Appendix

TWO OF THE VICTORY BOOKS ISSUED
BY THE COMMISSION

"WAR GARDENING," VICTORY EDITION, 1919

"HOME CANNING AND DRYING,"
VICTORY EDITION, 1919
Victory Edition 1919

WAR GARDENING
and Home Storage of Vegetables

Published by
National War Garden Commission
Washington, D.C.

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WAR DEPARTMENT
WASHINGTON

NATIONAL WAR GARDEN COMMISSION,
WASHINGTON, D. C.

June 7, 1918.

Dear Sirs:

The War Department finds much satisfaction in the creation of War Gardens at various army camps by the Conservation and Reclamation Division of the Quartermaster General’s office. Food production at these camps has been the subject of some concern with the department. The large areas of tillable land within many of the military reservations have been regarded as offering potential food production on a large scale, and I feel that the army is to be congratulated that the utilization of this space has now taken concrete form.

Camp War Gardens will serve more than one useful purpose. The production of food at the mess door is of great importance in that it not only lessens the army’s demand on the usual sources of supply but eliminates transportation as well.

To the National War Garden Commission I extend the thanks of the Department for its quick response to the appeal of the Quartermaster General’s office for co-operation. Not confining itself to mere compliance with the letter of the request, the Commission entered fully into its spirit. At a time when funds were not available through Government channels the Commission voluntarily provided seed, fertilizers and equipment which made possible the establishment of a War Garden of 300 acres or more at Camp Dix. For this generous contribution and for swift action to overcome the handicap of a late start I take pleasure in making this acknowledgment and in expressing the hope that the Camp Dix War Garden of the National War Garden Commission will prove an unqualified success.

Cordially yours,
(Signed) NEWTON D. BAKER,
Secretary of War.

UNITED STATES FOOD ADMINISTRATION

Baltimore, Maryland.

September 14, 1918.

NATIONAL WAR GARDEN COMMISSION,
Maryland Building,
WASHINGTON, D. C.

Gentlemen:

We wish to express to you our appreciation of your helpfulness in our war garden, canning and drying work in Maryland during the season of 1918. Your book on canning and drying has been of great value, while the canning outfits which you so kindly gave us made it possible for us to establish canning centers throughout the State, with results of far-reaching importance which could not have been otherwise accomplished. We are equally appreciative of your prompt and willing response to our request for the services of one of your trained investigators to assist in our war garden work. Your spirit of prompt and willing service is cordially appreciated.

Yours truly,
(Signed) EDWIN G. BAETJER,
Federal Food Administrator for Maryland.
PLAN OF GARDEN 50 by 75 feet, in which careful attention has been paid to proper relation of the season’s crops and to a continuous supply of the more important vegetables.

<table>
<thead>
<tr>
<th>Hot Bed</th>
<th>Cold Frame</th>
<th>Asparagus</th>
<th>Rhubarb</th>
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**ARRANGEMENT OF SEASON’S CROPS**

Peas, followed by late Tomatoes

Peas, followed by Celery

Onion Sets, followed by Turnips

Corn, followed by Spinach

Beans (bush), followed by Beets

Beets, ½ row; Carrots, ½ row, followed by Corn

Turnips, followed by Bush Beans

Potatoes, followed by Spinach

Spinach, followed by Potatoes

Cabbage, with Lettuce and Radishes between, followed by Carrots

Beans, Bush Lima

Chard, ¾ row; Parsley, ¾ row

Parsnips, ¾ row (radishes to mark row); Salsify, ¾ row

Corn, followed by Kohlrabi, ½ row; Cauliflower, ½ row

Peas, followed by Corn

Beans, Bush Lima

Early Potatoes, followed by late Cabbage

Early Tomatoes

Peppers, ½ row; Potatoes, Okra or Eggplant, ½ row

Potatoes

Potatoes

Pole Lima Beans

Pole Beans

Corn

Corn

Corn

<table>
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<tr>
<th>Cucumbers</th>
<th>Squash (bush)</th>
<th>Squash (winter)</th>
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Rows are 30 inches apart. If soil is very fertile, rows may be closer.

Planting was begun at hotbed end of garden and plantings were made a few days apart to insure a constant supply of vegetables. Planting table on page 23.
AMERICA’S responsibility for the world’s food supply did not stop with the ending of the war. In peace, as in conflict, this country must carry the burden of Europe’s food problems. With the advent of peace these problems have become intensified. America is now expected to furnish the solution and this can be done only through the continued application of high pressure food production and unwavering food conservation.

For two years of war the War Gardens of America produced food-stuffs which helped establish the balance of power between starvation and abundance. In the spring of 1918, General Haig declared, “We stand with our backs to the wall.” Of that call to the civilized world no phase was more vital than its interpretation and answer in terms of food. During that year the answer was given by the American people with true American spirit. The war gardeners of the United States responded with a vigor which carried the War Gardens over the top to victory. By the addition of more than five hundred million dollars of crop value to this country’s food production they made it easier for America to feed her own people and the people of France and Belgium.

The Victory Garden is now as vital as the War Garden. Peace brings new food needs. In reclaiming territory from the enemy France and Belgium have greatly increased the number of their people who must be fed. By restoring these former expatriates to citizenship these countries have also assumed the burden of feeding them. This will mean a vast increase in the demands on America as the source of Europe’s food supply in 1919. Europe cannot feed herself during the first year of reconstruction; Russia faced famine conditions in the winter of 1918-1919, and Mr. Hoover says that the world’s food shortage will last for another seven years.

The war gardener’s responsibility, therefore, did not end with the coming of peace. His War Garden must now be made a Victory Garden in the full sense of the words. It must help solve the problem of feeding people rendered helpless by years of ruthless and terrible war.

The garden crop of 1919 must be even greater than that of 1918, and there must be more canning and drying for winter use. The people of America have a real duty to perform in this respect and the nation counts confidently on full measure of individual response.
PART I

WAR GARDENING MANUAL

As a result of emergency created by war the home garden of America has become an institution of world-wide importance. The planting and growing season of 1918 demonstrated that the products thus raised are essential to the feeding of the people of the United States and the Allied Nations. Under the impetus given by the National War Garden Commission the people of this country last year produced a crop valued at $520,000,000 in gardens cultivated in backyards, on vacant lots and on other land previously un-tilled—the patriotic gift of the war gardens to the nation.

Peace can in no wise diminish America’s responsibility for feeding Europe. The recovery of vast areas of devastated country in France and Belgium greatly increases the number of people to be fed and adds heavily to the food burden of America. Because of this the Victory Garden is no less necessary than the War Garden.

WAR GARDENS HELP SOLVE TRAFFIC PROBLEM

War-time brought the most serious traffic congestion the United States has ever seen. This condition has no meaning more significant than that the gardens of this year must do even more than those of 1918 in freeing the overburdened railroads from the need for transporting food products. With food shortage threatening the Allied Nations and with railroad congestion as an added factor, the war garden results of the coming season must be considerably greater even than the vast yield of last year.

COMMUNITY GARDENING

Excellent results are obtained through co-operative gardening work. If several families join forces they can reduce the cost of gardening in time, labor and money. Families having adjoining or neighboring garden plots may use one set of tools. To prevent clash of convenience it is well to have an understanding in advance as to the time when each gardener is to have the use of particular tools. By this arrangement it is possible to have complete equipment at expense much less than if each gardener bought his own. Money can also be saved in buying seeds, fertilizers and spraying materials by clubbing together and gaining advantage of the lower prices for large lots.

One of the advantages of doing community work is that it is possible for the gardeners interested in the project to employ a man and a team to prepare their gardens by plowing and harrowing. In this way the man and team can be kept busy throughout the day and the expense to each gardener will be slight.

On a larger scale this principle should be applied to garden plots on tracts of vacant land allotted to individuals in or near cities or towns. Each plot in such a tract is a separate garden, belonging to the individual or family to whom allotted. In many instances the municipal authorities, the mayor's war garden committee or some similar local organization, will provide an expert to supervise work on community gardens of this character. This expert will give advice and instructions as to preparation, planting and cultivation and on other technical subjects.

If an expert is not provided in this way it is wise for the gardeners to club together and arrange for one at their own expense, if the project is large enough to make this possible without too great individual cost. The help of an expert is of great value.

School children and parents may work together to good advantage on these garden plots. In some communities school authorities allow the children to spend a portion of the school hours, on stated days, in their garden work. Through co-operation with street cleaning departments a municipal government may arrange to deliver manure to war gardeners at nominal cost. In at least one important city this is done at a charge of $2 per load.

It is a good plan for municipal governments to arrange for lectures at school houses or other places on practical problems in gardening. This increases efficiency.
CORPORATION GARDENS

Manufacturing concerns, and other enterprises which employ labor on a large scale, may make valuable contribution to the national food supply by encouraging their employees to cultivate war gardens. Many concerns furnish large tracts of land, which are divided into individual garden plots. These plots are allotted to such employees as are willing to cultivate them. Each plot and everything it produces are recognized as the individual property of its cultivator. The company bears the expense of plowing and fertilizing these plots and employs an expert to have charge.

HOW TO HAVE A GOOD GARDEN

Garden Plan

Have a plan for your garden—drawn to scale on paper—before you start, to give proper order in planting and enable you to buy the right amount of seeds in advance while the selection is good.

Put in one general group small plants like beets, onions, lettuce, carrots, radishes and parsnips. In another general group put larger plants like corn, tomatoes and potatoes. Spreading ground vines, like melons and cucumbers, which need wider spacing, should be put in another general group. The reason for this grouping is that the various plants in a group need similar general treatment as well as spacing.

In making a plan provide space in which to enter costs and yield of the various crops. This will give you a complete record which will be useful another year. Another helpful use of the plan is that it will guide you in the rotation of next year’s crops. For this purpose save your plan for next season.

In planning your garden formulate some definite plan as to what you will do with surplus vegetables. Detailed instructions for home storage of vegetables for winter use are given in Part II of this booklet. Detailed instructions for canning, drying, pickling and other forms of conservation are given in the Home Manual on these subjects issued by this Commission.

Sunshine

In the location of a garden it is not always possible to choose conditions as to sunlight. It is important, therefore, that in the arrangement of the various varieties of vegetables which are to be planted, due care should be given to providing the greatest exposure to the sun for those crops which need it most. Those plants which must ripen their fruits, such as tomatoes and eggplant, require the greatest amount of sunshine, while lettuce, spinach, kale and other leaf crops require relatively less. Foliation crops must have at least 3 hours of sunlight a day and plants which ripen fruits at least 5 hours a day. This is important.

Vary from Last Year’s Plan

It is important to remember that plant diseases and insects are apt to thrive in a spot in which they have become established. For this reason those who make gardens this year should take care not to place the individual crops in the spot in which the same crops grew last year. Varying the arrangement of the garden in this way will reduce the danger from disease and insects. The same vegetables in the same place each year exhaust certain food elements, and reduced yields are sure to result.

SURPLUS PRODUCTS

At times, even with the best of planning, a gardener will find that his garden has matured more of some varieties of vegetables than can be used immediately. None of this excess should be wasted and there is no occasion for waste. If there is no ready market for the surplus it should be prepared for winter by either canning or drying. By modern methods either canning or drying may be done with little expense of time, trouble or financial outlay. By using the
cold-pack method as small a quantity as a single can or jar may be put up in a short time. With proper instructions it is possible for the housewife to dry a handful of peas or beans, sweet corn, a few sweet potatoes or turnips, or small quantities of many other vegetables with practically no expenditure of her time. Explicit and simple directions for canning and drying are given in the Manual issued by the National War Garden Commission.

THE SOIL AND MANURES

The back yard gardener must use the soil he has, but he can improve it if is poor, and he must do this as far as possible. Stable manure will help even the richest soil, and you are not likely to use too much of it. During a single season professional gardeners apply as much as six inches of it. From 400 to 600 pounds can be used to advantage on a plot 20 by 20 feet. Coarse manure should be applied and thoroughly plowed or spaded under in the fall. In the spring, fine, rotted manure is applied, just before plowing or spading, preceding the planting of any crop. If the ground is fairly rich, and well-rotted manure is scarce, the manure may be scattered in the row only, and should be mixed into the soil before the planting of seed.

Loam is the best garden soil. Sand, with manure, gives good results. Clay is hardest to work, but is greatly improved by well-rotted manure and vegetable matter—called humus. These should be well worked in with hoe and rake. Sifted coal ashes, entirely free from clinkers, will help loosen up clay when mixed into it, but will not remove an acid condition nor increase fertility.

Where manure has been worked into the soil, reduce the fertilizer application approximately one-half.

Tomatoes, eggplants, potatoes, spinach and some other crops requiring rather long growing seasons, are materially benefited by a second application of fertilizer when half grown. Side dressings of this kind should be scattered between the rows at the rate of four ounces (one-half pint) to 10 feet of row, when rows are spaced 2 feet apart; and pro rata for rows spaced a greater or lesser distance. To insure even distribution mix the fertilizer with fine, dry earth just before spreading.

Fig. 2—This shows the construction of an outdoor cold frame. A hotbed is built in the same way, except that for the hotbed a pit and manure are required. See page 7 for directions for making cold frames and hotbeds.

Commercial Fertilizer

Many gardeners experience difficulty in obtaining supplies of well-rotted manure. In such cases commercial fertilizers should be used. Even where stable manure has been secured and worked into the soil it is well to supplement with moderate quantities of quick-acting fertilizer in order to give plants an early start and hasten maturity.

It is safest to rely upon the ready-mixed fertilizers usually obtainable at seed and hardware stores. Several specially prepared mixtures in convenient packages are now on the market. For large areas, 100 to 200-pound bags may be obtained. A mixture containing 3 to 4 per cent nitrogen and 8 to 10 per cent phosphoric acid is about right for the average garden. Your dealer will inform you on this point. If the fertilizer also contains potash, so much the better, but this year potash is scarce and high in price.

Where no manure is used the fertilizer should be spread over the surface of the finely prepared seed-bed at the rate of 5 pounds for a plot 10 feet square, just before planting. The surface soil should then be thoroughly raked so as to mix the fertilizer evenly to a depth of 2 inches. Never place seed or transplanted plants in direct contact with fertilizer. Thorough mixing of the fertilizer with the soil is essential to prevent injury of seed or roots.

Compost

Compost is especially desirable when quick growth is wanted. Compost is thoroughly rotted manure or organic material. It is prepared from six to twelve months before being used, by putting the manure and other material in piles having perpendicular sides and flat tops. These piles are usually from 2 to 4 feet high and 6 to 8 feet long.

Besides the usual waste of garden rubbish, there is a large waste of leaves, weeds and the skins and other unused portions of fruits and vegetables. These should all be thrown on the compost pile to decay for use on the
garden next spring. Destroy all plants which are diseased. The compost pile should be built up in alternate layers of vegetable refuse a foot thick and earth an inch or more thick. The earth helps to rot the vegetable matter when mixed with it. The top of the pile should be left flat that the rain may enter and help in the process of decay.

If the pile can be forked over once a month when not frozen and the contents well mixed together, they will decay quite rapidly and be in good usable condition in the spring. The compost may be either spread over the garden and plowed under or it may be scattered in the rows before the seed are sown. This is, of course, not as rich as stable manure, but it is a good substitute.

Compost is also used as a top dressing during the growing season for hastening growth.

In the cities and towns tons of leaves are burned every fall. This is a loss which ought to be prevented. These leaves properly composted with other vegetable waste and earth would be worth hundreds of dollars to the gardens next spring.

In planning a permanent garden, a space should be reserved near the hotbed or seed bed, and in this space should be piled, as soon as pulled, all plants which are free from diseases and insects. This applies to all vegetables and especially to peas and beans, as these belong to a group of plants which take nitrogen from the air, during growth, and store it in their roots. When these plants are decayed they will return to the soil not only much of the plant food taken from it during their growth but additional nitrogen as well. Nitrogen in the soil is necessary for satisfactory leaf growth. The material so composted should be allowed to decay throughout the winter, and when needed should be used according to the instructions given for using compost. The sweepings of pigeon lofts or chicken coops make valuable fertilizer. When cleaning roosts from day to day add ¼ as much acid phosphate as sweepings. When needed apply 1 pound of this mixture to every 5 square feet of ground, mixing it thoroughly into the soil.

Prepared sheep manure, where procurable at a reasonable price, is possibly the safest concentrated fertilizer. It should be used in small quantities rather than spread broadcast. Scatter it along the row before seed is sown or apply by mixing it with water in a pail, stirring the mixture to the consistency of thin mush, and pouring it along the rows of the plants.

**Green Manure**

Green manure is useful as a fertilizer. It consists of green plants turned under by plowing or spading. Rye is the most satisfactory for this purpose. If planted in July or August the crop may be turned under in the fall if early spring planting is desired. If planted later, it is usually turned under in the spring. When not turned under until spring, the growth will prevent the leaching of soluble plant food or the washing away of rich soil.

In sowing rye for this purpose, use at the rate of 1 pound of seed to a strip of ground 50 feet long and 10 feet wide. If the ground is rough or hard it should be cultivated just before the seed is sown, and then cultivated again to cover the seed. Sow the seed between the rows of crops not yet gathered. Rye is very hardy and will sprout even though there is frost nearly every night. At a cost of about 5 cents for a pound of seed a garden of 10 by 50 feet can thus be treated to an application of green manure. The green rye plants soon decay when turned under and answer the same purpose as a light dressing of manure.

Green manure, however, should not be relied upon to do the work of stable manure, as it does not provide phosphorus or potassium.

**Lime**

Land which has long been unused, or land in lawns, is apt to be sour. To remedy this condition apply evenly 1 pound of air-slaked lime or 2 pounds of ground limestone to every 30 square feet. The lime should be applied and raked in to a depth of 2 inches when the seed bed is being prepared in the spring. Instead of lime 2 pounds of unleached
wood ashes may be used. Do not apply lime at the same time as manure or mixed fertilizers, as it will cause loss of nitrogen.

As an addition to soil lime is of considerable value. Besides correcting acidity it changes the physical structure of the soil. One of the elements of lime is calcium, which is required for plant growth.

OUTDOOR HOTBEDS

For early planting a hotbed may be made, located in a sheltered spot with southern exposure, where it will receive a generous supply of sun. A width of 6 feet is desirable, and the length should be such as will enable the use of standard 3 by 6 foot hotbed sash. A simple, boxlike frame, 12 inches high in the rear and 8 inches high in front, will hold the sash and give a better angle for the rays of the sun.

Dig a pit 1 1/2 to 2 feet deep, the size of the sash frame to be used. Line the sides of this with boards or planks, brick or concrete, and make a tile drain, or place stones on the bottom of the pit, to carry off surplus water. This pit is to be filled with fresh horse manure. The manure will require special treatment before being placed in the pit. It should be thrown into a pile and allowed to heat. When it has heated and is steaming fork it over into a new pile, throwing the outside material into the center. When the new pile has become well heated fork the material once more into a new pile. This will require from ten days to two weeks and is important in that it gets rid of excessive heat. After this process fill the pit with the manure, packed down firmly and evenly, level with the surface of the surrounding earth. On top of this manure make a covering of good garden loam 3 or 4 inches deep.

When the sash has been put in place the manure will generate heat, in addition to the heat that will be derived from the sun. After this heat has reached its highest point and dropped back to between 80 and 90 degrees F. the seed should be planted. Use the best seed obtainable. Until the seed germinate the hotbed should be kept shaded to hold moisture. This can be done by spreading over the sash strips of old carpet, heavy cloth or newspapers. After germination strong light will be needed. The plants must be watered each morning on clear days, and the sash left partially open for ventilation, as it is necessary to dry the foliage to prevent mildew.

Proper ventilation is essential to the production of strong, healthy plants. The sash should be raised during the warmest part of the day on the side opposite the direction from which the wind is blowing. By opening it in this way instead of facing the wind, the hotbed receives fresh air without receiving direct draft. On cold days raise the sash slightly three or four times a day for a few minutes only. In severe weather cover the beds with mats, straw or manure to keep in as much heat as possible. About two weeks before transplanting time the sash should be removed during the day to "harden" the plants. While in the hotbed the plants should be thoroughly watered, but the water should not reach the manure underneath. Early morning is the best time for watering, so that the plants will be dried before night.

An outdoor hotbed of this character should be started in the early spring—February or March.

THE COLD FRAME

A cold frame is useful for hardening plants which have been started in the hotbed. It is built like a hotbed, but without the pit or manure. It is built on the surface of the ground. Good, rich soil should be used and the soil kept slightly moist. In mild climates the cold frame may be used instead of a hotbed for starting plants. It is also used in the fall and early winter for growing lettuce, radishes, carrots, parsley, etc.

TOOLS

Not many implements are required for home gardening. The essentials are a spade or a garden fork, a hoe, a rake with steel teeth, a trowel, a dibble or pointed stick, and a line such as is used by masons, or a piece of common string or cord, to stretch between two stakes for marking off rows. In the case of hard packed earth a pick is useful for digging. For watering, a rubber hose is needed where pipe connections are available. Lack- ing this equipment a watering pot should be provided. A hand cultivator or wheel hoe is useful, especially in a large garden, and saves much time and labor in turning small furrows. With simple attachments it is used for stirring the soil and the removal of weeds.

PREPARATION OF SOIL

After the frost goes out test the ground by squeezing a handful of it. If it crumbles the soil is ready for spading. If it packs into a mud ball, the ground is still too wet and should not be worked.

Spade deeply, 8 to 15 inches, unless this latter depth turns up poor soil and buries the richer soil of the top. Pulverize the dirt deeply with hoe, spade and rake, breaking all clods on the surface. If a lawn roller is available it is useful for crushing clods. All vegetable growth on the surface, such as grass
or weeds, should be turned under, to rot and enrich the soil. This is especially important with ground that has had a growth of turf.

**SELECTION OF CROPS**

The home garden campaign for 1919 should be planned with a view to the production of the largest possible amount of food with the smallest possible outlay of seed and fertilizer. Authorities agree that the seed shortage is the worst the country has ever seen. The supply of fertilizers and natural manures is far below the normal. The demand for these materials is exceedingly great and war-time efficiency makes it vital that war-time conservation be practised in the use of them. To this end gardens should be devoted as far as possible to those crops which are most useful for food and in which the chances of failure are least to be feared.

In the selection of vegetables for the home garden preference should be given to the staple crops such as potatoes, beans, tomatoes, corn, onions, and cabbage. Crops of next importance, such as peas, carrots, parsnips, beets, squash, greens, turnips, cauliflower, radishes and celery, should be grown if space in the garden permits.

Soils vary so much that serious attention should be given to the crops suited to the individual garden. This is a local question. Consult your local war garden committee's experts as to the best crops for your particular soil. Expert advice will prevent mistakes.

In many communities, last year witnessed an over-production of some vegetables that had to be used during the growing season. Many gardeners had larger crops of these than they could possibly use. Much waste resulted. To prevent this loss in seed, fertilizer, garden space, labor and foodstuffs every gardener should give especial attention to the selection of crops. Plant sparingly of those things which must be used as they mature and plant liberally of those things which may be saved for winter use by canning, drying or storing.

**PROCURE SEED EARLY**

Seed shortage was a handicap to many gardeners last year. In 1919 the planting of gardens will be increased and the demand for seed even greater than in 1918. It is important, therefore, that the home gardener should procure his supply of seed early—well in advance of planting time. Be sure to patronize a reliable dealer, as quality is vital.

**Use Seed Sparingly**

Home gardeners often plant seed thickly to make sure of a good stand. This is a wasteful method, excepting with such vegetables as will produce young plants which may be used as greens. The better way is to plant according to the directions given in the planting table.

The pronounced seed shortage this year makes it imperative that no seed be wasted.

**Testing Seed**

A simple test will give useful advance information of the germinating value of seed. This test is useful as enabling the gardener to determine whether or not seed have been properly cured and are otherwise in good condition. Seed which are too old or have been kept under unfavorable conditions are unsatisfactory.
HOW MUCH SEED TO BUY

The following amounts of seed will plant in each case a garden row 100 feet long. Measure your rows and buy accordingly. Also compare your figures with planting table on page 23.

String beans ........................................... 1/2 to 1 pint
Lima beans ........................................... 1/2 to 1 pint
Cabbage ........................................... 1/4 ounce
Carrot ........................................... 1 ounce
Cauliflower ........................................... 1 packet
Celery ........................................... 1/4 ounce
All squash ........................................... 1/2 ounce
Beans ........................................... 1/2 ounce
Sweet corn ........................................... 1/2 ounce
Lettuce ........................................... 1/4 ounce
Muskmelon ........................................... 1/2 ounce
Cucumber ........................................... 1/2 ounce

1 or 2 pecks of early potatoes and 1/2 to 1 bushel of late potatoes are enough to plant to supply four persons.

Plant 8 or 10 seed to the inch, keep the soil damp, and set the box in a window. When the plants are an inch high transplant them to other seed boxes, spacing plants 2 inches apart. This insures sturdy plants with good root systems.

Transplanting

Before transplanting the plants to the garden set the box outdoors, in mild weather, to harden the plants. Set out each plant with a ball of the box dirt sticking to the roots. Thorough watering several hours before transplanting causes the earth to stick as required.

If the root system is broken in the removal trim away some of the larger leaves of the plants. In moist ground open a hole with trowel or dibble. Make the hole larger than is needed to hold the roots and a little deeper than the roots grew. Place roots in hole, and, with the hands, pack the soil firmly around the plant. In dry soil pour a pint of water into each hole before inserting plant. Rake some dry earth about the surface surrounding each plant to hold the moisture.

Transplanted plants cannot stand strong sunshine at first and cloudy days or late afternoon are preferable for transplanting. In bright weather place newspapers over them for a day or two, making tents of the papers, in the shape of an inverted V.

A homemade paper pot, a round, bottomless paper band or a berry box, filled with soil
should be used to produce plants for a hill of cucumbers, squash, melons or other "vining" plants which are started indoors, as these do not stand transplanting if the roots are disturbed. The pot or other holder may be set into the ground without disturbing the roots. Tomatoes, eggplants and beans may also be started in this way.

Fig. 9—Seed box for starting plants indoors.

WHEN TO PLANT

When heavy frosts are over, plant early peas, onion sets and seed, early potatoes, kale, lettuce and spinach. All of these will stand light freezing except potato plants, which should be covered with dirt when frost threatens.

