breeding, plant protection (including research in the cadang-cadang disease), coconut wood utilization and studies on the improvement of copra quality. The Branch also assists the Coconut Extension Training Center, which is located on one of the three Research Centers.

The paper outlines the development of ARB over the past six years, the research undertaken and the results achieved and will form a useful introduction to coconut research in the Philippines and the optional field visits which have been arranged for participants of the Working Party.

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## INTRODUCTION

Coconut world statistics continuously show the premier position of the Philippines as a coconut producing country. This is primarily due to the 2.5 million hectares devoted to this crop. Yet, inspite of this size, the Philippines has only recently established a national institution for applied research.

The first government corporation created to promote the growth and development of the industry was the National Coconut Corporation (NACOCO). This was replaced by the Philippine Coconut Administration (PHILCOA) on 17 June 1954 and in June 1964, the Philippine Coconut Research Institute (PHILCORIN) was created to monitor, evaluate and conduct scientific researches on coconut. Then, in August 1971, the Coconut Coordinating Council (CCC) was created to supervise, coordinate and evaluate the implementation of the coconut self-sufficiency program of the government. The existence of these different coconut agencies hand in hand with other bureaus which were working independently from one another and the need for the accelerated growth and development of the industry prompted the integration of their diffused efforts. Thus, the Philippine Coconut Authority (PCA) was evolved in late 1973 through Presidential Decree No. 232.

The PCA, as embodied in its charter, "shall promote the accelerated growth and development of coconut and other

palm oils industry..." To fully operationalize PCA, the agencies namely; PHILCOA, CCC and PHILCORIN were abolished. Cognizant of the practicality and relevance of PHILCORIN's research program, this agency became the now Agricultural Research Branch (ARB) of PCA. The functions of other bureaus in relation to coconut were transferred to the Authority.

#### AGRICULTURAL RESEARCH BRANCH

From the inception, the Agricultural Research Branch (former PHILCORIN) of PCA has been planned, established and developed as an efficient applied coconut research organization. It receives assistance from the Food and Agriculture Organization of the United Nations with funding from the United Nations Development Programme. The assistance program from FAO/UNDP helped the Government in developing a modern applied research institution for coconut. This was an important step, for the Philippines was the only major coconut producer without such a facility.

Presently, the Agricultural Research Branch operates a network of three research centers and a tissue analysis laboratory complex. A coconut extension training center provides the linkage between the researchers and the extensionists.

## RESEARCH CENTERS

Activities on various subjects are undertaken in three research centers; the Albay Research Center (ARC) in Luzon, the Davao Research Center (DRC) and the Zamboanga Research Center (ZRC) in Mindanao. Although each research center is being developed towards particular areas of specialization, the activities are nonetheless guided by a unified research approach.

DRC, as the nucleus of the other centers and the pivotal point in coconut agricultural research in PCA still houses the major studies on agronomy, breeding and genetics, crop protection (except 'cadang-cadang'), and primary processing. However, in the general program, DRC is being developed principally into an agronomy-soils research center.

The Center is located in Bago-Oshiro, Davao City and has an area of 189 hectares.

In March 1973, the ZRC at San Ramon, Zamboanga City was formally acquired. The Center initially covered 500 hectares where studies in coconut breeding, primary processing and coconut wood utilization are being undertaken.

In December 1976, the ARC located in Banao, Guinobatan, Albay was acquired from the Bureau of Plant Industry. The 63-hectare research center continues to work on the 'cadang-cadang' malady. This station is envisioned to be the center for an integrated crop protection research.

## FIELDS OF DISCIPLINE

Agronomy-Soils.- The main objective is to evolve a comprehensive recommendation on agronomic practices based on palm nutrition and closely associated factors. The studies being conducted include: a) yield-limiting factors survey in coconut producing provinces; b) establishment and management of a viable network of field fertilizer trials; and c) conduct of agronomic researches and mineral nutrition experiments. To facilitate this endeavor, a fully-equipped tissue analysis laboratory was established. The results of leaf analysis are translated into fertilizer and other recommendations which are currently being applied in field fertilizer trials. Already, the analysis of coconut leaves and a limited number of essential field experiments have provided a good insight into the nutritional status of the country's major coconut areas, in particular, the common deficiency of nitrogen and the clear demonstration of the importance of chlorine for coconuts. Many trials related to the nutritional needs of polybag nurseries have been undertaken and more are planned to meet the needs of the Hybrid coconut nurseries.

Breeding and Genetics.- The primary objective is to continuously strive to improve coconut productivity through breeding. To achieve this, it is necessary to assemble, evaluate and characterize the many local and foreign coconut cultivars.

The PCA germplasm collection consists of 12 dwarfs,

4 imported and 8 locals and 11 tall, 5 of which are imported and 6 are locals. The breeding & genetics division, after several years of painstaking preparations, has become one of the few in the world with facilities and technical capability to undertake legitimate breeding programmes. Presently, 22 hybrids are studied in 7 trials.

On the more fundamental aspects, cooperative work with other agencies and universities is in progress.

Plant Protection.- The general activity involves: a) survey and monitoring of outbreaks of coconut pests and diseases, b) studies on the major pests and formulates control measures with emphasis on biological control and c) development and maintenance of basic facilities to permit the application of an integrated pest control measure.

On 'kadang-kadang' research, with the collaboration of a consultant working from the Waite Agricultural Research Institute in South Australia, the cause of the disease has been identified as a viroid. Unfortunately, the method of natural spread has not yet been identified but techniques are being developed to screen coconut types artificially for resistance to the disease.

Coconut Wood Utilization.- Investigations into the potential and economic uses of coconut wood is being undertaken at the Zamboanga Research Center. Basically, this need arose due to the great magnitude of coconut trunks to be felled with

the onset of the replanting program. These trunks, if not properly disposed, would be ideal breeding places for the rhinoceros beetle, but if properly utilized, would provide additional income.

Three years of research made apparent the great potential of coco-wood. It was found suitable for a number of structural uses and for decorative and utility articles. With the support of the New Zealand Government, additional equipment and expertise were made available to the Timber Utilization Division. Further studies concentrate on improving and simplifying effective preservation methods. With high hopes, the increasing knowledge on the unique properties of coco-wood could become the basis of a new major industry - the Coconut Wood Industry.

Copra Processing.- The work investigates on the causes of poor quality copra and the development of adaptive and feasible primary processing methods. These studies are necessary to minimize losses of the industry emanating from the production of inferior copra.

Results have showed that the hot-air drying method is by far the best method for copra drying. Modifications on the hot-air dryer are being introduced to further improve its drying efficiency.

## COCONUT EXTENSION TRAINING CENTER

Cognizant of the fact that results of research only become fully appreciated when finally adopted by the coconut farmer, the PCA includes an extension program in its organizational set-up. To make this possible, the Coconut Extension Training Center (CETC) was created. The outfit provides the necessary technical training, through basic courses in coconut technology, refresher courses and specialized training to PCA coconut development officers throughout the country.

The CETC is located at DRC to ensure the compilation of relevant and up-to-date information on coconut technology. Being in the same station, researchers and training staff are always in direct contact to discuss specialized subjects. The basic course on coconut technology is a live-in, ten-week session of practical training. Each trainee devotes 70% of his time to actual field exercises to prepare him for the task ahead.

## S U M M A R Y

The undertakings and achievements made so far reflect the original concept on which the project was designed; that research should avoid expensive irrelevance and concentrate on real problems of the coconut industry; that experiments should be conducted in accordance with the highest scientific

standards and integrity; and that PCA scientists must have the capability to formulate immediate but effective recommendations for any unforeseen problem that may occur.