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A small home war garden supplies the family needs.
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THE HOME WAR GARDEN

BY J. J. THORNER, BOTANIST

Patriotic citizens everywhere owe it to themselves and their country to grow a war garden. The only excuse one can offer for not growing some vegetables and fruits needed for the family is a lack of soil or water for irrigation. Women, children, and elder members of the family can help to win the war by growing a garden. Vegetables should be grown now even where it costs as much to produce them as to buy them from the store. Fruits and vegetables grown at home will not only supply the immediate needs of the family, but in many cases they may be dried or canned for winter use. The production of fruit and vegetables in small lots everywhere over the country will save the shipment by railroads of many carloads of similar foods. The country needs the railroads now to carry men, munitions and other commodities to be used directly or indirectly for war work, and this need may become even greater. When we grow fruits and vegetables at home we are helping to release a corresponding supply of like food for use elsewhere in our country, and this will help to conserve staple food supplies for shipment overseas to our own soldiers and to our allies. As good citizens, therefore, we must not neglect, however busy we are, to grow a small war garden.

Besides the above, gardening utilizes spare moments in the home more profitably than perhaps any other industry. Gardening encourages the use of more vegetables in the home. It is well known that a family will use twice the quantity of vegetables grown in the garden than it will use if these must be bought. This is partly because vegetables fresh and crisp from the garden are better flavored and more succulent than those ordinarily bought at the market. Home grown vegetables are also more wholesome than those shipped in. Epidemics of typhoid fever have been traced to commercially grown vegetables irrigated, in part, with city sewage. Another reason why we should eat more vegetables than we have in the past is that they are among the best regulators of bodily health we have. The well known axiom "eat an apple a day and keep the doctor away" applies equally well to a liberal use of vegetables in the diet. It is a part of one's patriotism now to live a healthy life.

Unfortunately, gardening has been sadly neglected in our plan of specialized farming, and too often has been left to the Chinese gardener who has done a thriving business in the past even in some of
our more favored agricultural communities. California grown vegetables and California canned goods are used in large quantities today by many of our farmers as well as by people living in towns and cities. With our splendid long growing seasons and rich irrigated lands we should be sellers rather than buyers of farm and garden produce. The "tin-can-dump," characteristic of the southwest, should be a thing of the past. To use California grown vegetables and fruits in quantity does not speak well for a new State that boasts of its rich agricultural soils and home-making possibilities. We have overlooked in the past one of our most important assets—the garden.

**Soil and location** A fine sandy loam soil with a gentle southern, southeastern or southwestern slope, if convenient, should be selected for the garden spot. The character of the soil is of greater importance than the slope. Sandy soils are lighter and warmer than clay soils and southern slopes are warmer in winter than northern slopes and hence vegetables make the most successful growth during the cool fall, winter and spring months with these conditions. Sandy soils are also more easily cultivated than clay or adobe soils. Earliness is essential to the success of a garden. It is provoking to have to wait for one's early vegetables a week or longer after they appear on the market. It is laudable, now as formerly, to have the earliest radishes, lettuce, peas, and new potatoes in the community. The heavier soils, even with northern slopes, can be used for gardening and they give splendid results, but the vegetables do not mature as early. On the other hand, heavier soils require somewhat less irrigation and are richer in plant food and hence usually produce a more luxuriant growth than lighter soils.

For numerous reasons the garden should be located near one's home, and it should have plenty of sunlight. Foliage crops like lettuce and spinach can be grown with partial shade, but fruit crops like tomatoes, eggplants, and melons need an abundance of sunlight. The garden may be rectangular or square in form, preferably longer than wide, and for the needs of an average family may be an acre or so in size. Such a garden, if well tended, will often reduce the living expenses of the family one-third to one-half. Even a small garden 25 by 25 feet, or 25 by 50 feet in size will provide a remarkably large supply of fresh grown vegetables during the growing season. An abundance of such easily grown vegetables as radishes, lettuce, spinach, green peas, beans, onions, turnips, beets, tomatoes, and summer squashes can be grown on an area of this size. As fast as one crop matures or is harvested the ground should be cleared,
The returns from gardening are often several times those from ordinary field crops. This is particularly true if one makes a wise selection of vegetables and varieties, and gives proper culture.

The garden should be fenced or otherwise protected from stock and poultry. If strong winds are prevalent it should also have a windbreak. Soils containing any considerable amount of sand will drift or blow with strong winds, thus killing or injuring tender vegetation. This is particularly the case in dry-farming communities which are usually at altitudes of 4,000 to 6,000 feet. The spring winds are cold and at all seasons the winds blow more continuously and with greater velocities than at altitudes somewhat lower. In such cases a windbreak or hedge of Arizona cypress, Russian oleaster, or one of the several kinds of tamarisks is desirable. These plants are very hardy and drought resistant, though for best growth they should have some irrigation. They should be set about two feet part in the row, which in turn should be about 12 or 15 feet from the prepared garden soil, otherwise their roots will take up a large amount of moisture and plant food from the garden.