When frosts are about over plant radishes, parsnips, carrots, beets, late peas and early sweet corn, and set out cabbage and cauliflower plants. (An old and useful rule is to "plant corn when the oak leaves are the size of a squirrel's ear").

When all frosts are over and apple trees are in bud, plant string beans and late sweet corn, and set out a few early tomato plants from the indoor boxes.

When apple trees have finished blossoming plant cucumbers, melons, squashes, lima beans and set out the rest of the indoor plants.

SEED BEDS

Plants for second crops may be raised in an outdoor seed bed occupying small space. These plants may be grown while the space allotted to them in the garden plan is still in use for earlier crops.

The rows of seed are not spaced so closely as in boxes used inside the house. If the plants crowd each other too much some of them may be removed and transplanted to another part of the garden. The seed bed plan is useful for such crops as cauliflower, Brussels sprouts, late cabbage and the like.

FALL PLANTING

It is well to plant a fall garden of some crops, for in spite of the risk of injury by early frost the chances are in favor of satis-

factory results. There can be no absolute rule as to the time of planting. The probable time of the first frost in each locality must be taken as a general guide. For planting in August, and possibly even in early September, the following vegetables may be grown:

When first frost may be expected between September 15 and September 25:

Lettuce, Spinach, Turnips, Parsley, Multiplier Onions and Turnips. (Kale and Radishes may be risked.)

When first frost may be expected between September 20 and October 5:


When first frost may be expected between October 5 and October 15:

Beets for canning, Carrots, Kale, Multiplier Onions, Spinach, Chard, Endive, Lettuce, Radishes and Turnips.

When first frost may be expected between October 15 and October 25:

Any of the vegetables mentioned in the preceding lists. (String beans may be risked.)

LAYING OFF ROWS

Straight rows add to the garden's beauty and make cultivation easier. To make the rows straight stretch a stout string between stakes and follow it with the point of a hoe, with a wheel hoe, or with the end of the handle of the rake or hoe, to open up the row. The plan is suggested in Fig. 10.

Fig. 10—Straight rows add to the beauty of the garden and are easier to cultivate. The simplest way to lay them off is to stretch a line between two stakes and mark row with a hoe, hoe handle or stick.

SUCCESSION OF CROPS

Nature generously provides for more than one crop on the same soil. Vegetables which reach maturity early in the season should be followed by later crops of the same vegetable or by rotation of other kinds. Onions to be used green may be grown in rows which are to be occupied by late tomato plants, as a few of the onions may be removed to plant the tomatoes. Radishes mature early and as they are harvested the space may be used for cabbage, lettuce, cauliflower, Brussels sprouts
and other plants. Many combinations of this kind may be made to good advantage. Once a week is better than to sprinkle every day. Late afternoon is the best time to sprinkle.

![Fig. 11—Beans planted at proper depth.](image)

![Fig. 12—Lima beans, planted properly, with eyes down.](image)

**FOR CONTINUOUS CROPS**

With some of the important vegetables a series of plantings is desirable. Of string beans, lettuce, radishes, spinach, sweet corn, peas, beets and carrots there should be several successive plantings, two or three weeks apart, to provide a fresh and continuous supply all season.

**DEPTH OF PLANTING**

Do not plant too deeply. The old rule is to plant to a depth of 5 times the thickness of the seed. This, however, is not an absolute rule and is not safe in all cases. Consult planting table on page 23 for depth.

**HOEING**

When the green rows appear it is time to start hoeing or cultivating. Never hoe or cultivate deeply—an inch or two is deep enough—but stir the ground frequently, and always after rain or watering, as soon as it is dry enough. The hoeing must not be done after rain or watering when the ground is still so wet as to cause the muddy earth to pack like cement, as this causes the earth to cake and dry out altogether too rapidly, which is undesirable. Frequent hoeing causes the formation of a dust layer which prevents the soil underneath from drying out. The garden should always be kept free from weeds, as these, if permitted to grow, consume plant food and moisture needed by the plants.

**WATERING**

A plentiful supply of moisture is essential. If there is not sufficient rainfall the moisture should be provided by watering the garden. In doing this it is better to soak the ground.

To moisten the surface is not enough. There must be a thorough wetting. If pipe connections are available a garden hose is the best means of watering. One of the most satisfactory methods is to open small furrows between rows and allow water to run into these trenches, raking the earth back into place several hours later and making a mulch, after the water has thoroughly soaked in. The sprinkling pot will serve if hose is not available, but it is more laborious. Overhead sprinklers are very satisfactory. They consist of pipes mounted on supports extending the length of the area to be watered. Holes are drilled at intervals of 3 to 4 feet and small nozzles are inserted which yield a spray-like misty rain when the water is turned on. By turning the pipes and also changing the position of them it is possible to water an area of any size.

In home gardens proper drainage is often disregarded. Drainage improves the soil by allowing air to enter; by raising the temperature of the soil; by rendering the soil more porous and granular; by enabling the roots of plants to grow deeply into the soil and by allowing earlier cultivation in the spring.

Blind ditches, partly filled with stones or other material covered with soil, or open ditches, will be found satisfactory for the home garden. They should be along the lowest level of the garden, and have suitable outlet. Lacking an outlet, lay tile 12 inches below surface of garden, slanting toward a hole 10 feet deep and 5 feet across, in center of garden. Fill this, two thirds to top, with stones, covering stones with clay and covering the clay with loam.
WAR GARDENING

DIRECTIONS FOR VEGETABLE GROWING

POTATOES

As one of the staple needs of the household Potatoes are entitled to special attention in Home Gardening and Community Gardening. In selecting for seed it is desirable to choose medium to large, smooth, shallow-eyed potatoes. The best seed will produce the best crop. Potatoes grow best in sandy loam or in a gravel loam. Heavy, sticky clay or loose sand is not desirable soil. Potatoes should not be grown in the same place in the garden in which they were grown the previous year. A rotation of three or four years is desirable.

Preparation of the soil should be done with care. The ground should be worked with plow, spade and hoe, to a depth of 8 or 10 inches, and should be thoroughly broken up or pulverized, then thoroughly worked with a steel-toothed rake. This preparation is of great importance and should not be slighted. Attention to details is necessary to success.

Treat Seed for Scab

One of the most common diseases affecting seed potatoes is scab. This attacks the skin of the potato, causing it to thicken, and giving it a scabby appearance. It is carried through the winter, in soil, in manure and on the potatoes themselves. To control this affection it is important that potatoes should be rotated with other crops as to location, and the same soil not used for potatoes except at intervals of three or four years. A simple remedy, easily applied, is to soak the seed potatoes before planting, in a solution of Formalin and water. This solution is made of 1 ounce of Formalin (40 per cent formaldehyde), mixed in 2 gallons of water. In this mixture soak the uncut potatoes for two hours, and spread them out to dry. The solution can be used on as many lots of potatoes as desired.

Seed potatoes should be spread out in a room in which they will be exposed to strong light for two weeks before cutting, to start sprouts and detect poor seed. If large potatoes are used cut them into pieces weighing from 1 to 2 ounces, each piece having at least two eyes. If potatoes are scarce and expensive the pieces may be cut to a single eye. Do not cut the seed until it is to be planted.

Planting

For planting, prepare trenches or furrows from 3 to 5 inches deep and from 24 to 36 inches apart. Plant seed pieces 3 inches deep for early potatoes and 5 inches for late varieties. The seed pieces should be 14 to 18 inches apart in rows, the smaller the pieces the closer the planting. Fill the trench with dirt, firming it in order that the moisture may be brought in contact with the seed pieces to assist in the process of germination.

Usually potatoes should not be planted as late as the first week in July very far north of the Mason and Dixon line except in sections where it is known that they will mature before freezing weather arrives.

Cultivation

As soon as the potato plants come up begin cultivating them. The cultivation should begin before they come up if a crust forms. Cultivate or hoe every week during the season, to keep the surface in good condition. When the plants are young work the soil up around them to support the plants.

Potatoes are subject to diseases and insects which are scheduled on page 21. Take precautions to keep these from getting a start. Follow instructions as to spraying and keep at it during the season. It is better to spray before trouble appears than to take chances.

Dig early potatoes when they are of the size desired. Late potatoes, for storing, should not be dug until the leaves and stems are dead, or until the skin is so firm that it may not easily be rubbed off.
SWEET POTATOES

Sweet potatoes are grown mostly in the Southern States or where there is warm, sandy soil, and are not especially recommended for the home garden. If space permits a few plants may be grown.

If you wish to grow your own plants start a hotbed about six weeks before apple-blossom time. Place 5 or 6 inches of sand over the manure in the hotbed and lay down small, healthy sweet potatoes, close together but not touching. Cover them with one or two inches of sand; water occasionally to keep slightly moist. Sprouts will soon begin to grow and immediately send out roots into the sand. When these sprouts are four or more inches long they may be pulled from the potatoes and are rooted ready to be planted. They need not be pulled, however, until time to plant them in the garden, when all danger of frost is past. They should be set 14 inches apart in rows 36 to 60 inches apart. If only a few plants are wanted they should be purchased from a seedsmen, as the trouble involved in growing them in small quantities is too great to make it worth while.

On land which is not thoroughly drained the plants should be set on ridges and these should be made broad, as narrow ridges will dry out too rapidly. The ridges should be maintained during the entire growing season.

Sweet potatoes should be dug when the soil is dry and the weather bright, before there is danger of hard frosts. A spading fork may be used in digging them. Guard against bruising or injuring them in digging and handling. Let the roots lie out to dry for two or three hours after digging.

Asparagus

Use strong plants two years old, which may be purchased from seedsmen. Set them 18 inches apart, in rows 3 feet apart. The rows should be 8 to 10 inches deep, with width of 6 to 8 inches at bottom. After spreading out roots cover crowns with 2 inches of soil. With the growth of the shoots gradually fill in with earth until level with surface. Careful cultivation is required during the season. A small bed heavily manured will furnish plants for 2 or 3 persons.

Beans

Beans form a staple crop which may be raised in almost every climate. They need a rich soil which holds moisture, but is well drained. Frequent shallow cultivation must be given and they must be kept growing with-

out a check until harvested. Never cultivate while moisture is on vines.

Beans are susceptible to cold and for sure results they should not be planted until danger of frost is past. So little trouble is involved in bean planting, however, that it is a good plan to take a chance on making the first planting as soon as the ground is reasonably warm. If the first planting should be killed by frost there is a good chance that the second will come up and that it will mature early. In this way a crop will be assured early enough to make it worth while to take the small risk involved in the possible loss of the early planting.

Dry shell beans are planted and treated the same as string beans are planted and treated. The beans are allowed to mature in the pods. They should be thoroughly dried, shelled and stored as directed for storage of seed on page 32.

String and lima beans are grown alike. There are two sorts of each—low bush vines and bean vines that climb poles. Pole beans are best for small gardens.

Plant beans and bush limas 1 inch deep, 4 to 6 inches apart in rows.

Make successive plantings every ten days until hot weather. In late summer make successive plantings of string beans until eight weeks before the usual time of first frost.

Plant pole beans and pole limas in hills 1 inch deep, 4 seeds to hill, hills 3 feet apart. Thin to 2 plants to the hill. Before planting fix firmly in each hill a pole 5 to 6 feet long. If desired have two rows of hills and slant the poles so that each set of 4 may be tied together at the top like an Indian teepee. This prevents the poles from falling, but reduces the yield of the vines.

Help the vines to start twining around the poles from right to left.

Note: Plant lima beans with the “eyes” of the seed downward.

Beets

Sow seed rather thickly in row, using 1 oz. to 50 feet, but thin the young plants by pulling until the survivors are 4 inches apart. The pulled plants make fine greens for cooking or canning.

Brussels Sprouts

Grown like cabbage.

Cabbage

Set plants from indoor seed boxes or pots 15 inches apart in rows, the rows being 30 inches apart. Between these rows
early lettuce, radishes, and other little crops may be planted. Early cabbage should be gathered as soon as it has formed solid heads. Late cabbage may be stored in trenches and covered with straw and earth.

**Carrots**

Sow seed ½ inch deep, using ½ ounce to 25 feet of row. Thin to 2 or 3 inches apart when roots crowd each other.

**Cauliflower**

Grown the same as cabbages, except when the heads form, the loose outer leaves should be tied together over the heads to keep out the light and bleach them.

**Celery**

Sow seed in seed boxes and set plants in garden in June or July, 6 inches apart, trenches 6 inches deep and 3 feet apart. Make the trenches 6 to 8 inches wide at the bottom so that rains will not wash the earth over the young plants. As the plants grow, cultivate the ground into the trenches. When plants are large heap earth around stalks to whiten them.

**Celeriac**

This is a large rooted form of celery. It is grown like celery, except that the plants do not need bleaching. The large root is cooked for use. The plants should be protected in freezing weather by straw or mulch (half-rotted manure and straw), and dug when needed.

**Corn, Sweet**

Plant 5 or 6 seed 1 inch deep in hills 3 feet apart. When plants are 4 inches high pull out all but 2 or 3 plants in each hill. Make new plantings every 2 weeks until July or August so as to have corn for use during the entire season.

**Cucumbers**

Plant 8 to 10 seed 1 inch deep in hills 4 feet apart. Later thin to 2 plants per hill. Do not plant until soil is warm and frosts are over. Hoe or cultivate only until plants start to vine, then pull weeds by hand.

**Eggplant**

Little plants from seed boxes are set 2 feet apart in rows 3 feet apart.

**Endive**

In midsummer sow seed ½ inch deep and later thin plants to 8 inches apart. To blanch hearts raise leaves and tie together over heart.

**Kale**

Sow seed ½ inch deep in rows 18 to 24 inches apart. Thin the plants until they are from 6 to 8 inches apart in the rows.

**Kohlrabi**

Sow seed ½ inch deep and later thin plants to 4 or 6 inches.

**Lettuce**

Sow seed ½ inch deep in rows 1 foot apart and later thin out until plants are 5 to 6 inches apart. There should be successive plantings, but lettuce is not grown in extremely hot weather. Sow seed the last of August and in September to be transplanted to the cold frame in October.

**Mint**

Roots may be procured from a seedsman or neighbor. Plant one or two clumps of these roots in a corner of garden in the spring.

**Muskmelon**

Grown like cucumbers except hills must be 6 feet apart. Muskmelons are difficult to raise and are not recommended to gardeners who are not experienced in their culture.

**Okra**

Sow seeds when corn and beans are being planted. Sow 1 inch deep a few inches apart in rows 3 to 5 feet apart. Thin plants to 18 or 24 inches apart. Until plants are almost grown cultivate frequently and not very deeply. Pick young pods every day to keep plant bearing.

**Onions**

Onions will grow from seed or from bulbs, called sets. It is better to use sets in home gardens. For early green onions plant sets
3 inches apart in rows 1 foot or more apart. To grow from seed, plant the seed rather thickly ¾ of an inch deep in rows and thin them later until plants are 2 to 3 inches apart. If sets for planting next spring are desired, do not thin out any plants, but let them crowd so they will remain small. Seed may be planted in seed box or seed bed and when transplanted placed 3 inches apart.

**Parsley**
Sow seed thinly ¾ inch deep, later thinning plants when they crowd each other.

**Parsnips**
Sow seed thinly ¾ of an inch deep in rows 18 to 24 inches apart and later thin plants to 3 inches apart.

**Peas**
An important factor in the successful raising of garden peas is that the smooth-seeded type are not easily damaged by light frost. Because of this they may be planted early in the spring — practically as soon as weather conditions permit preparation of the ground. They may be grown in almost any ordinary soil. The best soil is sandy loam, well drained, and rich with rotted manure. To give continuous supply throughout the growing season make successive plantings from one to two weeks apart. For the earliest crops select the smooth-seeded varieties of quick maturity. These varieties require no supports. For later crops select the large, wrinkled varieties.

As soon as plants break through the ground, cultivate. Continue to do this three or four times a week until the vines lop over. Peas should be planted in trenches 4 inches deep, the seed being covered with 2 to 3 inches of soil. From 1 to 2 pints of seed will plant 100 feet of row. As the plants grow, gradually fill in the trench around them. Let the vines of the tall varieties grow up on brush or poultry wire. The rows of peas should be 3 to 4 feet apart, but if the space is small it is desirable to plant double rows 1 foot apart, placing the brush between these rows.

**Peppers**
Set young plants from seed box 18 inches apart in row. Pepper plants are tender and should not be set out until the ground is warm.

**Potatoes**
For special instructions on Irish and Sweet Potatoes see pages 12 and 13.

**Pumpkin**
Plant in hills 8 to 10 feet apart, using 8 to 10 seed to a hill. Plant seed 1 inch deep. Later thin to 2 or 3 plants to a hill.

**Radishes**
Planted and grown the same as carrots.

**Rhubarb**
Procure roots from a neighbor or dealer as seed planting is not advised. Set them 3 to 4 feet apart, in rows or next to fence. Use manure freely.

**Salsify or Oyster Plant**
Also called vegetable oyster. Grown like carrots. Plants must be thinned to 3 inches apart.

**Spinach**
Sow seed thickly 1 inch deep in rows 12 to 18 inches apart, for both early spring and fall crops.

**Squash**
Grown the same as cucumbers or muskmelon, except that the hills of Hubbard squash should be 7 to 9 feet apart.

**Swiss Chard**
Sow seed ¾ inch deep. Thin out when necessary.

**Tomatoes**
Tomatoes form one of the favorite crops of the home garden, as they will grow in all types of soil. Sandy loam, with plenty of humus, is ideal for growing tomatoes.
If plants are grown in seed flats, hotbeds or cold frames, follow the directions for transplanting given on pages 9 and 10. Plants suitable for setting out should be 4-6 inches high, having a thick stem and dark green leaves. Begin cultivation as soon as the plants are set. Cultivate deeply and close to plants at first but later cultivation should be more shallow to prevent injury to roots. Cultivate frequently to keep the soil loose over the surface, so preventing evaporation. Always cultivate after a rain.

When preparing seed flats, hotbeds, or cold frames for tomato seed, use soil which has never grown tomatoes. This insures plants free from disease. It is not advisable to plant tomatoes on land which has been planted the previous year with white potatoes, melons or tomatoes. To plant on such soil increases the danger from disease and pests.

It is always advisable to train the plants to stakes or other supports. They may be trained on wires or on poultry wire fastened on posts set about fifteen feet apart in rows. Barrel hoops a foot apart fastened to stakes eighteen inches apart are some times used. To tie plant to support, loop the string around the support and tie it under a leaf stem. Remove all side branches at the axil of the leaves as soon as they appear. Do not remove flower clusters. When the plant has reached a height of 5 feet cut off the top.

When three or four clusters of fruit have formed and some of the fruit is as large as a silver dollar prune the leaves at the base one half. This hastens ripening.

Once a month apply a little commercial fertilizer or compost around each plant. Avoid the use of fresh or unrotted manure as this produces too much leaf growth, the fruit does not set and disease is encouraged.

**Turnips**

For early spring, plant $\frac{1}{4}$ ounce of seed to 50 feet of row, sowing them $\frac{3}{4}$ inch deep, in rows 1 foot or more apart. For fall crop $\frac{1}{2}$ ounce of seed to 50 feet of row, $\frac{1}{4}$ inch deep, or make the rows 8 to 10 inches wide and scatter seeds thinly in broad rows.

**Vegetable Marrow**

Plant 6 or 8 seed to a hill, one inch deep, in hills 8 to 9 feet apart. Thin to 2 plants to hill. Give the same care as for pumpkins. The young and tender vegetable marrow may be baked whole like sweet potatoes or may be sliced and fried like eggplant, or boiled like summer squash.

**Watermelon**

Plant 1 inch deep, 8 or 10 seed to each hill, the hills 10 feet apart. Later thin to 2 plants to each hill.

Watermelons require much room and are not recommended for small gardens.

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**DISEASE AND INSECT PREVENTION**

Every garden is subject to attack from insects and diseases. Your garden may not be attacked, but it is wise to take advance precautions. Spraying at occasional intervals from the time the plants have made their start until they are harvested is worth while. A hand sprayer should be used to distribute the necessary solutions on the plants. Such sprayers may be bought in various types. Some of them may be bought for a dollar or less and others range up to the neighborhood of $10 for the small, compressed air type. The simplest and cheapest type is the small atomizer sprayer with hand pump and with glass receptacle for holding mixture. (Figure 21.) Another type, costing a little more, is the bucket pump. (Figure 21.) If you have no spray pump a

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*Fig. 21—Some of the best types of sprayer. At the left is a hand sprayer, which is one of the most satisfactory for the small garden. The glass receptacle is better than metal. This sprayer can be bought for from 50 cents to $2.00. In the center is a bucket sprayer which costs about $5.00. At the right is a compressed air sprayer, which is highly efficient and costs from $5.00 to $10.00. One sprayer may be used by several families, or by community gardeners, reducing the cost to each user.*
good substitute is the whisk broom, for spattering the spray on plants. After using, wash out pump and hose as some sprays will corrode metal and others will rot hose. The ordinary sprinkling pot may be used to apply mixtures, but this is wasteful.

**Buy Spraying Materials Early**

Early purchase of spraying materials is important. The supply will be limited and the demand large. Make a list of the materials you will need, with amounts, and place your order immediately. If you have equipment from last season place your order early for repair parts for pump, hose or nozzle, especially extra couplings and hose splicers for burst hose. If you delay until the spraying season arrives you are likely to fail to procure your supply. By joining with friends or neighbors and buying in quantities you can procure materials at lower prices than if buying alone.

For home mixing the poisons and chemicals required for sprays and other remedies and preventives can be bought at a drug or seed store. The mixtures ready prepared can be bought at a seed store.

**Diseases**

The ordinary blights are usually overcome by spraying with Bordeaux mixture, made as indicated in the next paragraph. There are some diseases, however, which cannot be overcome, and when trouble appears that does not yield to treatment the affected plants should be taken up and burned to prevent the spread of the infection to others.

**Bordeaux Mixture**

Copper Sulphate, Blue Stone or Blue Vitriol. 3 ounces
Lump Lime or Hydrated Lime. 3 ounces
Water. 2½ gallons

To make Bordeaux mixture procure the ingredients at a drug or seed store. If lump lime is used it must be fresh. Instead of lump lime some authorities prefer fresh hydrated lime as being just as good and at the same time much simpler to use, needing only to be stirred into the water. Hydrated lime is lime to which enough water to dry-slate it has been added by the manufacturer. It is a powder and does not require slaking.

For making or holding Bordeaux mixture use containers of wood, glass or earthenware. In one container dissolve the copper sul-

phate in about one-half gallon of hot water and then dilute with enough cold water to make a total of 1½ gallons; or wrap the copper sulphate in a small piece of cheesecloth, fill a quart jar with cold water and suspend the copper sulphate into the top of the water; in a couple of hours it will be dissolved. In another vessel slake the lime and dilute it with enough water to make 1½ gallons. If hydrated lime is used simply mix it with water. Then pour these two solutions together, pouring the solution of copper sulphate slowly into the mixture of lime and water, stirring vigorously while this process is under way. The stirring insures proper mixing of the two.

Bordeaux mixture may be purchased in concentrated form from seedsmen, but the homemade mixture is better and cheaper. Do not make more at one time than will be needed within a short time. The mixture is better and more effective if made fresh for each spraying.

**Sulphur**

For the control of mildew, pulverized sulphur or flowers of sulphur, procured at a drug or seed store, is dusted full strength on the diseased plants. A tin can with small holes punched in the bottom makes a good sifter for this purpose, or a cheap flour sifter may be used. The holes in a flour sifter are the proper size for this purpose.

**THE SUCKING INSECTS**

For the destruction of insects which suck the sap of plants, such as the true bugs and the plant lice, or aphids, it is necessary to
use a mixture which kills by contact or substances which smother. Aphids, or plant lice, usually collect on the underside of leaves, causing them to crumple. This crumpling causes the edges of the leaves to turn down, protecting the aphids. Badly crumpled leaves should be picked and burned. In spraying be sure to apply the spray to the underside of the leaves. Otherwise the edges will serve as protection and prevent the spray from reaching the entire plant effectively.

Nicotine Sulphate Solution

To destroy the sucking insects use nicotine sulphate solution, made as follows:

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nicotine sulphate</td>
<td>1/2 ounce</td>
</tr>
<tr>
<td>Laundry or other soap</td>
<td>1/2 ounce</td>
</tr>
<tr>
<td>Water</td>
<td>2 gallons</td>
</tr>
</tbody>
</table>

Dissolve the soap and then add this and the nicotine sulphate to the water.

Arsenate of Lead Solution

Arsenate of lead spraying solution is made by mixing 1 ounce of arsenate of lead powder (or 2 ounces of paste) with 6 quarts of water. If the arsenate of lead is used in paste form instead of powder mix 2 ounces with 6 quarts of water. The powder is more easily weighed and handled. Keep the mixture well stirred while spraying, to insure even distribution.

To apply arsenate of lead in dry form mix 1 ounce of the powder with 3 pounds of air-slaked lime, dry road dust or ashes finely sifted. Use a sifter for dusting this onto the plants, while the plants are wet with dew or rain.

Bordeaux-Arsenate of Lead Combination

Spraying with a combination of Bordeaux mixture and arsenate of lead every two weeks is a wise safeguard against both disease and eating insects. To make this combination spray use Bordeaux mixture instead of water when preparing the arsenate of lead. By using a combination spray half the labor of spraying is saved.

In spraying cabbage and cauliflower with Bordeaux and arsenate of lead before the heads form, a little soap mixed with the arsenate of lead will make it stick better. Shave the soap, add a small quantity of water and boil until the soap is dissolved or put it in cold water and stir occasionally until dissolved. Cool and stir into the arsenate of lead solution.

Paris green has long been used for protection, but arsenate of lead is now used much more extensively and is considered better.

