

HORTICULTURE

Victory Gardens

Working your own little patch of ground is part of the home front fighter's front-line assignment. Chief weapon should be tomatoes.

By **DR. FRANK THONE**

► **VICTORY GARDENS** will be planted by everybody this year. It is something to be taken for granted, like buying bonds and war stamps, like salvaging metal scrap and waste fats. It is part of the home-front fighter's front-line assignment.

Make your garden in your own back yard if you can, otherwise join up with your community gardening project and get an allotment in the larger area your neighbors are working jointly.

It is an advantage to do your gardening at home—saves time in getting to work, in a year when there isn't too much spare time at best; saves labor in getting the vegetables from earth to kitchen, and lets the housewife step out at will to harvest a few carrots or enough lettuce for a salad; leaves your own property in better shape for further gardening, or for landscaping if you don't want to keep on raising vegetables after the war is over.

However, before you plump for a garden right outside your own back door, go out and take stock of your prospects. The U. S. Department of Agriculture sets an area of 30 to 50 feet as a minimum, and considers one 50 by 100 feet, or nearly four times as big, as much more desirable. So unless you have at least that 1500 square foot minimum, free of shade, better join the crowd at the community gardens.

Study the Soil

Also, take a good look at the soil itself. If it is like all too many town lots, a mixture of raw clay and cinders, with maybe a generous dressing of brickbats, obviously it won't do. If the ancient Israelites could not make bricks without straw, neither can we modern toilers grow even straw out of bricks. If your soil isn't naturally fertile, or capable of growing your vegetables with the modest amount of fertilizer you will be able to purchase this spring, again better look to the community plot, which has been selected with a special eye to soil fertility.

One very considerable advantage the

community project will have: since the land lies all in one piece, arrangements are being made to have it plowed and harrowed, so you won't have the heavy work of spading it up and breaking the big clods with hoe and rake. Spading the good earth is great fun—for the first half-hour or so. After that, it's just plain labor. So it isn't such a bad idea, after all, to let a team or a tractor save your unaccustomed back and leg muscles.

If you don't have the 1500 square foot minimum on your own premises, perhaps a compromise may be possible. Arrange with your community garden leader for as much of an allotment as you can work in about an hour a day (it's really a surprisingly large piece, too, if you stick at it), and use that for your main crops of tomatoes and bush beans and root vegetables. Then spade up a fairish bit of your own back yard for quick garnerings the Missus thinks of at the last minute—green onions, radishes, lettuce, a few bush beans, and by all means a few tomato vines.

Plant Tomatoes

Allot a very generous share of your space to tomatoes. They are by far the most important soldiers in the whole Victory Vegetable army; agreeable to eat, easy to feed to children, easy to put up for winter, rich in vitamins and minerals. Most garden books direct setting tomatoes three or four feet apart. If your soil is rich, or you can get enough fertilizer, you can crowd this a bit and get more tomatoes from your space, by training the plants up to stakes and keeping them pruned strictly back to one stalk apiece. Immigrant gardeners using this method set their tomatoes as close as only two feet apart.

Row distances for some of the most recommended vegetables are: carrots (next in importance to tomatoes), 12 to 15 inches; beets (valuable mainly for their tops), 18 inches; bush beans, two feet; onion sets, 12 inches; lettuce, 15 inches; parsnips, 18 inches; turnips (plant only the yellow kind—rutabagas), 15 inches; spinach, 15 inches.

Don't plan on space-consuming crops like potatoes, sweet potatoes, corn and cabbage, desirable though these may be, unless you have more than the 1,500-square-foot minimum. Their rows have to be about three feet apart—which eats up space most astonishingly. Melons and cucumbers are space-consumers, too, and are hardly worth fooling with because of their relatively low vitamin values. You might plant a few hills of winter squash, in space vacated by the harvesting of early crops like lettuce and onions. They rate as yellow vegetables for vitamin values, and are easy to store, besides.

Better not bother with "fancy" stuff like asparagus, artichoke and Brussels sprouts, unless you have had more than one season of gardening experience—and if you have had that much, you won't be needing to read this article.

Follow Seed Catalog

After you have planned how many feet of each kind of vegetable you want in your garden rows, check up in your seed catalog to find how many packets or ounces of seed you will need to plant them. In the catalogue descriptions, or on the backs of the packets in your neighborhood store's seed rack, you will find statements of the amount of row each will provide. Directions cannot be made more definite here, because the quantity of seed in a packet differs according to variety, cost of production (it's high at present for most seeds), and the individual seed firm's traditional practice.

Don't overbuy. There isn't an over-supply of any kind of seed this year, due to war-caused interruption of our former European supplies; and there is an actual scarcity of some kinds, notably cabbage, onion and carrot.

