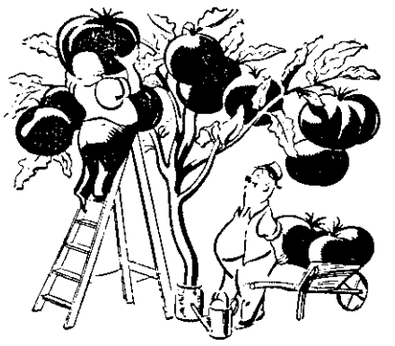
WATER DOES THE WORK

The Science Of Gardening Without Soil



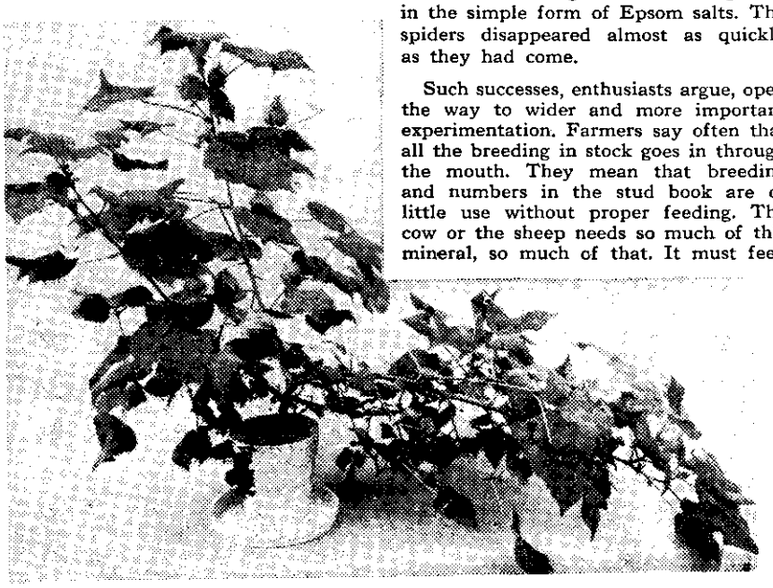
Vegetables all the year round; flowers at any season, coloured as you please; gardens without disease; gardens, in fact, without gardens—gardens in tanks; that is hydroponics. This article tells how the science of soil-less gardening has advanced in New Zealand in the past year. It claims no authority. It simply passes on the story told to "The Listener" by enthusiastic propagandists.

A YEAR ago, hydroponics in New Zealand was a novelty. It was novel enough to be little more than a stunt. Now, hundreds of members of the New Zealand Hydroponics Institute have made from it a fascinating hobby or a profitable sideline. Hydroponics is established, and is still growing in popularity.

Plants do not actually use up the soil in which they grow. The soil is only the medium through which they take in mineral supplies essential for growth. It stores these constituents for the plants, and holds them up to the sun and air, from which they take other essential supplies. The science of hydroponics does the same thing for the gardener's plants, but it does them without the soil. To carry the minerals it uses water. To hold the seeds or plants it uses any suitable material like netting. And it gives the gardener almost absolute control over the feeding and maintenance of his flowers, fruit, or vegetables.

For Pleasure or Profit

Its first great advantage is simplicity. There is no garden to be dug, no plot of land to be bought or leased, no surplus space to be covered. All that is needed is a tank, some odds and ends of netting, scrim, etc., water, and a supply of chemicals. These materials the "hydropondriacs," as their secretary, J. Crowe, of Wellington, calls them, secure through the Institute.



Cotton plant grown by the continuous flow method of sand culture

As simply as that, they secure the means for water-culture gardening. As they feel inclined, they can use it either for a hobby, or as a profit-making business. One Institute member started with a few tomato plants in a small tank. Now he's growing thousands. He can grow them any time of the year he likes to have them, and he can grow them prolifically and as sweet and firm, he maintains, as the plants grown in soil.

Those are only some of the more obvious uses to which hydroponics can be put. For both the horticulturist and the plain gardener there are a host of other uses for such a simple and handy method of growing things.

