

## HYDROPONICS

# Food From Soilless Gardens

The Army's soilless farms are yielding millions of pounds of vegetables for the American occupation forces in Japan. Other hydroponic installations have been made.

➤ **SOILLESS** gardening is producing tomatoes, lettuce and other fresh things to eat by millions of pounds for American garrisons and occupation forces in Japan and other far islands. An Army Quartermaster Corps survey shows that the expected green-vegetable crops from all hydroponics installations will amount to more than 3,582,000 pounds. Nowhere else has this type of gardening ever been undertaken on such a scale.

Biggest installation is in Japan, where there is a 55-acre soilless "farm" at Chofu, near Tokyo, and another of 25 acres at Otsu, near Kyoto. Five acres of the Chofu installations are under glass—and that's major greenhouse operation in any man's gardening. These big projects are under the command of Lt. Col. E. W. Elliott, who had had previous experience in directing soilless gardening at the now abandoned pioneer establishment on Ascension island and at Atkinson Field in British Guiana. Other hydroponic installations now operating are on Iwo Jima and near Nanking, China.

## First on Ascension Island

Soilless gardening was resorted to originally in such places as Ascension and Iwo because American soldiers like fresh salad vegetables and there wasn't any soil in which to grow them. It is being conducted in Japan and China because the unsanitary fertilization practices of Oriental agriculture make it unsafe to eat anything raw. All these places are so far from American ports that it is impracticable to transport fresh vegetables, either by refrigerator ship or by air.

Vegetables raised in all these soilless gardens have been reduced to a standard set of six: tomatoes, lettuce, radishes, cucumbers, onions and green peppers. The Japanese gardens are expected to produce 2,000,000 pounds of tomatoes alone. For production in the tropics, a very lucky stroke was the creation by plant breeders in the U. S. Department of Agriculture of a variety named "Slobolt", which will not go to seed when the weather is hot, as most kinds of lettuce do.

The type of soilless gardening or hydroponics adopted by the Army is known as gravel culture. Very long, shallow troughs of concrete or asphalt are filled with fine washed gravel, volcanic cinder or other inert material. Plants with their roots supported in this are watered at regular intervals with a solution containing fertilizer salts in a balanced formula. Solution running out at the lower end of a series of such troughs is caught in a sump, analyzed to determine what salts it has lost, and brought back up to standard for re-use at the next watering.

Production of vegetables by this method is admittedly not cheap. Cost accounting shows that some items, like lettuce and radishes, cost about twice the ordinary commercial production figures. On the other hand, hydroponic tomatoes cost only three cents more than commercial tomatoes: 19 cents as against 16. And cucumbers actually cost much less: four cents a pound as against 11 cents for commercially raised "cukes". Cost was highest on the pioneer establishment at Ascension island, which is strictly a desert island. There every pint of water used in the garden, and for all other purposes, had to be distilled out of sea water, with imported oil as fuel.

Costs in Japan are kept down, partly because there is plenty of natural water, but mainly because of the very high quality of Japanese help. High-ranking horticultural scientists eagerly assist Col. Elliott, and many of his "field hands" are graduate students from the universities who want to gain the "know-how" of this new American technique.

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## AERONAUTICS

## Inland Ports Planned To Promote Water Flying

➤ **INLAND PORTS** for flying boats, definitely included in a program of the U. S. Civil Aeronautics Administration, will extend water-flying across the continent. Lakes, rivers and flood-control and irrigation reservoirs will have a new use.

Approximately 250 major seaplane

bases throughout the United States are planned. The scheme is to have at least one such facility available to cross-country flying-boat pilots every 125 miles. In addition there are thousands of lakes that can be used for private flying.

The program is aimed at eliminating the biggest present stumbling block to the growth of seaplane flying, the Aviation Writers Association was told by Theodore M. Wayave of the CAA. Now, except for certain highly-developed regions of the country such as the Atlantic coast, seaplane pilots have few places to go where they can obtain adequate service, he stated.

The Federal Airport Act provides federal assistance in developing seaplane bases, and calls for 50-50 sharing of costs by the Federal government and local sponsors. Proper anchorage, docks for unloading, and facilities for re-fueling and servicing planes are necessities at the proposed flying-boat ports. Approach lights, and a traffic control system, would be needed at those with heavy use. The ports would require an average of \$10,000 to develop, Mr. Wayave estimates. Surveys are now underway.

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