There's no sense in hoarding seed. Year-old seed loses some of its viability; in some varieties all of it. Moreover, by next spring the supply of American-grown seed will probably be much larger than it is this year. So buy conservatively; leave what you aren't sure you'll need in the store to supply your neighbor's needs.

Victory Gardens will do their best, or less than their best, according to the fertility of the soil into which you drop your seed.

We warned against wasting labor and seed on hopelessly poor soil. But above that starvation threshold there are many levels of fertility, and hence of the amount and kind of fertilizer that can profitably be applied.

It is impossible to give a blanket recommendation on fertilizers. Soils differ too much from region to region, even from one part of a township to another, for such shotgun advice to be valid.

However, a few general considerations may be in order. A soil's natural fertility is roughly indicated by its color. A black soil is usually a fertile soil; a gray soil usually less so. Yellow soils are hard to judge. As a rule, they are less fertile than the darker soils; yet they may be capable of good production if well managed.

Management of a soil includes two groups of factors: mechanical or physical, which are largely a matter of soil texture and tillage; and chemical, which are determined by natural fertility but may be added to by the application of fertilizers.

Best of all fertilizers are the ones nearest nature's own processes in their action, in that they contribute to both physical and chemical betterment of the soil. These are dead plant and animal materials, returning to the dust from whence they came by the natural processes of decay.

Prime choice, if you can get it, is well-rotted stable manure. But getting this is largely a matter of luck—having a riding stable somewhere in the vicinity, or knowing someone who keeps cows. Only a generation ago, manure was a troublesome waste to be hauled away and obscurely dumped, and never to be mentioned by name in polite conversation. Only farmers placed any value on it. Thanks to our motorized age, it is all but unobtainable now; fortunate are the few who can find a supply.

Leaf-Mold Is Good

Next best, among natural fertilizers, is leaf-mold, decayed until little or no trace of fibrous texture remains. It can be found in deep, dank pockets in woodland ravines. Lack of hauling facilities makes this difficult to obtain also, but if you can locate a supply of it, get the consent of its owner, and find a truck to bring it to your garden patch, you have cause for thanks.

You can provide yourself with a supply of humus-making material by setting up a compost heap. This is simply a pile of lawn clippings, dead leaves, vegetable parings and trimmings, and weeds



FOR VICTORY—This young man is contributing his bit toward victory and picking himself a luscious meal in the bargain. Tomatoes are the best of all victory crops.

pulled out of your garden, interlayered with an inch or so of soil thrown on from time to time, to hasten the decay process. However, if you didn't set up a compost heap last year or the year before you won't get the benefit of it for this year's garden. It takes time to ripen compost. If you haven't a compost heap now, better get one started right away. The raking and sweeping you ordinarily burn when you clear up your place in spring can serve as foundation. And now that you're finding it necessary to use more fresh vegetables since canned and frozen ones "went rationed," you'll have more parings and trimmings to add to it. Don't waste anything.

If neither manure, woodland leaf mold nor compost is available, you can fall back on commercial fertilizer. This used to be abundantly available, with manufacturers eager to boost their sales. Now the situation is reversed, because three of the critical ingredients of all standard fertilizer mixtures are also critical war chemicals: nitrogen, phosphorus and potash.

However, the Department of Agriculture and the War Production Board have jointly authorized the use of what has been christened Victory Garden Fertilizer. It is what is known as a 3-8-7 mixture; that is, it contains 3% of nitrogen, 8% phosphoric acid and 7% potash. This

mixture is a bit leaner in nitrogen than has been customary in the past, but on the whole it is a very good fertilizer for ordinary garden needs. It is put up by the regular fertilizer producers under their own brand names, and is marketed in bags ranging in size from five to 100 pounds.

It is even possible that you can get along for one year without any fertilizer at all, if your soil is naturally rich and has not raised any crops but grass and weeds for several seasons. Letting land lie idle, or fallow, as it is technically called, has been for many centuries one way of at least partially recovering its fertility.

All that was said here must be taken as suggestions of the most general sort. Fertilizing is a highly local kind of problem, so if you have any doubts it is best to consult your local community garden leader, or at least some neighbor known to be a successful gardener.

Gardens should be well thought out in advance. One element in this planning should be an arrangement of the plants according to their height. In general, the taller plants, like corn and pole beans, should be put at the north or east side, and low-growing plants, like carrots and beets, at the south or west. This insures plenty of sunlight for all.

Whatever you do, be absolutely sure that your tomatoes get plenty of sun, even if it has to be at the expense of some other crop. Tomatoes, it cannot be emphasized too often, are the most valuable single vegetable crop you can raise. You cannot do them too many favors.

As a rule, it is better to plant your garden in long rows from end to end or side to side, rather than in neat, blocked-off individual beds. The row arrangement is most economical of space, and saves labor when the long job of weeding and hoeing comes on with warmer weather. If you have a relatively large plot and plan to work it with a wheel-hoe, of course row-planting is obligatory.