Fertilization, irrigation and cultivation: The successful garden requires good fertilization, irrigation and cultivation, and if planned properly a relatively small outlay of time is necessary to care for it. More than one well tended garden plat has pointed the farmer the way to successful farming. To begin with, the surface should be properly leveled, leaving just enough slope to carry the water down the furrows. Sandy soils should have more slope than heavy soils. The land should then be given a heavy application of well-rotted dairy, barnyard, sheep or poultry manure and plowed deeply and dragged. After this the garden should receive annually at one's convenience good applications of manure. If no manure is at hand old leaves, straw, hay or other trash may be plowed or spaded under. The soil that contains a large amount of organic matter and humus is easier to cultivate, holds moisture better because of its porous and spongy character, and is less likely to become hard and baked when dry. Besides this, well fertilized soil produces larger crops. Sour or bur clover, scarlet vetch and similar winter crops may be grown on unused garden areas during the winter season and turned under in the spring for green manuring. Planting should be done in rows never broadcast—as this facilitates irrigation and clean and rapid cultivation. The old fashioned garden with its square, pattern-like beds has no place in the arid southwest. The rows should be as long as possible, but convenience in irrigation will determine the
length and direction of these. The slope of the surface may necessitate their being short and even curved. However, it is more economical to cultivate and irrigate long rows than short ones, and except for good reasons the rows should not be interrupted by a path or road across the garden. Such a road may well extend lengthwise to the rows. During the fall, winter, and spring months one irrigation a week, not including rainfall, is sufficient for the ordinary vegetable crop; in the summer season, i.e., from May 15 to October 1, most vegetables should be irrigated every four to six days. With less irrigation than this the yields will be smaller than they should be and, worse yet, the vegetables may be tough, pithy or bitter. Vegetables growing in deep soils, because of their greater water storage capacity, require less frequent irrigation than when growing in shallow soils or those underlain with hardpan or caliche. In general there should be sufficient irrigation to keep the plants healthy, succulent and in good growing condition.

Cultivation is as essential as irrigation. The soil should be cultivated every week or ten days until the plants are large enough to shade the ground. Frequent cultivation keeps the surface soil loose and in good tilth and also forms a dust mulch which helps to stop the excessive evaporation of the water from the soil. Cultivation should be shallow—two to three inches—so as not to disturb the roots of the plants. It is best to cultivate as soon after irrigation as the soil can be worked without sticking, packing or forming into clods. Sandy soils can be worked after irrigation sooner than clay soils. With frequent cultivation the weed problem will largely disappear from the garden, and there will be only occasional use for the backbreaking hoe. Irrigation and cultivation can be lessened during the summer season by giving the plants, after they have grown to some considerable size, a heavy mulch of old straw, spoiled alfalfa hay or similar material. This also keeps the ground cooler.

The up-to-date gardener uses a Planet, Jr., or other similar wheel hoe for the culture of smaller garden crops like radishes, lettuce, onions, spinach, peas, beans, turnips, beets, carrots, and parsnips or those vegetables that are mostly planted in rows 12 to 15 or 20 inches apart. A small one-horse cultivator drawn by a pony or burro is best for the larger crops, including cabbage, tomatoes, chili, potatoes, corn, egg plants, squashes and melons or those plants that need to be planted at greater distance, i.e., 3 to 6 feet or so. A one-horse plow is also very useful for plowing, ridging and cultivating in gardens a half acre or more in size. The use of tools like these will greatly reduce the hard work, and one will be repaid for the
outlay within one year's time. Where horse power is used in a
garden turning space should be left at the ends of the rows.

*Flat culture versus ridged culture* Garden culture under irriga-
tion is quite different from that where rainfall is depended upon. In
the latter instance flat culture, such as is practiced in the central
and northern states and in our dry-farming districts including the
country about Flagstaff and Springerville, is best. With irrigation,
however, the soil is usually ridged and the plants or seeds are
planted on the ridge or more frequently part way down the sides.
The soil composing the ridge, not being flooded, does not become
packed and baked, and likewise no crust forms over the surface.
The ridges should be 5 to 10 inches high at their centers and broad
and flattish or rounded. Sharp or narrow and small ridges dry out
quickly and do not keep their form. The furrows should be as nar-
row and shallow as convenient. With the ridges two feet from
center to center, which is about the distance apart they are usually
made for the smaller garden crops, the rows of vegetables will be 12
inches apart, if planted about half-way down the sides of the ridges.
Where the ridges are three feet apart the rows on the sides will be
18 inches distant. The soil in the furrow or trough being flooded
frequently is inclined to pack and become hard, and hence needs
cultivation.

With practice one can become quite expert with a shovel or hoe
in making straight, uniform ridges and in keeping the furrows of the
same width and depth. In planting on any considerable scale and
in general for the larger vegetables, the ridges are made most
economically with a horse and plow, two or more furrows being
thrown together. This latter brings the ridges 3 to 4 feet from
center to center, according to the depth and width of the furrows.
For smaller vegetable crops a single deep plowed furrow will often
suffice. Before planting, the ridges are finished off by being
rounded, flattened and firmed with a shovel, after which the land
is given a heavy irrigation. In this condition the ridges hold their
form better and planting is easier.

Some gardeners prefer to set out tomato, eggplant, pepper, cab-
bage, cauliflower and similar plants along single shallow furrows
and ridge or hill up the plants later as they continue growth. Others
make two small parallel furrows 12 to 15 inches apart for
irrigation and plant out seeds, preferably larger ones, or plant be-
tween these furrows. The ridging is done later according to the
needs of the plant and also for convenience in irrigation. As the
ridge is made larger the furrows are pushed farther apart. These
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are simply modifications of the general principle of ridging the surface under conditions of irrigation.

