AGRICULTURE

Research on Coffee

Latin nations only recently started development of modern agricultural methods. Production could be increased by relatively inexpensive cultivation practices.

By C. MARDEN COTTON

➤ THE OLD feeling that agriculture is a "poor man's business not worth spending money to study and advance" is the root of the coffee shortage in Latin America in the opinion of a U. S. horticulturalist.

Dr. William H. Cowgill of the U. S. Department of Agriculture has been in Central America as an adviser on agricultural problems since 1944.

"Most of the countries are anxious to improve their agriculture now," he says, "but they have no technicians and no facilities to train technicians in their own countries."

For the countries involved, the problem is much broader than coffee, since the failure to develop a modern, scientifically-based agriculture also affects their ability to produce food crops for their own people.

The cost of many possible improvements in coffee culture would be slight, Dr. Cowgill pointed out. Heavy fertilization might be more expensive than the average grower can afford, he said, but there are many other ways coffee production could be increased.

Per Acre Yield Low

In Costa Rica, for example, weeds in coffee plantations have for generations been hoed with an implement resembling a snow shovel. This is unnecessary and actually detrimental to the soil and the crop, Dr. Cowgill said. Most plantations are planted with the tree, *Coffea arabica typica,* but there are other varieties of *Coffea arabica* available that yield more beans and are easier to grow.

The low average yield per acre could be attacked scientifically by better plants and methods at costs within the means of plantation growers, Dr. Cowgill emphasized. Only extensive use of fertilizers and sprays might cost more than the farmers could afford.

Throughout the Latin countries today with the exception of Guatemala, Dr. Cowgill said, there is an increased awareness of the importance of scientific research in agriculture. Most of the Central American countries have set up, or plan, programs resembling our extension service to carry the results of research to the individual farmer.

Colombia is at the present time the most advanced in extension work through its Federation of Coffee Growers. Some of the countries have only recently established a Ministry of Agriculture in their government, Dr. Cowgill continued.

The United States has also attempted to help the coffee countries by growing breeding stock at the Glenn Dale, Md., Plant Introduction Station of the Department of Agriculture.

Breeding experiments to develop a high-yielding, disease-resistant coffee plant with a flavorful bean have just started in the coffee area. All of the coffee trees growing commercially in Latin America now are the descendants of one or at most only a few original plants, Dr. Frederick L. Wellman, another U. S. scientist working with coffee, has pointed out.

Drs. Cowgill and Wellman made a 'round-the-world trip to gather different varieties of coffee as a basic breeding stock for such experiments. As a result about 100 plants were started in this country to avoid the possibility of introducing diseases with the plants in the coffee plantations.

The scourge of coffee over most of the globe is a rust disease, *Hemileia vastatrix.* Dr. Wellman is convinced it is only a matter of time before this disease enters Latin America, the only major area still free of the rust.

The rust is particularly devastating to the *Coffea arabica* variety which is the type grown in Latin America.

Coffee of Varying Quality

One of the factors which has slowed up the breeding program is the wide variance in the quality of the coffee produced by various species. *Coffea arabica* yields a much finer coffee than other varieties that may be more resistant to rust and other diseases.

Most of the breeding work that has been done so far has been carried on in Brazil. Dr. C. A. Krug, a coffee geneticist, has been experimenting with mutant varieties of *Coffea arabica.*

Mutations are caused by changes in the

COFFEE IN MARYLAND—Frank Dowdle, propagator, packs coffee plants as they are taken from beds by Walter Hawley, assistant horticulturist, at the Plant Introduction Station of the U. S. Department of Agriculture, Glenn Dale, Md. The plants are being sent to Costa Rica, Colombia, Portugal, El Salvador, California and Florida to aid in plant breeding experiments to increase coffee production.

genes and chromosomes which are the carriers of hereditary characteristics in plants and animals. One of Dr. Krug's mutant trees has very high yields, but the beans are poorly formed.

Most agricultural scientists who have studied the problem are convinced that the only hope for greater coffee production is a combined plant-breeding, modern-methods program to reach every coffee plantation in Latin America.

Nathan Koenig of the Department of Agriculture set up a project on coffee cultivation at the University of Puerto Rico in 1950. Since that time the application of scientific methods has more than doubled coffee yields in Puerto Rico, he reports.

In discussing agriculture in the coffee countries and particularly their coffee culture problems, Mr. Koenig characterized their agriculture as similar to this nation's before the development of new methods, crops and machinery.

Hybrid Plant Needed

What coffee production needs is a hybrid plant and methods that will do for the coffee countries what hybrid corn and new methods did for corn production in this country.

This possible increased production probably would not bring a return to the cheap coffee U. S. housewives dream about. In addition to production problems, coffee processing as now carried on is largely a hand operation.

Cheap coffee died with the start of industrialization in the Latin countries, Alphonso Varela, technical adviser to the Coffee Commission in Washington, reported. The industrialization ended the vast pool of cheap labor which was the basis of cheap coffee.

The fruit of a coffee tree is called a cherry. The seeds of the cherries are the coffee beans. Each cherry usually contains two beans enclosed in pulp and covered with a silvery skin. Pulp and skin must be removed, the beans dried and graded before they can be shipped.

Cooperation on Research

To separate the beans from the pulp and skin, a fermentation process has been used in the past. This process is inefficient, time consuming, and often results in beans of widely varying quality.

A cooperative research program between the United States and El Salvador worked out a chemical coffee curing method that takes less than an hour to free the beans from the pulp. The chemical method utilizes caustic soda.

One of the worst aspects of the fermentation method is that it reduces the weight of the coffee beans by transforming some of the solid materials in the bean into gases that are lost. This loss can go as high as nine percent in a 40-hour fermentation period. Due to its speed, the caustic soda method reduces the weight losses.

Because the plant owner can control the curing time, he can put his whole operation on something resembling an assembly line basis, lowering his costs and producing coffee of uniformly good quality.

Naturally the final test of any coffee processing method is in the cup. According to reports, chemically cured coffee has a better flavor and aroma than the coffee produced from fermented beans.

More research of this type on coffee processing which will substitute machines and chemicals for hand labor will be needed to lower the cost of coffee in grocery stores.

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MEDICINE

Overweight and Cancer

► FOR MICE and men, overeating is dangerous in cancer development.

Formation of cancer tumors has been noticeably blocked in mice that were fed a small proportion of calories, stated Dr. Albert Tannenbaum, director of the Department of Cancer Research at the Medical Research Institute of Michael Reese Hospital in Chicago.

Mice restricted to as much as one-third of their calorie diet lived far longer and maintained their weight more than other mice not restricted calorie-wise, Dr. Tannenbaum pointed out before a group of biologists and graduate students at New York University. In these calorie-restricted mice, no cancer tumors arose over a period of two years, although carcinogenic agents had been injected.

The more restricted the calorie intake, the less the incidence of tumors, he stated.

"The same seems to hold for men also," Dr. Tannenbaum said, pointing out that life insurance records show a definite relationship between overweight and cancer mortality. Cancer incidence increases with increasing weight, insurance reports show.

It takes about one-fifth of the life span of animal or man for a tumor to develop after the patient has been exposed to cancer. Dr. Tannenbaum cited a four- to six-month period between the time cancer has been induced in mice and the sign of the first tumor. For dogs, tumors are noticed two to three years after induction. And for man, 10 to 15 years can pass before the actual lump is noticed.

"This means that the cancer process has been going on for a long while by the time the patient actually notices a tumor and calls his doctor," he said. It is in this time period that caloric diet can restrict the appearance of tumors, the loss of weight and increase the life span of man and animals with cancer.

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