

AGRICULTURE

New Crops for Retired Land

Uncle Sam's plant explorers are discovering new agricultural crops in distant lands to grow industrial materials on land unneeded for food, Fremont Davis reports.

► SPECIAL CROPS are being developed that can grow on land not now actively helping our economy.

The world is being thoroughly explored so that we can have a full range of useful plants. The world's best plants are being found. They are improved, tested and made ready for commerce.

This is some of the work of a relatively small, well-trained group of plant explorers of the U.S. Department of Agriculture under their plant introduction program.

Most of the work is carried on at nine plant introduction stations scattered throughout the United States from Washington to Florida. At these stations, tests are made to determine the ability of plants to thrive in various soils and climates.

You may someday be enriching your eating experience by using new foods, but indications are that industry will be using more plant material from the abundant production of our farm lands. Some new or relatively unknown food crops that have been investigated extensively in recent years at the U. S. Plant Introduction Station, Savannah, Ga., include the chayote, a pear-shaped single-seeded fruit; the dasheen, a starchy underground tuber of high quality; and the Chinese water-chestnut, an edible, short, bulblike underground stem, called a corm, somewhat resembling a gladiolus bulb.

Buyers Are Capricious

Even if the plants become readily available, can be grown easily and relatively cheaply, and have good food value, it still does not follow automatically that you will want to eat them. The caprice of the buying world is influenced by many factors. Things hard for scientists to understand like national attitudes, the actions of public leaders and writers, and pictures seem to influence our eating habits, as well as the merit of the food. Just now we seem to be very much interested in things Japanese.

Plants have been introduced many times. In fact, all major crops that are used in the U.S. economy have come from afar. Corn, tobacco, pumpkins, squash and beans originally came from the tropical American countries. Later introductions include Lardino clover from Italy, dates from Africa, and barley from Asiatic Turkey.

Now there are many fields that are not producing because of the peculiar U.S. economic situation that finds a saturation of certain crops. The land out of production can be used for crops which do not compete for markets with the established staples of which we have too much.

Much more now unused land will be

farmed for industrial crops, such as the castor bean, source of castor oil. They do not contribute to the food surplus.

A new introduction which looks as though it will be widely used in the future is crambe (*Crambe abyssinica*). Dr. John L. Creech, assistant chief of new crops, U.S. Department of Agriculture, says: "The chances are you have never heard of it, but you probably will." It is a crop with great industrial potential. A fine oil is obtained from its seed that is of use in synthetic rubber manufacture, plastics, lubrication, temperature quenching and other specialized industrial uses.

This plant comes from northern Africa—Ethiopia or Abyssinia. It is a relative of mustard and grows seeds like round grape seeds on two- to three-foot spikes. Tests show that it grows in northern states in summer months and in southern Texas in winter months.

Dr. Creech pointed out that plant introduction work will not make it possible to use enough land to completely solve the surplus situation, but it may help in some specific areas.

The United States is showing great interest just now in Japanese foods and ornamentals, and Dr. Creech has just returned from the Orient with a treasure of material.

The medical profession has shown great interest in the plant kingdom in its hunt for compounds to fight major diseases such as cancer, high blood pressure, and arthritis. More than 400 species of tropical yams (*Dioscorea*), a steroid producing plant which is used in manufacturing cortisone, have been brought in, but only about five yield sufficient amounts of steroids. This may never be a great crop for the United States, but scientists must continually search, for some clue to better life or health may be found in such plants and supplies of these plants must be always available.

Search for New Plants

The search for new beneficial plants goes on under the supervision of specialists. The casual collector could never do the job.

"With our widespread official contacts, through agricultural attaches, and agricultural technical assistance programs, the need for the casual collecting of seeds, or plants, by individual foreign travelers should no longer be necessary," Dr. Creech said.

"Requirements for germ plasm, the hereditary units for breeding, have become so exacting that explorers may be chosen from experiment stations where the needs are thoroughly understood. For example, when we require peanut breeding stocks, we send a peanut breeder to South America, or if a broad knowledge of species is required for general screening, a botanist undertakes the expedition."

"Usually the material is fitted into an



INTRODUCING NEW PLANT—Richard F. Baker, agriculture aide, carefully records the growth of tropical yams (*Dioscorea*) at the U.S. Plant Introduction Station, Savannah, Ga. Material from the yams is used to synthesize cortisone.

already active program and there is an understanding of the needs for the introduction by our specialists at Beltsville at the time the material is received."

