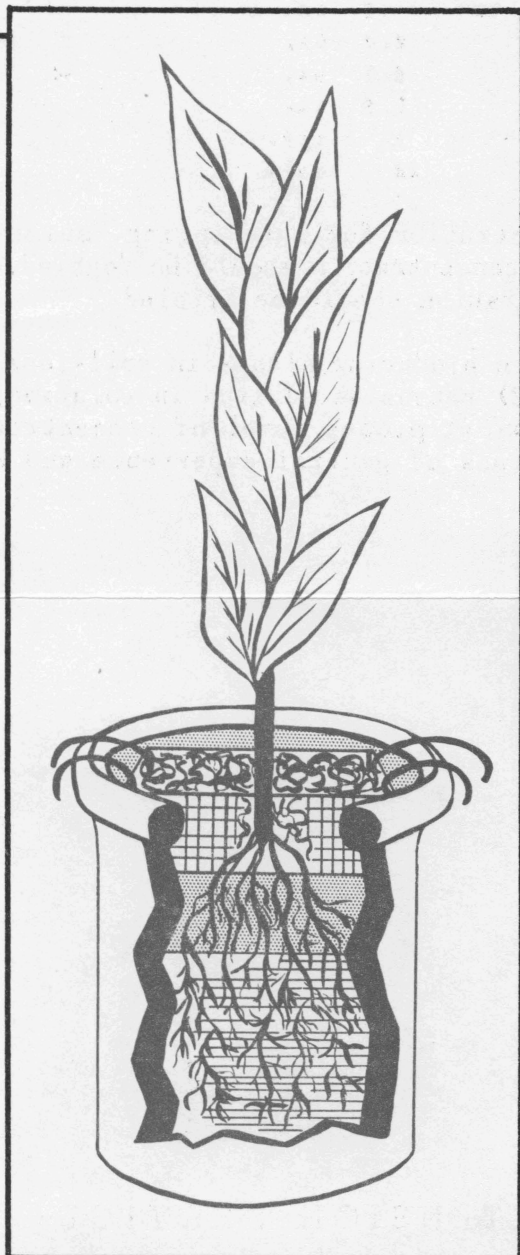


Growing Plants in Water

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Growing plants without soil is a method known by several names, such as "soil-less" culture, water culture, chemical gardening, hydroponics, and tank farming.

Such methods of plant production are essentially the same as when using soil except that the necessary plant nutrients are supplied in water solution rather than in soil.

Generally, growing vegetable and flower plants in chemical solution is neither practical nor economical. In most cases it should be tried only as a hobby. Where greenhouses are used for growing plants in water the regular benches which are 36 inches to 42 inches wide and 6 to 8 inches deep must be made waterproof, using asphalt (not tar) with melting point of 190 degrees. The asphalt may be applied with a mop. Concrete or wooden containers may be substituted for greenhouse benches.

The plants must be rooted in sand or in an ordinary plant bed. The young plants may be placed on wooden trays with the bottom covered with 1/4 inch mesh screening. On top of this place excelsior, shavings or moss. Set young plants into holes made in these trays with the roots suspended below in the solution, which at the beginning is kept level with the screen. As roots develop the level of the water drops so that approximately 2 inches of air space is maintained between the solution and the screen. As the plants grow they have to be supported by stakes or strings attached to overhead wires.

Water does not retain enough free oxygen so some provision must be made for aerating the water in the tank; otherwise the plant roots die. To add oxygen to the water, air must be pumped through the water approximately 15 minutes of every hour during the day and about four 15-minute periods during the night. A piece of 3/8 inch pipe capped on one end and with 1/4 inch holes drilled every foot serves as an

aerator. The pipe is laid lengthwise in the bottom of the tank and is connected with the air line or pump by means of a rubber hose.

In water culture the solution should have an alkalinity or acidity ratio to fit the requirements of the plants to be grown. Tomatoes, for example, need a pH of 5.5.

In the preparation of the solution these materials and amounts should be used:

Monobasic potassium phosphate	.5	oz.
Potassium nitrate	2.0	oz.
Calcium nitrate	3.0	oz.
Magnesium sulphate	1.5	oz.
Iron sulphate	1	tsp.
Water	25	gals.

The contents above are the proper concentration for late spring, summer and early fall. For early spring and late fall the concentration should be doubled. During dark weather of winter months, the concentration should be tripled.

Some difficulties apt to be encountered in producing plants in soil-less culture are: (1) maintenance of the proper pH, (2) retention of iron in solution, (3) providing proper aeration, (4) keeping solution at proper level of concentration, (5) poor sunlight, (6) improper humidity and lack of general experience and knowledge on the part of the gardener.

TEXAS AGRICULTURAL EXTENSION SERVICE

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