Poisoned Bait

Poisoned bait is useful against cutworms and slugs. Small portions of the bait should be placed around plants subject to attack by them. The pests feed at night and hide under chips or other objects during the day. Bait should be placed beneath these. Poisoned bait may be made at home thus:

- Wheat bran: 1 pound
- White arsenic, powdered: 1 ounce
- Cheap syrup: 1 or 2 ounces
- Water to make a thick mash of the mixture.
液态中毒饵料

将1盎司的砷酸钠溶解在4夸脱的水中，并加入1品脱的糖浆。将切好的蔬菜放入其中搅拌，适用于鞭打或用刷子涂抹。将这些放在树枝上。

去除昆虫

较大的害虫可能用手或用棍子将其从水中捞起。

保卫对抗疾病和害虫

预防胜于治疗。绿色植物和害虫是一个问题。清洁的花园土壤有助于防止害虫和疾病。所有的植物都应该是健康的，没有疾病。在种植前，唐克里特土豆要先去皮，以防受害虫侵害。

许多害虫携带疾病和孢子，从一种植物传播到另一种植物。在种植和收获过程中，都要小心，尽量避免损伤植物和蔬菜。

在花园中保持整洁，特别是在冬季，所有植被都可能成为害虫和疾病的栖息地。所有没有被清除的作物要在季节末时被焚烧，所有的翻土也要在季节末时被焚烧。这包括垃圾，树枝和石头。它可能会变成一种垃圾，因为蔬菜要被烧掉。

护根人

这可能是一个冬季景观。

玉米秆，卷心菜叶子和树桩，如果不能被砍掉，那么其他健康的植物也应该被保存起来，可以用来覆盖或被添加到堆肥堆中。

在地面上的一些小量的油浮在水面上。收集在手的害虫应该立即被消灭。

对于蛞蝓和蜗牛，可以在植物和它们出现的周围撒上石灰粉。

其他保护形式

一种保护的方法是用纸带，将它裹在茎上，以防止害虫，特别是地下部分。

小的结构覆盖了蚊帐或防虫网，可以保护幼苗。

 guarded against diseases and insects

The remnants of vegetable matter, which are not infected with disease or insects, should be made into compost heaps for the coming year and covered with stable ma-

Fig. 24—Emphasizing the importance of spraying. On the left is a potato plant which was not sprayed. The ravages of the potato bug are plainly shown. On the right is a plant which was properly sprayed as a preventive measure.

Take No Chances

Too much emphasis cannot be placed on the need for taking precautions against diseases and insects. Familiarize yourself with such diseases and insects as prevail in your neighborhood on the crops you plan to raise. Then provide yourself in advance with remedies and equipment. Watch carefully for first signs of trouble and apply remedies at once. Inspect your garden every two or three days.
WAR GARDENING
PREVENTIVES AND REMEDIES

NOTE: It is important that immediate attention be given insects and diseases as soon as they appear. Delay in spraying or removal may prove fatal.

ASPARAGUS

Rust—(Rusty appearance of leaves and stems).— Procure rust resistant variety, such as Reading Giant or Palmetto.

Remedy: Spray with Bordeaux mixture when plants are 3 to 4 inches high, repeating 2 and 4 weeks later.

Web worm—(Eats the leaves).

Remedy: Spray with arsenate of lead when worms appear; repeat when necessary.

BEETS

Leaf spot—(Reddish and purple spots, turning ash gray).—Usually not affecting garden beets.

Remedy: Spray with Bordeaux mixture when plants are 3 to 4 inches high, repeating 2 and 4 weeks later.

Web worm—(Eats the leaves).

Remedy: Spray with arsenate of lead when worms appear; repeat when necessary.

BUSH BEANS

Anthracnose—(Dark, sunken spots, scab-like, on pods; spots on leaves).—Pick and burn diseased pods. In saving seed discard those from diseased plants, as seed carry the infection.

Leaf beetles—(Very small, dark or pale stripes; eat leaves).

Remedy: Spray with arsenate of lead when pests appear, repeat in 10 days and later if necessary. Bordeaux mixture repels but does not kill.

SPINACH

Spinach aphids—(Sucks sap from leaves).

Remedy: Spray with nicotine sulphate when pests appear and repeat when necessary. In order to strike the aphids the spray must be directed against the undersides of the leaves.

Beet root aphids—(Sucks sap from roots).

Remedy: Pour a small amount of nicotine sulphate spray around roots and repeat if necessary.

CABBAGE AND CAULIFLOWER

Club root—(Root swells and decays).—Pull up and burn plants.

Preventive: In spring apply 1 lb. lime to each 8 sq. ft. of ground before setting out plants.

Black rot—(Leaves turn yellow, then brown and black and decay. Pull up and burn plants).

Preventive: Soak seed 15 minutes in solution made of 1/4 oz. formalin and 3 pints water; rinse in clean water; plant at once.

Yellows—(Leaves turn yellow, then brown, and drop).

Pull up and burn plants.

Preventive: Treat seed as for black rot.

Cabbage worms—(Eat leaves).

Remedy: When worms appear spray with arsenate of lead, repeating if necessary before heads form. Add an ounce of laundry soap per gallon of spray to make it stick to the leaves. Do not use arsenate of lead later than 3 weeks before using or marketing cabbage.

Aphids or lice—(Suck sap from leaves).

Remedy: Spray with nicotine sulphate solution when pests appear; repeat if necessary.

Cabbage looper—(Eats leaves).

Remedy: Treat as for cabbage worms.

CABBAGE MAGGOTS—(Tunnel inside of roots).

Preventive: When plants are set out take a piece of tared building paper 2 or 3 inches in diameter, cut a slit from one side to center, and 4 or 5 slits at center. Fit this around stem by slipping plant through the long slit, and press paper firmly against ground, to prevent young maggots from reaching root.

BLACK LEG—(Diseased, sunken areas on stem, leaf stem and leaves, plant becoming purplish).

There is no remedy. Pull up and burn plants.

Preventive: Disinfect seed for 10 minutes with 1 tablet of corrosive sublimate mixed in 1 pint of water.

Cutworms—(Dark colored, eat young plants off at surface of earth).

Remedy: Spread poisoned bran mash over ground before setting out plants; spread around plants when set. Afterwards spread poisoned bait around plants as necessary to control worms. It is wise to wrap paper around stem from leaves to root just before setting out. Cutworms are especially abundant where sod has grown.

CELERY AND CELERIAC

Blight or leaf spot—(Gray or brown spots, dropping stems).

Remedy: Spray young seedlings, in seed box or seed bed, with Bordeaux mixture. Spray again as soon as set in garden, repeating 10 to 14 days later. Repeat again if necessary. Spraying in seed bed must not be neglected if disease appears.

DAMPING OFF—(Small seedlings dying in seed bed).

Preventive: Care should be taken to water and partially shade the young seedlings in hot and dry weather. As soon as seed are planted cover bed with thin layer of sand.

SWISS CHARD

Leaf spot—(Symptoms same as with beets).

Remedy: When disease appears, spray as directed for beets. (Usually no spraying will be found necessary). Wash sprayed leaves well before using.

Aphids—(Suck sap from leaves).

Remedy: Spray under side of leaves with nicotine sulphate, when aphids appear. Repeat a second and third time if necessary.
Smut—(Large, black, irregular swellings on ears or tops). The only remedy is to cut off and burn the smut swellings.

CORN

Smut—(Large, black, irregular swellings on ears or tops). The only remedy is to cut off and burn the smut swellings.

Corn ear worms—(Bore through husk and eat the young kernels). Kill all worms which are found when husking corn for use.

Cutworms—(A dark worm which cuts plant off at surface of earth when plant is small).

Remedy: Use poisoned bait in the same manner prescribed for cabbage. Repeat if necessary. Being a night worker the cut-worm is usually found in the morning in the ground by cut off plants. Dig out and kill.

Seed Corn Maggot—(Tunnels in seed, sprouts and stems of plants).—Apply liquid poisoned bait with a whisk broom.

CUCUMBERS

Anthracnose—(Brown spots on leaves).

Remedy: Spray with Bordeaux mixture when plants begin to form vines. Repeat two or three times if necessary, at intervals of 2 weeks.

Downy mildew—(Yellow spots on leaves).

Remedy: Treat as for anthracnose.

Wilt—(Leaves droop and wilt quickly).—Pull up and burn plants. Striped beetles act as carriers of this disease and should be controlled carefully.

Stink bug or squash bug—(Sucks sap from leaves and injects an injurious substance).

Remedy: Pick them or shake them into pan of water and kerosene. Destroy egg masses. Place small pieces of boards near hills. The bugs will collect underneath these and may be easily crushed.

Eggplant

Blight or wilt—(Whole plant wilts).—No remedy. Pull up and burn plants.

Flea beetle—(Small jumping beetle which eats leaves).

Remedy: Spray with Bordeaux mixture and arsenate of lead combination.

ONIONS

Thrips—(Very small sucking insects, which cause leaves to turn a silvery color or whitish, and later to curl and twist).

Remedy: Spray with nicotine sulphate solution when pests appear, repeating once or twice as necessary.

Cutworms—(Dark worms which attack onions as they do corn).

Remedy: Same as with corn.

Onion Maggot—(Eats bulb, inducing decay).

Remedy: Apply liquid poisoned bait with a whisk broom.

PEAS

Powdery mildew—(Covers plant with powdery white powder).

Remedy: Use pulverized sulphur or flowers of sulphur, or Bordeaux mixture, by sprinkling on plants when mildew appears, just before bloom appears. Repeat if necessary two weeks later and again 2 weeks later.

Peach Aphis—(Small, jumping insect which eats leaves, usually appearing when plant is small).

Remedy: Same as for bean aphis.

SWEET POTATOES

Beetles—(Eat foliage).

Control: Spray with arsenate of lead and lime.

Cutworms—(Worms which cut plants off at the surface of earth).

Control: Use poisoned bait in the same manner as prescribed for cabbage.

POTATOES

Colorado potato beetle—(The common potato bug, which eats leaves).

Remedy: Spray with Bordeaux mixture when plants are set, repeating 10 days later and again 10 days later.

Early blight—(Brown spots, with concentric rings on leaves. Worst in moist weather.)

Remedy: Spray with Bordeaux mixture when plants are 6 inches high. Repeat two weeks later and again two weeks later.

Late blight—(Dark brown spots on leaves, appearing water soaked and not having concentric rings. The spots become yellow and the leaves die. Worst in hot, sultry weather, August and September. Lives over winter in seed potatoes.)

Remedy: Same as for early blight.

PEAS

Powdery mildew—(Covers plant with powdery white powder).

Remedy: Use pulverized sulphur or flowers of sulphur, or Bordeaux mixture, by sprinkling on plants when mildew appears, just before bloom appears. Repeat if necessary two weeks later and again 2 weeks later.

Peach Aphis—(Small, jumping insect which eats leaves, usually appearing when plant is small).

Remedy: Same as for Colorado potato beetle.

Black Rot—(Black, sunken and nearly circular spots appear on tubers. It begins as small spots on stems and spreads until the stems rot off.)

Control: Use only sound healthy tubers to produce healthy plants.

SWEET POTATOES

Beetles—(Eat foliage).

Control: Spray with arsenate of lead and lime.

Cutworms—(Worms which cut plants off at the surface of earth).

Control: Use poisoned bait in the same manner as prescribed for cabbage.

PUMPKIN

This plant is subject to the same diseases and insects as cucumber, and should be treated the same way.

RUTABAGA

This plant is subject to the same pests as cabbage and should be treated the same way.
AVOID WASTE—STORE, CAN OR DRY

The home gardener must remember that his responsibility does not end with the maturity and harvesting of his crops. Authorities are agreed that after several years of war 1919 will see the world’s food shortage more marked than ever before. For this reason the matured crops must be considered as only a beginning. Garden products must be put by for winter use in order that the abundance of the growing season may be made to supply the needs of the months of non-production.

EVERY POUND OF THE SUMMER’S CROP THAT CAN BE SPARED FROM THE SUMMER DIET MUST BE STORED, CANNED OR DRIED IF AMERICA IS TO GIVE THE WORLD THE FULL WORTH OF HER HOME GARDEN PRODUCTION. NOTHING MUST GO TO WASTE.

Vast quantities of foodstuffs must be sent overseas to feed the people of starving Europe. In order that a sufficient volume of exportable food may be available for this purpose it is imperative that the home-grown foodstuffs be made to supply this country’s household needs, as far as possible, for the coming winter.

For home storage complete directions are given in Part II of this book. For home canning and home drying full details are given in a manual issued by the Commission. The book also contains directions for jelly making, the making of fruit butters, pickling, fermentation and salting.

For a copy of the book on canning, drying, etc., write to the National War Garden Commission, Washington, D. C.

RADISH

Cabbage maggot—(Small worm which tunnels into the radish).

Preventive: Sprinkle tobacco dust along row when seed is planted, or spread sand on which kerosene has been sprinkled along the row when plants are small. Burn all plants that may be infested.

TURNIP

Subject to the same diseases and insects as cabbage, and should be treated the same way.

RHUBARB

Flea beetle—(Eats small holes in the leaves).

Remedy: Same as for flea beetle of potato, applied when beetles first appear and repeated when necessary.

SQUASH

This plant is subject to the same diseases and insects as cucumbers and should be treated the same way.

TOMATOES

Leaf spot, or blight—(Leaves become spotted, turn yellow and drop; stems dry up and fruits drop).

Remedy: Spraying is not entirely effective but is helpful. Spray with Bordeaux mixture while plants are small in seed box or seed bed. Repeat soon after transplanting to garden and repeat again 3 weeks later and every 3 weeks while disease exists.

Fruit rot—(Decay begins at blossom end of fruit).

Preventive: In the absence of an effective remedy the only safeguard is to cultivate well and be careful to water as the plants need.

Anthracnose—(Sunken, discolored spots in fruit, followed by decay).

Remedy: Same as for leaf spot.

Wilt—(Causes plant to wilt and die).—Pull up and burn plants.

Tomato worms—(Large green naked caterpillar, which eats leaves).

Remedy: Pick by hand and destroy, or spray with lead arsenate solution. (These worms do not often appear in large numbers.)

Cutworms—(Dark worms which cut plants off at the surface of earth).

Remedy: Same as with cabbage.

Flea beetle—(Small jumping beetle which eats small holes in leaves).

Remedy: Same as with potatoes.

WATERMELON

Anthracnose—(Brown spots on leaves; small sunken spots on fruit).

Remedy: Spray with Bordeaux mixture when melons are half grown. Repeat 10 days later and again if necessary.

Insects—This plant is subject to the same insects as cucumber and should be treated the same way.

YOUR QUESTIONS WILL BE ANSWERED

This Commission maintains a Department of Household Science which will welcome questions connected with Gardening, Canning, Drying and kindred subjects. Technically trained workers, of practical experience, will give prompt attention to all inquiries. Address Department of Household Science, National War Garden Commission, Washington, D. C.
## PLANTING TABLE

<table>
<thead>
<tr>
<th>Vegetable</th>
<th>Quantity required for 100 feet of row</th>
<th>Distance Apart In Inches</th>
<th>Depth of Planting Inches</th>
<th>Time of Planting</th>
<th>Mature (In days, except as noted)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asparagus, seed</td>
<td>1 oz.</td>
<td>12 to 24</td>
<td>3 to 5</td>
<td>½ to 1</td>
<td>Early spring: 3 to 4 yrs.</td>
</tr>
<tr>
<td>Asparagus, plants. 60 to 80</td>
<td>⅛ oz.</td>
<td>36 to 48</td>
<td>16 to 20</td>
<td>8 to 10</td>
<td>Early spring: 1 to 3 yrs.</td>
</tr>
<tr>
<td>Beans, snap</td>
<td>½ to 1 pt.</td>
<td>18 to 24</td>
<td>4 to 6</td>
<td>1</td>
<td>April to August: 49 to 65.</td>
</tr>
<tr>
<td>Beans, pole.</td>
<td>½ oz.</td>
<td>20 to 24</td>
<td>4 to 6</td>
<td>1</td>
<td>May and June: 50 to 80.</td>
</tr>
<tr>
<td>Beans, Lima, bush ½ to 1 pt.</td>
<td>⅛ oz.</td>
<td>36 to 48</td>
<td>4 to 6</td>
<td>1</td>
<td>May and June: 60 to 90.</td>
</tr>
<tr>
<td>Beans, Lima, pole. ½ pt.</td>
<td>12 oz.</td>
<td>36 to 48</td>
<td>Hills 24–36</td>
<td>1</td>
<td>April to June: 60 to 80.</td>
</tr>
<tr>
<td>Beets</td>
<td>2 oz.</td>
<td>12 to 18</td>
<td>5 to 6 or 6 ft.</td>
<td>1</td>
<td>April to July: 60 to 80.</td>
</tr>
<tr>
<td>Brussels sprouts</td>
<td>1 oz.</td>
<td>24 to 30</td>
<td>16 to 24</td>
<td>½</td>
<td>April to August: 60 to 80.</td>
</tr>
<tr>
<td>Cabbage, early</td>
<td>1 oz.</td>
<td>21 to 30</td>
<td>12 to 15</td>
<td>½</td>
<td>March and April: (Start in hotbed during February): 90 to 130.</td>
</tr>
<tr>
<td>Cabbage, late</td>
<td>⅛ oz.</td>
<td>23 to 36</td>
<td>16 to 24</td>
<td>½</td>
<td>May and June: 75 to 110.</td>
</tr>
<tr>
<td>Carrot</td>
<td>1 oz.</td>
<td>18 to 24</td>
<td>6 or 7 to ft.</td>
<td>½</td>
<td>April to June: 60 to 80.</td>
</tr>
<tr>
<td>Cauliflower</td>
<td>1 packet.</td>
<td>24 to 30</td>
<td>14 to 18</td>
<td>½</td>
<td>April to June: 60 to 80.</td>
</tr>
<tr>
<td>Celery</td>
<td>⅛ oz.</td>
<td>18 to 36</td>
<td>4 to 8</td>
<td>½</td>
<td>May and June (Start in hotbed during March or April): 120 to 150.</td>
</tr>
<tr>
<td>Chard</td>
<td>1 oz.</td>
<td>18 to 24</td>
<td>4 to 6 or 6 ft.</td>
<td>½</td>
<td>March and April: 60 to 80.</td>
</tr>
<tr>
<td>Corn, sweet</td>
<td>½ oz.</td>
<td>30 to 36</td>
<td>30 to 36</td>
<td>1 to 2</td>
<td>May and July: 60 to 100.</td>
</tr>
<tr>
<td>Cress, upland</td>
<td>⅛ oz.</td>
<td>12 to 18</td>
<td>5 to 7 to ft.</td>
<td>½</td>
<td>March to May: 30 to 40.</td>
</tr>
<tr>
<td>Cucumber</td>
<td>⅛ oz.</td>
<td>48 to 72</td>
<td>48 to 72</td>
<td>½</td>
<td>April to July: 60 to 80.</td>
</tr>
<tr>
<td>Eggplant</td>
<td>1 oz.</td>
<td>24 to 36</td>
<td>18 to 24</td>
<td>½</td>
<td>April and May: (Start in hotbed during March): 90 to 140.</td>
</tr>
<tr>
<td>Endive</td>
<td>1 oz.</td>
<td>18</td>
<td>8 to 10</td>
<td>½</td>
<td>Midsummer: 90 to 120.</td>
</tr>
<tr>
<td>Horse-radish</td>
<td>70 roots</td>
<td>24 to 30</td>
<td>4 to 6</td>
<td>3 to 4</td>
<td>Early spring: 1 to 2 yrs.</td>
</tr>
<tr>
<td>Kale</td>
<td>⅛ oz.</td>
<td>18 to 24</td>
<td>6 to 8</td>
<td>½</td>
<td>Early spring and August and September: 90 to 120.</td>
</tr>
<tr>
<td>Kohlrabi</td>
<td>⅛ oz.</td>
<td>18 to 24</td>
<td>6 to 8</td>
<td>½</td>
<td>March to September: 90 to 120.</td>
</tr>
<tr>
<td>Lettuce</td>
<td>1 oz.</td>
<td>12 to 18</td>
<td>4 to 6</td>
<td>½</td>
<td>April to June: 60 to 80.</td>
</tr>
<tr>
<td>Muskamelon</td>
<td>72 oz.</td>
<td>72 to 96</td>
<td>Hills 72</td>
<td>1</td>
<td>May and June: 120 to 150.</td>
</tr>
<tr>
<td>Okra, or gumbo</td>
<td>2 oz.</td>
<td>36 to 48</td>
<td>24 to 30</td>
<td>1 to 2</td>
<td>April and May: 150 to 180.</td>
</tr>
<tr>
<td>Onion, seed</td>
<td>1 oz.</td>
<td>12 to 18</td>
<td>5 or 10 to ft.</td>
<td>¼ to 1</td>
<td>Autumn (and March) to May: 90 to 120.</td>
</tr>
<tr>
<td>Onion, sets</td>
<td>1 oz.</td>
<td>12 to 18</td>
<td>4 or 5 to ft.</td>
<td>1 to 2</td>
<td>Early spring and September: 90 to 120.</td>
</tr>
<tr>
<td>Parsley</td>
<td>⅛ oz.</td>
<td>12 to 18</td>
<td>6 to 8</td>
<td>½</td>
<td>April and May: 90 to 120.</td>
</tr>
<tr>
<td>Parsnip</td>
<td>⅛ oz.</td>
<td>18 to 24</td>
<td>4 or 6 to ft.</td>
<td>½</td>
<td>March to September: 125 to 160.</td>
</tr>
<tr>
<td>Peas</td>
<td>⅛ oz.</td>
<td>36 to 48</td>
<td>15 to 18</td>
<td>½</td>
<td>April to June: 40 to 80.</td>
</tr>
<tr>
<td>Pepper</td>
<td>⅛ oz.</td>
<td>18 to 24</td>
<td>15 to 18</td>
<td>½</td>
<td>May and June: (Start early plants in hotbed during March): 100 to 140.</td>
</tr>
<tr>
<td>Potato, Irish</td>
<td>5 lbs.</td>
<td>24 to 36</td>
<td>14 to 18</td>
<td>3 to 5</td>
<td>March to June: 80 to 140.</td>
</tr>
<tr>
<td>Pumpkin</td>
<td>⅛ oz.</td>
<td>1 oz.</td>
<td>24 to 36</td>
<td>14 to 18</td>
<td>March to June: 100 to 130.</td>
</tr>
<tr>
<td>Radish</td>
<td>⅛ oz.</td>
<td>12 to 18</td>
<td>8 or 12 to ft.</td>
<td>½</td>
<td>March to September: 100 to 140.</td>
</tr>
<tr>
<td>Rhubarb, plants</td>
<td>36 oz.</td>
<td>36 to 48</td>
<td>36 to 48</td>
<td>½ to 1</td>
<td>Early spring: 100 to 140.</td>
</tr>
<tr>
<td>Salsify</td>
<td>⅛ oz.</td>
<td>18 to 24</td>
<td>2 to 4</td>
<td>½</td>
<td>Early Spring: 20 to 40.</td>
</tr>
<tr>
<td>Spinach</td>
<td>2 oz.</td>
<td>12 to 18</td>
<td>7 to 8 ft.</td>
<td>½</td>
<td>Early spring: 100 to 140.</td>
</tr>
<tr>
<td>Squash, bush</td>
<td>¼ oz.</td>
<td>36 to 48</td>
<td>Hills 36 to 48</td>
<td>1</td>
<td>September or very early spring: 80 to 100.</td>
</tr>
<tr>
<td>Squash, late</td>
<td>⅛ oz.</td>
<td>84 to 120</td>
<td>Hills 84 to 108</td>
<td>1</td>
<td>April to June: 80 to 100.</td>
</tr>
<tr>
<td>Tomato, seed</td>
<td>⅛ oz.</td>
<td>36 to 48</td>
<td>30 to 36</td>
<td>¼ to 1</td>
<td>May and June: 100 to 140.</td>
</tr>
<tr>
<td>Tomato, plants</td>
<td>⅛ oz.</td>
<td>36 to 48</td>
<td>30 to 36</td>
<td>¼ to 1</td>
<td>Early spring: 80 to 100.</td>
</tr>
<tr>
<td>Turnip</td>
<td>½ oz.</td>
<td>18 to 24</td>
<td>6 or 7 ft.</td>
<td>½ to ¾</td>
<td>April and August: 80 to 100.</td>
</tr>
<tr>
<td>Veg. marrow</td>
<td>⅛ oz.</td>
<td>96 to 144</td>
<td>Hills 96 to 108</td>
<td>1</td>
<td>May and June: (Start early plants in hotbed during February and March): 80 to 100.</td>
</tr>
<tr>
<td>Watermelon</td>
<td>⅛ oz.</td>
<td>96 to 120</td>
<td>96 to 120</td>
<td>1</td>
<td>May: 100 to 120.</td>
</tr>
</tbody>
</table>

*NOTE.—Set rhubarb plants so that growing tips are at surface of ground.

Absolute dates for planting can not be given, because of variations in seasons from year to year and varying climatic conditions in different sections. For general guidance see “When to Plant,” on page 10.
PART II
HOME STORAGE MANUAL FOR VEGETABLES AND APPLES

No form of Food Conservation is more important than the home storage of vegetables for winter use. Canning and drying are essential to the nation’s food supply, and should be practised to the fullest possible extent, but they do not take the place of storage. To keep vegetables in their natural state is the simplest form of preparation for winter needs. By taking proper precautions against decay and freezing an abundant supply of certain kinds of fresh vegetables may be kept at minimum expenditure of money and effort.

STORAGE HELPS SOLVE FOOD PROBLEM

The importance of making provision for winter food needs is even greater this year than it was in 1918. Every pound of foodstuffs that can be spared for export will be needed in Europe for feeding American troops and to prevent the starvation of the domestic and military populations of the Allied nations. Every pound of vegetables stored away for home uses will release exportable food. A nation with a food shortage is a nation in peril. For this reason it is of vital importance that no vegetables of high food value be allowed to go to waste. To save is to be patriotic.

The home gardening campaign conducted by the National War Garden Commission will this year result in the creation of a vast new planting area. The output of these gardens is greatly in excess of immediate needs. Unless proper steps are taken to safeguard the surplus the waste will be prodigious. This Commission will stimulate nation-wide activity in canning and drying. An important purpose of this booklet is to arouse similar interest in the storage of vegetables.

WHAT AND HOW TO STORE

There are many vegetables which can be stored to good advantage. Included in the list are Potatoes, Beets, Carrots, Parsnips, Onions, Sweet Potatoes, Celery, Salsify, Cabbage, Cauliflower, Brussels Sprouts, Winter Squash, Turnips, Beans and Lima Beans. Good results in storage depend upon:

1—Ventilation.
2—Regulation of temperature.
3—Sufficient moisture.
4—Quality of vegetables stored.

