

UNITED STATES SCHOOL GARDEN ARMY
DEPARTMENT OF THE INTERIOR

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BUREAU OF EDUCATION
WASHINGTON



GARDEN MANUAL FOR THE
SOUTHWESTERN REGION

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GARDEN MANUAL FOR THE SOUTHWESTERN REGION.

This Garden Manual for the Southwestern Region of the United States School Garden Army has been prepared from leaflets issued from this office in the hope that it will be found valuable by garden teachers as an aid in their classroom work. The order of the lessons may be changed by the teacher to suit conditions under which she is doing garden work. The lessons have been planned for 15-minute classroom periods in any grade above the third.

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GARDEN MANUAL FOR THE SOUTHWESTERN REGION.

PREPARING YOUR GARDEN.

Lesson 1: HOW TO CHOOSE YOUR GARDEN.

About 40 per cent of the food consumed in Germany during the Great War was raised in home gardens. We can do as well as this if we try. The first important thing to do when you intend to raise a garden is to select a site that will be convenient and suitable. The garden should be placed in the home yard, if possible. When it is connected with the home it becomes a permanent part of our home life and will likely receive more careful attention than it would if located away from the home.

Vacant lots are only to be considered when there is no available space about the home. The lot should be chosen as near the home as possible. The distance from the home to the lot should not be too great. A great distance tends to decrease the interest and the feeling of proprietorship. Teachers can aid children in obtaining vacant lots from the owners and can greatly help in the selection of them.

Lots that can be seen from the home can be more easily protected from garden vandals and thieves. All arrangements for lots should be made well in advance of the time for planting in order that the land may be improved by use of manures. After the lot is selected, whether it be at home or away from it, the soil should be fertilized with street sweepings, gathered leaves, and stable manure.

If the lot is away from the home, the owner should be seen and his permission obtained to cultivate it. This is generally easily obtained, as nearly every owner realizes that garden work will increase the value of his property. Sometimes it is necessary to pay rent for the lot. This should be entered as an item in the cost of the garden and should appear in the garden record.

After the garden plot is obtained you must dig up the grass. The soil should be well shaken out of this and the grass thrown in a pile at the side of the garden, where it can rot and be used for fertilizer later on. Cover the piled-up grass with fallen leaves and you will have a little compost pile to use on your garden when you need it.

Heavy clay soils will require much work. If they lack humus you must supply it before your plants will grow. It is generally better to get sandy or humus soils if you can. Clay soils should have at least a year of preparation before they are used for garden purposes.

Most home gardens are well adapted for garden work and do not require as much labor as the vacant lot. This is because the soil is generally worked over and over from year to year by the people living in the house.

Lesson 2: HOW TO PLAN YOUR GARDEN.

In order to have a successful garden you must plan your work well in advance. Good gardening can not be done in the few spring weeks if you do not know exactly what you have to do and how you are to do it. Garden plans ought to be made during the winter, when there is little opportunity to work in the garden.

The first thing you should do is to determine the size of your garden. This will depend a good deal upon what land you can get and the needs of your family. A garden about 20 by 40 feet is sufficiently large for one gardener to attend. This will supply enough vegetables for a family of four if it is properly cultivated. Your garden should not be larger than you actually need. If you can use more room than your family table requires, you can raise vegetables for the market on the extra space.

Plan your garden with paths that will make it easy for you to go from row to row without hurting the growing plants. Rows must be farther apart if you use a horse or handwheel cultivator than they would be for hand tools such as the rake or hoe. Do not waste any of your garden space.

Plan your planting so that you can use the land continuously. When you take one crop from the garden, replace it with another different crop to follow. This is called rotation. You should not grow the same kind of crops over and over on the same ground. A planting calendar (see Lesson 15) will tell you how you can always have fresh vegetables in your garden.

Use all your land. Plant some crops between others. Plant late maturing crops between early maturing ones. Vegetables that ripen quickly may be grown between those that ripen more slowly. Lettuce, radishes, and spinach may be planted between tomato plants, potatoes, or corn.

The plants you will use should be determined by the needs of your family and the demands of the market where you plan to sell your products. Do not plant anything in your vegetable garden that you can not eat, can, or sell.

Lesson 3: SELECTION OF CROPS FOR THE GARDEN.

You should grow only those crops that can be used at home or readily sold in the markets. Do not try to grow too many varieties; select the more easily grown crops at first, such as onions, radishes, peas, beans, turnips, beets, tomatoes, and cabbages. Study the local demands of your community and plant your garden to meet these.

