BOTANY

How to Grow Plants in House

Hints on flower pot gardens and how to make them flourish; new technique of chemical feeding of flowers and vegetables grown without soil.

➤ LITTLE indoor gardens kept in flower pots play a part in the home life of almost everyone. They may range all the way from the scores of thriving plants kept by active housewives to the single struggling rubber tree of a crowded city apartment. Everyone can have a few green leaves and maybe a flower or two around the house.

Planting in Flower Pots

The conventional flower pot has been found, through many generations of use, well suited for growing plants indoors. A few hints may be useful, however to make sure of their proper management.

In the first place, the pot should be large enough for the plant that is to grow in it. It is to be remembered that most plants spread their roots at least as far as they spread their branches, and farther. Even a seemingly big pot, therefore, is close quarters for a plant, and the deficiency will have to be made up to the crowded roots by ample water and rich earth.

But not too much water, and neither too much nor too little earth. If you fill the pot too full, you will be washing part of it over the rim, or slopping water over, and in any case you will be encouraging a heap of dry dust to form above the level of the edge. If you put in too little, the natural settling of the soil will bind the roots down into the narrow end of the pot, in half the space they were intended to have; and of course the less earth in the pot the lower is the fertilizer supply available for the plant and the more likely one is to over-water and turn the soil into a mass of bricky mud. There is a happy medium: one finger-width (that excellent, flexible old unit of measurement!) below the rim of the pot.

If Soil Is Not Good

The time-honored way of keeping houseplants in pots of garden soil is excellent—if you have good soil to start with. However, many of us who live in cities are handicapped by not having any good soil in our own backyards. Instead, we are all too likely to have sterile stuff that was thrown out when the basement was dug for our apartment house, perhaps mixed with building debris and later accumulations of cinders. Plants can't thrive on that. And even when they are started with good soil in their pots, houseplants eventually use up its initial supply of the chemical elements they need for their life-activities. So to the soil in the pots, whether good or poor to start with, it is often necessary to add new supplies of these elements.

This may sound as if you had to be a chemist or a plant physiologist in order to keep your houseplants going. It isn't really as complicated as that. You can get from any well-stocked drugstore the few things needed, for the major mineral elements in plant nutrition are only seven: potassium, magnesium, calcium, phosphorus, sulfur, nitrogen and a little bit of iron. These are not supplied to the plant separately, but paired with each other in compounds: potassium phosphate, magnesium sulfate, calcium nitrate, with the iron also coming as a sulfate.

Plant Chemicals Ready to Use

It is possible to get these compounds ready made up and weighed out in vials, to be dissolved in water for a balanced plant ration. When you get a set of the balanced-ration chemicals, all you need to do is dissolve them in water according to directions, and water your plants with that solution instead of ordinary tap-water.

It will be easy to make up the solutions, because the chemicals in the Science Service Soilless Gardening Kit have all been weighed out in the right proportions for the best nourishment of plants. The chemicals for the nutrient solution are in plastic bottles.

To make six gallons of solution, just empty all the large bottles except the one of ferrous sulfate into 24 quarts or six gallons of water. It is best to used distilled water, such as you can get at your auto service station, but if this is not convenient, ordinary tap water will do.

Do not mix in the ferrous sulfate until you are sure you are ready to use the solution, because if it stands the iron salts will precipitate out. In the case of this chemical, you don't need to use all the contents of the vial—one-eighth of the contents of the bottle is plenty to meet the iron requirements of the plants, because they need very little iron for growth.

There is nothing about this solution to spoil, and it will keep indefinitely, but you don't need to make it all up at one time unless you feel like it. To mix a smaller quantity, just use a proportionate part of the chemicals. For example, to make up two gallons, or eight quarts, use one vial of the potassium acid phosphate, two-thirds vial of magnesium sulfate, and one-third vial of calcium nitrate.

In addition to the elements mentioned, certain others are needed in extremely small quantities or "traces". It is not necessary to add any of these, however, for they are contained as "impurities" in the chemicals in your kit. These are not the highly purified chemicals used in the laboratory, but what is known as the "technical grade."

Only one precaution: Do not keep your solutions in metal containers; use glass or pottery. You can mix them in aluminum, however.

With this nutrient solution it is possible to keep plants healthy and vigorous when they are growing in the poorest of soils. It even enables you to grow plants without any soil at all; increasing numbers of people are having a lot of fun doing this—a thing that used to be possible only to scientists in research laboratories.

Gardening Without Soil

It is often easier, cleaner and more interesting to do without soil altogether in gardening in the house. Since the chemical solutions furnish the materials needed by the plants for growing, it is possible to use for the "soil" substances that don't contribute to the growth process.

One of the most convenient of these is a kind of mica material, called vermiculite. This is light in weight, much lighter than sand or gravel. It is clean and easy to handle. And it can be used over and over again.

Instead of conventional clay garden pots, there are now available attractive green pots made of processed cardboard that can be kept flat in little space and assembled when needed.

This material is contained in the Science Service Soilless Gardening kit, along with the chemicals, seeds, etc.

To plant seeds, first fill one of the little pots with vermiculite up to about a half inch from the top. The next step is to lay the seeds on top of the "soilless soil."

The number of seeds that you plant in one pot depends upon the size of the seed. For big soybeans, use only one to a pot. Use two each of sunflower, gourd and nasturtium. Use four of the okra and radish seeds. The tomato seeds are smallest; you can plant as many as six of these. Radishes or gourds will come up fastest and so if you like to see results quickly, begin with those.

Next cover your seeds by adding another quarter inch of the vermiculite. Then water.