For some vegetables satisfactory storage places are afforded by the pantry shelf or attic. For others the cellar is the right place. For others outdoor storage is preferable. This may take the form of pits or banks, or it may be done in hillside caves or cellars.

COMMUNITY STORAGE

Especially good results may be obtained if several neighboring families will form community clubs to provide storage facilities. In this way very complete provision may be made for handling winter supplies at slight trouble and expense to the individual household.

Community or co-operative storage may be effected in various ways. Several families may join together and construct outdoor cellars or they may join in the use of an available building conveniently located in which vegetables may be stored in large quantities.

CELLAR STORAGE

<table>
<thead>
<tr>
<th>Beets</th>
<th>Parsnips</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cabbage</td>
<td>Potatoes</td>
</tr>
<tr>
<td>Carrots</td>
<td>Salsify</td>
</tr>
<tr>
<td>Celery</td>
<td>Turnips</td>
</tr>
</tbody>
</table>

In a house heated by a cellar furnace vegetables may be stored to good advantage in the cellar. Partition off a small room as far as possible from the heating plant. Two sides of this room should be outside walls. There should be at least one outside window, for temperature regulation and ventilation. The suggested arrangement in Figure 1 shows ventilation afforded by a stove-
pipe inserted through one of the lower panes of the window, to admit cold air and indicates the removal of one of the upper panes of glass to allow the escape of warm air. This affords constant circulation.

An earth floor is desirable, but this is not always possible, as most city and many town and country houses have floors of concrete. In a cellar with a concrete floor the concrete should be covered with two or three inches of sand, which should be sprinkled with water from time to time.

In this room may be stored Beets, Carrots, Cabbage, Celery, Parsnips, Salsify, Turnips and Potatoes. (Special attention is given Potatoes on page 28.) Put them in bins or in boxes, baskets, slat crates or barrels. It is best to use movable containers and small ones. Bins should not hold more than two or three bushels apiece, as the larger bulk brings danger of heating and consequent decay. There should be full protection from mice.

The vegetables should be harvested when the ground is dry, if possible, and should lie outdoors a few hours until any surface moisture on them has evaporated. Remove the tops, leaving an inch or so, from beets, turnips, carrots and salsify. To leave an inch or so of top prevents bleaching and drying out. Sort vegetables according to size and condition. Imperfect or bruised ones should be selected for immediate use and only sound vegetables should be stored.

In cellar storage beets, turnips and carrots may be buried in slightly damp sand to good purpose.

Cabbages may be stored in the cellar in boxes or barrels of earth or sand, or they may be placed in a cool cellar on the floor with roots up.

Celery, to be stored in a cellar, should be allowed to stay in the garden until there is danger of severe freezing. In order to prolong the period of keeping it outdoors the plants should be protected from frost by banking them with earth to within two or three inches of the tops. On cold nights protect the tops with paper, burlap, mats, straw or other covering. The importance of not harvesting at the first appearance of frost arises from the fact that this period is likely to be followed by warm weather, which will cause decay by creating too high a temperature in the place of storage. With the arrival of steady cool weather, which will freeze the plants, dig them, leaving some soil adhering to the roots. For cellar storage place the plants upright, covering the roots with three or four inches of sand or light soil. (Fig. 2.) Earth may be banked around the stalks but this is not necessary. Water the soil occasionally, being sure to keep the leaves and stalks dry to prevent decay.

Celery may also be stored in cellar boxes, following these same directions.

The cellar storage room may also be used for the storage of fresh fruits and for canned goods, preserves and dried vegetables and fruits. Fig. 1 shows a suggested arrangement for shelves for canned and dried articles. If the shelves are not protected from light by doors all canned goods in glass should be wrapped in brown paper, to prevent bleaching.
of the contents as a result of exposure to the light.
Wide fluctuations of temperature should be avoided. The ideal temperature is 40 degrees F. The root cellar should be kept at not less than 32 degrees and not over 50 degrees.

## PIT STORAGE

<table>
<thead>
<tr>
<th>Beets</th>
<th>Potatoes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carrots</td>
<td>Turnips</td>
</tr>
<tr>
<td>Cabbage</td>
<td>Salsify</td>
</tr>
<tr>
<td>Celery</td>
<td>Parsnips</td>
</tr>
</tbody>
</table>

For outdoor storage one of the best forms is a mound shaped pit. To prepare for this remove two or three inches of earth and line this shallow excavation with hay, straw, leaves or similar material. Place the vegetables on this in a conical pile. Cover the vegetables with several inches of the material used in making the lining. Cover this with 3 or 4 inches of earth. As severe weather approaches the outer covering should be increased. An additional layer of hay or similar material may be placed over the layer of earth and on top of this another layer of earth. In extremely cold climates the total thickness of earth layers should be as much as 12 inches. Over the outer layer of earth pile manure or corn stalks for added protection. To give ventilation have the inner layer of straw project through the outer covering and extend to the top of the cone. For protection from rain and snow this opening should be covered. A board laid over the top and weighted with a stone is suitable for this purpose. An idea of the construction is given in Fig. 5.

It is well to make several small pits rather than one large one, for the reason that when a pit has been once opened the entire contents should be removed. This form of storage is used for potatoes, beets, carrot, turnips, parsnips, cabbages and salsify. It is well to store several varieties of vegetables in one pit so that the opening of a single pit will afford a supply of all of them. In following this plan it is desirable to separate the various crops by the use of straw or leaves.

When a pit has been opened it is impossible to give adequate protection to vegetables therein. For this reason those not required for immediate use should be removed, placed in the basement storage room, or other cool place, and used as needed. This emphasizes the importance of making small pits, each one holding not more than two to six weeks' supply.

Instead of making a dirt pit, barrels may be used in which to place vegetables. (Fig. 8.) Make a slight depression the length of the barrel and put in a thick layer of straw or leaves. On this place the barrel. Cover the barrel with successive layers of straw or leaves, and dirt. As the weather grows colder put on more dirt until there is from 14 to 18 inches of covering. For ease in opening make a door at one end, against which pile earth and manure of sufficient thickness to prevent freezing.

### Cabbage

For late varieties of cabbage the pit should be long and narrow. The cabbages are placed in rows with heads down and covered with dirt. No other covering is needed. The removal of a portion of this supply does not disturb the remainder. (Fig. 6.)

Cabbages may also be stored by placing the whole plants in a trench, roots down and plants close together. The roots should be covered with dirt. A frame should be built around the trench by driving stakes at the corners and placing boards against these to form the enclosure. The construction of such a trench is shown in Fig. 7. The boards are banked with earth and across the top of the trench boards or poles are placed, supported by the frame. These should be covered with straw, hay or corn fodder, for protection of the contents of the trench. Two feet of the straw or similar material will be required in cold climates.

Mature heads of cabbage of long-keeping sorts, such as Danish Ball Head, may be cut
from the plant and stored one layer deep on shelves in cool, frost-proof cellars.

**Celery**

In storing celery in a pit or trench, the plants are set side by side as close as they may be packed and wide boards set up along the outside edges of the pit. Dirt is banked up against these boards and the top covered with corn fodder or similar covering. If celery is kept in the row where grown the earth should be banked around the plants with the approach of cold weather. For freezing weather bring the dirt to the tops of the plants and cover the ridge with coarse manure, straw or fodder, using stakes or boards to hold the covering in place. Only late maturing and late planted celery can be safely stored. (Fig. 9.)

A hotbed, instructions for the making of which are given on page 7 (Fig. 2), in Part I of this booklet, makes an excellent place for outdoor storage for celery. The surplus earth and manure should be removed and a board covering should be substituted for the sash and glass. Store the celery in the same manner as in pit storage. For protection from cold use any covering that will prevent freezing.

Celery should not be stored with turnips or cabbage. It will absorb odors from these vegetables and its flavor will be impaired.

### OUTDOOR CELLAR

<table>
<thead>
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</tbody>
</table>

**Cabbage**

An outdoor cellar makes a good storage place. In cold climates this should be partially underground. A side-hill location is desirable for ease in handling the vegetables. To make such a cellar dig an excavation and in this erect a frame by setting posts in rows near the dirt walls. Saw these posts off at uniform height and place plates on their tops. On these plates place rafters. Board up completely with the exception of a place for the door. The whole should be covered with dirt and sod, and in cold climates added protection should be given by a layer of straw, fodder or similar material. Ventilate with a flue. A dirt floor is best, as some moisture is desirable. This form of storage is especially good for the joint use of several families.

On a more pretentious scale cellars of this nature may be made of brick, stone or concrete. Such cellars afford practically perfect storage room for potatoes, carrots, cabbages, parsnips, beets, turnips and salsify.

### VARIOUS METHODS

Permanent cold frames, with deep pits, may also be used to advantage in storing vegetables if the drainage is made thorough. After the frames are filled the sash should be covered with boards and the outside banked with soil or manure. As the weather becomes severe a covering of straw or mats is necessary. This covering should be heavy enough to prevent freezing.

Cauliflower and Brussels Sprouts which have not matured may be taken up and planted in shallow boxes of soil in a light place in the cellar. If kept well watered they will mature for winter use.
Dry beans may be stored in cloth bags in a pantry or in any cool, dry and well ventilated room. The bags should be hung away from the floor to prevent damage by rats and mice.

Onions require a cool, dry place. They should be cured by being exposed to the air for a few days in the shade. The tops should be removed before storing. Keep them in baskets, trays or other holders which let the air circulate. Onions are not damaged by temperatures slightly below freezing, and for storing them the attic is better than the cellar. If stored in the cellar they should be suspended from the ceiling.

Squashes are susceptible to cold and moisture, and for that reason should be stored in a dry place where the temperature will be between 50 and 60 degrees F. Squashes may be kept by placing them in a single layer on a dry floor and covering with rugs or carpets, but care must be taken that the stems are not broken off and that they do not become bruised before storing. Whenever it is found that any of the squashes or pumpkins are showing signs of decay, the sound portions should be canned.

Tomatoes may be saved by pulling up the entire plant before freezing weather. The vines should be suspended by the roots in a cool cellar. The tomatoes will gradually ripen. If these tomatoes, when cooked, are found to be acid, the acidity can be overcome by using baking soda.

Parsley may be saved by transplanting into flower pots late in the fall. These should be kept in windows where they will receive sunshine.

Parsnips and salsify are not injured by remaining in the ground all winter. Enough for immediate needs may be dug in the fall and the others harvested as required.

POTATOES

As one of the staple vegetables, potatoes are entitled to special consideration for winter storage. If you have raised a surplus crop in your own garden save as many as possible for your winter's supply. If you have none of your own raising it is well to buy them early in the fall, at the time of greatest supply and lowest prices, and store them for the winter, making yourself independent of the market during the time of highest prices.

Potatoes may be stored in cellars, pits and outdoor cellars, as already described. Before they are stored they should be allowed to dry. This is done by digging them on bright days, if possible, and allowing them to lie alongside the rows for a few hours. Before storing sort them carefully as to size and soundness. The smaller potatoes and those which show signs of threatened decay should not be stored, but should be used early.

The success of potato storage depends on the exclusion of light, proper ventilation, the proper amount of moisture, the size of the pile or container and the type of the tubers stored.

In storing potatoes it should be remembered that the purpose is to protect them from great changes of temperature and from light. Even a small amount of light changes the food value of potatoes. There should be enough moisture to keep the potatoes from wilting, but not enough to cause moisture to gather on the surface.

If potatoes are stored in a place where there is moisture in the air, provision should be made to permit free circulation of air through the containers. Barrels, boxes and bins may be ventilated by boring holes in sides and bottoms. Barrels, boxes and crates should be set on slats to hold them off the floor and allow the air to circulate underneath. If the storage place is light a blanket, several thicknesses of paper, or old sacks should be placed on top of the containers.

If the air of the storage place is dry it should not be allowed to circulate freely through the containers, as dry air will cause withering of the potatoes. In such storage places the potatoes should be put
in containers made airtight by lining bottom and sides with several thicknesses of newspaper and covering the top snugly in the same manner.

The temperature of a cellar storage room for potatoes should be carefully controlled to prevent wide fluctuations. A constant temperature around 40 degrees F. is desirable. It should not be allowed to go below 32 degrees or above 50 degrees.

Potatoes should not be washed before storage. If they begin sprouting in the spring all the shoots should be rubbed off. The bins should be examined occasionally and any rotting potatoes removed to prevent the spread of infection.

Bins
Do not have one large bin for potatoes, as those in the center will be subjected to too high temperature, which will cause all of them to go through a sweating process. Too large a bin makes good ventilation impossible. Open bins, not more than a foot deep, arranged as a shelf, as shown in Fig. 3, are excellent for cellar storage. Another good arrangement of shelf storage for certain crops is shown in Fig. 4.

Pits
A small pit provided with ventilation, as shown in Fig. 5, is the most satisfactory. It is better to have several small pits than one large one, as the entire contents must be removed when a pit is opened. Place not more than two to six weeks' supply in a single pit.

SWEET POTATOES
In storing sweet potatoes the important points to be kept in mind are that the potatoes must be well matured before they are dug; they must be handled with extreme care; they must be allowed to dry or cure thoroughly before storage, and they must be kept at an even temperature. A test for maturity is to cut or break a sweet potato and expose it to the air for a few minutes. If the surface of the cut or break dries the potato may be considered mature, but if moisture remains on the surface it is not properly ripe. In sections where frosts come early digging should take place about the time the first frost is expected, without regard to maturity. Care in handling is necessary to prevent bruising and subsequent decay. Curing is done by keeping them at an even temperature of 80 to 85 degrees F. for a week or ten days after harvesting, to dry off the moisture. The room in which this is done must be ventilated in order that the moisture-laden air may escape.

For storing sweet potatoes on a large scale a specially constructed house is desirable. For home storage the roots may be kept near the furnace in the cellar or near the furnace chimney in a vacant upstairs room or in the attic. The room should be kept fairly warm. After curing the temperature should be maintained around 55 degrees F.

Care should be taken not to store sweet potatoes which are infested with the sweet potato weevil or root-weevil, one of the most serious pests of the Gulf region. This pest practically confines itself to destruction of the tubers after harvesting. When the tubers are found infested they should be fumigated with carbon disulphid, to be procured at a drug store. Place the tubers in a box or other container which can be tightly closed. The carbon disulphid is a liquid which gives off fumes heavier than air, and one ounce per bushel should be placed in an open dish on top of the roots and the container closed. Do not allow open lights or fire in the presence of this gas as it is highly explosive. All badly affected roots should be burned.

APPLES
Apple storage is simple and is desirable not only for those who grow their own apples but also for those who depend on the market for their supply. The one essential is that the fruit be kept in a cool,
dry place, and so stored as to be in no danger of absorbing odors from vegetables stored nearby.

Families raising no apples, but having a good storage place, meeting the requirements as to temperature, will find it advantageous to buy a winter’s supply in the fall, when prices are low. The cost of purchases thus made will be considerably less than if apples are bought as needed during the winter.

To store, sort apples carefully, removing and using at once all fruit which is bruised or shows signs of decay. The best results are secured by wrapping each apple in half a sheet of newspaper and storing in barrels, boxes, crates or bins. The wrapping prevents the apples from touching each other and thus prevents the spread of decay which may start. It also protects the apples from odors if vegetables are stored nearby. Apples absorb odors freely from potatoes, onions, turnips and other vegetables and should never be stored, unwrapped, in the same room with vegetables of any kind. In addition to wrapping the individual apples it is desirable to line the barrel or other container with a half inch thickness of newspapers, on the bottom and sides, and then cover the top with newspapers and either nail a cover on or tie the papers securely with strings. This will keep odors out. The lining and covering give full protection and make it possible to store apples in the general cellar storage room.

Remember that the cellar or other place in which they are stored must be cool. A temperature of 32 degrees F. is ideal, and the temperature should not be allowed to go above 40 degrees if it can be held this low.

Apples may be stored unwrapped in barrels, boxes, crates or bins if proper attention is paid to sorting, to providing a cool place for storage and to occasional sorting during the winter, for the removal of possible decayed fruit. If any of the fruit in any container is found to have begun to decay all the apples in all the containers should be sorted at once and decaying fruit removed. Apples stored unwrapped must not be kept in the room with vegetables.

SAVE NEXT YEAR’S SEED FROM THIS YEAR’S GARDEN

Owners of gardens will find that the saving of seed from this year’s gardens will be of great help for next year’s planting. While it is more satisfactory, ordinarily, to purchase seed from reliable dealers the increased planting of home gardens, the poor crop of seed, the decrease of foreign importation, the exporting of certain seed to Europe and the use of certain kinds for food have caused a shortage and, as an emergency measure, each gardener should save as much seed as possible.

Saving of seed is easily done, though it requires care and attention. In saving seed select them from plants of a single variety grown by itself if possible, rather than from plants where more than one variety have been planted. Where there are two or more varieties of the same vegetable growing side by side, cross fertilization takes place and standard seed cannot be obtained. It is well to learn all the features which make up the most desirable type of variety of vegetable from which seed is to be saved. Seed saved where it is grown has two advantages. For one thing more careful selection can be given than is possible for all seed placed on the market. Another advantage is that plants from this seed will succeed best under local conditions.

Select seed plants which are free from disease, which show a vigorous growth, a good yield and quality, and mature early. Mark selected plants with string. Plants selected for seed should be given especially careful cultivation and every effort should be made to promote their full development. When seed is ripe harvest with care.

Seed properly stored, with the exception of parsnip and onion, should retain vitality from 2 to 5 years. Thus enough seed may be saved from a good crop to tide over the poor years.

SEED MATURING IN ONE YEAR

Some of the seed desirable for saving because they mature in one year are:

Beans—Select the best plants and let the pods mature. Pull up plants preferably in

Fig. 10—In selecting corn to be saved for seed, choose the most perfect ears.

Fig. 11—A good way of hanging seed corn to dry.
the early morning, to prevent shattering. Place plants in a dry, well aired place until seed are hard. Shell and spread in a layer until dry.

**Sweet Corn**—Select the ears just at maturity and while on plants, as plant must be considered as well as the ear. The plant should be free from disease and preferably have two or more good ears to the stalk. The distance between joints should be short and the ears set on short, strong shanks. Ears should be nearly cylindrical and should taper but slightly from butts to tips. They should be well filled out, with husks tightly folded over ears. Pick ears from plants maturing at nearly the same time, uniform in size, strong and well rooted. Medium sized ears are best. When fully mature strip down husks and string up 10-15 ears in a dry shady place so as to dry out ears quickly.

**Cucumbers and Summer Squash**—Select desirable fruits when in the usable stage. Allow them to remain on vines until ripe, as indicated by change of color or hardening of surface. Remove the seed from the ripe fruit and wash free of pulp. Spread in a thin layer in the sunshine to dry, stirring frequently. A quart or less should dry satisfactorily in a day.

**Eggplant**—When fruit is opened for food, select the best formed seed, wash and dry.

**Lettuce**—Plants for seed should be started early enough so that seed setting and ripening does not occur during the hot weather. With heading varieties it may be necessary to cut across the tops of the heads to allow the seed stalks to push through. When seed heads turn white and open, cut or pull the plants, put heads in paper bags and hang in a dry place until seed are ripened and drop out of heads, or lay the plants on a table in a dry airy place.

**Potatoes**—Select productive seed hills, as nearly free from disease as possible. Potatoes should be true as to variety, which means that a late variety should not be substituted for early variety if the crop is to be harvested early. Early varieties cannot be substituted for late varieties as they are not as productive. Seed potatoes should be kept dormant in a dark, cool place until planting time. The production of long sprouts, or wilting, will reduce the vigor. Rub off the long sprouts before the potatoes are planted.

**Radishes**—Select the finest roots and cut off all but a few central leaves. Put the roots in a moist, airy place for a short time and then plant them with the crown an inch below the surface. When seed ripen, cut plants and lay on paper exposed in the sun. When the outside covering is dry, then rub out seed, dry and store.

**Tomatoes**—Gather fruit from selected plants when a little over ripe, but not decayed. The seed may be freed by one of two methods. One of these is to crush the fruit, and force through a sieve, and then put the seed in a coarse cloth and press out pulp under water. Another method is to crush fruit, put in a container and allow to ferment for two or three days, stirring once in a while. The seed settle and the pulp which rises may be poured off. Wash the seed in clear water and dry.

**Winter Squash, Pumpkin, Muskmelon, Watermelon**

When fruit is opened for food, select the best formed seed, wash and dry.

**Seed Maturing in Two Years**

Such vegetables as beets, carrots, parsnip, salsify, cabbage, etc., which require one season in which to grow will produce seed in the second year. Seeds of beets, carrots, cauliflower, turnips and late radishes are not often grown satisfactorily in the home garden.
They must be carefully stored during the winter. Root crops of late planting are most satisfactory for seed. Select those of the best shape, color and size. Cut off all but an inch or two of the leaf stems and store in a frost proof pit or cellar. If a cellar is used protect the roots from withering by putting them in sand, fine soil or sifted coal ashes. They should be kept very slightly moist. Do not store them in a heated cellar.

Cabbage—In the fall select the best heads, pull up entire plants and store them in a trench. Next spring set out two or more plants as one plant alone rarely produces seed. It may be necessary to cut the head across the top to allow the seed stalk to develop. When the seed pods turn yellow cut off the stalk and lay it on paper in a cool shady place to dry; early morning is the best time to gather. Rub out the seed when the pod is dry. Do not grow kale, collards, cabbage or kohlrabi—any two of them—in the same garden, as they will cross-fertilize.

Onions—Seed bearing bulbs should be well rooted. In the fall plant them 3 inches deep. As cold weather approaches cover with earth to protect them from freezing. In the spring remove the ridges. The seed stalks should be supported with stakes. When most of the seed is ripe cut out the seed stalks, dry in the sunshine and rub out the seed.

PARSNIPS—These may be left in the ground all winter. In the spring plant selected roots 3 to 5 feet apart in row. When seed are ripe cut seed stalk and dry.

STORAGE OF SEED

Put heavy seed, such as beans and peas, in cloth bags; smaller seed in paper bags or envelopes. Label each bag carefully, inside and out, as to contents. To protect seed from mice put the bags in perforated tin boxes. A bread box makes an ideal storage place for seed. An upstairs room or attic room, provided it is not warm, is a very good place in which to store seed. The room must be dry and well ventilated to prevent molding.

Stored seed should be occasionally examined for insects. If insects or weevils are present fumigate with carbon bisulphid, a liquid which vaporizes, producing a gas heavier than air. To fumigate, place the seed in an air-tight receptacle and pour the carbon bisulphid over the seed. Open to air in from 24 to 36 hours. Use an ounce of carbon bisulphid to a bushel of seed. Carbon bisulphid is very inflammable and fire or flame must not be taken near the fumigating receptacle. Disregard of this precaution will result in an explosion.

This manual was prepared by the Commission’s experts and is based on their own research and experience, supplemented by information procured from the United States Department of Agriculture, Agricultural Colleges, Experiment Stations, and other sources.

The National War Garden Commission, wishing to do all within its power to aid the War Industries Board in the very necessary economy in the use of paper, has limited the edition of this book and asks those who receive it in quantity to make the most careful distribution so that the book may reach the hands of none but those who will use it. IF THE INDIVIDUAL RECIPIENT CAN NOT USE THIS BOOK IT IS URGED THAT IT BE HANDED TO SOME ONE WHO WILL USE IT.

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UNITED STATES FOOD ADMINISTRATION

Mobile, Alabama.
September 6th, 1918.

MR. P. S. RIDSDALE, Secretary,
National War Garden Commission,
WASHINGTON, D. C.

Dear Mr. Ridsdale:

I desire to tender my sincere thanks for the books which you have furnished for distribution and use among the war gardeners of Mobile, and as encouragement and assistance to others to take up this splendid work conducive not only to increased supply of food products, but to the health and happiness of those who wisely give Mother Earth the attention which just at this time she all the more richly deserves.

It is needless for me to assure you that the books have been extremely helpful. I consider them the most complete and serviceable ever produced; and excepting only the family Bible, the foundation of all ethics and morality as well as the common law, these books are of more vital importance to every householder, in fact, good citizens throughout the land, than most printed matter obtainable.

Your books on canning and drying are likewise of inestimable value, and your splendid co-operation in the common cause of increasing and conserving the food supply in our present crisis meets with the heartiest appreciation.

Very sincerely,

(Signed) HENRY A. FORCHHEIMER,
Federal Food Administration Board.

UNITED STATES FOOD ADMINISTRATION

Davenport, Iowa.
September 5, 1918.

MR. P. S. RIDSDALE, Secretary,
National War Garden Commission,
WASHINGTON, D. C.

My dear Mr. Ridsdale:

We have found your publications of great value in our work in this State and it gives me pleasure to thank you for your prompt and cordial compliance with all of our requests.

Your book on War Vegetable Gardening and the one devoted to Canning and Drying are filled with information of great value to the gardener and housewife.

It has been a source of great satisfaction to us to be able to distribute your books in every County in Iowa and we have used care to place them in the hands of people who need them and who are constantly calling for just the information contained in them.

We feel that your co-operation has been of great importance.

Faithfully yours,

(Signed) M. L. PARKER,
State Merchant Representative,
Iowa Food Administration.
NATIONAL WAR GARDEN COMMISSION

A Patriotic Organization Affiliated with the Conservation Department of the American Forestry Association

WASHINGTON, D. C.

CHARLES LATHROP PACK, President.
Percival S. Ridsdale, Secretary. Norman C. McLoud, Associate Secretary.

Luther Burbank, Calif.
Dr. Charles W. Eliot, Mass.
Dr. Irving Fisher, Conn.
Fred H. Goff, Ohio
Fairfax Harrison, Va.
Hon. Myron T. Herrick, Ohio.
P. P. Claxton, U. S. Commissioner of Education.
WAR DEPARTMENT  
WASHINGTON  

NATIONAL WAR GARDEN COMMISSION,  
WASHINGTON, D. C.  

June 7, 1918.  

Dear Sirs:  

The War Department finds much satisfaction in the creation of War Gardens at various army camps by the Conservation and Reclamation Division of the Quartermaster General's office. Food production at these camps has been the subject of some concern with the department. The large areas of tillable land within many of the military reservations have been regarded as offering potential food production on a large scale, and I feel that the army is to be congratulated that the utilization of this space has now taken concrete form.  