The amount of space devoted to producing vegetables for home use will depend upon the size of the family to be supplied. One-fourth of an acre is sufficient for an average family, and the rest of the garden space may be planted in crops to be sold in the local market. If a smaller garden is a necessity, only those crops used at home should be planted. By careful attention to the rotation of crops and interplanting (that is, planting between rows and other plants), one-fourth of an acre can be made to supply a family of six with all the vegetables needed.

Plan out a general cropping scheme similar to that given below. Always keep in mind that your plan must provide for a continuous succession of garden crops.

PLANTING PLAN.

First planting.—Radishes, onion sets, turnips, garden peas, beans, lettuce (from young plants), and cabbages.

Second planting (two to four weeks later).—Beets, carrots, corn, and parsley.

Third planting (two to three weeks later).—Beans, beets, tomatoes (from plants), melons, okra, and corn.

Fourth and fifth plantings (late in summer or early in fall).—Beans, turnips, carrots, onion sets, mustard, cabbage.

The above suggestions may be adopted by any community, with such additions as needed. The main thing is to have a definite planting plan, one that contains succession crops.

TWO IMPORTANT POINTS.—Keep your garden busy and plant only those things you can either eat or sell.

Lesson 4: SMALL-GARDEN PLANS.

The following plan for a small garden, 20 by 30 feet, has been found very satisfactory:

DIAGRAM OF 20 BY 30 FOOT GARDEN.

North end.

Lettuce, Radishes, followed by Late Cabbages.				
Onions, followed by Late Cabbages.				
Onions, followed by Parsnips.				
Carrots, followed by Kale.				
Beets, followed by Kale.				
Early Peas, followed by Cauliflower.				
Beans, followed by Fall Potatoes.				
Cabbage, followed by Fall Potatoes.				
Peppers, followed by Spinach.				
Cucumbers, followed by Flat Turnips.				
Early Potatoes, followed by Fall Beans.				
P A T H				
Tomatoes.	Squash.	Compost Pile.	Cold Frame.	Hot Bed.

Lesson 5: LARGE GARDEN PLANS.

The following plan for a large garden, 50 by 75 feet, has been found very satisfactory:

DIAGRAM OF 50 BY 75 FOOT GARDEN.

North end.

Gate.

Lettuce, Radishes, Late Cabbages to follow.	P A T H	Hot Bed.
Onion Sets, Late Cabbages to follow.		
Carrots, Kale to follow.		Cold Frame.
Early Beets, Kale to follow.		Humus Pile.
Early Peas, Late Beets to follow.		Tomato Plants.
Turnips, Winter Onions to follow.		Cucumbers.
Beans, Fall Potatoes to follow.		Melons.
Cabbage, Fall Potatoes to follow.		
Cauliflower, Kohlrabi, Fall Potatoes to follow.		
Early Potatoes, Fall Beans to follow.		
Spinach, Rutabagas to follow.		
Peppers,		Squash.

Lesson 6: THE HOTBED.

If your garden does not contain a hotbed for raising early plants it would be well to construct one during October or early in the spring before the garden is started, when time can be devoted to it. The construction of a hotbed is not difficult and offers an excellent project for manual training. If the bed is constructed properly in the fall it will be in excellent condition for the next spring.

In building a hotbed, a pit is dug from 2 to 3 feet deep and from 5 to 6 feet wide. Glass sashes are used to cover the pit. These sashes are generally 6 feet long and 3 feet wide, but other standard sizes may be obtained if necessary. Make the pit long enough to fit the size of the sash chosen.

Place a 2-inch plank, 12 to 15 inches wide, on the north side of the bed. The plank used on the south side of the pit is about half the width of the one used on the north side. This arrangement permits the sash to slope toward the south in order to get better results from the sunlight. The ends of the bed are inclosed with boards cut to fit snugly and soil is banked up around the entire framework to keep out the cold.

The sashes may be hinged at the top and supported, when the pit is opened, by strong sticks, or they may be hinged on the side and thrown back when the pit is opened. Sometimes the sashes are made to slide in and out on strips of wood set into the sides of the hotbed. The opening of the sashes is necessary to secure proper ventilation of the bed and to allow the gardener to work in the pit.