Small seeds like lettuce and radishes should be planted one-half to three-fourths of an inch deep in well prepared, moist soil. They should be given an irrigation soon after planting, which usually insures sufficient moisture to bring the seedlings up. If a hard crust forms on the surface it should be broken with a rake. If the weather is hot and dry two or more irrigations may be necessary to start the seeds to grow. It is well in hot weather, in the small garden, to cover over the seed rows with a fine mulch, with one thickness of newspapers or with small twigs. The latter are excellent to protect seedling plants from birds. One of the trying problems of the gardener is to get a uniform stand of seedlings from the smaller vegetable or flower seeds. If planted too deep the seeds will not grow, and if too shallow the soil dries out before the seeds germinate. During the fall and winter season birds often pick the young plants out as fast as they appear. Excessive irrigation may induce the growth of damping off diseases. A good plan is to water at noon and again in the evening with a garden can and in addition cover with paper or twigs.

Large seeds like peas, beans, and corn should be planted two or two and one-half inches deep and given one irrigation soon after planting, which usually brings the seedlings up. The young plants may be pulled out by thrasher birds but this danger is overcome in the small garden with a loose covering of twigs. If given moderate irrigation seedling plants like these will not suffer from hot, dry weather. Tomato, cabbage, eggplants and similar other plants should be set quite deeply on the tops of ridges that are about two feet apart or alternating with one another on the sides of ridges three feet apart. The soil will, of course, be moist and well prepared and the plants should be irrigated soon after being set out and as often thereafter as is necessary to keep them in good growing condition.

Rotation of crops: It is well to have a plan of the garden on paper with a suggested rotation of the vegetables in the case of the larger garden extending over a period of 3 or 4 years. Do not grow the same crop continuously on the same area. The crops should be rotated so that the land will not lie vacant for any length of time. In general, root crops, like potatoes, radishes, turnips, and parsnips should rotate with foliage crops like lettuce, spinach, and mustard, or fruit crops like tomatoes and eggplants. Plants belonging to the same botanical family, as tomatoes, eggplants,
and peppers, should not succeed each other. This helps to hold in check insect pests and plant diseases, particularly those caused by soil infection. Cabbage, cauliflower, and Brussels sprouts may be followed by beans, late peas or sweet potatoes, or by tomatoes, eggplants, and peppers; either of these latter groups of vegetables may alternate with spinach, lettuce or onions, or with beets, parsnip or carrots. Cantaloupes, cucumbers, squashes, and melons can be alternated with cabbage, cauliflower, Brussels sprouts or turnip or any other fall and winter growing crop.

Classification of vegetables according to plant families

- **Lily family:** asparagus; chives; garlic; onions.
- **Grass family:** corn.
- **Lamb'squarter family:** beets; chard; spinach.
- **Mustard family:** Brussels sprouts; cabbage; collards; Chinese cabbage; horseradish; kohlrabi; kale; mustard; radish; turnip.
- **Clover family:** peas; beans.
- **Parsnip family:** carrot; celery; parsley; parsnip.
- **Squash family:** cantaloupe; cucumber; gourd; pumpkin; squash; watermelon.
- **Nightshade family:** eggplant; pepper; potato; tomato.
- **Chickory family:** endive; lettuce; salsify.
- **Thistle family:** globe or French artichoke.

Crop pests: Watch the garden closely for insect pests and plant diseases. For the small garden a reliable bucket spray pump can be purchased for $5 to $7 and with the timely use of this one will have little occasion to see the results of his season's labor swept away by a pest in a few days' time. It is often difficult to eradicate a pest that has become established, but when taken at the start it is an easy matter. Through lack of space it is not possible to discuss spraying here; there are, however, numerous circulars and bulletins on this subject. Unfortunately, many of our plant diseases develop through garden soils becoming infected with soil fungi; these can be controlled best by careful crop rotation. It may be necessary at times to change the garden spot. Old or discarded vegetable growth, vines, leaves, and roots should never be spaded or plowed under. They should be burned to prevent insect pests and plant diseases from "holding over" to prey on next year's crops. This applies, in particular, to cabbage, cauliflower, Brussels sprouts, mustard, cantaloupe, cucumber, squash, tomato, eggplant, beets, asparagus, and potatoes.
Seeds and seed-testing. Purchase good seeds from reliable houses and get varieties adapted to local conditions. Cheap seeds are expensive in the long run and are the forerunners of almost certain failure. It is economy to pay 20 cents a packet for good cauliflower seed rather than 5 cents for poor seed. This applies likewise to cabbage, turnip, tomato, onion, celery, and lettuce seed. Save seeds from the best and earliest fruits or plants of thoroughly satisfactory varieties. Test garden seeds before planting. The well known “dinner plate tester” made with two soup or dinner plates and one or more moist strips of sterilized cotton goods, preferably cotton flannel, will be found satisfactory. The cotton strips are sterilized in boiling water to destroy spores of moulds and other fungi present, folded twice upon themselves and placed in one of the plates. The seeds are placed between the folds of the cloth so as not to touch each other, and the second plate is inverted over the first, thus forming a moist, aerated and more or less sterile chamber. The cotton strips must be kept well moistened, but not saturated, and water should be used that has been previously sterilized by boiling. Two or three lots of seeds can be tested in the germinator at one time, but each should be included in a separate cotton fold or strip, and numbered to avoid error.