Camp War Gardens will serve more than one useful purpose. The production of food at the mess door is of great importance in that it not only lessens the army's demand on the usual sources of supply but eliminates transportation as well.  

To the National War Garden Commission I extend the thanks of the Department for its quick response to the appeal of the Quartermaster General's office for co-operation. Not confining itself to mere compliance with the letter of the request, the Commission entered fully into its spirit. At a time when funds were not available through Government channels the Commission voluntarily provided seed, fertilizers and equipment which made possible the establishment of a War Garden of 300 acres or more at Camp Dix. For this generous contribution and for swift action to overcome the handicap of a late start I take pleasure in making this acknowledgment and in expressing the hope that the Camp Dix War Garden of the National War Garden Commission will prove an unqualified success.  

Cordially yours,  

(Signed) NEWTON D. BAKER,  
Secretary of War.  

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UNITED STATES FOOD ADMINISTRATION  

Baltimore, Maryland.  
September 14, 1918.  

NATIONAL WAR GARDEN COMMISSION,  
Maryland Building,  
WASHINGTON, D. C.  

Gentlemen:  

We wish to express to you our appreciation of your helpfulness in our war garden, canning and drying work in Maryland during the season of 1918. Your book on canning and drying has been of great value, while the canning outfits which you so kindly gave us made it possible for us to establish canning centers throughout the State, with results of far-reaching importance which could not have been otherwise accomplished. We are equally appreciative of your prompt and willing response to our request for the services of one of your trained investigators to assist in our war garden work. Your spirit of prompt and willing service is cordially appreciated.  

Yours truly,  

(Signed) EDWIN G. BAETJER,  
Federal Food Administrator for Maryland.
BACK UP THE CANNON BY USE OF THE CANNER

By CHARLES LATHROP PACK, President
National War Garden Commission

We stand with our backs to the wall.” That call to the civilized world, made by General Haig in the spring of 1918, has brought and still must bring answer from the women. Only by their cooperation has it been possible for that call to be answered, for no nation can do a great work unless the women of that nation put their influence into the job.

We were forced into a war which was something more than a war to decide policies or mark boundaries—a war involving the most sacred questions with which men and women have to deal—the sanctity of womanhood, the sacredness of childhood and the right to live in freedom. We could not yield these rights while we had the strength to defend them.

In the emergency created by this war the question of food goes hand in hand with thrift. Our position has been no less closely involved in the conflict than that of Europe. In proof of this let me call attention to the plan the enemy had for us. I quote from a book called “War,” by Klaus Wagner, published in 1916 in Berlin. On page 165 the author says: “Not only North America, but the whole of America must become a bulwark of German Kultur, perhaps the strongest fortress of the Germanic races. That is every one’s hope who frees himself from his own local European pride and who places race feeling above his love for home.”

Mark that well—his race feeling above his love for home; and then let me quote one of the thousands of letters received by the National War Garden Commission. Here it is, from a boy:

“I have decided to help win the war by having a war garden, and I have just read your notice that anyone can have a free garden book. Please send it to me. My father joined the army in 1915 and was killed in 1916.—Harvey Cameron, New Glasgow, Nova Scotia.”

That boy is typical of the boys and men of many nations who have been fighting against the common enemy. If they could look the job in the face that way, what can we do? Our boys have been giving their lives toward the achievement of victory. Every mile of reclaimed territory in devastated France and Belgium adds hundreds of hungry mouths to be fed. With France and Belgium liberated many more people have become dependent on this country’s food supply. In victory we must feed not only more millions abroad but also care for our own people at home and our soldiers until they return. Peace cannot mean an increase of the world’s grain supply for another year at least, and it will take several years of bountiful crops to refill the empty bins and granaries of the world.

Victory, therefore, must necessarily bring a large increase in our obligation. We must not only produce food as close to the kitchen door as possible, but we must save a vast volume of this food for winter use. To save it we must can it, dry it, or otherwise prepare to have it in readiness for the months of non-production. Canning and drying, therefore, are as imperative to-day as if the war were just beginning.
TIME-TABLE FOR BLANCHING AND STERILIZING

The following time-table shows blanching time for various vegetables and fruits, and also sterilizing time in the hot-water bath outfit, and in equipment for sterilization by the water-seal method, the steam-pressure method and the aluminum steam-cooker method:

<table>
<thead>
<tr>
<th>Vegetables</th>
<th>Blanching</th>
<th>Sterilizing</th>
<th>Steam pressure in lbs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Minutes</td>
<td>Hot-water</td>
<td>Water seal</td>
</tr>
<tr>
<td>Asparagus</td>
<td>10 to 15</td>
<td>120</td>
<td>90</td>
</tr>
<tr>
<td>Beets</td>
<td>5</td>
<td>90</td>
<td>80</td>
</tr>
<tr>
<td>Brussels sprouts</td>
<td>5 to 10</td>
<td>120</td>
<td>90</td>
</tr>
<tr>
<td>Cabbage</td>
<td>5 to 10</td>
<td>120</td>
<td>90</td>
</tr>
<tr>
<td>Cauliflower</td>
<td>3</td>
<td>60</td>
<td>40</td>
</tr>
<tr>
<td>Carrots</td>
<td>5</td>
<td>90</td>
<td>80</td>
</tr>
<tr>
<td>Corn</td>
<td>5 to 10</td>
<td>120</td>
<td>90</td>
</tr>
<tr>
<td>Greens</td>
<td>15</td>
<td>120</td>
<td>90</td>
</tr>
<tr>
<td>Lima beans</td>
<td>5 to 10</td>
<td>120</td>
<td>90</td>
</tr>
<tr>
<td>Okra</td>
<td>5</td>
<td>120</td>
<td>90</td>
</tr>
<tr>
<td>Parsnips</td>
<td>5</td>
<td>90</td>
<td>80</td>
</tr>
<tr>
<td>Peppers, sweet or hot</td>
<td>5 to 10</td>
<td>120</td>
<td>90</td>
</tr>
<tr>
<td>Peppers, pimentos</td>
<td>Roast</td>
<td>35</td>
<td>25</td>
</tr>
<tr>
<td>Peas</td>
<td>5 to 10</td>
<td>120</td>
<td>90</td>
</tr>
<tr>
<td>Pumpkin</td>
<td>See directions</td>
<td>120</td>
<td>90</td>
</tr>
<tr>
<td>Salsify</td>
<td>5</td>
<td>90</td>
<td>80</td>
</tr>
<tr>
<td>Sour-crust</td>
<td>5</td>
<td>120</td>
<td>90</td>
</tr>
<tr>
<td>String beans</td>
<td>5 to 10</td>
<td>120</td>
<td>90</td>
</tr>
<tr>
<td>Squash</td>
<td>See directions</td>
<td>120</td>
<td>90</td>
</tr>
<tr>
<td>Tomatoes</td>
<td>To loosen skins</td>
<td>22</td>
<td>18</td>
</tr>
</tbody>
</table>

**Fruits**

<table>
<thead>
<tr>
<th>Fruits</th>
<th>Blanching</th>
<th>Sterilizing</th>
<th>Steam pressure in lbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apples</td>
<td>1 1/2</td>
<td>20</td>
<td>12</td>
</tr>
<tr>
<td>Apricots</td>
<td>1 to 2</td>
<td>16</td>
<td>12</td>
</tr>
<tr>
<td>Blackberries</td>
<td>none</td>
<td>16</td>
<td>12</td>
</tr>
<tr>
<td>Blueberries</td>
<td>none</td>
<td>16</td>
<td>12</td>
</tr>
<tr>
<td>Dewberries</td>
<td>none</td>
<td>16</td>
<td>12</td>
</tr>
<tr>
<td>Cherries, sweet</td>
<td>none</td>
<td>16</td>
<td>12</td>
</tr>
<tr>
<td>Cherries, sour</td>
<td>none</td>
<td>16</td>
<td>12</td>
</tr>
<tr>
<td>Currants</td>
<td>none</td>
<td>16</td>
<td>12</td>
</tr>
<tr>
<td>Fruit juices</td>
<td>See directions</td>
<td>16</td>
<td>12</td>
</tr>
<tr>
<td>Gooseberries</td>
<td>1 to 2</td>
<td>16</td>
<td>12</td>
</tr>
<tr>
<td>Oranges</td>
<td>1 to 2</td>
<td>12</td>
<td>8</td>
</tr>
<tr>
<td>Pears</td>
<td>1 1/2</td>
<td>20</td>
<td>12</td>
</tr>
<tr>
<td>Peaches</td>
<td>To loosen skins</td>
<td>16</td>
<td>12</td>
</tr>
<tr>
<td>Plums</td>
<td>none</td>
<td>16</td>
<td>12</td>
</tr>
<tr>
<td>Pineapples</td>
<td>3 to 5</td>
<td>30</td>
<td>15</td>
</tr>
<tr>
<td>Quinces</td>
<td>1 1/2</td>
<td>20</td>
<td>12</td>
</tr>
<tr>
<td>Raspberries</td>
<td>none</td>
<td>16</td>
<td>12</td>
</tr>
<tr>
<td>Rhubarb</td>
<td>16</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Strawberries</td>
<td>none</td>
<td>16</td>
<td>12</td>
</tr>
<tr>
<td>Fruits without sugar</td>
<td></td>
<td>30</td>
<td>20</td>
</tr>
</tbody>
</table>

The time given in this table is for quart jars. Add 30 minutes for 2-quart jars and deduct 5 minutes for pint jars.

The time given is for fresh, sound and firm vegetables. Increase the time of sterilization by adding one-fifth for vegetables which have been gathered over 24 hours.

The time given is for altitudes up to 1000 feet above sea level. For higher altitudes increase the time in hot-water bath 10 per cent for each additional 500 feet. For example, if the time is given as 120 minutes in the table and your location is 1500 feet above sea level, the time should be made 132 minutes.

Neither home-made nor commercial hot-water bath outfits are entirely satisfactory, however, for canning at very high altitudes, as the temperature of water in them does not reach 212 degrees F. In such localities water-seal and steam-pressure outfits are advisable, as they give higher temperatures.
PART I

HOME CANNING MANUAL

To save vegetables and fruits by canning this year is a patriotic duty. War has made the need for Food Conservation more imperative than at any time in history. America is responsible for the food supply of Europe. The American family can do nothing more helpful in this emergency than to Can All Food That Can be Canned. In this way the abundance of the summer may be made to supply the needs of the winter.

CANNING IS FOOD THRIFT

The National War Garden Commission's campaign for five million or more War Gardens has brought about the creation of a vast food supply hitherto greatly neglected. To utilize this to the best advantage calls for Canning operations in every household throughout the nation.

The preservation of foodstuffs by Canning is always effective Food Thrift. It enables the individual household to take advantage of summer's low prices for vegetables even if no garden has been planted. It affects the saving of a surplus of foodstuffs that would otherwise be wasted through excess of supply over immediate consumption. It eliminates the cold storage cost that must be added to the prices of commodities bought during the winter. Of vital importance, also, is that it relieves the strain on transportation facilities of the country. This phase has been especially emphasized for this year by the unprecedented traffic situation. All this increases the need for Home Canning and proves that this is a national obligation.

CANNING MADE EASY BY MODERN METHODS

By the Single Period Cold-Pack method it is as easy to can vegetables as to can fruits, and this year it is more useful. By the use of this method canning may be done in the kitchen or out of doors. It may be done in the individual household or by groups of families. Community canning is important in that it makes possible the use of the best equipment at small individual outlay and induces Food Conservation on a large scale. Community canning by school children, under the direction of competent teachers, is especially valuable.

This Manual presents all necessary instructions for canning vegetables and fruits, in a manner which may be so readily understood that the work is no longer a problem, but is so simple that any adult or child may do it with success.

COLD-PACK IN THE SOUTH

In some parts of the Southern States there has been complaint as to results obtained in the use of the Single Period Cold-pack method, but inquiry and research have shown that in most cases the trouble arose from lack of care in following instructions or the use of poor rubbers, and was not to be blamed on the method itself. With proper care and perfect cleanliness the results in the South are as good as elsewhere.

COMMUNITY WORK

One of the best methods to follow in canning and drying operations is for several families to club together for the work. The work may be carried on at a schoolhouse, in a vacant storeroom, at the home of one of the members or at some other convenient and central location where heat and water can be made available. By joining in the purchase of equipment each participant will be in position to save money as against individual purchases and at the same time have the advantage of larger and more complete equipment. The cost is slight when thus divided and the benefits very great to all concerned.

For a co-operative enterprise it is well to have a committee of from three to five to take charge of all details. First determine how many people will take part in the work, how much each proposes to can or dry, what vegetables and fruits each will furnish and such other information as will have a bearing on the selection of equipment. After deciding how much money will be needed,
have each member contribute his or her proportion, determined by the amount of canning or drying he or she proposes to do.

The equipment should be bought as early as possible to prevent disappointment in delivery which is almost certain to follow delay. This equipment may be ordered through a local dealer or direct from the manufacturers. The National War Garden Commission publishes a list of manufacturers which may be had upon application.

The equipment may be used by the individual members on a schedule arranged by the committee, or a working force may be appointed to do all the work, receiving pay in the form of a percentage of the product.

Publicity is important in keeping interest aroused and there should be a committee to arrange with the local papers for the publication of information concerning the enterprise. This serves as an incentive to others.

The National War Garden Commission will send upon application its pamphlet on Community and Neighborhood Canning and Drying, giving details as to organization.

STERILIZATION OF FOOD

The scientist has proved that food decay is caused by microorganisms, classed as bacteria, yeasts and molds. Success in canning neces-

sitates the destruction of these organisms. A temperature of 160° to 190° F. will kill yeasts and molds. Bacteria are destroyed at a temperature of 212° F. held for the proper length of time. The destruction of these organisms by heat is called sterilization.

METHODS OF CANNING

There are five principal methods of home canning. These are:


2. Fractional or Intermittent Sterilization Method.

3. Open Kettle or Hot-pack Method.


5. Vacuum Seal Method.

The method recommended for home use is the Single Period Cold-pack method. It is much the best because of its simplicity and effectiveness, and in this book detailed instructions are given for its use.

The outlines of the various methods are:

1. Single Period Cold-pack Method: The prepared vegetables or fruits are blanched in boiling water or live steam, then quickly cold-dipped and packed at once into hot jars, the contents covered with boiling water or syrup, and the jars partially sealed and sterilized in boiling water or by steam pressure. The jars are then sealed tight, tested for leaks and stored. Full details are given on page 7 and the pages following.

2. Fractional or Intermittent Sterilization Method: Vegetables are half sealed in jars and sterilized for 1 hour or more on each of three successive days. This method is expensive as to time, labor and fuel and discourages the home canning of vegetables.

3. Open Kettle or Hot-pack Method: Vegetables or fruits are cooked in an open kettle and packed in jars. There is always danger of spores and bacteria being introduced on spoons or other utensils while the jars are being filled. This method should never be used in canning vegetables. Even with fruits it is not as desirable as the cold-pack.

4. Cold Water Method: Rhubarb, cranberries, gooseberries, and sour cherries, because of their acidity, are often canned by this method. The fruits are washed, put in sterilized jars, cold water is added to overflowing, and the jar is then sealed. This method is not always successful as the acid content varies with ripeness and the locality in which the fruits are grown.
5. Vacuum Seal Method: Vegetables are washed, blanched, cold-dipped and cooked as aforesaidable use; packed and sealed in especially made vacuum seal jars. The jars must be well made and the work properly done to bring about satisfactory results.

ADVANTAGES OF THE COLD-PACK

The Single Period Cold-pack method is a simple and sure way of canning. It insures a good color, texture and flavor to the vegetable or fruit canned. In using this method sterilization is completed in a single period, saving time, fuel and labor. The simplicity of the method commend it. Fruits are put up in syrups. Vegetables require only salt for flavoring and water to fill the container.

Another advantage is that it is practicable to put up food in small as well as large quantities. The housewife who understands the process will find that it pays to put up even a single container. Thus, when she has a small surplus of some garden crop she should take the time necessary to place this food in a container and store it for future use. This is true household efficiency.

COLD-PACK EQUIPMENT

1. The Homemade Hot-water Bath Outfit.— A serviceable Single Period Cold-pack canning outfit may be made of equipment found in almost any household. Any utensil large and deep enough to allow an inch of water above jars, and a false bottom beneath them, and having a closely fitting cover, may be used for sterilizing. A wash-boiler, large lard can or new garbage pail serves the purpose when canning is to be done in large quantities. Into this utensil should be placed a wire or wooden rack to hold the jars off the bottom and so constructed as to permit circulation of water underneath the jars.

For lifting glass-top jars use two button-hooks or similar device. For lifting screw-top jars, suitable lifters may be bought for a small sum. A milk carrier makes a good false bottom, and if this is used the jars may be easily lifted out at the end of the sterilization period.

2. Commercial Hot-water Bath Outfits.— There are upon the market outfits on the order of the wash-boiler or pail type of homemade canner. These are excellent and are especially desirable if one has considerable quantities of vegetables or fruits to put up. There are also commercial canners conve-

![Fig. 5. Water-seal outfit. On the left is shown the cover, with thermometer. In the center is the double walled vat or holder. On the right is a crate for jars.](image)

![Fig. 6. Aluminum pressure canner.](image)

nient for out-door work, having fire-box and smoke-pipe all in one piece with the sterilizing vat. As with the homemade outfit, containers are immersed in boiling water.

3. Water Seal Outfits.— These are desirable, as the period of sterilization is shorter than in the homemade outfit and less fuel is therefore required. The outfit consists of two containers, one fitting within the other, and a cover which extends into the space between the outer and the inner container. The water-jacket makes it possible for the temperature in the inner container to be raised several degrees above 212°F.

4. Steam Pressure Outfits.— Canning is very rapid when sterilization is done in steam maintained at a pressure. There are several canners of this type. Each is provided with pressure gauge and safety valve and they carry from 5 to 30 pounds of steam pressure. This type is suitable for home or community canning.

5. Aluminum Pressure Outfits.— These cookers are satisfactory for canning and for general cooking. They carry from 5 to 30 pounds of steam pressure. Each outfit is provided with a steam pressure gauge and safety valve.

HIGH ALTITUDES

At high altitudes the boiling point of water is below 212°F. At moderate elevations satisfactory results may be obtained in the use of the hot-water bath by increasing the time of sterilization 10 per cent for every
500 feet above 1000. To insure best results in very high altitudes, however, a steam pressure canner or aluminum pressure cooker is recommended to be used. This type of canner produces a temperature up to 250° F. at 15 lbs. pressure, insuring proper sterilization and also saving time and fuel. A steam pressure canner may be bought around $20. Several families may use one, and divide the cost.

OPERATION OF PRESSURE CANNERS AND ALUMINUM COOKERS

1. Have water in the canner up to the false bottom, but not above it. Keep this water boiling during the time that packed jars are being placed in the canner, and add water occasionally to prevent it boiling dry.

2. To prepare product follow instructions in "Steps in the Single Period Cold-pack Method" on pages 8 and 9. As each jar is packed, set it at once, partially sealed, in the canner. The cover of the canner may be put in position, but not clamped.

3. When all of the filled jars are placed in the canner, put on the cover, and fasten opposite clamps moderately tight; then tighten each pair of clamps fully.

4. The petcock should be left open until live steam escapes from it. The canner should be steam-tight, and no steam should escape except through the open petcock. When live steam escapes, close the petcock completely.

5. Begin to count time when the steam gauge registers the required temperature.

6. Maintain a uniform pressure during the sterilizing period by setting the weight on the arm, when the proper pressure is registered on the steam gauge, so that surplus steam will escape at that desired pressure. A uniform temperature may be maintained also, by turning down the flame or moving the canner to a less hot part of the stove.

7. When the sterilization period is complete, do not allow steam to escape, but allow the canner to cool until the steam gauge registers zero.

8. Open petcock, remove the cover of canner, and take out the jars. As each jar is removed, complete seal at once.

CONTAINERS

For home use glass jars are more satisfactory for canning than tin. This is especially true this year when there is a shortage of tin cans. Tin cans are used chiefly for canning on a large scale for commercial purposes.

There are many jars of different styles and prices on the market; and provided the seal is not defective, equally good results may be obtained from all. Glass is a popular household choice because one can see through it and thus have some idea as to the condition of the contents. Glass jars may be used for years if properly cared for.

All types of jars which seal readily may be used. Jars having glass tops held in place by balls are especially easy to handle while hot. Screw-top jars are serviceable. Glass caps held in place by separate metal screw bands are now on the market, as well as the one-piece sort of former years. Vacuum seal jars are very easily managed. Tops for Economy jars should be purchased each year. The composition material, which takes the place of rubber, should have a rubber-like texture. If of mealy consistency it is unfit for use and the top will not make a tight seal.

The color and shape of jars are not of first moment, but are to be considered. Containers made of white glass should be used if the product is to be offered for sale, as blue or green glass detracts from the appearance of the contents. Wide-mouthed jars are best for packing whole products and are easiest to clean. Small-necked bottles can be used for fruit juices. Large-mouthed bottles can be used for jams, marmalades and jellies.

TESTS FOR JARS

Jars should be tested before they are used. Some of the important tests are here given:

1. Glass-top Jars.—First examine for cracks. Then run a finger around the edge of necks of jars, and if there are sharp projections, file them off, or scrape them off with an old knife. If left on they may cut rubberers and interfere with perfect sealing. Place a top on a jar. It will slip from side to side, but should not rock, when tapped. Rocking tops will not make a tight seal. Sometimes the fault is with the top and sometimes with the neck. Defective jars and tops when discarded for
canning purposes may be used as containers for jams, etc. The top-bail should go into position with a light snap. If too loose it should be taken off and bent slightly inward in the center. If too tight bend outward.

2. Screw-top Jars.—Use only enameled, lacquered or vulcanized tops. Screw the top on tightly without the rubber. If the tip of a knife or finger nail can be inserted under the rim, the tops should not be used for cold-pack canning. If the defect is very slight, however, it may be remedied by pressing a knife handle on the lower edge against a hard surface, thus straightening the offending bulge. Another test is made by putting on the rubber, screwing the top on tightly and then pulling the rubber out. If the rubber returns to place, the top does not fit and should not be used on that jar.

3. Vacuum seal jars may be tested in the same way as the glass-top jars. See if the tops rock if tapped, when placed on the jar without fastening.

STANDARDS AND TESTS FOR RINGS

1. Good Rubber Essential.—Buy new rubbers every year, as rubbers deteriorate from one season to another. A good rubber for cold-pack canning must be such as to stand four hours of continuous boiling or one hour under 10 pounds of steam pressure. The combination of moist heat plus acids and mineral matter in vegetables and fruits tends to break down the rubbers during sterilization. Rubbers kept in a hot or very warm place, as for example, on a shelf near the kitchen range, will deteriorate in quality. Be very particular about the rubbers used. Spoilage of canned goods has been traced frequently to the use of poor rubbers.

2. Testing Rubbers.—It is always well to test rubbers when buying. A good rubber will return to its original size when stretched. It will not crease when bent double and pinched (Fig. 10). It should fit the neck of the jar snugly. It is cheaper to discard a doubtful rubber than to lose a jar of canned goods.

GRADING

Vegetables and fruits should be sorted according to color, size and ripeness. This is called grading. It insures the best pack and uniformity of flavor and texture to the canned product, which is always desirable.

BLANCHING AND COLD-DIPPING

The most important steps in canning are the preliminary steps of blanching, cold-dipping, packing in hot, clean containers, adding hot water at once, then immediately half-sealing jars and putting into the sterilizer. Spoilage of products is nearly always due to carelessness in one of these steps. Blanching is necessary with all vegetables and some fruits. It insures thorough cleansing and removes objectionable odors and flavors and excess acids. It starts the flow of coloring matter. It reduces the bulk of greens and causes shrinkage of fruits, increasing the quantity which may be packed in a container, which saves storage space.

Blanching consists of plunging the vegetables or fruits into boiling water or exposing them to steam for a short time. For blanching in boiling water place them in a wire basket (Fig. 17) or piece of cheesecloth (Fig. 18). The blanching time varies from one to fifteen minutes, as shown in the time-table on page 2, and the products should be kept under water throughout the period. Begin counting time when the articles are first placed in boiling water or steam.

Spinach and other greens should not be blanched in hot water. They must be blanched in steam to prevent the loss of mineral salts, volatile oils and other valuable substances. To do this place them in a colander and set this into a vessel which has a tightly fitting cover. In this vessel there should be an inch or two of water, but the water must not be allowed to touch the greens (Fig. 12). Another method is to suspend the greens in the closed vessel above an inch or two of water. This may be done in a wire basket or in cheesecloth. Allow the water to boil in the closed vessel fifteen minutes. Excellent results are obtained, also, by the use of a steam cooker or steam pressure canner.

When the blanching is complete remove the vegetables or fruits from the boiling water or steam and plunge them once or twice
into cold water—the colder the better. This latter process is the Cold Dip. It hardens the pulp under the skin, so that the products are not injured by peeling. It also sets the coloring matter. Do not allow the products to stand in the cold water.

Always blanch and cold-dip only enough product to fill one or two jars at a time. The blanching and cold-dipping should follow at once when the vegetable or fruit is prepared, and the packing into jars should immediately follow the blanching and cold-dip.

**PROCESSING**

Processing is the sterilization treatment to which products are subjected after packing them into jars. As soon as the jar is filled, put the rubber and cap in place and partially seal by adjusting top bail or screwing on top with thumb and little finger. If Economy jars are used the top should be held in place with clamp. The jar should then be put into sterilizer at once.

In using the hot-water bath outfit, count the time of sterilization from the time water begins to boil. The water in the sterilizer should be at or just below the boiling point when jars are put in. With the Water Seal Outfit begin counting time when the thermometer reaches 214° F. With the Steam Pressure Outfit begin counting time the number of pounds called for in directions.

When the processing is finished, at once remove and seal each jar.

**ARRANGING FOR CANNING**

It is important to plan your work so that whatever may be needed will be ready for use. Arrange everything conveniently in advance. Preliminary provisions include:

1. A reliable alarm clock in a convenient place (set to ring when the sterilizing is done).
2. All the necessary equipment in place before beginning work. See Fig. 14.
3. Jars, tops and rubbers carefully tested.
4. Fresh, sound fruits and vegetables.
5. Plenty of hot water for sterilizer, blanching, warming the jars and for pouring into packed jars.
6. Salt or syrup at hand.
7. Reliable instructions, carefully followed.
8. Absolute cleanliness.