Control of Pests

The gardener who has been worried by insect pests or plant diseases, given some knowledge of his subject, can set about experimenting in the development of resistance to disease among his plants. It has been found, for example, that the red spider pest comes to plants suffering from magnesia deficiency. The Institute carried out an experiment to prove the worth of its work in this direction. A plant was growing strongly in the ordinary solution. This was drained off and replaced with a solution from which magnesia had been omitted. Within a week that plant was covered with red spiders. They were allowed to remain for a day or two, and then the solution was strengthened with magnesia, in the simple form of Epsom salts. The spiders disappeared almost as quickly as they had come.

Such successes, enthusiasts argue, open the way to wider and more important experimentation. Farmers say often that all the breeding in stock goes in through the mouth. They mean that breeding and numbers in the stud book are of little use without proper feeding. The cow or the sheep needs so much of this mineral, so much of that. It must feed on healthy pasture, and the pasture in its turn cannot be healthy unless the soil in which it grows is healthy too. The same applies to human beings. They can drink all the milk in the world and still miss essential minerals if these have not been present in the pasture from which a cow has made that milk. They can eat all the vegetables in the world, all the fruit, and all the meat, and their diets will still be deficient if there has been a lack of necessary constituents in the soil which first fed all these things.

With hydroponics the gardener can see with his own eyes exactly what minerals are made available to the plant. The farmer, if he likes, can try out his clovers and grasses in the hydroponic tank, and see for himself why they grow richly in the water solution while they grow poorly on his undernourished land. Perhaps he is using plenty of one manure, forgetting about other necessities. His pasture may look rich, but his stock are still suffering from a deficiency. Tests may prove that sick plants and sick animals mean sick soil. If they do, the lessons learned in the tank can be applied quickly to the paddock.

Aesthetic Possibilities

There are interesting æsthetic possibilities in hydroponics for horticulturists. Mr. Crowe demonstrated this fact with a hydrangea. He grew a hydrangea plant in a short length of drain-pipe, blocked at one end with cement, and set up in the hallway of his home. A wooden collar at the open end supported the plant, which fed on a mineral-soaked solution, without earth, sand, or gravel of any sort. By altering the acidity of this sclution, using such common ingredients as citric, tartaric, or sulphuric acid, in minute quantities, he was able to give that hydrangea almost any colour that he wanted. One week it was pink, next week cream, then purple, or scarlet.

For Institute members with no world-shattering ambitions, hydroponics is simplicity itself. They need not know even the contents of the packets of chemicals they receive. They make their tank, pour in the stuff, and up come the plants. If this interests them enough, they can begin their experiments.

Experiments in California

For the formulæ that enable so many people to grow their gardens right under their hands and eyes, "hydropondriacs" are indebted to Doctor W. F. Gericke, a Professor at the University of California. Many other other scientists had thought of the artificial manufacture of a soil equivalent. Dr. Gericke put the idea into practical form. He started with small tanks, established his basic formulæ, and continued his experiments with huge tanks growing tons of vegetables, or acres of flowers, in season and out. When he grew 80 tons of tomatoes to the acre of tank, professionals began to wonder if their noses were not going entirely out of joint. He went from one success to another, until his University became so interested, and so exasperated at the Doctor's refusal to announce his formula until he had everything quite straightened out, that it assigned other scientists to duplicate the work. Experiments are still going on, but they have already put hydroponics well on its feet, even if they are only web-feet.

Pan-American Airways uses the method to grow plants for its staff on the base at barren Wake Island. Admiral Byrd became interested in the work done in New Zealand and took two tanks to Little America last year. Russian scientists, who have been working independently of the Americans, nourish settlements in the Arctic with nothing but liquid-soil and artificial sunlight to make the plants grow.

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Tip For Singers

The latest "scientific" theory is that meat eating is harmful to the vocal chords. The British, the argument goes, eat more meat than most other nationalities, and good singing voices among them are few. Whereas in Italy good singers are the rule rather than the exception. The average Italian diet consists mostly of cereals and vegetables.

As further proof of this theory its supporters offer the fact that birds with the sweetest notes are vegetarians, while the carnivorous birds, such as eagles, hawks, and vultures can only utter harsh, croaking sounds. But what does a lark live on? And what happens to the worm when the thrush meets it on the lawn?