Kit Is Available

For those who wish to utilize this novel method of home gardening, Science Service, as a part of its non-profit activities for the popularization of science, has assembled and made available a kit for soilless gardening. Full directions are given in a booklet on how to use the kit, and additional information is given on extending hydroponics to large-scale use. In this kit there are a dozen green pots, the chemicals the plants will need, seven kinds of interesting seeds suitable for soilless gardening use, a box of vermiculite, which is the shiny stuff that serves as soil but isn't really. In addition there are two vials of plant growth-promoting chemicals, one with which you can grow seedless fruit in your outdoors or indoors garden and the other which you can use to promote the growth of roots on cuttings for vegetative propagation of plants.

All this material is contained in the Science Service SOILLESS GARDENING kit that will be sent postpaid anywhere in the U.S.A. for a remittance of $4.95 addressed to Science Service, 1719 N St., N. W,. Washington 6, D. C. Be sure to ask for the Soilless Gardening Kit.

Science News Letter, February 26, 1949

MEDICINE

Chemical Lead to Cancer

➤ A GOOD lead toward the possibility of some day being able to do something with chemicals to cure cancer seems to have been found by scientists working with vitamins, antivitamins and related compounds.

In some cases children with acute leukemia, which is a cancer of the blood, got better temporarily following treatment with a chemical called aminopterin. But the chemical is dangerous. Some patients were lost because of the drug's toxic effects. All patients were in the last, hopeless stages of their disease before getting it. They did not recover, but the temporary improvement, or remissions, encourages the scientists to go on with research on these chemicals.

Studies on this and newer chemicals, called An-Fol-A and Amino-An-Fol, were reported by Drs. T. H. Jukes, E. L. R. Stokstad and A. L. Franklin of Lederle Laboratories, Pearl River, N. Y., at a New York Academy of Sciences symposium.

The An-Fol part of the names of these new drugs shows that they are analogues of, or similar to, that relatively new and exciting vitamin, folic acid.

These new chemicals are also being tried, very cautiously, in two other malignant conditions, Hodgkin's disease and lymphosarcoma. And at the Sloan-Kettering Institute, the antivitamins, or folic acid antagonists, are being tried on experimental tumors in animals, in the hope of gaining still better leads to possible chemical cures for human cancer.

Antivitamins, or at least some of them, also have antihormone effect. In chicks, they can check the effect on growth of female sex hormone chemicals, Drs. R. Hertz and W. W. Tullner of the National Cancer Institute, Bethesda, Md., found.

Such interference with a hormone by an antivitamin, they think, may help both to explain the mechanism of hormone action and to develop chemicals of curative value.

Science News Letter, February 26, 1949

ENGINEERING

Magnetic Alloy Developed

➤ A NEW magnetic alloy of superior properties, developed by the U. S. Naval Ordnance Laboratory, has proved exceptionally valuable in magnetic amplifiers for use instead of delicate electronic tubes. The Navy has named it Orthonol.

The Navy's interest in research in magnetism, and the development of this superior magnetic alloy, was discussed by Dr. G. W. Elmen, internationally famous scientist in the magnetic alloy field, and Edward A. Gaugler, both of the Naval Ordnance Laboratory, as guests of Watson Davis, director of Science Service, on Adventures in Science, heard over the Columbia network.

Orthonol, like others, is an iron-nickel alloy, but one in which the best magnetic qualities are brought out by a different heating treatment. The "ortho" in its name comes from a Greek word meaning rectangular, and the "nol" stands for the Naval Ordnance Laboratory.

The reproduction in this country of the German magnetic alloy known as Permenorm 5000-Z at the Navy laboratory was also discussed by these scientists. It was used during the war in Germany in the fabrication of huge rectifiers and applied in the electro-chemical industry. Its chemical make-up was easily determined, but the heat treatment required to bring out its best magnetic properties took several years to determine. In the year since the process was discovered, and the information released to the public, several manufacturers have started making it, and found several valuable applications. It is an important alloy, but is said to be somewhat inferior to the new Orthonol.

Without magnetic metals we would have practically no industry, Dr. Elmen declared. The transfer of electrical energy to mechanical energy would be impossible. Our vast production lines would be non-existent. We would have no electric lights, no telephones, and practically none of our modern conveniences.

The Navy's primary interest is the Nation's security, and the job of the Bureau of Ordnance is to provide weapons for the Navy. All the research carried on by the Bureau's activities is directed toward that end. But for the efficient operation of these weapons, magnetic metals, in one form or another, are essential.

Science News Letter, February 26, 1949

NUCLEAR PHYSICS

New Diagram Shows How Atom Bomb Might Be Made

➤ A DIAGRAM showing how an atomic bomb might be built has just been published.

The diagram, drawn in the form of a conventional bomb, is really more like a gun, explains Lt. Col. David B. Parker, General Staff Corps, in the ANTIAIRCRAFT JOURNAL (Jan.-Feb.), published in Washington by the United States Coast Artillery Association.

His drawing shows a fuze and powder charge. Half of the fissionable material, either uranium 235 or plutonium, is at the end of a gun barrel and the other half is in the breech. A highspeed bullet would set off the chain reaction of the atomic bomb.

Science News Letter, February 26, 1949

AGRICULTURE

Save on Pea Processing By Using Froth Flotation

➤A PROCESS first used to concentrate ores in the mining industry is saving $600,-000 a year in the processing of peas.

The process is froth flotation in which floating is used to separate materials. Cracked peas, pea skins, nightshade berries and tar-weed seeds are now floated out of batches of peas in the way foreign material is floated out of ore.

Developed at the U. S. Department of Agriculture's Bureau of Agricultural and Industrial Chemistry laboratory in Pullman, Wash., the froth flotation process is expected to save an estimated $2,000,000 yearly in the future in the cost of processing peas for canning or freezing.

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