About 10 or 12 weeks before the time of outdoor planting the pit should be filled with well-heated stable manure. This manure should be covered with 6 or 8 inches of rich soil, finely pulverized. Keep the soil moist while it is being heated by the fermenting manure. Keep a soil thermometer in the pit and carefully record the temperature from day to day. When the temperature falls to 90° or 85°, it is safe to sow seeds. If the bed has been properly constructed it will produce sufficient heat to grow plants during a period of five or six weeks.

Lesson 7: THE COLD FRAME.

A cold frame is made like a hotbed, except that no manure is used. Sufficient heat is secured from the sun.

The chief object of using a cold frame is to harden plants that have been grown in a hotbed. If plants like the tomato were to be taken directly from the hotbed and planted in the open field they would probably die. They can not stand the quick change from warm to cold conditions. If, however, such plants are first hardened by being transplanted to a cold frame, they are able to stand considerable cold without injury.

Cold frames should be constructed in the fall so that they will be ready for spring work. It is sometimes well to have many cold frames in the garden, especially in northern latitudes, as they will save our plants during the cold spells of spring.

In the middle of the day, when the air is warm, the glass or canvas above the frames may be raised. This permits a better ventilation for the plants and at the same time hardens them. As night approaches the plants should be covered. Later on the frames may be kept open for a large part of the day, but this should not occur except when the day is warm. Before the plants are transferred to the garden the sashes should be kept off the frames for several days.

In some parts of the country it is impossible to grow plants in a hotbed or cold frame during winter unless additional protection is given. This is sometimes done by placing straw or hay over the glass.

Lesson 8: THE COMPOST PILE.

Most gardens need plenty of humus. Decayed animal and vegetable matter contains a great deal of plant food. When natural plant food can not be supplied to our gardens we have to depend upon commercial fertilizers, and these are expensive. Commercial fertilizers contain no humus and so do not permanently enrich the soil. In cities it is becoming very difficult to get stable manure, as automobiles are displacing our horses.

The best way for us to obtain humus for our gardens is to make a compost pile. A convenient spot should be chosen in our garden that will not interfere with our planting. Select some out-of-the way corner for this purpose. Pile on this spot the refuse vegetation from the kitchen and garden; mix this with soil and stir thoroughly, keeping the mixture moist, as this will help decay. Clippings from the lawn, fallen leaves, and street sweepings should be added from time to time.

Mix the materials thoroughly, forking over the pile at least twice a season. The more thorough the mixing, the more rapid the decay. Compost piles started in the fall will be ready for the spring planting.

The compost pile becomes a very handy place to put all our garden refuse. It is surprising how rapidly compost material will accumulate. A little of the compost mixed with fresh, mellow soil will stock our flower pots with plenty of plant food for our home plants.

Frequently a regular compost bed is made by gardeners. To make such a bed you should dig a pit about 4 feet square and about 3 feet deep. Place the refuse gatherings of the lawn, kitchen, and garden in this. Add a little manure and mix thoroughly. Add some garden soil to the bed. Gradually fill the pit in this way, being careful to keep the mixture moist to help decay.

Compost that is well rotted may be used at once. The rougher the material used, the longer the time necessary for complete decay. The coarser portions of the compost may be buried at the bottom of the bed. When needed, the top layer should be taken off first.

Lesson 9: USE OF FALLEN LEAVES.

Every fall the streets and lawns of our cities are covered with fallen leaves. Generally these are raked together into large piles and burned. This is a great waste of plant food, for these leaves would be very valuable to our gardens. Thousands of dollars are lost every year through this wasteful extravagance.

All the leaves about your home should be gathered and added to your compost pile, where they will decay and make humus. Mix them thoroughly with soil, add to your compost heap, and allow them to decay.

If you have no compost pile, spread the leaves on your garden where crops are not growing and spade them in thoroughly. As fast as you remove a crop from the garden cover the vacant space with leaves and work them into the soil.

Place a thick layer of leaves about the roots of your small fruit bushes, such as raspberries, currants, etc. Place leaves between the rows of your strawberry plants. These leaves should be held in place by a light covering of garden soil or a thin layer of grass or hay. This will form an excellent mulch for your plants.

Nature's way of making her soils rich is to shed the leaves of her trees and allow them to decay and sink into the top soil. This is the ordinary leaf mold we find so frequently in our forests. We can add leaf mold to our gardens just as nature does.

Lesson 10: COMPANION CROPS.