Aids to earliness in the garden. To secure earlier vegetables one should start plants in hot beds, cold frames or flats. The latter is the most economical means for the home gardener and is quite satisfactory. It consists of a wooden box 4 to 5 inches deep, 12 to 14 inches wide and about 20 or 24 inches long. A layer of gravel or cinders about an inch deep is put on the bottom after which it is filled nearly to the top with good rich soil or with garden soil mixed with an equal amount of leaf mould. The seeds are sown thinly in January or February in the warmer parts of Southern Arizona in rows 2 inches apart and about a half inch deep, and the soil is kept moderately moist but not wet. During cold weather the box with the plants is kept indoors, in a window, but with warmer weather the box is set out of doors in a protected place to “harden off” the plants before setting them in the garden. Where the winter temperatures are not severe a box about twice the size of the above and 6 inches deep can be used and kept in a protected place on the south side of one’s house. It should be covered every night and during cold days to prevent the plants from being frozen. If the box is covered with a piece of glass or window sash better growth will result. Early tomatoes, eggplants, peppers, lettuce, melons, and cu-
cumbers may be grown easily in this way. The melons and cucumbers are best planted in old strawberry boxes, the bottoms of which are cut out at the time of transplanting to the field.

In mild climates a cold frame is an excellent device for starting early plants. It may be located on the south side of a wall or building and a south exposure is essential. It can be of any convenient size, 4 to 6 feet wide and as long as desired. Plain inch boards, with 2x4-inch pieces at the corners and about every 6 feet on the sides for support, can be used in construction. The north side should be 18 to 24 inches high and the south side 8 to 10 inches with the ends, of course, tapering. It should be covered during nights and cold or stormy days and the covering may consist of window sash or canvas. The soil should have good drainage and should be a rich, sandy loam. Besides growing early plants for the garden, one can grow continuously in winter crops of such vegetables as lettuce, endive, spinach, radishes, and turnips.

**Altitudes and seasons of planting** In southern and western Arizona, at altitudes below 2,500 or 3,000 feet, it is possible to have a garden during practically 12 months of the year. Only the hardier vegetables can be planted in the fall, winter and early spring months, i.e., those vegetables that are not injured with severe frosts. Ordinarily such vegetables will not be damaged with occasional winter temperatures as low as 18 or 20 degrees F. During severe winters when the temperature drops as low as 8 or 10 degrees F. considerable injury will be done to the plants but the gardener can well afford to take this chance. The growth of hardy vegetables during mild winters is almost continuous. The ground should be prepared for the fall garden toward the latter part of August and planting can be begun by September 1. The success of the fall and winter garden depends largely upon getting the seeds in the ground early. Among the vegetables that can be planted at this season are lettuce, radishes, spinach, turnips, beets, smooth peas, parsley, and onion sets or onion seeds. Several sowings of radishes, lettuce, spinach, and turnips can be made, thus providing a supply of these vegetables until May, when it is usually too hot at the lower altitudes for their successful growth. Seeds of cabbage, cauliflower, Brussels sprouts, kohlrabi, and onions should be sown in prepared seed beds in the early part of August so as to have the plants ready to set in the garden by September 15 or October 1.

Above altitudes of 3,500 or 4,000 feet the winter temperatures are usually too severe to make possible the successful winter growth of the hardy vegetables just noted. However, the ground should
be prepared in the late fall so that planting can be begun in the spring even before danger from heavy frosts is past. Lettuce, spinach, and onion sets can be planted late in the fall and the seed beds protected during the winter with a covering of twigs or other coarse material. These plants will begin growth early in the spring as soon as the warm days return. The seeds of Brussels sprouts, cabbage, cauliflower, and kohlrabi can be sown in flats or coldframes during the latter part of January or February, as already described, and the plants set out in the garden late in March or April as the season permits.

The vegetables tender to frost are represented by string beans, wrinkled peas, sweet potatoes, corn, tomatoes, eggplants, peppers, and the various members of the squash family. The seeds of these are not planted until danger from frost is quite generally past. At the lower altitudes this is toward the latter part of March or April while at the higher altitudes it will be as late as May or even June. Tomatoes, eggplants, and peppers should be started in flats or coldframes as early as February or March in order to grow into large plants for transplanting when danger from frost is past. Even melons, cantaloupes, cucumbers, and squashes may be started in shallow paper boxes or discarded strawberry baskets and the bottom of these cut out when the plants are set in the field. This will insure early vegetables for the table. In southern Arizona one should have ripe tomatoes and cantaloupes by the middle of June and in addition cucumbers, squashes, and eggplants for the table.

**LIST OF HARDY VEGETABLES WITH DESIRABLE VARIETIES FOR THE FALL, WINTER, AND SPRING GARDEN**

| Asparagus: | Palmetto; Conover's Colossal; Columbian Mammoth. |
| Beets: | Crosby's Egyptian; Early Blood Turnip; Early Eclipse. |
| Cabbage: | All Seasons; Early Jersey Wakefield; Sure Head. |
| Cauliflower: | Dry Weather; Early Snowball; Autumn Giant. |
| Kohlrabi: | Early White Vienna; Purple Vienna. |
| Lettuce: | New York Market; California Butter; Iceberg. |
| Onions (Sets): | White Bottom; Yellow Bottom. |
| Onions (Seeds): | White Bermuda, Australian Brown; Prizetaker. |
| Peas (Smooth): | Alaska; Blue Prussian; Large White Marrowfat. |
The Home War Garden

Radishes: Early Scarlet Turnip; White Icicle; Chinese Winter.  
Spinach: Prickly Winter; Bloomsdale.  
Turnip: Purple-top Strap-leaf; White Flat Dutch; White Egg.  