In other words, a good idea of the dream plant needed is already in mind. These introductions can help make it come true.

Scientists try to improve plants by making them more resistant to pests and diseases, more adaptable to conditions of growth, and also improve the taste, color and table quality of the plants.

Constant Work Needed

This side of the new crop program requires constant work, to breed, with the help of introductions, new crops from the old.

Time and again breeders have turned to wild introductions which are primitive in comparison to modern varieties as a source of much needed genes. The spinach industry has thrived only because breeders were able to find resistance in wild introductions of spinach from the Middle East each time new races of downy mildew and other leaf diseases developed on supposedly resistant varieties.

The work is a slow process and one of the problems is to keep the seed material available over a long period. It is not at all unlikely that a future generation of scientists will sorely need the source seed used by today's plant breeder.

A great seed storage laboratory at Fort Collins, Colo., is in use by the U.S. Department of Agriculture to alleviate this diffi-

culty. Valuable species resulting from more than 60 years of plant exploration are kept under controlled temperatures and humidity. Nine rooms can store 300,000 quarts of seeds.

Under these conditions the seeds will keep their growing ability for a long time, but means are provided for the planting and redevelopment of seed, so viable seed is always available.

This makes a germ plasm bank for tomorrow's plant workers. The seed is available free to qualified research workers for breeding studies, when all other sources fail.

When Nikita Khrushchev was in the United States, he saw the results of years of highly scientific plant breeding which resulted in the hybrid corn crop in the United States.

Khrushchev Liked U.S. Corn

He admired the corn and probably for good reason. The Soviet problem is quite different, for they need all the food they can produce. One factor in high U.S. production is good plants and seeds. So his admiration of the full, large ears of corn was most likely genuine.

Only a fraction of the world's plant kingdom has been used by man. This includes main food, animal feed, textile and industrial fiber, and specialty crops, including ornamentals and drugs. The search goes on, and the United States can have much of what it wants in the way of new crops.

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SPACE

The Life of Space Mice

► SALLY, AMY AND MOE, the inseparable team of U.S. Air Force moustro-nauts that 17 months ago blazed a trail in space—for men and monkeys—in the nose cone of the mighty Atlas, have broken up. Amy, alas, is no more.

The little black space pioneer died last November, more than a year after she and her colleagues made their record-breaking flight. A hernia caused by her high-living habits on earth rather than high-flying in space was blamed.

Amy enjoyed taking high jumps in the little luxury-type mouse enclosure in which she was housed at the Air Force's School of Aerospace Medicine, Brooks Air Force Base, Tex., Dr. Hans G. Clamman, chief of the department of Space Medicine, told SCIENCE SERVICE.

The three space mice had 26 minutes of weightlessness in the Atlas nose cone and had gone as high as 600 miles during a 4,400-mile trajectory that carried them from Cape Canaveral to Ascension Island.

During their ride, while in a weightless state, all three moustro-nauts dined comfortably from special plastic feeding tubes on oatmeal, gelatin and roasted peanuts mixed with water into a paste.

A tiny radio transmitter carried on Sally's back telemetered physiological responses back to earth that indicated that the mice had no difficulty adjusting to weightlessness.

In fact, judging from their condition and responses when they were recovered, they

must have enjoyed the experience, particularly Amy. All the mice were frisky and friendly, but Amy displayed greater friskiness.

However, her frequent high jumps on earth are believed to have aggravated an inherited tissue weakness that is not uncommon in mice as well as in men. A surgical attempt to correct the condition in Amy was successful, but she hemorrhaged, possible as a consequence of a slipped suture.

Besides Sally and Moe, Amy is survived by more than a dozen children and grandchildren, all vigorous and healthy. Both Amy and Sally were mated with Moe when they returned from space. No abnormal births resulted.

Sally and Moe, now both 20 months old, the equivalent of 60 years of human age, still are active. Moe's dark hair has grayed, but not from radiation, Dr. Clamman said. Sally is still an attractive little brunette, appearing much younger than her advancing months.

Dr. Clamman predicts both may live beyond the normal two-year life span. Upon their peaceful demise, taxidermy may preserve Sally and Moe for posterity.

While there are no announced plans for their offspring, rumor has it that they may be groomed for lunar flight. Who better than a moustro-naut could settle for all time whether the moon is made of green cheese?

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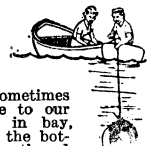
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