**STEPS IN THE SINGLE PERIOD COLD-PACK METHOD**

In canning by the Single Period Cold-pack method it is important that careful attention be given to each detail. Do not undertake canning until you have familiarized yourself with the various steps, which are as follows:

1. Vegetables should be canned as soon as possible after picking; the same day is best. Early morning is the best time for gathering. Fruits should be as fresh as possible.
2. Before starting work have on the stove the boiler or other holder in which the sterilizing is to be done, a pan of boiling water for use in blanching, a vessel containing water to be used for warming several jars at a time, and a kettle of boiling water for use in filling jars of vegetables; or, if canning fruits, the syrup to be used in filling the jars. Arrange on this working table all necessary equipment, including instructions. (Fig. 14.)
3. Test jars and tops. All jars, rubbers and tops should be clean and hot, at the moment of using.
4. Wash and grade product according to size and ripeness. (Cauliflower should be soaked 1 hour in salted water, to remove insects if any are present. Put berries into a colander and wash, by allowing cold water to flow over them, to prevent bruising.)
5. Prepare vegetable or fruit. Remove all but an inch of the tops from beets, parsnips and carrots and the strings from green beans. Pare squash, remove seeds and cut into small pieces. Large vegetables should be cut into pieces to make close pack possible. Remove pits from cherries, peaches and apricots.
6. Blanch in boiling water or steam as directed. Begin to count time when the product is immersed.
7. Cold-dip, but do not allow product to stand in cold water at this or any other stage.
8. Pack in hot jars which rest on cloths wrung out in hot water. Fill the jars to within \( \frac{3}{4} \) to \( \frac{1}{4} \) inch of tops. (In canning lima beans, squash, corn, peas, pumpkin and sweet potatoes fill the jars to within 1 inch of the top, as these vegetables swell during sterilization. In canning berries, to insure a close pack, put a 2 or 3 inch layer of berries on the bottom of the jar and press down gently with a spoon. Continue in this manner, with other layers until jar is filled. Fruits cut in half should be arranged with pit surface down.)
9. Add salt and then boiling water to vegetables to cover them. To fruits add hot syrup or water.
10. Place a new wet rubber on jar and put top in place.
11. With bail-top jar adjust top bail only, leaving lower bail or snap free. With screw-top jar screw the top on lightly, using only the thumb and little finger. (This partial sealing makes it possible for steam generated within the jar to escape, and prevents breakage.) On vacuum seal jars adjust spring securely.

12. Place the jars on rack in boiler or other sterilizer. If the homemade or commercial hot-water bath outfit is used, enough water should be in the boiler to come at least one inch above the tops of the jars, and the water, in evaporating, should never be allowed to drop to the level of these tops. In using the hot-water bath outfit, begin to count sterilizing time when the water begins to boil. Water is at the boiling point when it is jumping or rolling all over. Water is not boiling when bubbles merely form on the bottom or when they begin to rise to the top. The water must be kept boiling all of the time during the period of sterilization.

13. Consult time-table on page 2 and at the end of the required sterilizing period remove the jars from the sterilizer. Place them on a wooden rack or on several thicknesses of cloth to prevent breakage. Complete the sealing of jars. With bail-top jars this is done by pushing the snap down (Fig. 15); with screw top jars by screwing cover on tightly.

14. Turn the jars upside down as a test for leakage and leave them in this position till cold. Let them cool rapidly but be sure that no draft reaches them as a draft will cause breakage. (If there is any doubt that a bail-top jar is perfectly sealed a simple test may be made by loosening the top bail and lifting the jar by taking hold of the top with the fingers. (Fig. 28.) The internal suction should hold the top tightly in place when thus lifted. If the top comes off put on a new wet rubber and sterilize 15 minutes longer for vegetables and 5 minutes longer for fruits.) With screw-top jars try the tops while the jars are cooling, or as soon as they have cooled, and, if loose, tighten them by screwing on more closely. Vacuum seal jars should be placed upright while cooling, and the clamp removed when the jar is cool. Then lift by the top and turn upside down, as a test for leakage.

15. Wash and dry each jar, label and store. If storage place is exposed to light, wrap each jar in paper, preferably brown, as light will either fade or darken the color of products canned in glass. The boxes in which jars were brought afford good storage. Store in a cool, dark place, preferably dry. Exposure to mold will cause decay of rubber, allowing the leakage of air into jars. Paper wrappings prevent mold.

CAUTION AGAINST FREEZING

From a number of sources it has been learned that the severe weather of last winter caused considerable loss through the freezing of canned goods. To prevent similar trouble, care should be taken to store canned vegetables and fruits where they will be protected from freezing. If the place of storage is not frost-proof the jars should be moved to a warmer place in severe weather.
SPECIAL INSTRUCTIONS FOR CANNING VEGETABLES

The addition of 1 level teaspoonful of salt to a jar of vegetables is for quart jars. For pint jar use ½ teaspoonful. For 2 quart jar use 2 teaspoonfuls.

Asparagus
Wash, scrape off scales and tough skin. With a string bind together enough for one jar. Blanch tough ends from 5 to 10 minutes, then turn so that the entire bundle is blanched 5 minutes longer. Cold-dip. Remove string. Pack, with tip ends up. Add 1 level teaspoonful of salt and cover with boiling water. Put on rubber top and adjust top bail or screw top on with thumb and little finger. Sterilize 120 minutes in hot-water bath. Remove jars, complete seal and cool. With Steam Pressure Outfit sterilize 60 minutes at 5 to 10 pounds pressure.

Beets
Use only small ones. Wash and cut off all but an inch or two of root and leaves. Blanch 5 minutes, cold-dip and scrape off skin and stems. They may be packed in jar sliced or whole. Add 1 level teaspoonful of salt and cover with boiling water. Put on rubber and top and adjust top bail or screw top on with thumb and little finger. Sterilize 90 minutes in hot-water bath. Remove jars, complete seal and cool. With Steam Pressure Outfit sterilize 60 minutes at 5 to 10 pounds pressure.

Cabbage and Brussels Sprouts
The method is the same as for cauliflower, except that the vegetables are not soaked in salted water. Blanch 5 to 10 minutes. Sterilize 120 minutes in hot-water bath. With Steam Pressure Outfit sterilize 60 minutes at 5 to 10 pounds pressure.

Carrots
Select small, tender carrots, leave an inch or two of stems, wash, blanch 5 minutes and cold-dip. Remove stems and scrape off skins. Pack whole or in slices, add 1 level teaspoonful of salt and cover with boiling water. Put on rubber and top and adjust top bail or screw top on with thumb and little finger. Sterilize 90 minutes in hot-water bath. Remove jars, complete seal and cool. With Steam Pressure Outfit sterilize 60 minutes at 5 to 10 pounds pressure.

After partially sealing jars, place them in hot-water bath. Fig. 22 shows jar being placed in ordinary household wash-boiler for sterilizing. Fig. 23 shows the adjustment of cover, with cloth to give tighter fit and make it hold the steam. Fig. 24 shows jars being removed. (Continued at bottom of next page.)
Cauliflower

Wash and divide head into small pieces. Soak in salted water 1 hour, which will remove insects if any are present. Blanch 3 minutes, cold-dip and pack in jar. Add 1 level teaspoonful of salt and cover with boiling water. Put on rubber and top and adjust top bail or screw top on with thumb and little finger. Sterilize 60 minutes in hot-water bath. Remove jars, complete seal and cool.

With Steam Pressure Outfit sterilize 30 minutes at 5 to 10 pounds pressure.

Greens

Wash until no dirt can be felt in the bottom of the pan. Blanch in steam 15 minutes. (Mineral matter is lost if blanched in water.) Cold-dip, cut in small pieces and pack or pack whole. Do not pack too tightly. Add 1 level teaspoonful of salt and cover with boiling water. Put on rubber and top and adjust top bail or screw top on with thumb and little finger. Sterilize 120 minutes in hot-water bath. Remove jars, complete seal and cool.

With Steam Pressure Outfit sterilize 60 minutes at 5 to 10 pounds pressure.

Corn

Canning corn on the cob, except for exhibition purposes, is a waste of space, time and fuel. For home use remove the husks and silk, blanch tender ears 5 minutes, older ears 10 minutes, cold-dip, and cut from cob. Pack lightly to within 1 inch of the top of the jar, as corn swells during sterilization. Add 1 level teaspoonful of salt and cover with boiling water, put on rubber and top, adjust top bail or screw top on with thumb and little finger. Sterilize 180 minutes in hot-water bath. Remove jars, complete seal and cool.

(When canned on cob 1 hour longer of sterilization is necessary.)

With Steam Pressure Outfit sterilize 90 minutes at 5 to 10 pounds pressure.

Lima Beans

Shell. Blanch 5 to 10 minutes. Cold-dip, pack in jar, add 1 level teaspoonful of salt and cover with boiling water. Put on rubber and top, and adjust top bail or screw top on with thumb and little finger. Sterilize 180 minutes in hot-water bath. Remove jars, complete seal and cool.

With Steam Pressure Outfit sterilize 60 minutes at 5 to 10 pounds pressure.

Okra

Wash and remove stems. Blanch 5 to 10 minutes, cold-dip and pack in jar. Add 1 level teaspoonful of salt and cover with boiling

After removal from hot-water bath jars are inverted to test for leakage (Fig. 25) and left inverted until cooled. They should be cooled rapidly, but protected from draft. Fig. 26 shows wrapping jar in brown paper to exclude light. Fig. 27 shows storage on shelves. If shelves are exposed to light, do not neglect wrapping.
A WORD OF CAUTION

It must not be forgotten that success in canning demands careful attention to every detail. No step should be slighted. Follow one set of instructions closely and do not attempt to combine two, no matter how good both of them may be. To attempt to follow two sets will inevitably cause spoilage.

The experience of the United States Department of Agriculture during the last five years indicates that 75 per cent. of the spoilage has been due to the use of poor rubbers, the use of old tops on screw-top jars, and improper sealing resulting from the use of defective joints, springs and caps. Another fruitful source of trouble is that people sometimes undertake to can stale or wilted vegetables. No amount of sterilizing will overcome staleness. Careless handling is also sure to cause loss. Absolute cleanliness in every step is essential.

In sterilizing care must be exercised to see that the temperature is high enough and maintained for the proper length of time.

IN OTHER WORDS DO NOT BLAME THE METHOD FOR FAILURE. FOLLOW DIRECTIONS CAREFULLY AND PREVENT FAILURE.

water. Put on rubber and top, adjust top bail or screw top on with thumb and little finger. Sterilize 120 minutes in hot-water bath. Remove jars, complete seal and cool.

With Steam Pressure Outfit sterilize 60 minutes at 5 to 10 pounds pressure.

 Parsnips

The method is the same as for carrots.

Peas

Those which are not fully grown are best for canning. Shell, Blanch 5 to 10 minutes and cold-dip. Pack in jar, add 1 teaspoonful of salt and cover with boiling water. If the jar is packed too full some of the peas will break and give a cloudy appearance to the liquid. Put on rubber and top and adjust top bail or screw top on with thumb and little finger. Sterilize 180 minutes in hot-water bath. Remove jars, complete seal and cool.

With Steam Pressure Outfit sterilize 60 minutes at 5 to 10 pounds pressure.

Peppers

Wash, stem and remove seeds. Blanch 5 to 10 minutes, cold-dip and pack in jar. Add 1 level teaspoonful of salt. Cover with boiling water, put on rubber and top and adjust top bail or screw top on with thumb and little finger. Sterilize 120 minutes in hot-water bath. Remove jars, complete seal and cool.

With Steam Pressure Outfit sterilize 60 minutes at 5 to 10 pounds pressure.

Pimientos

Place in a hot oven from 6 to 8 minutes. Peel, remove seeds, and pack in flat layers. Do not add any liquid. Sterilize 35 minutes in hot-water bath.

Pumpkin, Winter Squash

(a) Remove seed. Cut the pumpkin or squash into strips. Peel and remove stringy center. Slice into small pieces and boil until thick. Pack in jar and sterilize 120 minutes in hot-water bath. Remove jars, complete seal and cool.

(b) Another method is to prepare the pieces as in (a), Blanch 3 minutes, cold-dip, pack in jars and add 1 level teaspoonful of salt to each quart jar. Cover with boiling water and sterilize as (a).

With Steam Pressure Outfit sterilize 60 minutes at 5 to 10 pounds pressure.

Salsify

Wash, Blanch 5 minutes, cold-dip and scrape off skin. It may be packed whole or in slices. Add 1 teaspoonful of salt, and cover with boiling water. Put on top and rubber and adjust top bail or screw top on with thumb and little finger. Sterilize 90 minutes in hot-water bath. Remove jars, complete seal and cool.

With Steam Pressure Outfit sterilize 60 minutes at 5 to 10 pounds pressure.

String Beans

Wash and remove ends and strings and cut into small pieces if desired. Blanch from 5 to 10 minutes, depending on age. Beans which have been properly blanched will bend readily without breaking. Cold-dip, pack immediately in jar, add 1 level teaspoonful salt and cover with boiling water. Put on rubber and top and adjust top bail or screw top on with thumb and little finger. Sterilize 120 minutes in hot-water bath. Remove jars, complete seal and cool.

With Steam Pressure Outfit sterilize 60 minutes at 5 to 10 pounds pressure.

Summer Squash

Pare, cut in slices or small pieces and Blanch 10 minutes. Cold-dip, pack in jars, add 1 level teaspoonful of salt, cover with boiling water, put on rubber and top and adjust top bail or screw top on with thumb and little finger. Sterilize 120 minutes in hot-
water bath. Remove jars, complete seal and cool.
With Steam Pressure Outfit sterilize 60 minutes at 5 to 10 pounds pressure.

**Tomatoes**

Take medium sized tomatoes. Wash them, blanch 1½ minutes or until skins are loose, cold-dip and remove the skins. Pack whole in jar, filling the spaces with tomato pulp made by cooking large and broken tomatoes until done and then straining and adding 1 level teaspoonful of salt to each quart of the pulp. Put on rubber and top and adjust top bail or screw top on with thumb and little finger. Sterilize 22 minutes in hot-water bath. Remove jars, complete seal and cool.
With Steam Pressure Outfit sterilize 15 minutes at 5 to 10 pounds pressure.
Tomatoes may be cut in pieces, packed closely into jars and sterilized 25 minutes in hot-water bath. If this is done do not add any liquid, as the liquid in the tomatoes will be sufficient.

**THE CANNING OF FRUITS**

For fruits, as well as for vegetables, the Single Period Cold-pack method is best. With some exceptions, as shown in the table on page 2, fruits should be blanched before canning. When fruits are intended for table use, syrup should be poured over them to fill the jars. In canning fruits to be used for pie-filling or in cooking, where unsweetened fruits are desirable, boiling water is used instead of syrup, and the sterilization period in hot-water bath is thirty minutes.

**SYRUPS**

In the directions given various grades of syrup are mentioned. These syrups are made as follows:

- Thin—1 part sugar to 4 parts water.
- Medium—1 part sugar to 2 parts water.
- Thick—1 part sugar to 1 part water.

**SPECIAL INSTRUCTIONS FOR CANNING FRUITS**

**Apples**

Wash, pare, quarter or slice and drop into weak salt water. Blanch 1½ minutes, cold-dip, pack into jar and cover with water or thin syrup. Put on rubber and top and adjust top bail or screw top on with thumb and little finger. Sterilize for 20 minutes in hot-water bath. Remove jars, complete seal and cool.
With Steam Pressure Outfit sterilize 8 minutes at 5 to 10 pounds pressure.
Apples shrink during sterilization and for this reason economy of space is obtained by canning them in the form of sauce instead of in quarters or slices. In canning sauce fill the jars with the hot sauce and sterilize 12 minutes in hot-water bath.

**Apricots**

Use only ripe fruit. Wash, cut in half and remove pit. Blanch 1 to 2 minutes. Pack in jar and cover with medium syrup. Put on rubber and top and adjust top bail or screw top on with thumb and little finger. Sterilize 16 minutes in hot-water bath. Remove jars, complete seal, cool and store.
With Steam Pressure Outfit sterilize 10 minutes at 5 to 10 pounds pressure.

**Blackberries**

Wash, pack closely and cover with medium syrup. Put on rubber and top and adjust top bail or screw on top with thumb and little finger. Sterilize 16 minutes in hot-water bath. Remove jars, complete seal and cool.
With Steam Pressure Outfit sterilize 10 minutes at 5 to 10 pounds pressure.

**Blueberries** **Loganberries**

The method is the same as for blackberries. Sterilize 16 minutes in hot-water bath. With Steam Pressure Outfit sterilize 10 minutes at 5 to 10 pounds pressure.

**Currants** **Raspberries**

**Cherries**

Cherries should be pitted before being canned. Pack in jar and cover with medium syrup. Put on rubber and top and adjust top bail or screw on top with thumb and little finger. Sterilize 16 minutes in hot-water bath. Remove jars, complete seal and cool.
With Steam Pressure Outfit sterilize 10 minutes at 5 to 10 pounds pressure.

**Fruit Juices**

See “Winter Jelly Making” on page 17.

**Pears**

Peel and drop into salt water to prevent discoloration. Blanch 1½ minutes. Pack in jar, whole or in quarters, and cover with thin syrup. Put on rubber and top and adjust top bail or screw on top with thumb and little
finger. Sterilize 20 minutes in hot-water bath. Remove jars, complete seal and cool. A slice of lemon may be added to the contents of each jar for flavor.

With Steam Pressure Outfit sterilize 8 minutes at 5 to 10 pounds pressure.

Peaches
Blanch in boiling water long enough to loosen skins. Some peaches do not peel readily even if dipped in boiling water. In such cases omit dipping in boiling water and pare them. Cold dip and remove skins. Cut in half and remove stones. Pack in jars and cover with thin s rup. Put on rubber and top and adjust top bail or screw on top with thumb and little finger. Sterilize 16 minutes in hot-water bath. Remove jars, complete seal and cool.

With Steam Pressure Outfit sterilize 10 minutes at 5 to 10 pounds pressure.

Plums
Wash, pack in jar and cover with medium syrup. Put on rubber and top and adjust top bail or screw on top with thumb and little finger. Sterilize 16 minutes in hot-water bath. Remove jars, complete seal and cool.

With Steam Pressure Outfit sterilize 10 minutes at 5 to 10 pounds pressure.

Pineapples
Pare, remove eyes, shred or cut into slices or small pieces, blanch 3 to 5 minutes, according to size of pieces, and pack in jar. Cover with medium syrup. Put on rubber and top and adjust top bail or screw on top with thumb and little finger. Sterilize 30 minutes in hot-water bath. Remove jars, complete seal and cool.

With Steam Pressure Outfit sterilize 10 minutes at 5 to 10 pounds pressure.

Quinces
The method is the same as for apples. They may be canned with apples. Sterilize 20 minutes in hot-water bath

With Steam Pressure Outfit sterilize 8 minutes at 5 to 10 pounds pressure.

Rhubarb
Wash and cut into short lengths. Cover with boiling water or thin syrup. Put on rubber and top and adjust top bail or screw on top with thumb and little finger. Sterilize 20 minutes in hot-water bath. Remove jars, complete seal and cool.

With Steam Pressure Outfit sterilize 15 minutes at 5 to 10 pounds pressure.

Strawberries
Wash and pack closely in jar. Cover with medium syrup, put on rubber and top and adjust top bail or screw on top with thumb and little finger. Sterilize 16 minutes in hot-water bath. Remove jars, complete seal and cool.

With Steam Pressure Outfit sterilize 10 minutes at 5 to 10 pounds pressure.

CANNING IN TIN

In sections where there is a large yield of fruits or vegetables canning in tin in the home is practical. This is especially true when the goods are to be sold, as tin cans are more easily transported than glass containers. Tin cans of standard sizes may be purchased in sanitary or cap and hole type. The No. 2 can is most satisfactory for canned vegetables and small fruits. No. 3 is used for peaches, pears, and tomatoes. Enameded tins should be used when canning berries, plums, cherries, beets, pumpkins, and greens. To can in tin special equipment is needed. This includes a capping steel, a tipping copper, fire pot for heating tools, flux, sal ammoniac and wire solder. Sanitary cans require a special machine for sealing, which eliminates the use of all other equipment.

Fruits and vegetables are prepared as shown in the directions given for the cold-pack method on pages 8 and 9. The only variation is that after the product is packed the cap is soldered and cans are then put into the sterilizer and exhausted from two to fifteen minutes, depending upon the kind of contents. Exhausting is necessary as it

A WORD AS TO BOTULISM

Wide-spread attention has been attracted by the statement that vegetables canned by the Single Period Cold-pack Method had caused cases of poisoning technically known as botulism. It has been declared that the bacillus botulinus, which produces botulism, was a menace to all users of vegetables canned by this method. Such statements were obviously circulated by those seeking to discourage American food-thrift. Expert research workers of the National War Garden Commission and the United States Department of Agriculture agree that there is no danger of botulism from eating vegetables which have been canned by carefully following the directions issued by the Commission or the Department. CARE MUST BE TAKEN, HOWEVER, TO FOLLOW DIRECTIONS EXPLICITLY. Cooking canned vegetables for 10 minutes at the boiling point, after opening the jar for use, will remove any possible danger. This applies also to Apricots and Pears.
drives out the air which will cause the can to bulge, giving it the same appearance as when spoilage has occurred. After exhausting, the cans are removed from the sterilizer and the vent hole is closed. The cans are returned to the sterilizer and sterilized, following the time-table given on page 2. At the end of the sterilization period remove cans and plunge immediately into cold water. Do not stack cans closely until cold.

After packing, label each can by writing the name of contents on the side. If intended for sale affix a label just before shipping. Do not allow paste to touch the can, as it will cause the tin to rust. The label should be large enough to encircle the can and overlap at the edges. Put the paste on one of the overlapping edges and draw label tightly around can, pasting the two edges together.

To seal, wipe top of can clean and dry and then put the cap in place, applying flux carefully to the groove. Do not allow the flux to enter can, as it is poisonous. Hold the cap in place with the center rod and lower the hot capping iron squarely and firmly on the solder rim of the cap, or melt a little solder in the groove by holding the solder wire against the lower part of the capping steel. Revolve the iron to melt the solder and seal the can. Lift the capping iron with a sudden twist, holding the center rod in place. When solder has hardened remove center rod.

To tip, dry top of can and apply flux to the hole in the center of the cap. Hold the solder in the left hand, brush it with the hot tipping iron so only a bead will drop and close hole.

The steels must be kept clean and well coated with solder. To do this, if capping steel is rusty, clean with a file, brick or emery paper. To tin the capping steel heat and dip in flux, then heat again until red hot and dip in sal ammoniac and solder until well coated. Sal ammoniac is made by mixing equal parts of dry sal ammoniac with solder chips. Coat the tipping copper in same way.

Flux is made as follows: To muriatic acid add strips of zinc until no more will dissolve. Strain through a cloth and when ready to use add an equal quantity of water. Flux which is used for tinning the tools should not be used for soldering.
PRINCIPLES OF JELLY MAKING

To be satisfactory, jelly must be made from fruit juice containing pectin and acid. Pectin is a substance in the fruit which is soluble in hot water and which, when cooked with sugar and acid, gives, after cooling, the right consistency to jelly.

Fruits to be used should be sound, just ripe or slightly under-ripe, and gathered but a short time. Wash them, remove stems and cut large fruits into pieces. With juicy fruits add just enough water to prevent burning while cooking. In using fruits which are not juicy cover them with water. Cook slowly until the fruits are soft. Strain through a bag made of flannel or two thicknesses of cheesecloth or similar material.

JELLY MAKING WITH PECTIN TEST

To determine if the juice contains pectin, boil 1 tablespoonful of grain or wood alcohol and mix, gently rotating the glass. Let stand for a while. If a solid mass—which is pectin—collects, this indicates that in making jelly one part of sugar or sugar substitute (corn syrup or honey) should be used to one part of juice. If the pectin collects in two or three masses, use \( \frac{1}{2} \) to \( \frac{3}{4} \) as much sugar or substitute as juice. If it collects in several small particles use half. If the presence of pectin is not shown as described, it should be supplied by the addition of the juice of slightly under-ripe fruits, such as sour apples, currants, crab-apples, green grapes, green gooseberries or wild cherries.

Measure the juice and sugar or substitute. Sugar may be spread on a platter and heated. Do not let it scorch. When the juice begins to boil add the sugar or substitute. Boil rapidly. This is important. The jelly point is reached when the juice drops as one mass from the side of a spoon or when two drops run together and fall as one from the side of the spoon. Skim the juice, pour into sterilized glasses and cool as quickly as possible. Currant and green grape juice require 8 to 10 minutes boiling to reach the jelly point while all other juices require from 20 to 30 minutes.

When the jelly is cold pour over the surface a layer of hot paraffin. A toothpick run around the edge while the paraffin is still hot will give a better seal. Protect the paraffin with a cover of metal or paper.

Three or more extractions of juice may be made from fruit. When the first extraction is well drained cover the pulp with water and let it simmer 30 minutes. Drain, and test juice for pectin. For the third extraction proceed in the same manner. The juice resulting from the second and third extractions may be combined. If the third extraction shows much pectin a fourth extraction may be made. The first pectin test should be saved for comparison with the others.

If the second, third or fourth extraction of juice is found thinner than the first extraction, boil it until it is as thick as the first, then add the sugar or substitute called for.

JELLY MAKING WITHOUT TEST

The test for pectin is desirable, but it is not essential. A large percentage of housewives make jelly without this test, and satisfactory results may be obtained without it if care is taken to follow directions and to use the right fruits. For the inexperienced jelly maker the safe rule is to confine jelly-making to the fruits which are ideal for the purpose. These include currants, sour apples, crab-apples, under-ripe grapes, quinces, raspberries, blackberries, blueberries, wild cherries, and green gooseberries. These contain pectin and acid in sufficient quantities.

In making jelly without the alcohol test, with the juice of currants and under-ripe grapes use 1 cup of sugar to 1 cup of juice. With raspberries, blackberries, blueberries, sour apples, crab-apples, quinces, wild cherries and green gooseberries use \( \frac{3}{4} \) cup of sugar to 1 cup of juice. This applies to the first extraction of juice and to the later extractions when they have been boiled to the consistency of the first extraction.