ASPARAGUS*  

Asparagus is one of our earliest spring vegetables and should have a place in every garden. One hundred 1 and 2-year old plants set out will make a splendid beginning. For a larger bed seeds can be sown in the spring about an inch deep in rows 18 inches apart. After a bed of asparagus is well established, with good care it should last for 15 or 20 years. Asparagus does well in rich loamy soil and tolerates considerable alkali. It is so well adapted to our growing conditions that commonly it escapes and grows wild along fences, ditchbanks and in orchards. It is an important commercial crop in California and yields equally well here, all standard varieties thriving under our conditions.

Though quite drought resistant, asparagus should be irrigated weekly during the cutting season and biweekly for the remainder of its growing period. No shoots should be cut the first year the plants are set out, and even for the second year the cutting should be light. After this, however, with proper care the plants will stand regular cutting for three months, beginning early in spring. Before planting, the land should be well enriched and plowed deeply. Furrows are next dug or plowed 12 to 14 inches deep and as wide. These should be 4 or 4½ feet from center to center and the plants are set 15 inches apart in the row. In these plowed furrows well rotted manure is strewn to a depth of about 3 inches. This is covered with a layer of 3 inches of soil and the plants are set on this and covered with 4 inches of soil. As set in these sunken rows the plants can be irrigated until they begin to make good growth, after which the soil is gradually drawn in from both sides until low, broad ridges are formed and the crowns of the plants are covered to a depth of 7 or 8 inches. After this the plants are irrigated from the furrows on both sides of the rows. Every second year after the cutting season is over, the soil should be dug away carefully from the sides of the rows and the furrow partly filled with well rotted manure, after which the soil is shoveled back again.

*For further information on asparagus culture see Timely Hint No. 101, published by the Arizona Agricultural Experiment Station.
At altitudes below 2,500 feet or thereabouts, beets may be sown during the first week in September. They will be ready to use during the winter and spring months and they may be left in the ground and dug as needed. At these altitudes another sowing can be made in the early spring. At higher altitudes beets can be sown in the spring as soon as the danger from severe frosts is passed. Beet seed should be sown about an inch deep in drills 15 inches apart, as already suggested, on the sides of low broad ridges. When 3 or 4 inches high the plants should be thinned to about 4 inches in the row, the plants pulled out being used if desired for greens, or the larger ones transplanted. For best growth beets require good rich soil with moderate irrigation. They endure some alkali.

**BRUSSELS SPROUTS, CABBAGE, CAULIFLOWER, AND KOHLRABI**

These are all cool weather vegetables and require very similar culture. For good growth they require rich soil, moderate irrigation and frequent cultivation. For fall and winter gardens the seeds should be sown in well prepared seed beds late in July or August so as to have the plants ready to set out in the garden by September 15. Good care should be given the seed beds to insure the growth of large, healthy plants. Brussels sprouts, early cabbage, and cauliflower plants should be set 18 to 20 inches apart in the rows and the rows should be 3 feet distant. The plants may be set rather deeply on ridges a few inches high or on level ground and the surface ridged and furrowed later through cultivation. Late cabbage plants should be planted 24 to 30 inches apart. Kohlrabi plants should be set about 8 inches apart and otherwise treated similar to cabbage.

Brussels sprouts are harder than cabbage and are quite easily grown. They have also a milder flavor than cabbage and command a better price on the market. Instead of a single head, Brussels sprouts form a large number of small ones along the stem in the axils of the leaves. As these heads begin to crowd, the leaves should be broken off from among them to give more room. A few leaves, however, should be left at the top. Cauliflower is not as hardy as cabbage and also more difficult to grow. It is, however, a choicer vegetable than cabbage. When the heads are half-grown, the leaves are gathered together over the top and tied. This helps to keep plant lice out of the head, Blanches it, and assists in keeping
Kohlrabi is often called turnip-rooted cabbage. The edible part is the fleshy, swollen stem which somewhat resembles a turnip in taste. They should be used while fresh and tender, and their growth must be continuous. It is almost needless to say that the soil should be moist and in good condition when cabbage, cauliflower and similar plants are transplanted to the field or garden.

Where the winters are too severe for the successful growth of the above vegetables, the seeds should be sown in flats or coldframes in February or March and the plants set out in the garden in the early spring when the severest freezing weather is over.

LETTUCE

Lettuce is a cool weather crop, though with partial shading it can be grown in quite warm weather. In order to secure crisp, tender leaves the growth should be forced, this requires rich soil, with frequent irrigation and cultivation. The seeds are sown about a half inch deep in drills 15 inches apart, and the plants are thinned to 10 or 12 inches. Lettuce transplants readily so that the plants pulled out can be replanted if desired. Another plan is to sow lettuce in seed beds and transplant to the garden rows when an inch or so high. With proper culture this method is quite certain to produce good head lettuce. In southern Arizona with successive sowings lettuce may be grown for the table almost continuously from October to May inclusive. During quite cold winter weather lettuce grows well in coldframes covered with canvas. Where the weather is too severe for a winter garden, lettuce plants can be started in flats or coldframes in February or March and transplanted later in the garden, or the seed may be sown in beds in the garden late in the fall, when it will begin growth with the first warm days of spring. Such beds should be protected with a layer of cornstalks, twigs or brush.

