

PHARMACY

Refugee Crops

Medicinal plants, formerly grown in far parts of the world, are now being adapted to the American way of plant life to ease war shortages.

By GLENN SONNEDECKER

► STRANGE new victory crops like deadly nightshade, henbane, stramonium and castor beans are now being grown by the nation's farmers. Botanical drugs, many of them strangers in a foreign land, are being adapted to the American way of plant life to ease important shortages.

Dr. D. M. Crooks and his associates in the Division of Drug and Related Plants guide the development of drug production here from amid the sprawling laboratories and greenhouses, and the rolling tests fields that make up the government's Bureau of Plant Industry at Beltsville, Md. Scope of the program includes experiments conducted in every state.

Of the shortages of European drugs that have received such wide publicity, Dr. Crooks reveals that all have now been replaced by American-grown products of equal or better quality than the original imports.

Some medicinal plants from other regions still have the experts stumped because they are not adapted to our soil and climate.

What about morphine, for example, and other pain-killing derivatives of opium, which medical men count among their most valuable drugs in either war or peace? Tales of a dwindling stockpile of opium hoarded in old U. S. Treasury vaults has caused this question to be raised by many a physician and pharmacist.

Poppy Is Banned

Production of the opium-yielding poppy is specifically banned in the United States by the Opium Poppy Control Act because of the dangers of illicit traffic and addiction. Crude opium for the manufacture of medicinal supplies is imported through the Bureau of Narcotics from Persia, Turkey, India and elsewhere in the Orient.

Before this product can ease suffering in America, however, it must journey thousands of miles through the war zone. By plane, ship—somehow—opium is still getting through. But Uncle Sam is not content to depend on this slender line of

communication with the possibility of Turkey, India or other opium producers being blotted from the picture by war clouds.

Cooperating with the Bureau of Narcotics, the Bureau of Plant Industry conducted research and developed ways and means of producing opium here in case it is necessary. Results of the experiments are a carefully guarded secret. But it can now be revealed that the government has the information and suitable seed at hand to produce this valuable medicine in quantities to fill the needs of both the armed forces and civilians, should a war shortage develop.

Another vital drug, belladonna, is usually imported from around on the opposite side of the globe from the opium growers. This broad-leafed herb, also called deadly nightshade, has always flourished readily in certain parts of this country. But mainly because of cheap labor pharmaceutical laboratories have depended on growers in Central Europe to provide the crude drug.

From the leaves or roots are extracted potent white crystals used in various

forms to relax asthmatic spasms, dry and dilate bronchial tubes and relieve pain. Eye specialists use certain forms of it extensively in examinations because it paralyzes the adjustment mechanism of the eye and dilates the pupil.

The women of old Italy were also familiar with this dilating action and used it to give their eyes a more alluring luster—whence the name belladonna, which means "beautiful lady."

Started Two Years Ago

This old and still important drug might soon be disappearing from medical kits if research had not been started two years ago by Dr. Crooks and his associates. At Beltsville they increased plantings of selected strains, then collected the seed harvest and replanted for more seed. By last spring they were ready to distribute the seed to 200 prospective growers with suitable soil and equipment in Wisconsin, Ohio, Pennsylvania, Tennessee, Virginia and other states.

It's a small specialty crop—only 500 acres were planted in all. But from it and a few other scattered plantings came enough deadly nightshade to meet our military and civilian needs. Content of active constituents in the crude drug averaged almost twice the standard in the U. S. Pharmacopoeia, an official book of drugs.



YOUNG PLANTS—Propagated drug seedlings are being inspected in an experimental greenhouse.



BELLADONNA—This important medicinal plant is shown being harvested from test plots and weighed to determine yield.

Stramonium is a drug with action similar to belladonna and of the same family. Although imported from Europe for economic reasons, it grows wild in the middle half of the United States as the evil-smelling jimsonweed or thorn-apple. When war came and prices shot up, all that remained to do was increase collections from the countryside. Cultivated plots were also expanded and shipments have begun from South America.

As a result, it looks as though a surplus has developed. Like many other drugs, stramonium is needed but only in relatively small amounts.

"We've tried to guide drug production to those who have a chance to make something out of it and at the same time make a valuable contribution to the nation's welfare," Dr. Crooks explains. "From the standpoint of land utilization drug growing is insignificant, but from the standpoint of importance as medicine it is vital."

A Parasite

Ergot is an important drug that requires no additional land at all for production. It is not a green plant but a tiny parasitic fungus that infests fields of rye and grows in place of the grain during warm moist weather.

Ergot contains powerful medicinal principles of value in preventing hemor-

rhage after childbirth and hastening delivery.

In this country, ergot has been screened out of our rye grain and thrown away. Otherwise it would turn up in beer or bread, causing widespread poisoning in the form of spasms and circulatory disturbances or gangrene. In olden times, it was not unusual for people's limbs to drop off mysteriously—later this was proved to be gangrenous ergot poisoning.

But in proper dosage doctors need preparations of this peculiar drug. Considerable quantities were imported from pre-war Russia and Spain, for there it could be produced most cheaply.

With foresight, the government has built an ergot stockpile. Supplies are now being augmented by ergot processed from rye screenings of United States mills.

Digitalis or foxglove, the invaluable heart remedy, is a drug familiar to many gardeners for its ornamental purple flowers. Escaping into meadows and pastures, it now grows wild in many localities and is especially abundant in the Pacific Northwest. Collections of these plants, coupled with increased production of drug farms, quickly made up for the lack of European imports. Excellent quality of the American product and a new official method of standardizing the heart medicine by testing it on cats in-

stead of frogs, should result in an even better product than we had before the war.

Drugs that have been cut off from the Pacific area are not so easily replaced. Many are slow-growing trees, vines and shrubs, often fussy about proper climate.

Here South America is playing an important role. It is the natural home of cinchona trees, for example, from which we get quinine. But samples which Dr. Crooks and his associates are receiving for analysis confirm that the trees contain relatively little quinine.

Since regular imports from the South Pacific have been cut off, the Bureau of Plant Industry in a cooperative project with the Board of Economic Warfare and other agencies is supplying improved high-yielding cinchona strains for South American planting. Experiments increased the active constituents in the bark of some selected strains to 10% compared to about 4% yield from the native trees.

It is believed that many other drugs that have come from across the Pacific could also be produced successfully by our neighboring republics.

Castor beans are exported from Brazil, but here again our main source was formerly far-off India.

Experts were wondering what could be done to fill the nation's needs for castor oil which even in peacetime demanded imports of more than 140 million pounds. Although castor oil still has considerable medicinal use, most of the supply is used for a variety of industrial purposes. War has skyrocketed these demands to enormous proportions.

Seed Production Program

So Dr. Crooks and his associates at the Bureau of Plant Industry went into action. After extensive tests they entered upon a seed production program of three selections of castor plants in cooperation with the Agricultural Adjustment Agency and Commodity Credit Corporation. Still in progress, this project is expected to yield 5,000,000 pounds of seeds at the end of the coming season.

Commercial production of castor beans will then be launched if war transportation fails to supply sufficient imports.

Research is also being conducted with an eye toward establishing castor beans as a permanent part of post-war agriculture.

Some of the other newcomers may also stay on after the war, finding their niche among specialty growers of drug plants who are content with a small crop of great importance.