Satisfactory jelly may be made by using \( \frac{3}{4} \) to \( \frac{3}{4} \) cup corn syrup or honey to 1 cup of fruit juice, following the general directions for jelly making. The proportion of sugar substitute will depend upon the acidity and pectin content of the fruit juice. On account of the water content of the corn syrup the juice will require a little longer cooking before the jelly point is reached.

Fruits which contain pectin but lack sufficient acid are peach, pear, quince, sweet apple and guava. With these acid may be added by the use of juice of sour apples, crab-apples or under-ripe grapes.

Strawberries and cherries have acidity but
lack pectin. The pectin may be supplied by the addition of the juice of sour apples, crab-apples or under-ripe grapes.

**GENERAL DIRECTIONS FOR JELLY MAKING**

Wash, remove stems, and with the larger fruits cut into quarters. Put into a saucepan and cover with water. Allow to simmer until the fruit is tender. Berries require the addition of only a small amount of water. A double boiler is excellent for heating a small quantity. Put into a bag to drain, after wringing the bag out in scalding water. If desired, test juice for pectin as described. Measure juice and sugar or syrup in proportions indicated by the test for pectin or as directed under “Jelly Making Without Test.” Add the sugar or syrup when the juice begins to boil. The sugar or syrup may be heated before being added. This avoids chilling the juice. When the boiling juice reaches the jelly point as shown on page 16, skim and pour into sterilized glasses.

**WINTER JELLY MAKING**

Fruit juices may be canned and made into jelly as wanted during the winter. The use of sugar is not necessary until the actual jelly making is undertaken.

To prepare for canning pour the juice into sterilized bottles or jars. Put into hot-water bath, with the water reaching to the neck of the containers. Allow to simmer 20 to 30 minutes. If jars are used half seal them during the simmering and complete seal when removed from the sterilizer. Put absorbent cotton into the necks of bottles and when the bottles are taken from the bath put in corks, forcing the cotton into the neck. Corks should first be boiled and dried to prevent shrinking. They may also be boiled in paraffin to make them air-tight. After corking the bottles apply melted paraffin to the tops with a brush, to make an air-tight seal. Each bottle should be labeled. In making jelly from these juices during the winter follow the “General Directions for Jelly Making.”

Any fruit juice may be bottled following the above method and used for beverages and for flavoring desserts. Store jelly and bottled juices in a cool, dark, dry place.

The need for conserving sugar makes winter jelly making an especially useful form of conservation in these days of shortage.

**FRUIT BUTTERS**

Fruit butters may be made from good sound fruits or the sound portions of fruits which are wormy or have been bruised. Wash, pare and remove seeds if there are any. Cover with water and cook 3 or 4 hours at a low temperature, stirring often, until the mixture is of the consistency of thick apple sauce. Add sugar, syrup or honey to taste when the boiling is two-thirds done. Spices may be added to suit the taste when the boiling is completed. If the pulp is coarse it should be put through a wire sieve or colander. Pour the butter into sterilized jar, put on rubber and cover and adjust top bail. Put into a container having a cover and false bottom. Pour in an inch or so of water and sterilize quart jar or smaller jar 5 minutes after the steam begins to escape. Remove, push snap in place and cool.

**Apple and pear butter may be made by following the directions for apple butter with cider but omitting the cider.**

**Peach Butter**

Dip peaches in boiling water long enough to loosen the skins. Dip in cold water, peel and stone them. If peaches do not peel readily when dipped in boiling water, omit dipping and pare them. Mash and cook them without adding any water. Add half as much sugar, syrup or honey as pulp and cook until thick. Pour into sterilized jars and sterilize 5 minutes in steam.

**Plum butter may be made following the directions for peach butter.**

**Apple Butter with Grape Juice**

To every 4 quarts of strained apple sauce add 1 pint of grape juice, 1 cup of brown sugar, syrup or honey and 1/2 teaspoonful of salt. Cook slowly, stirring often, until of the desired thickness. When done stir in 1 teaspoonful of cinnamon, pack in hot jars and sterilize 5 minutes in steam.

**Dried Peach Butter**

Soak dried peaches over night. Cook slowly until tender. To each 2 pounds of dried peaches add 1 quart of canned peaches and 1 1/4 pounds of sugar, syrup or honey. If a fine texture is desired, strain pulp through a colander. Cook slowly, stirring often, until thick. Pack in hot jars and sterilize 5 minutes in steam.
PART II

HOME DRYING MANUAL

Drying vegetables and fruits for winter use is one of the vital national needs. As a national need it becomes a patriotic duty. As a patriotic duty it should be done in every family.

Failure to prepare vegetables and fruits for winter use by Drying is one of the worst examples of American extravagance. During the summer nature provides an over-abundance. This year, with the planting of 5,285,000 home food gardens, stimulated by the National War Garden Commission and the United States Department of Agriculture, this abundance will be especially large. The excess supply is not meant to go to waste. The over-abundance of the summer should be made the normal supply of the winter. The individual family should conduct Drying on a liberal scale. In no other way can there be assurance that America’s food supply will meet our own needs. In no other way, surely, can we answer the enormous demands made upon us for furnishing food for our European Allies.

IMPORTANCE OF FOOD THRIFT

Winter buying of vegetables and fruits is costly. It means that you pay transportation, cold-storage and commission merchants’ charges and profits. Summer is the time of lowest prices. Summer, therefore, is the time to buy for winter use.

Every pound of food products grown this year will be needed to combat Food Famine. The loss that can be prevented, the money saving that can be effected and the transportation relief that can be brought about make it essential that every American household should make vegetable and fruit Drying a part of its program of Food Thrift. The results can be gained in no other way.

Vegetable and fruit Drying have been little practiced for a generation or more. Its revival on a general scale is the purpose of this Manual. There is no desire to detract from the importance of canning operations. Drying must not be regarded as taking the place of the preservation of vegetables and fruits in tins and glass jars. It must be viewed as an important adjunct thereto. Drying is important and economical in every home, whether on the farm, in the village, in the town, or in the city. For city dwellers it has the special advantage that little storage space is required for the dried product. One hundred pounds of some fresh vegetables will reduce to 10 pounds in drying without loss of food value or much of the flavor.

This year’s need for vegetable and fruit Drying is given added emphasis by the shortage of tin for the manufacture of cans. This condition has created an unusual demand for glass jars. For this year, therefore, Drying is of more than normal importance. Dried products can be stored in receptacles that could not be used for canning. This is excellent conservation.

DRYING IS SIMPLE

A strong point in connection with vegetable and fruit Drying is the ease with which it may be done. The process is simple. The cost is slight. In every home the necessary outfit, in its simplest form, is already at hand. Effective Drying may be done on plates or dishes placed in the oven, with the oven door partially open. It may be done on the back of the kitchen stove, with these same utensils, while the oven is being used for baking. It may also be done on sheets of
paper or lengths of muslin spread in the sun and protected from insects and dust.

Apparatus for home Drying on a larger scale may be made at home or bought at small cost. Still larger equipment may be bought for community drying operations in which a group of families combine for cooperative work, at a school or other convenient center. This latter is especially recommended as giving the use of the most improved outfits at slight cost to the individual family. See "Community Work," page 3.

Best results are obtained by rapid drying, but care must be taken not to let the temperature rise above the limit specified in the directions and table.

One of the chief essentials in Drying is free circulation of air, in order that the moist air may escape and dry air take its place.

METHODS OF DRYING

For home Drying satisfactory results are obtained by any one of three principal methods. These are:

1. Sun Drying.
2. Drying by Artificial Heat.
3. Drying by Air-blast. (With an electric or other motor fan.)

These methods may be combined to good advantage.

SUN DRYING

Sun Drying has the double advantage of requiring no expense for fuel and of freedom from danger of overheating. For sun Drying of vegetables and fruits the simplest form is to spread the slices or pieces on sheets of plain paper or lengths of muslin nailed to strips of wood and expose them to the sun. Muslin is to be preferred if there is danger of sticking. Trays should be used for large quantities. Sun Drying requires bright, hot days and a breeze. Once or twice a day the product should be turned or stirred and the dry pieces taken out. The drying product should be covered with cheesecloth tacked to a frame for protection from dust and flying insects. Care must be taken to provide protection from rain, dew and moths. During rains and just before sunset the products should be taken indoors for protection.

TRAYS FOR SUN DRYING

To make a tray cheaply for use in sun drying, take strips of lumber three-quarters of an inch thick and 2 inches wide for the sides and ends. To form the bottom, laths should be nailed to these strips, with spaces of one-eighth of an inch between laths to permit air circulation. A length of 4 feet, corresponding to the standard lengths of laths, is economical. Nail 3 strips across the bottom in the opposite direction from the laths to prevent warping and to allow space when the trays are stacked. The trays should be of uniform size in order that they may be stacked together for convenience in handling. Never put trays directly on the ground. They should rest on supports a few feet above the ground and should face the south or southwest so as to receive the sun's rays the longest possible time.

A small homemade Sun Drier, easily constructed (Fig. 4), is made of light strips of wood, a sheet of glass, a small amount of galvanized wire screen and some cheesecloth. A convenient size for the glass top is 18 by 24 inches. To hold the glass make a light wooden frame of strips of wood ¼ inch thick and 1 inch wide. This frame should have legs of material 1 by 1½ inches, with a length of 12 inches for the front legs and 18 inches for those in the rear. This will cause the top to slope, which aids in circulation of air and gives direct exposure to the rays of the sun. As a tray support, nail a strip of wood to the legs on each of the four sides, about
4 inches below the top framework and sloping parallel with the top. The tray is made of thin strips of wood about 2 inches wide and has a galvanized wire screen bottom. There will be a space of about 2 inches between the top edges of the tray and the glass top of the Drier, to allow for circulation. Protect both sides, the bottom and the front end of the Drier with cheesecloth tacked on securely and snugly, to exclude insects and dust without interfering with circulation. At the rear end place a cheesecloth curtain tacked at the top but swinging free below, to allow the tray to be moved in and out. Brace the bottom of this curtain with a thin strip of wood, as is done in window shades. This curtain is to be fastened to the legs by buttons when the tray is in place.

**Drying by Artificial Heat**

Drying by artificial heat is done in the oven or on top of a cookstove or range, in trays suspended over the stove or in a specially constructed drier built at home or purchased.

When drying with artificial heat a thermometer must be used. This should be placed in the drier and frequently observed.

**Oven Drying**

The simplest form of Oven Drying is to place small quantities of foodstuffs on plates in a slow oven. In this way leftovers and other bits of food may be saved for winter use with slight trouble and dried while the top of the stove is being used. This is especially effective for sweet corn. A few sweet potatoes, apples or peas, or even a single turnip, may be dried and saved. To keep the heat from being too great leave the oven door partially open. For oven use a simple tray may be made of galvanized wire screen of convenient size, with the edges bent up for an inch or two on each side. At each corner this tray should have a leg an inch or two in length, to hold it up from the bottom of the oven and permit circulation of air around the product.

An oven drier which can be bought at a low price is shown in Fig. 5.

**Drying on Top of or Over Stove**

An effective Drier for use over a stove or range may be made easily at home. Such a Drier is shown in Fig. 9. For the frame use strips of wood ½-inch thick and 2 inches wide. The trays or shelves are made of galvanized wire screen of small mesh tacked to the supports; or separate trays, sliding on strips attached to the framework, are desirable. This Drier may be suspended from the ceiling over the kitchen stove or range, or over an oil, gasoline, or gas stove, and it may be used while cooking is being done. If an oil stove is used there must be a tin or galvanized iron bottom 4 inches below the lowest tray, to prevent the fumes of the oil from reaching and passing through the material which is to be dried, and to distribute the heat. A bottom of this kind may be easily attached to any Drier, either home-made or commercial. A framework crane as shown in Fig. 9 makes it possible for this Drier to be swung aside when not in use.

In Fig. 8 is shown another form of Homemade Cookstove Drier, more pretentious than that shown in Fig. 9, but still easily and cheaply made. A good size for this is: base, 16 by 24 inches; height, 36 inches. The lower part or supporting framework, 6 inches high, is made of galvanized sheet iron,
slightly flaring toward the bottom, and with two ventilating holes in each of the four sides. The frame, which rests on this base, is made of strips of wood 1 or 1½ inches wide.

Wooden strips, 1¾ inches wide, and 3 inches apart, serve to brace the sides and furnish supports for the trays.

In a Drier of the dimensions given there is room for eight trays. The sides, top and back are of galvanized iron or tin sheets, tacked to the framework, although thin strips of wood may be used instead of the metal. Small hinges and thumb-latch are provided for the door. Galvanized sheet iron, with numerous small holes in it, is used for making the bottom of the Drier. To prevent direct heat from coming in contact with the product, and also to distribute the heat by radiation, a piece of galvanized sheet iron is placed 2 inches above the bottom. This piece is 3 inches shorter and 3 inches narrower than the bottom and rests on two wires fastened to the sides.

The trays are made of wooden frames of 1-inch strips, to which is tacked galvanized wire screen. Each tray should be 3 inches shorter than the Drier and enough narrower to allow it to slide easily on the supports in being put in or taken out.

In placing the trays in the Drier push the lower one back as far as it will go, leaving a 3-inch space in front. Place the next tray even with the front, leaving the space at the back. Alternate all the trays in this way, to facilitate the circulation of the heated air. It is well to have a ventilating opening, 6 by 2 inches, in the top of the Drier to discharge moisture. The trays should be shifted during the drying process, to procure uniformity of drying.

One of the simplest forms of homemade Drier is a tray with bottom of galvanized wire screen, suspended over stove or range, as shown in Fig. 12.

**Commercial Driers**

Cookstove Driers are in the market in several types. One of these, shown in Fig. 7, has a series of trays in a framework, forming a compartment. This is placed on top of the stove. A similar drier is shown in Fig. 10. Another, shown in Fig. 6, is a shallow metal box to be filled with water, and so constructed that one end may rest on the back of the stove and the other on a prop reaching to the floor, or it may be suspended over a lamp.

Commercial Driers having their own furnaces may be bought at prices ranging from $24 to $120. This type is pictured in Fig. 11. Some of these, in the smaller sizes, may be bought without furnaces, and used on the top of the kitchen stove, as Fig. 7. The cost is from $16 upwards.

**AIR-BLAST—ELECTRIC FAN**

The use of an electric fan is an effective means of Drying. Fig. 15 shows how this household article is used. A motor fan run by kerosene or alcohol serves the same purpose. Sliced vegetables or fruits are placed on trays and the fan placed close to one end of the box holding the trays, with the current
directed along the trays, lengthwise. Insects must be kept out by the use of cheesecloth or similar material. Drying by this process may be done in twenty-four hours or less. With sliced string beans and shredded sweet potatoes a few hours are sufficient, if the air is dry. Rearrange the trays after a few hours, as the drying will be more rapid nearest the fan.

As artificial heat is not used in fan drying it is important to blanch or steam the vegetables for the full specified time. It is also necessary that all fan-dried products be heated in an oven to 180° F. for 10 or 15 minutes before storing.

DETAILS OF DRYING

As a general rule vegetables or fruits, for Drying, must be cut into slices or shreds, with the skin removed. In using artificial heat be careful to start at a comparatively low temperature and gradually increase. Details as to the proper scale of temperatures for various vegetables and fruits are given in the directions in this Manual and in the timetable on page 28. To be able to gauge the heat accurately a thermometer must be used. An oven thermometer may be bought at slight cost. If the thermometer is placed in a glass of salad oil the true temperature of the oven may be obtained.

PREPARING MATERIAL FOR DRYING

A sharp kitchen knife will serve every purpose in slicing and cutting vegetables and fruits for Drying if no other device is at hand. The thickness of the slices should be from an eighth to a quarter of an inch. Whether sliced or cut into strips the pieces should be small so as to dry quickly. They should not, however, be so small as to make them hard to handle or to keep them from being used to advantage in preparing dishes for the table such as would be prepared from fresh products.

Food choppers, crout slicers or rotary slicers may be used to prepare food for drying.

Vegetables and fruits for Drying should be fresh, mature and in prime condition for eating. As a general rule vegetables will dry better if cut into small pieces with the skins removed. Berries are dried whole. Apples, quinces, peaches and pears dry better if cut into rings or quarters. Cleanliness is imperative. Knives and slicing
devices must be carefully cleansed before and after use. A knife that is not bright and clean will discolor the product on which it is used and this should be avoided.

**BLANCHING**

Blanching is desirable for successful vegetable Drying. Blanching gives more thorough cleansing, removes objectionable odors and flavors, kills protoplasm and softens and looses the fiber, allowing quicker and more uniform evaporation of the moisture, stops destructive chemical changes, and gives better color. It is done by placing the vegetables in a piece of cheesecloth, a wire basket or other porous container and plunging them into boiling water. A more desirable way is to blanch in steam. For small quantities a pail or deep kettle is serviceable. A false bottom raised an inch or more is necessary. Upon this rests a wire basket or cheesecloth filled with the prepared vegetables. The water should be just below the false bottom and be boiling vigorously when the products are put in. Cover with a tight-fitting cover. Keep the water boiling during the blanching period. For larger quantities a wash-boiler partially filled with water is convenient. Bricks set on end or a wooden frame raised a few inches above the water make good supports for the containers.

Do not continue blanching longer than the prescribed time as some of the valuable constituents will dissolve out, the color will be destroyed and the starch will be partially cooked to a paste.

The time required is short and varies with different vegetables. For the proper time in each case consult the directions given for Drying on pages 25, 26, 27 and 28 and the time-table on page 28.

After blanching, drain to remove moisture and arrange on trays.

**DANGER FROM INSECTS**

In addition to exercising great care to protect vegetables and fruits from insects during the Drying process, precautions should be taken with the finished product to prevent the hatching of eggs that may have been deposited. One measure that is useful is to subject the dried material to a heat of 180° F. for from 5 to 10 minutes. By the application of this heat the eggs will be killed. Be careful not to apply heat long enough to damage the product. Store as soon as removed from the oven.

**“CONDITION” BEFORE STORING**

The word “conditioning” as used in connection with drying vegetables and fruits simply means “thorough drying.” It indicates the after treatment of products on their removal from the drying trays.

Put the dried products in bins, boxes, or, if the quantity is small, in bowls. Once a day for a period of ten days to two weeks, stir thoroughly or pour from one box to another. The containers should be in a clean, dry room, and protected from light and insects. Shutters and screens at the window are desirable. Otherwise protect the dried food by spreading clean cloths over it. If any part of the material is found to be moist, after this process, return it to the drier for a short time. When for several days no change in the moisture content has been noticed, and therefore no extra drying has been necessary, the products are ready to be stored.

Properly conditioned products can be stored without danger of spoiling, because spores and fungi cannot begin growth if there is uniform freedom from moisture on the surface.

**PRACTICALLY ALL DRIED PRODUCTS SHOULD BE CONDITIONED.**
STORAGE FOR DRIED PRODUCTS

Of importance equal to proper Drying is the proper packing and storage of the finished product. With the scarcity of tins and the high prices of glass jars it is recommended that other containers be used. Those easily available are baking-powder cans and similar covered tins, pasteboard boxes having tight-fitting covers, strong paper bags, and patented paraffin paper boxes, which may be bought in quantities at comparatively low cost.

A paraffin container of the type used by oyster dealers for the delivery of oysters will be found inexpensive and easily handled. If using this, or a baking-powder can or similar container, after filling adjust the cover closely. For storage on a larger scale use closely built wooden boxes with well-fitted lids. Line each box with paraffin paper in several layers. The paper should cover the top of the contents.

It is essential that the container should exclude light and insects but it should not be air-tight. Products stored in air-tight containers suffer damage through moisture which escapes from the product and condenses in the package.

If a paper bag is used, the top should be twisted, doubled over and tied with a string. Another good precaution is to store bags within an ordinary lard pail or can or other tin vessel having a fairly close-fitting cover.

The products should be stored in a warm, dry place, well ventilated and protected from rats, mice and insects. An attic or upstairs-room which is warmed by pipes or flues passing through makes a very satisfactory place. Shelves near a furnace also make a suitable storage place.

In sections where the air is very moist, especial care must be used. The containers should be opened occasionally and if any moisture has been taken up the contents should be placed in the oven until dry.

It is good practice to use small containers so that it may not be necessary to leave the contents exposed long after opening before use.

For convenience label all packages.

Before storing products prepared by sun drying, artificial heat must be applied to destroy possible insect eggs. To do this place the products in the oven, spread in thin layers, and allow them to remain until the temperature reaches 180° F. as indicated by a thermometer inside partially open oven.

WINTER USE OF PRODUCTS

In preparing dried vegetables and fruits for use the first process is to restore the water which has been dried out of them. All dried foods require soaking. After soaking the dried products will have a better flavor if cooked in a covered utensil at a low temperature for a long time. Dried products should be prepared and served as fresh products are prepared and served. They should be cooked in the water in which they have been soaked, as this utilizes all of the mineral salts, which would otherwise be wasted.

There can be no definite rule for the amount of water required for soaking dried products when they are to be used, as the quantity of water evaporated in the drying process varies with different vegetables and fruits. As a general rule from 3 to 4 cups of water will be required for 1 cup of dried material.

In preparing for use, peas, beans, spinach and like vegetables should be boiled in water to which there has been added soda in the proportion of 1/4 teaspoonful of soda to 1 quart of water. This improves the color.

In preparing to serve dried vegetables season them carefully. For this purpose celery, mustard, onion, cheese and nutmeg give desirable flavoring, according to taste.

From 3 to 4 quarts of vegetable soup may be made from 4 oz. of dried soup vegetables.
DIRECTIONS FOR VEGETABLE DRYING

Potatoes
Wash well, and pare very thinly. If a rotary peeler is used, the potatoes should be graded for size, and those of similar size pared in groups. The eyes will have to be removed by hand. Cut into slices \(\frac{3}{16}\) to \(\frac{3}{4}\) inch thick. Blanch in steam 1 to 3 minutes; or in boiling water 2 to 3 minutes. The water should boil vigorously enough to keep the pieces separated and in motion. Drain and place on drying trays in one-inch layers, then dry at once. The blanching should be just long enough to prevent darkening while the potatoes are drying. Start drying at a temperature of 125°F. and raise gradually to 145°F. to 150°F. toward the end of the drying period. When dry enough, the pieces of potato will be free from opaque, spongy white places, and will rattle when stirred. Remove from drier, condition and store.

Beets, Carrots and Parsnips
Wash well, scrape off skin, and cut into slices of a uniform thickness—\(\frac{3}{16}\) to \(\frac{3}{4}\) inch. Blanch 2 minutes in steam or boiling water. Drain well, spread on drying trays, and dry at an initial temperature of 120°F. and not exceeding 145°F. during the entire drying period. These products are sufficiently dry when the pieces break if an effort is made to bend them, and when no moisture shows if they are pressed between the fingers.

Cabbage
Take heads which are well developed. Remove all loose outside leaves and central stalk. Shred or cut into strips a few inches long. Blanch in steam 3 minutes, or in boiling water 4 minutes. Use a wire basket, fill not more than 6 to 8 inches deep; and stir well during the process. When drying, spread in layers not over 1 inch deep, and stir frequently until the product is dry enough not to stick together in close masses. Begin drying at 115°F. to 125°F. and when the cabbage is nearly dry, raise the temperature to 135°F. Remove from drier when no moisture can be squeezed out of thicker pieces by strong pressure between the fingers.

Cauliflower
After cleaning, divide into small pieces. The head may be cut by a vegetable slicer, if preferred. Blanch 6 minutes in steam or 4 minutes in boiling water. Spread in thin layers on drying trays. Start at a temperature of 120°F. and gradually increase to 130°F. Although turning dark while drying, cauliflower will regain part of original color in soaking and cooking. The drying is complete when strong pressure between the fingers does not squeeze out moisture from the thicker pieces.

Celery
After washing, carefully cut into even-length pieces—\(\frac{3}{4}\) inch or 1 inch is a good measure. Blanch 3 minutes in steam or 2 minutes in boiling water. Drain well, and spread on drying trays in \(\frac{3}{4}\) inch layers. Dry at 135°F., stirring occasionally.

Garden Peas
If the pods are dusty, wash well before shelling. Garden peas with non-edible pod are taken when of size suitable for table use. Blanch 3 to 5 minutes according to size, then drain and spread on drying trays. A depth of \(\frac{3}{4}\) to 1 inch is practicable, but single layers will dry quicker. Start the drying at

FIRE PREVENTION
In home drying care should be taken that danger from fire does not result. Driers made wholly or partly of wood should not be exposed to heat in such way that the woodwork might catch fire if accidentally overheated or left alone too long. **DO NOT USE WOOD ON TOP OF A STOVE.**
a temperature of 115° to 120° F., raising it gradually to 140° F. Stir occasionally. When sufficiently dry, peas will show no moisture near the center when split open.

For use in soups or puree, shell mature peas, pass them through a meat grinder, spread the pulp on trays and dry.

**Spinach**

Select plants which are well grown. Remove roots and wash well. Steam 2 minutes. Spread on trays and dry at a constant temperature of 130° F. Remove from drier before the leaves break when handled.

**Green String Beans**

Select only such beans as are in perfect condition for table use. Wash carefully and string. If full grown they should be slit lengthwise or cut—not snapped—into pieces ⅜ to 1 inch long. Blanch 5 to 8 minutes according to age. To set the color of nearly grown beans add 2 level tablespoonsfuls of baking soda to every gallon of boiling water. Drain well after blanching and spread in thin layers on drying trays. Begin the drying at a temperature of 130° F. and gradually raise it to 140° or 145° F. Drying is complete when no moisture can be pressed from freshly broken pieces.

**Lima Beans**

Choose mature beans. Shell and blanch 3 minutes in boiling water, keeping the beans well stirred by the motion of the rapidly bubbling water. Drain to remove surface moisture. Spread in thin layers on drying trays, and stir occasionally during the drying process. Start drying at 120° to 130° F. and raise this temperature gradually to 150° F.

**Okra**

After washing, blanch young tender pods 2 to 3 minutes in boiling water or steam. Allow 2 minutes for older pods, which should be cut into halves or quarters. Dry the younger pods whole. Spread on trays in single layers and start drying at a temperature of 115° F. to 120° F. Gradually raise this to 135° F.