The following list gives the names of the usual companion crops cultivated in your garden. No one gardener will employ all of them but will choose those especially adapted to the type of work he is undertaking:

Snap bean, cucumbers, squash, beets.
 Pole beans, corn, onions, Swiss chard.
 Beets, lettuce, beans, carrots.
 Brussels sprouts, onions, beets, corn.
 Cabbage, radishes, carrots, lettuce.
 Cauliflower, beets, carrots, parsnips, salsify.
 Carrots, beets, beans, onions.
 Collards, onions, lettuce, spinach.
 Corn, melons, lettuce.
 Cucumbers, corn, tomatoes.
 Kale, corn, okra, tomatoes.
 Kohlrabi, lettuce.
 Lettuce, cucumbers, radishes, onions.
 Melons, potatoes, corn, radishes.
 Mustard, tomatoes, corn.

Okra, mustard, lettuce, onions.
 Onions, beets.
 Parsley, lettuce.
 Parsnips, onions, radishes.
 Peas, radishes.
 Peppers, carrots.
 Potatoes (Irish), lettuce.
 Potatoes (sweet), corn.
 Radishes, beets.
 Rutabaga, parsnips.
 Spinach, beans, corn.
 Squash, corn.
 Swiss chard, carrots.
 Tomatoes, Irish potatoes, spinach.
 Turnips, onions.

Lesson 11: SUCCESSION CROPS.

The following lists give the names of the usual succession crops cultivated in our gardens. No one gardener will employ all of them but will choose those especially adapted to the type of work he is undertaking:

SUCCESSION CROPS.

Early peas followed by late beets.
 Early beans followed by summer turnips.
 Onions sets followed by tomatoes.
 Early lettuce followed by celery.
 Early carrots followed by cabbages.
 Radishes followed by cabbages.

TO BE PLANTED AT 10-DAY INTERVALS.

Beans (dwarf).	Parsley.
Beets, early.	Peas.
Carrots, early.	Radishes.
Corn, early.	Spinach.
Kohlrabi.	Turnips.

LATE CROPS TO FOLLOW OTHERS.

Beets, late.	Cabbage, late.	Flat turnips.	Peas, late.
Brussels sprouts.	Cauliflower.	Kale.	Spinach.

Lesson 12: THE SEED LIST.

Seeds for your garden should be selected in advance of the planting period. Only the amount of seed absolutely necessary for planting should be purchased. The following table gives the approximate quantities of seed necessary to supply vegetables for a family of four. The amount needed by the student may be estimated from this table.

Bean:		Onion sets.....	4 to 6 quarts.
Bush lima.....	1 pint.	Pea, garden.....	4 to 6 quarts.
Pole lima.....	1 pint.	Parsley.....	1 ounce.
Snap.....	1 to 2 quarts.	Parsnip.....	$\frac{1}{2}$ ounce.
Beet.....	4 ounces.	Radish.....	1 ounce.
Cabbage:		Salsify.....	1 ounce.
Early.....	1 packet.	Spinach:	
Late.....	$\frac{1}{2}$ ounce.	In spring.....	$\frac{1}{2}$ ounce.
Carrot.....	1 ounce.	In fall.....	$\frac{1}{2}$ pound.
Cauliflower.....	1 packet.	Squash:	
Celery.....	1 packet.	Hubbard.....	1 ounce.
Corn, sweet.....	1 to 2 pints.	Summer.....	1 ounce.
Cucumber.....	1 ounce.	Tomato:	
Eggplant.....	1 packet.	Early.....	1 packet.
Kale.....	2 ounces.	Late.....	$\frac{1}{2}$ ounce.
Lettuce.....	$\frac{1}{2}$ ounce.	Turnip.....	2 to 3 ounces.
Melon:			
Muskmelon.....	1 ounce.		
Watermelon.....	2 ounces.		

It is not supposed that any family will use all the vegetables listed, nor will all families require the same amount of any crop. The pupil should select his seed from this list and make successive plantings so that fresh vegetables may be obtained throughout the season.

Lesson 13: BUYING GARDEN SEED.

It is very important that only the best garden seed be bought. Care should be exercised in making up the seed order and only the most reliable seedsmen should be dealt with. Although many seeds of a certain kind may look alike, yet the crops they produce will vary greatly. A seed is simply a baby plant wrapped in an outer covering, and it is hard to tell what the seed will produce unless its ancestors are known.