ONIONS

Onions are of easiest culture and grow readily from sets or seeds. Onion sets can be planted in September, one quart or pound being sufficient to supply green onions for the table during the fall, winter and spring months. The sets are planted about 2 inches deep in rows 12 to 15 inches apart and are much earlier than seedling.
onions. Other plantings may be made regularly until April. If seedling onions are planted the seeds should be sown in seed beds in July or August and the seedlings set out when 6 or 8 inches tall. They are planted 3 to 4 inches apart in the row and the tips of the leaves and roots are usually clipped off at planting time. Onions thrive best in sandy loam soil and should have frequent shallow cultivation and irrigation. Under field conditions flat culture is commonly used, the seedling onions being planted in rows as already described on carefully leveled lands. These lands are flooded from border to border with each irrigation and then cultivated as soon after as convenient. The practical farmer should have an abundance of green onions in the spring to feed young turkeys during their first six weeks or two months growth.

SMOOTH PEAS

Smooth peas endure quite low temperatures without injury, though with severe cold spells they are often injured. They should be planted as early in September as convenient and if their growth is successful they will supply green peas for Thanksgiving, Christmas and New Years. A second planting should be made the first week in October and still another during the latter part of October. The first two plantings may be of the Alaska or Blue Prussian varieties and the last one can be the taller growing Marrowfat. A planting of this variety can also be made in the early spring. Where the winters are too severe for the growth of peas, they should be planted in early spring, after the severest frosts are over. Peas should be planted 2 or 3 inches deep in double rows, i.e., rows about 8 inches apart with a space of 24 or 30 inches separating the next double row. Peas grow best in rich soil and require weekly irrigation and occasional cultivation. Where the vines grow more than a foot tall they should be supported with sticks, brush or wire netting.

RADISHES AND TURNIPS

Radishes and turnips are hardy and easily grown in gardens. They require practically the same treatment and do best in rich sandy loam soils with frequent irrigation and cultivation. Their growth must be rapid and continuous, otherwise they will be bitter or pithy. A supply of these vegetables can be grown in most southern Arizona gardens from October to April inclusive. Where the winters are too cold for their growth, the seeds can be sown in the early spring after freezing weather is over, and the sowings co.
The Home War Garden

continued during the summer season. They are also grown easily in coldframes. Sow the seeds thinly an inch deep in drills about 15 inches apart. An ounce of seed each of radishes and turnips will last for the season and successive sowings can be made every three or four weeks. Radishes should be thinned to 2 inches and turnips to 3 inches in the row and the young plants may be used for greens.

SPINACH

Spinach is a cool weather vegetable and is rarely injured with the occasional frosty winter nights in southern Arizona. Successive sowings should be made from September to April inclusive, which will provide the table with a continuous supply of choice greens. Where the winters are rather too cold for its successful growth, spinach can be grown in coldframes in winter and in the garden in the spring and early summer season. Spinach does not do well in hot weather. The seeds are sown one inch deep in rows about 15 inches distant. The plants are conveniently thinned by pulling out and using the larger ones, thus giving the smaller ones a chance to grow. Like other foliage crops, spinach does best in rich loamy soils with frequent irrigation and cultivation.

LIST OF VEGETABLES WITH DESIRABLE VARIETIES FOR THE SUMMER GARDEN

Beans: Early Refugee; Davis White Wax; Stringless Green Pod; Kentucky Wonder.
Celery: White Plume; Golden Self-blanching.
Carrots: Danvers Half-long; Ox-heart; Early Chatenay.
Cassaba: Improved Hybrid; Golden Beauty; Winter Pineapple.
Cucumbers: Davis Perfect; White Spine; Boston Pickling.
Eggplant: New York Purple; Black Beauty.
Parsnips: Hollow Crown; Improved Guernsey; Student.
Peppers: Large Sweet Spanish; Bull Nose; Pimiento.
Peas (Wrinkled): American Wonder; Yorkshire Hero; Strata-gem.
Potatoes: Bliss' Triumph; Early Ohio; Irish Cobbler.
Squash: Bush Scallop; Summer Crookneck; Hubbard.
Salsify: Sandwich Island.
Sweet Potatoes: Yellow Jersey; Yellow Nansemond; Southern Queen.
Sugar Corn: Papago; Stowell's Evergreen.
Tomato: Dwarf Stone; Dwarf Champion.
Watermelons: Chilean; Kleckey Sweet; Tom Watson.

STRING BEANS

String beans are among the most profitable vegetables to grow in a small garden and thrive in almost any soil. They should be given moderate irrigation and cultivation, and should not be planted in the spring until danger of frost is over. At altitudes below 2,500 feet string beans can be planted at intervals of two or three weeks from March 15 to August 15, while at altitudes somewhat higher they may be planted from April 15 to July 15 or August 1, according to the elevation. At the lower altitudes string beans often will not set pods well during June and July, but generally, successive plantings will give a nearly continuous supply of beans for the table during the growing season. Beans should be planted from 1 to 2 inches deep, according to the season and the character of the soil. In cool weather and in heavier soils they should not be planted as deeply as in warmer weather or in lighter soils. The plants should be 4 inches apart in the row and the rows about 20 to 24 inches distant. Flat podded beans like the Davis White Wax are regarded as best to plant during cool weather and round podded ones like the Early Refugee for warm weather. Pole beans like the Kentucky Wonder often bear better than bush beans, but they must be given tall, stout poles for support.