Okra may also be dried by being strung on a string and hung over the stove. This should not be done except with young and tender pods. Heat in oven before storing.

**Onions**

Peel and cut into ⅛ to ¼ inch slices. A rotary slicer is convenient for this. Blanching is not needed. Spread in thin layers, on drying trays and dry at a uniform temperature of 140° F. Stir occasionally when the process is three-fourths done to prevent pieces scorching. Remove promptly from drier when pieces break on bending.

**Pumpkin and Squash (Summer and Winter)**

Pare, remove seeds and spongy portions. Cut into ¾ inch pieces. Blanch 3 to 6 minutes, or until the pieces are semi-transparent. Spread on trays. Start drying at a temperature of 135° F. and raise this slowly to 160° F. These products will be pliable and leathery when dried enough, and show no moisture when cut.

The strips may be hung on strings and dried in the kitchen above the stove.

**Shell Beans and Peas**

Beans of different kinds, after maturing and drying on the vines, and being shelled, should be heated to 165° to 180° F. for 10 to 15 minutes to destroy any insect eggs which may be in them. This may be done in an oven. These heated beans cannot be used for planting, because they are devitalized and will not grow. Store in a dry place in bags.

Mature lima beans need only to be shelled and stored in bags. Cow peas or any field pea can be treated in the same way.

**Sweet Potatoes**

Wash, pare and slice, blanch 6 to 8 minutes and spread on drying trays. Dry until brittle, starting at a temperature of 145° to 150° F. and gradually raising it to 155° to 165° F., when the drying is nearly done. Remove from drier when pieces are brittle and break under pressure.

**Tomatoes**

Select fruit which is firm and well ripened. Blanch 1 or 2 minutes, or long enough to loosen the skins. When cool enough to handle, peel, and cut into slices ½ to ⅔ inch thick. Spread in single layers on drying trays, placing cheesecloth or other thin open-mesh fabric over the tray bottoms if made of wire. Start drying at a temperature of 120° F. and raise it gradually to 140° F. When dry enough the tomatoes will break when bent, on conditioning they will become somewhat pliable.

**Turnips**

Turnips for drying should be in prime condition and free from pithiness. Prepare as directed for potatoes. Blanch 1 to 2 minutes, drain and spread on drying trays. The drying temperature is 135° to 140° F. at the beginning, gradually raised to 160° to 165° F. When dry enough the pieces will rattle when stirred.

**Wax Beans**

These are dried in the same manner as lima beans.

**Soup Mixtures**

Vegetables for soup mixtures are prepared and dried separately. These are mixed as desired.

**Sweet Corn**

Select ears that are at the milk stage, prime for table use and freshly gathered. Blanch on cob in boiling water for 8 to 12 minutes to
set milk. Drain thoroughly, and with a sharp knife cut off in layers or cut off half the kernel and scrape off the remainder, taking care not to include the chaff. Start

**DIRECTIONS FOR FRUIT DRYING**

Fruits may be dried in the sun until the surface begins to wrinkle, then finished in the drier. With stone fruits, such as peaches, plums, apricots and cherries, none but fruits that are fresh, ripe and in perfect condition should be used. With apples, pears and quinces, effective thrill calls for using the sound portions of fruit that may be partially wormy or imperfect. When properly dried, fruits should be entirely free from moisture when pressed between the fingers on removal from drier and should be leathery and pliable.

**Sulphuring Fruits**

Apples, pears, peaches and apricots are subject to chemical changes as soon as the skin is removed or the flesh exposed to the air. To stop these changes and so preserve the natural appearance, color and flavor, it is necessary, before drying, to sulphur these fruits, as they can not be blanched. Blanching causes loss of sugars in the blanching process and dripping of the juice occurs when blanched fruits are subjected to the heat of the drier. Sulphuring does not affect the food value of the fruits and is not injurious to persons using them.

Provide a box large enough to enclose a stack of trays. This may be a packing box or a frame covered with canvas, building paper or wall-board. Stack the filled trays on bricks or blocks of wood which will hold the bottom tray several inches above the ground. The trays should be separated from each other by blocks of wood. Beneath this stack place one or two sticks of sulphur in an old saucepan, shovel or other holder. Set fire to this sulphur by using coals or lighted shavings and invert the box to cover trays and reach to the ground. Add sulphur as needed during the time specified in the directions. The time varies with various fruits and is given in special directions on pages 27 and 28.

**Apples and Pears**

Pare, core and slice, dropping slices into cold water containing eight level teaspoonsfuls of salt to the gallon, if a light-colored product is desired. Leaving them for a short time in salt water will prevent discoloration. (If preferred, core the whole fruit, after peeling, and slice into rings, dipping these for a minute or two into cold salted water as described above.)

To sulphur spread in trays of wire 1 to 1½ inches deep. Put each tray as soon as filled into the sulphuring box for 20 to 30 minutes. When the product feels moist on the surface and shows a lightened color, the sulphuring is complete.

Begin drying at 130° F. and raise this gradually to 175° F. Stir or rearrange fruit occasionally to insure even drying. The fruit is dry when a handful of slices is pressed and separate when released, leaving no moisture on the hand.

**Apricots**

Select ripe fruit before it drops from the tree. Remove pits by cutting fruit open with a sharp knife. Apricots are usually dried with the skins on. Arrange the halves on trays with pit cavity uppermost, and dry. If desired, they may be sulphured before drying—the time 1½ to 2 hours, or until liquid collects in the stone cavity.

Start drying at a temperature of 130° to 145° F. and raise it gradually to 165° F. Remove from the drier when pliable and leathery.

**Berries**

Dry as soon as possible after picking. Spread in thin layers and put each tray as soon as filled into the drier. It may be necessary to spread cheesecloth over wire mesh bottoms of trays to keep berries from falling through.

It is not advisable to dry such fruits as red raspberries, currants and strawberries, unless no other conservative methods are convenient.

Start the drying at a temperature of 135° to 145° F. and raise it gradually toward the end of the drying process to 150° to 155° F. Properly dried berries rattle somewhat when stirred and show no moisture when pressed.

**Cherries**

Pick over well and wash. Remove surface moisture by draining. Spread unpitted in thin layers.

Start drying at a temperature not above 120° F. and raise gradually to 150° F. Properly dried cherries are leathery.

**Figs**

Select ripe figs and pick over thoroughly. Wash, drain well and spread in single layers on drying trays. If dried in the sun, turn daily, protect from insects by glass or netting, and bring indoors at night. When applying artificial heat, start drying at a temperature of 120° F. and raise this gradually to 140° F. When nearly dry, immerse figs for 2 or 3 minutes in boiling brine (¼ pound salt to every 3 quarts water, or 1 pound to 3 gallons.) Drain, and finish the drying.
Peaches

Select fruit which is uniformly and fully ripe. Cut open with a sharp knife and remove the pits. Peaches are not usually pared, as the juice is lost by dripping if this is done. To sulphur arrange in single layers on trays with the pit surface up. Sulphuring will take from 1–2 hours and is complete when the juice collects in the pit. Care must be taken when transferring trays to drier to prevent loss of juice.

Start drying at a temperature of 130° to 145° F. and raise it gradually to 165° F. when the process is nearly completed.

Properly dried peaches are pliable and leathery.

Plums

Select fruit which is ripe. Remove pits by cutting fruit open with a sharp knife. Arrange halves on trays in single layer with pit cavity uppermost.

Treat with sulphur fumes 20 to 25 minutes. When liquid collects in the pit cavity the plums are sulphured enough, and are ready to dry. Start drying at a temperature of 130° to 145° F. When the surface begins to wrinkle increase slowly to 175° F.

Properly dried plums are leathery and pliable.

Prunes

Prunes which are fully ripe and have fallen from the trees are best for drying. Grade and dip into boiling lye for 16 to 20 seconds. Allow 1 oz. lye to 2 gallons water. When dipped long enough there will be a slight indication of cracking of the skin near the stem end, but the skin will not be broken. Too strong lye or too long a dip will cause the skin to split and peel off.

Rinse thoroughly in cold water and then spread on drying trays in single layers. Start drying at 130° F. and when the surface begins to wrinkle, raise the temperature very gradually to 175° F. Properly dried prunes show no moisture when cut or when pressed between the fingers.

### TABLE FOR BLANCHING AND DRYING

The following table shows blanching time for vegetables and the temperatures to be used in drying by artificial heat.

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<td></td>
<td>Minutes</td>
<td>Degrees</td>
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<tr>
<td>Beets</td>
<td>2</td>
<td>120 to 145</td>
</tr>
<tr>
<td>Cabbage</td>
<td>3 to 4</td>
<td>115 to 135</td>
</tr>
<tr>
<td>Carrots</td>
<td>2</td>
<td>120 to 145</td>
</tr>
<tr>
<td>Cauliflower</td>
<td>4 to 6</td>
<td>120 to 130</td>
</tr>
<tr>
<td>Celery</td>
<td>2 to 3</td>
<td>135</td>
</tr>
<tr>
<td>Figs</td>
<td></td>
<td>120 to 140</td>
</tr>
<tr>
<td>Garden peas</td>
<td>3 to 5</td>
<td>115 to 140</td>
</tr>
<tr>
<td>Green string beans</td>
<td>5 to 8</td>
<td>130 to 145</td>
</tr>
<tr>
<td>Lima beans</td>
<td>3</td>
<td>150</td>
</tr>
<tr>
<td>Okra</td>
<td></td>
<td>115 to 135</td>
</tr>
<tr>
<td>Onions</td>
<td></td>
<td>140</td>
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<tr>
<td>Parsnips</td>
<td>2</td>
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<tr>
<td>Potatoes</td>
<td>2 to 3</td>
<td>125 to 150</td>
</tr>
<tr>
<td>Prunes</td>
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<td>Summer squash</td>
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<td>8 to 12</td>
<td>130 to 140</td>
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<tr>
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<td>6 to 8</td>
<td>145 to 165</td>
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<tr>
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<tr>
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<td>1 to 2</td>
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<tr>
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<td>3</td>
<td>150</td>
</tr>
<tr>
<td></td>
<td></td>
<td>130 to 175</td>
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<tr>
<td>Apples</td>
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<tr>
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<td>Cherries</td>
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<tr>
<td>Plums</td>
<td></td>
<td>130 to 165</td>
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The exact time for Drying cannot be given. Individual judgment must be used following the directions in “Details of Drying,” on page 23, and the directions on pages 35, 36, 37 and 38.
FERMENTATION AND SALTING

The use of brine in preparing vegetables for winter use has much to commend it to the household. The fermentation method is in general use in Europe, and is becoming better known in this country as a means of making sour-croût and other food products which do not require the containers used for canning. No cooking is required by this process. Salt brine is the one requirement. The product may be kept in any container that is not made of metal and is water-tight. The vital factor in preserving the material is the lactic acid which develops in fermentation. An important feature is that vegetables thus prepared may be served as they are or they may be freshened by soaking in clear water and cooked as fresh vegetables.

Sour-croût

The outside leaves of the cabbage should be removed, the core cut crosswise several times and shredded very finely with the rest of the cabbage. Either summer growth or fall cabbage may be used. Immediately pack into a barrel, keg or tub, which is perfectly clean, or into an earthenware crock holding four or five gallons. The smaller containers are recommended for household use. While packing distribute salt as uniformly as possible, using 1 pound of salt to 40 pounds of cabbage. Sprinkle a little salt in the container and put in a layer of 3 or 4 inches of shredded cabbage and pack down gently with a wooden utensil like a potato masher. Repeat with salt, cabbage and packing until the container is full or the shredded cabbage is all used. Press the cabbage down as tightly as possible and apply a cloth and then a glazed plate or a board cover which will go inside the holder. If using a wooden cover select wood free from pitch, such as basswood.

On top of this cover place stones or other weights (using flint or granite and avoiding the use of limestone or sandstone). These weights serve to force brine above cover.

Allow fermentation to proceed for 10 days or two weeks, if the room is warm. In a cellar or other cool place three to five weeks may be required. Skim off the film which forms when fermentation starts and repeat this daily if necessary to keep this film from becoming scum. When gas bubbles cease to arise, if container is tapped, the fermentation is complete. If there is scum it should be removed. As a final step pour melted paraffin over the brine until it forms a layer from ¼ to ½ inch thick to prevent the formation of the scum which occurs if the weather is warm or the storage place is not well cooled. This is not necessary unless the croût is to be kept a long time. The croût may be used as soon as the bubbles cease to rise. If scum forms and remains the croût will spoil. Remove scum, wash cloth cover and weights, pour off old brine and add new. To avoid this extra trouble it is wise to can the croût as soon as bubbles cease to rise and fermentation is complete. (To can, fill jars, adjust rubber and partly seal. Sterilize 120 minutes in Hot-water Bath or 60 minutes in Steam Pressure Oufit at 5 to 10 pounds pressure.)

SALTING WITHOUT FERMENTATION

Preserving cabbage, string beans and greens for winter use by salting is a method which has long been used. To do this the vegetables should be washed, drained and weighed. The amount of salt needed will be one-fourth of the weight of the vegetables. Kegs or
CROCKS MAKE SATISFACTORY CONTAINERS. Put a layer of vegetables about an inch thick on the bottom of the container. Cover this with salt. Continue making alternate layers of vegetables and salt until the container is almost filled. The salt should be evenly distributed so that it will not be necessary to use more salt than the quantity required in proportion to the vegetables used. Cover the surface with a cloth and a board or glazed plate. Place a weight on these and set aside in a cool place. If sufficient liquor to cover the vegetables has not been extracted by the next day, pour in enough strong brine (1 pound of salt to 2 quarts of water) to cover surface around the cover. The top layer of vegetables should be kept under the brine to prevent molding. There will be some bubbling at first. As soon as this stops set the container where it will not be disturbed until ready for use. Seal by pouring very hot paraffin on the surface.

THE USE OF BRINE

This method is used for cucumbers, string beans, green tomatoes, beets, corn and peas, as these vegetables do not contain enough water for a good brine using only salt. Wash and put in a crock or other container within 3 or 4 inches of the top. Pour over them a brine made by adding to every 4 quarts of water used ½ pint of vinegar and ¾ cup salt. The amount of brine needed will be about ½ the volume of the material to be fermented. When fermentation is complete the container should be sealed as detailed for sour-crottle.

TO FERMENT CUCUMBERS

Unless the cucumbers are from your own garden wash them carefully to insure cleanliness after indiscriminate handling. Pack them in a keg, barrel or crock, leaving space at the top for the cover. Cover them with a brine made by adding to every 4 quarts of water used ½ pint of vinegar and ¾ cup of salt. The amount of brine needed will be one-half of the volume of the material to be fermented. Place a wooden cover or glazed plate on top of the contents and press it down by weighting it with a stone or other weight, to keep the cucumbers under the brine. Fermentation will require from 8 to 10 days in warm weather and from 2 to 4 weeks in cool weather. It is complete when bubbles cease to rise when the container is lightly tapped or jarred. When this stage is reached remove any scum which may have collected, pour hot paraffin over the cover and around the weight and store in a cool place.

GREEN TOMATOES

The process for green tomatoes is the same as that for cucumbers.

BEETS AND STRING BEANS

Remove the strings from beans. Beets should be washed thoroughly and packed whole. Spices may be used, as with cucumbers, but these may be omitted if the vegetables are to be freshened by soaking, when they are to be used. The method is the same as with cucumbers.

PREPARING FOR USE

To prepare salted vegetables for use, soak in 3 or 4 times their volume of cold water to draw out excess salt. One or two changes of water will shorten this process. They should then be drained and rinsed well, put in cold water, brought slowly to a boil, and cooked until tender. They may then be prepared and served as fresh products are prepared and served.

Fermented vegetables should be rinsed in fresh water after removing from the container. To retain the acid flavor do not soak in water before cooking.

If cooked without soaking, fermented dandelions, spinach, kale and other greens will have flavor similar to that of the greens in their fresh state.

Fermented corn should be soaked several hours, with three or four changes of water. During the cooking also there should be one change of water. The corn may then be used in chowder, pudding, omelet, fritters or waffles.

Salted string beans should be soaked to remove the salt and then prepared and served as fresh beans are prepared and served. Fermented string beans may be cooked without soaking and served as the fresh beans are served. Young and tender string beans may be eaten raw.

PICKLING VEGETABLES

Pickling is an important branch of home preparedness for the winter months. Pickles have little food value, but they give a flavor to a meal which is liked by many. They should not be given to children.

In pickling, vegetables are usually soaked overnight in a brine made of 1 cup of salt and 1 quart of water. This brine removes the water of the vegetable and so prevents weakening of the vinegar. In the morning the brine is drained off.

Alum should not be used to make the vegetables crisp, as it is harmful to the human body. A firm product is obtained if the vegetables are not cooked too long or at too high a temperature.
Spices, unless confined in a bag, give a dark color to the pickles. Enamelled, agate or porcelain-lined kettles should be used when cooking mixtures containing vinegar. Pickles put in crocks should be well covered with vinegar to prevent molding. Instructions for some of the most commonly used methods are given herewith.

**Tomato Catsup**

4 quarts ripe tomatoes, boil and strain. Add 4 tablespoonsfuls of salt. 2 cups of vinegar. 1 level teaspoonful each of cayenne pepper, cinnamon, cloves, allspice, mustard and black pepper.

Boil rapidly until thick. Pour into hot sterilized bottles. Put the corks in tightly and apply hot paraffin to the tops with a brush to make an airtight seal. All spices, except cayenne pepper, should be enclosed in cloth bag and removed when catsup is done.

**Chili Sauce**

2 dozen ripe tomatoes, dipped in boiling water to peel. 6 peppers (3 to be hot). 3 onions. 2/4 cup of corn syrup. 2 tablespoonsfuls of salt. 1 teaspoonful each of cloves, nutmeg and allspice. 1 quart of vinegar.

Simmer 1 hour. Pour into sterilized jars or bottles and seal while hot.

**Chow Chow**

2 pints cucumbers. (1 pint to be small ones). 1 cauliflower soaked in salted water for one hour. 2 green peppers. 1 quart onions.

Chop the above in small pieces. Sprinkle 1 cup of salt over them and let stand all night. Drain well in the morning.

The sauce for Chow Chow is made as follows:

- 2 quarts vinegar.
- 1/4 pound of mustard.
- 1 tablespoonful of turmeric.
- 1/4 cup of corn syrup.
- 1/2 cup of flour.

Make a paste of the mustard, turmeric, sugar, flour and a little vinegar. Stir this into the warm vinegar and boil until thick. Then add the vegetables and simmer for 1/2 hour. Stir to prevent burning. Put in cans while hot.

**Cold Tomato Relish**

8 quarts firm, ripe tomatoes; scald, cold-dip and then chop in small pieces.

To the chopped tomato add:

- 2 cups chopped onion.
- 2 cups chopped celery.
- 2 cups corn syrup.
- 1 cup white mustard seed.
- 1/4 cup salt.
- 4 chopped peppers.
- 1 teaspoonful ground mace.
- 1 teaspoonful black pepper.
- 4 teaspoonfuls cinnamon.
- 3 pints vinegar.

Mix all together and pack in sterilized jars.

**Corn Relish**

1 small cabbage. 1 large onion. 6 ears of corn. 2 tablespoonsfuls of salt. 2 tablespoonsfuls of flour. 1 1/4 cups of corn syrup. 2 hot peppers. 1 pint of vinegar. 1 1/2 tablespoonsfuls of mustard.

Steam corn 30 minutes. Cut from the cob and add to the chopped cabbage, onion and peppers. Mix the flour, sugar, mustard and salt—add the vinegar. Add mixture to the vegetables and simmer 30 minutes. Pour into sterilized jars or bottles and seal while hot.

**Cucumber Pickles**

Soak in brine made of 1 cup of salt to 2 quarts of water for a day and night. Remove from brine, rinse in cold water and drain. Cover with vinegar, add 1 tablespoonful brown sugar, some stick cinnamon, and cloves to every quart of vinegar used; bring to a boil and pack in jars. For sweet pickles use 1 cup of sugar to 1 quart of vinegar.

**Dill Pickles**

To make dill pickles follow the directions for fermenting cucumbers, page 30, using alternate layers of dill leaves, whole mixed spices and cucumbers. The top layer should be of beet or grape leaves an inch thick.

**Green Tomato Pickle**

Take 4 quarts of green tomatoes, 4 small onions and 4 green peppers. Slice the tomatoes and onions thin. Sprinkle over them 1/4 cup of salt and leave overnight in crock or other seasoned vessel. The next morning drain off the brine. Into a separate vessel put 1 quart of vinegar, 1 level tablespoonful each of black pepper, mustard seed, celery seed, cloves, allspice and cinnamon and 1 cup of corn syrup. Bring to a boil and then add the prepared tomatoes, onions and peppers. Let simmer for 20 minutes. Fill jars and seal while hot.

**Green Tomato Pickle**

Wash and slice tomatoes. Soak in a brine of 1/4 cup of salt to 1 quart of water overnight. Drain well. Put in a crock and cover with vinegar to which have been added stick cinnamon and 1 cup of corn syrup for every quart of vinegar used. Once a day for a week pour off vinegar, heat to boiling and pour over tomatoes again. Cover top of crock with a cloth and put on cover. This cloth should be frequently washed.

**Mustard Pickles**

2 quarts of green tomatoes. 1 cauliflower. 2 quarts of green peppers. 2 quarts of onions.

Wash, cut in small pieces and cover with 1 quart of water and 1/4 cup of salt. Let stand 1 hour, bring to the boiling point and
PROLONG THE SEASON

The season for home canning and drying does not end with summer or early autumn. Many things may be canned or dried in October and November. Among these are turnips, spinach, squash, pumpkin, carrots, parsnips, cabbage, celery, beets, late corn, kale, chard, salsify and tomatoes.

drain. Mix $\frac{1}{2}$ pound mustard, 1 cup of flour, 4 cups of corn syrup, and vinegar to make a thin paste. Add this paste to 2 quarts of vinegar and cook until thick, stir constantly to prevent burning. Add vegetables, boil 15 minutes and seal in jars.

**Piccalilli**

4 quarts of green tomatoes.  
1 quart of onions.  
1 hot red pepper.  
2 cups of corn syrup.  
$1\frac{1}{2}$ cups of salt.  
$1\frac{1}{2}$ ounces each of mustard seed, cloves and allspice.  
2 cups of vinegar.

Simmer 1 hour. Put into a covered crock.

**Pickled Onions**

Peel, wash and put in brine, using 2 cups of salt to 2 quarts water. Let stand 2 days, pour off brine. Cover with fresh brine and let stand 2 days longer. Remove from brine wash and pack in jars, cover with hot vinegar to which whole cloves, cinnamon and allspice have been added.

**Spiced Crab-Apples**

Wash apples, stick 3 or 4 whole cloves in each one and cover with vinegar to which have been added stick cinnamon and 1½ cups corn syrup for every quart of vinegar used. Cook slowly at a low temperature until apples are heated through. These may be put in jar or stone crocks.

**Sweet Pickled Peaches**

Wipe peaches and stick 3 or 4 whole cloves in each one. Put in jars or crock and cover with hot vinegar, allowing 3¼ cups of corn syrup to each quart of vinegar used. Every morning for a week pour off the vinegar, heat to boiling and pour over peaches again. On the last day seal jars or cover crock well.

**Table Relish**

Chop:

- 4 quarts of cabbage.  
- 2 quarts of tomatoes, 1 quart to be green.  
- 6 large onions.  
- 2 hot peppers.

Add:

- 2 ounces of white mustard seed.  
- 1 ounce of celery seed.  
- ¼ cup of salt.  
- 6 cups of corn syrup.  
- 2 quarts of vinegar.

Simmer 1 hour. Pour into sterilized jars or bottles and seal while hot.

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This manual was prepared by the Commission's experts and is based on their own research and experience, supplemented by information procured from the United States Department of Agriculture, Agricultural Colleges, Experiment Stations, and other sources.

The National War Garden Commission, wishing to do all within its power to aid the War Industries Board in the very necessary economy in the use of paper, has limited the edition of this book and asks those who receive it in quantity to make the most careful distribution so that the book may reach the hands of none but those who will use it. IF THE INDIVIDUAL RECIPIENT CAN NOT USE THIS BOOK IT IS URGED THAT IT BE HANDED TO SOMEONE WHO WILL USE IT.

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UNITED STATES FOOD ADMINISTRATION

Mobile, Alabama.
September 6th, 1918.

MR. P. S. RIDSDALE, Secretary,
National War Garden Commission,
WASHINGTON, D. C.

Dear Mr. Ridsdale:

I desire to tender my sincere thanks for the books which you have furnished for distribution and use among the war gardeners of Mobile, and as encouragement and assistance to others to take up this splendid work conducive not only to increased supply of food products, but to the health and happiness of those who wisely give Mother Earth the attention which just at this time she all the more richly deserves.

It is needless for me to assure you that the books have been extremely helpful. I consider them the most complete and serviceable ever produced; and excepting only the family Bible, the foundation of all ethics and morality as well as the common law, these books are of more vital importance to every householder, in fact, good citizens throughout the land, than most printed matter obtainable.

Your books on canning and drying are likewise of inestimable value, and your splendid co-operation in the common cause of increasing and conserving the food supply in our present crisis meets with the heartiest appreciation.

Very sincerely,
(Signed) HENRY A. FORCHHEIMER,
Federal Food Administration Board.

UNITED STATES FOOD ADMINISTRATION

Davenport, Iowa.
September 5, 1918.

MR. P. S. RIDSDALE, Secretary,
National War Garden Commission,
WASHINGTON, D. C.

My dear Mr. Ridsdale:

We have found your publications of great value in our work in this State and it gives me pleasure to thank you for your prompt and cordial compliance with all of our requests.

Your book on War Vegetable Gardening and the one devoted to Canning and Drying are filled with information of great value to the gardener and housewife.

It has been a source of great satisfaction to us to be able to distribute your books in every County in Iowa and we have used care to place them in the hands of people who need them and who are constantly calling for just the information contained in them.

We feel that your co-operation has been of great importance.

Faithfully yours,
(Signed) M. L. PARKER,
State Merchant Representative,
Iowa Food Administration.
NATIONAL WAR GARDEN COMMISSION

A Patriotic Organization Affiliated with the Conservation Department of the American Forestry Association

WASHINGTON, D. C.

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