The best seeds have had their ancestors carefully selected by the men who grew them. The poorer plants were discarded and only the best allowed to mature and produce these seeds. This process is called selection of seed and is a very important step in producing the best varieties. Reputable seedsmen make it a rule to handle only selected seeds. It is better to purchase a packet of a certain variety of seed, say Scarlet Globe Radish, than simply a packet of unnamed radish seed.

In planning the seed order, therefore, the first thing to consider is quality of seeds and the second is variety of seeds.

Seeds may be bought in bulk much cheaper than in packets. As a general rule better seeds are obtained in this way. The seed bought in bulk should be divided into seed packets, each packet containing sufficient seed for the garden of the individual pupil. The cost of the smaller packets should be computed from the cost per pound of the bulk seeds.

SUGGESTIONS FOR THE SEED ORDER.

1. Where possible, buy in bulk from reliable seed houses.
2. Buy only named varieties.
3. Select only those varieties recommended on lists sent out from this office or those varieties that have proved satisfactory to your best local gardeners.
4. Keep a record of the success of your varieties to guide you in the future.

Lesson 14: SEED TESTING.

A seed consists of two parts—an embryo and an outer covering. If the embryo plant is alive it will sprout into growth under favorable conditions. If dead, the seed is worthless. We ought to know that the seed we plant is good. It is a simple matter to test this sprouting ability of seeds by furnishing them with warmth, moisture, and air. Air is everywhere, so, practically, we need to provide only warmth and moisture.

SOME SIMPLE WAYS OF TESTING THE VIABILITY OR SPROUTING QUALITY OF SEEDS.

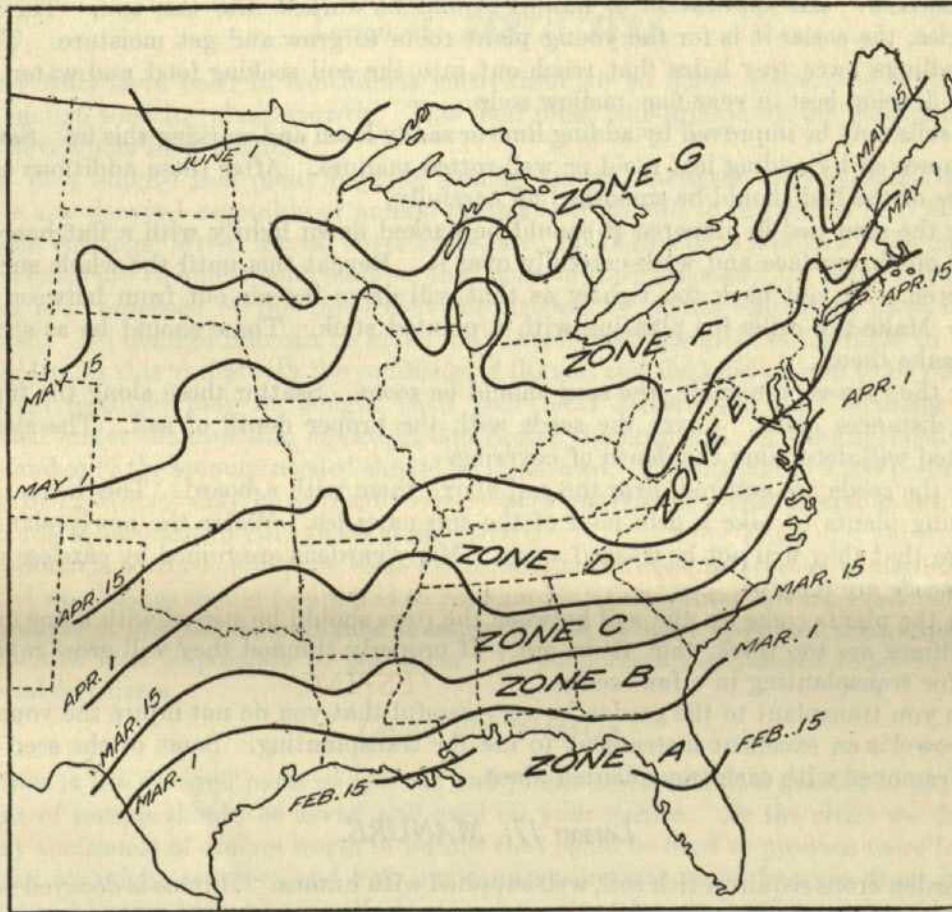
1. Fill a water tumbler, a cup, or bowl half full of clean, moist sand. Place 10 seeds on top of the sand. Cover the top of the tumbler with a small piece of glass or a saucer. Keep the seeds moist and warm. Note the proportion of seeds that germinate.
2. Cut three or more pieces of blotting paper so that they will lie flat in a pie or soup plate. Place 10 seeds between each two layers of the paper. Add enough water to moisten the paper. Keep in a warm room. Note the proportion of seeds that germinate.
3. Plant 10 seeds in the soil of a flower pot or a window box. Keep the soil moist and warm. Note the proportion of seeds that germinate.