CELERY

Celery seed should be sown in March or April in a well prepared seed bed or coldframe. The seed is slow to germinate and should be sown very shallow. The plants should be large enough to transplant in June or July. Celery plants are set 6 to 8 inches apart in trenches dug or plowed 10 to 12 inches deep and half filled with good soil and well rotted manure. In this sunken row they are irrigated, and with continued growth the soil is drawn against the plants until finally a ridge is built up, though the hearts of the plants must never be covered. The thick, fleshy leaf stalks are blanched with the soil and kept tender and brittle. Celery requires rich soil, preferably black loam, and rather heavy irrigation. While eaten as a relish for the most part, it is excellent when cooked and served in milk, even the fleshy crowns being usable in this way.
CARROTS AND PARSNIPS

The culture of carrots and parsnips is practically the same. The seeds are sown about an inch deep in drills 15 to 18 inches apart. Both vegetables require good rich soil, preferably sandy loam, and modern irrigation and frequent cultivation to keep the soil loose and in good condition. When about 3 inches tall, carrots are thinned to 2 inches and parsnips to 3 inches in the row. Carrots need not be dug in the fall where the winter climate is mild and the ground does not freeze. Parsnips are not injured, even with severe freezing weather, when left in the ground over winter, and many consider their flavor is improved with freezing. If these vegetables are not dug by spring they begin a second growth and run to seed, thereby becoming worthless. Carrots and parsnips can be sown in the spring as soon as danger of frost is past. Neither of these vegetables are used as much as they should be. A row of each in the garden will add variety to the table. Carrots are excellent when served in milk and parsnips fried brown in butter are capital in winter and early spring when vegetables are scarce.

CUCUMBERS, CANTALOUPES, CASSABAS, WATER-MELONS AND SQUASHES

All these plants are members of the *cucurbit* family and require similar culture. Generally, they do best in well enriched sandy loam soils. They are tender to cold and should not be planted in spring until danger of frost is over. They require considerable space for growth and hence should not be planted in small gardens, with the exception, perhaps, of bush scallop squashes, cantaloupes, and cucumbers, the latter of which may be planted against a tence and allowed to climb. For early use a few hills of cantaloupes and watermelons should be planted in March and protected for a time with small glass-covered frames; or, the seeds may be planted in strawberry baskets in coldframes or flats and these with the bottoms removed transplanted to the garden after danger of frost is past. Three or four hills each of cucumbers and squashes and about ten hills each of cantaloupes, cassabas, and watermelons will supply an average family, so productive are they. The seeds are planted an inch deep and about ten to the hill, and afterwards thinned to four or five thrifty plants. The hills should be eight feet distant each way, with the exception of bush scallop squashes which can be four feet apart. Cultivation should be continued until the vines begin to run, and after that the weeds kept pulled out. Cassabas or winter
muskmelons are excellent for dessert for the fall season and with care they may be kept until the holidays. The Hubbard squash is easily the favorite among squashes. Not only does it yield well, but it is an excellent keeper and finds a ready market. At the lower altitudes casabas and Hubbard squashes should be planted late in June or in July to prevent their maturing too early and at altitudes somewhat higher they can be planted during May.

EGGPLANTS, PEPPERS, AND TOMATOES

These plants belong to the nightshade family and require quite similar culture. They must not be transplanted to the garden until danger of frost is past. They do best in loamy soils with moderate irrigation and cultivation. For early garden plants the seeds should be sown in flats or coldframes early in February, or about eight weeks before the time to set them out in the garden. The coldframes can be covered with canvas or sash. It is well to transplant seedling tomatoes, pepper and eggplants when 2 inches tall in the flats or coldframes so that the plants will stand about 2 inches each way, or they may be potted in small paper pots, strawberry baskets or old tin cans. The latter should have their ends and sides melted loose, thus making it easy to remove the tins at planting time without disturbing the roots of the plants. For transplanting to the garden, the plants should be of good size, vigorous and well hardened off. Plants newly set in the garden may be covered for two or three days with one or two thicknesses of newspaper, the latter held in place with clods or stones. These plants should be set in rows three feet apart with peppers 18 inches distant, and eggplants and tomatoes 24 inches distant in the rows. A stout stake should be driven near tomato plants soon after they are set out to tie the plants to, otherwise they may be blown over during heavy winds. The plants can be set on ridges as already described or on level land which will be ridged afterwards leaving a furrow on one or both sides of the ridge for irrigation.

Pepper and eggplants are prolific and a dozen plants each will answer the needs of the average family from midsummer until late in the fall. The varieties of peppers recommended are mild and not like the well known Mexican chili. One must watch tomato plants carefully for grasshoppers and destructive green worms which eat both the leaves and fruits. Dwarf Champion and Dwarf Stone tomatoes, because of their dense foliage which largely prevents sunscald of the fruits, are the varieties recommended for planting below
altitudes of 3,000 or 4,000 feet. These varieties also set fruits better in summer. At higher altitudes the Stone and similar varieties of tomatoes are easily grown. Three dozen tomato plants well tended will supply the wants of an average family from July until November and furnish in addition tomatoes for canning, for preserves and green pickles in the fall. There is no occasion for the average person to pay 10 or 15 cents a pound for California grown tomatoes.

PEAS (WRINKLED)

The culture of wrinkled peas is similar in all respects to that of smooth peas. Wrinkled peas yield heavier than smooth peas and are superior in flavor. They are nearly as tender to frost, however, as string beans and so are included with the spring and summer vegetables. Below altitudes of 2,500 or 3,000 feet they may be planted about March 20 to April 1, when danger of severe frost is mostly over. Another planting can be made in August during the rainy season and these should mature in October or November. On account of heat and drought peas do not grow well at the lower altitudes in June or July. Above altitudes of 3,000 feet wrinkled peas can be planted from April or May until July, since the summer weather is cooler and with successive sowings they can be grown nearly continuously until frost.