Most varieties of garden seed are available in sufficient quantities for a big gardening season, the U. S. Department of Agriculture advises. It is a touch-and-go situation, for we formerly imported a very large proportion of our seed from northwestern Europe, which, of course, is out of the market for the duration;

so we have to grow our own seed now—and even produce a lot for shipment to our overseas allies.

For this reason, both federal and state authorities advise very strongly that each Victory Gardener use the contents of each packet of seeds he opens with an eye to the utmost efficiency. It is a common mistake for first-year gardeners to plant too thickly, perhaps on the naive assumption that since each seed can grow into a plant, that is the way to get the most plants. But overcrowded plants become spindly and must be wastefully thinned if they are to produce a useful crop instead of spending all their strength in futile competition.

Plant, therefore, as if each seed were a cartridge in this critical year's campaign—and you know the ammunition supply is no more than sufficient. Make each seed count. If anything, plant rather more sparingly than directions on the packet call for, and then prepare to weed and tend each individual plant for the highly valuable little ally that it is.

Science News Letter, March 20, 1943

● RADIO

Saturday, March 27, 1:30 p.m., EWT

"Adventures in Science," with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Dr. Floyd S. Daft, senior biochemist at the National Institute of Health, will discuss "What Are the Chances of Finding New Vitamins?"

Monday, March 22, 9:15 a.m., EWT; 2:30 p.m., CWT; 9:30 a.m., MWT; and 1:30 p.m., PWT

Science at Work, School of the Air of the Americas over the Columbia Broadcasting System, presented in cooperation with the National Education Association, Science Service and Science Clubs of America.

"Races and Nations" will be the subject of the program.

"The boy playing with a pile of pebbles on the seashore is dealing with a universe of distinguishable objects just as was the shepherd in ancient times who counted his flock by means of stones. In this simple process of one-to-one correspondence lies a basic difference between man and all other animals."

This is the basis for the concept of number.

Geometry arises from the idealization of physical bodies which are taken to be rigid forms and is practiced by the use of such simple "rigid bodies" as the ruler and protractor.

With only these three examples before them, mathematicians have set out to generalize and to modify. More recently they have added the concepts of time and a system of forces. From these have been built the framework of the universe of space and time.

Science News Letter, March 20, 1943

INVENTION

New Method Casts Rotating Bands on Shells

➤ A NEW METHOD for applying the copper rotating bands to artillery shells has been invented by Roy T. Hurley of Dobbs Ferry, N. Y. (patent 2,310,915).

In present practice, rotating bands are made big enough to slip over the base of the shell, and are then squeezed into the groove cut to receive them by a hydraulic or other press under very high pressure. This tends to distort the metal, and may cause failures in action.

In Mr. Hurley's method, the base of the shell is placed in a metal mold that holds it firmly. An annular space in the mold permits melted copper to be poured in, thus casting the rotating band right on the shell itself.

Rights in the patent have been assigned to the Bendix Aviation Corporation.

Science News Letter, March 20, 1943

PHYSICS—MATHEMATICS

Einstein Idea Unworkable

Harvard Mathematician finds famous theory of gravitation unsatisfactory because it does not fit into good explanation of the universe.

➤ EINSTEIN'S FAMOUS theory of gravitation, although it provides a satisfactory explanation of gravitational phenomena is "essentially unworkable," Prof. George D. Birkhoff, mathematician of Harvard University, told a scientific audience at the University of Cincinnati in a lecture which is also being delivered before local chapters of the honor society Sigma Xi throughout the country.

All the newer theories of quantum physics are found inadequate by the the mathematician because they cannot be fitted into a satisfactory explanation of the universe, Prof. Birkhoff indicated.

To the physicist, this larger view of nature seems unnecessary. It is sufficient if he can by means of his theory calculate results that can be verified by scientific experiment.

The mathematician, on the other hand, wants to understand how each theory fits into his whole knowledge of nature. When the theories were not developed from the simple aspects of nature—objects, sequences of events, or geometric

forms that can be recognized—but have been created by the human mind, then the mathematician wants to be able to build a physical model to fit the theory.

It is not possible, Prof. Birkhoff indicated, to build any such tangible model from the modern theories of quantum mechanics. It may be true, he said, in some mystical sense that God thinks multi-dimensionally whereas men can only think in a series of logical steps along a line. We need a satisfactory mathematical theory to remedy our deficiency in this respect.

The way mathematical concepts and theories have been developed from simple experiences of nature was described by Prof. Birkhoff:

"A child puts its hand too near the fire and is burned," he said, "and thereafter remembers that this A (touching fire) will bring about this B (pain and burn). The chain of association fixed in his memory is essentially of the propositional type 'A implies B.' He has learned a physical fact!"

This is the basis of logic.