POTATOES

At altitudes of 2,500 feet or lower, early potatoes may be planted in January or February. For six weeks or two months before planting it is well to have the tubers spread out on the floor of a well lighted room or building free from danger of frost to encourage a growth of short, stout, green sprouts. Select medium sized healthy tubers for planting. In cutting, first remove a thin slice from the stem end of the tuber to determine whether it is diseased or not. If the cut surface shows a brown or blackish discoloration do not plant. If healthy cut the tubers lengthwise, either once or twice according to size, thus forming longitudinal halves or quarters. Make the cut through the buds or sprouts at the seed end without injuring these. When cut in this way there will be one or more vigorous growing buds from the seed end or near the seed end of the potato on each piece to be planted. The land should be thoroughly irrigated and furrowed just before planting. Three feet from-center to center is a good distance to have the furrows and
the cut potatoes are planted 12 to 14 inches apart in the row and covered to a depth of 3 or 4 inches. As the young shoots begin to show above the ground they are covered with soil drawn in from both sides to prevent their being frozen back. This is continued until the furrow is filled. If necessary the potatoes can be irrigated in the sunken row before the furrow is entirely filled in. After this the potatoes are cultivated regularly and the soil is thrown toward the plants, thus forming low, broad ridges. They are then irrigated in the furrows formed between the rows by cultivation.

This method of cultivation gives the plant the advantage of warm soil for late winter and early spring growing and of deep planting for hot weather. They should be irrigated regularly and as often as is necessary to keep the soil moist. The ground should never be allowed to dry out, otherwise second growth may follow irrigation or a heavy rainfall. The tubers can be dug in May or early in June, since there will be no further growth of these after the hot weather begins.

A second crop of potatoes can be planted late in July or about the first of August. The tubers from the first crop will not do to plant at this time, since ordinarily they have not matured sufficiently. The yield from the fall crop is usually less than that of an average spring crop, though the potatoes are of fair quality.

At altitudes of 3,000 feet and above potatoes are usually planted in March or April and they mature accordingly later in the season than at the lower altitudes. The summer temperatures at these higher altitudes are more favorable for the growth of potatoes and hence the quality and yield are notably better than at the lower altitudes.

SWEET POTATOES

For the small garden sweet potato plants will be purchased, although for a field of any size one will grow his own plants. Sweet potatoes need considerable room and one will grow only a few early ones in the home garden. Like ordinary potatoes, sweet potatoes thrive best in light sandy soils with sufficient irrigation to keep them in good growing condition. Sweet potatoes are grown in the Southwest on rather large broad ridges made by turning three furrows together and then finishing these with a shovel. The ridges should be about four feet from center to center. Vigorous, well rooted plants are set several inches deep and about 15 inches apart on these ridges. They should be irrigated every ten days during
the summer season. April or May is a good time to set out early plants for the garden. The ground between the ridges should be cultivated to keep down weed growth. It is advisable to let the sweet potatoes remain in the ground until ready to use. The sweet potato is well adapted to our climate and the yields are usually good and the potatoes of excellent quality.

SALSIFY OR VEGETABLE OYSTER

Salsify seed is sown in the spring after danger from frost is past. April is a good time for southern Arizona gardens. An ounce of seed will plant two rows 50 feet long which are more than sufficient for an average family. The seeds are sown an inch deep along the sides of rather broad ridges and the rows should be 15 to 18 inches apart. When the plants are 2 or 3 inches tall they are thinned to about 2 inches in the row. Irrigation should be given on an average about every ten days throughout the summer and fall seasons. The roots may be left in the ground during the fall and winter until wanted for use, though if not dug before late spring they begin growth and go to seed, after which the plants die. Salsify is easily grown and like asparagus is so well suited to our climate that it is inclined to spread and become a weed. It is worthy of a place in every garden. The roots are excellent when boiled in milk or fried in butter. They have a slight oyster flavor, hence the name.

SUGAR CORN

Sugar corn is often not a successful crop here, since the ears are subject to damage from corn ear worms and commonly they are poorly filled out. The best results have come from planting late in June or July and the ears are ready for the table in September. The Papago corn, which is not as sweet as standard sugar corn, is the best all-around variety, both for spring and summer planting. This usually fills out well and is less subject to damage from cutworms than standard varieties of sugar corn. With a favorable summer and fall season, Stowell's Evergreen corn does well; though its quality is excellent, it is less certain to make a crop than Papago corn.
STRAWBERRIES

This paper is not intended to include a discussion on fruits, though the writer cannot close without suggesting a small strawberry patch, no garden being complete without one. Someone has said concerning the strawberry "Doubtless God could have, but he did not make a better fruit." With care strawberry plants may be set out during the rainy season in August, but October is early enough to plant in southern Arizona to secure a crop the following spring. Only strong, young plants are desirable and these should be planted slightly deeper than they grew but not deep enough to cover the crowns. Strawberries do best in sandy loam soils and they should be irrigated weekly throughout the summer season and once in two weeks during the remainder of the year. The soil should be ridged and the plants set 12 to 14 inches apart on the sides of ridges and high enough so that during irrigation the water will not touch the plants. The ridges should be 6 to 8 inches high from the bottom of the furrows and 30 to 36 inches distant. It is well to mulch the plants heavily with straw or old hay, as this helps to keep the ground cooler, lessens irrigation and holds in check weed growth. Good culture will insure strawberries from March to June. The Arizona Everbearing, A-I or Blue Ribbon, Texas, and Lady Thompson are all varieties well adapted for growing under southwestern conditions.