A record should be kept of these experiments, carefully noting results. If the pupil places 10 bean seeds in a germinating dish and seven grow, let him work out the percentage of viability.

It is especially important to test seeds that have been held over from previous years. It is worth while, however, to have pupils test samples of all kinds of seeds they sow.

Lesson 15: PLANTING DATES.

The Southwestern States contain six of the seven designated planting zones of the United States. These are known as A, B, C, D, E, and F. Definite planting dates are indicated on the map for each zone and the vegetables suitable for such plantings are grouped together under four heads.



EARLIEST SAFE DATES FOR PLANTING IN THE OPEN.

PLANTING DATES BY VEGETABLE GROUPS.

Zone.	Group 1.	Group 2.	Group 3.	Group 4.
A.....	Jan. 1 to Feb. 1.....	Feb. 1 to Feb. 15.....	Feb. 15 to Mar. 1.....	Mar. 1 to Mar. 15.
B.....	Feb. 1 to Feb. 15.....	Feb. 15 to Mar. 1.....	Mar. 1 to Mar. 15.....	Mar. 15 to Apr. 1.
C.....	Feb. 15 to Mar. 1.....	Mar 1 to Mar. 15.....	Mar. 15 to Apr. 1.....	Apr. 1 to Apr. 15.
D.....	Mar. 1 to Mar. 15.....	Mar. 15 to Apr. 15.....	Apr. 1 to May 1.....	May 1 to May 15.
E.....	Mar. 15 to Apr. 15.....	Apr. 15 to May 1.....	May 1 to May 15.....	May 15 to June 1.
F.....	Apr. 15 to May 1.....	May 1 to May 15.....	May 15 to June 1.....	May 15 to June 15.

GROUP 1 (may be planted two weeks before last killing frost).—Early cabbage plants from hotbed or seed box, radishes, collards, onion sets, early smooth peas, kale, early potatoes, turnips, and mustard.

GROUP 2 (may be planted about the date of the last killing frost).—Beets, parsnips, carrots, lettuce, salsify, spinach, wrinkled peas, cauliflower plants, celery seed, onion seed, parsley, sweet corn, and Chinese cabbage.

GROUP 3 (should be planted two weeks after last killing frost).—Snap beans, okra, and tomato plants.

GROUP 4 (can not be planted until ground is well warmed up, about a month after last hard frosts).—Lima beans, pepper plants, eggplant, cucumbers, melons, squash, and sweet potatoes.

Lesson 16: THE OUTDOOR SEED BED.

The outdoor seed bed is a great help in starting our gardens properly. It is not necessary that this bed be very large, but it should be located in a well-sheltered spot, where it can get plenty of sunlight. The soil of the bed should be rich and well-drained.

After the seed bed is selected, you should spade up the soil very thoroughly, making it fine and mellow. An application of humus should be worked into this soil. The finer the soil particles, the easier it is for the young plant roots to grow and get moisture. The roots of our seedlings have tiny hairs that reach out into the soil seeking food and water. These root hairs develop best in very fine, mellow soils.

Clay soils may be improved by adding lime or sandy loam and working this in. Sandy soils will be improved by adding leaf mold or well-rotted manure. After these additions are made the surface of the bed should be smoothed off carefully.

After the seed bed is prepared it should be packed down lightly with a flat board. Lay the board on the surface and walk carefully over it. Repeat this until the whole surface has been covered. Do not pack too tightly as that will drive the air out from between the soil particles. Make the drills for planting with a pointed stick. These should be as straight as you can make them.

After the furrows are made, the seed should be sown. Scatter these along the furrows at the right distances apart. Cover the seeds with the proper depth of soil. The size of the seed planted will determine the depth of covering.

After the seeds are covered, firm the soil above them with a board. This helps the roots of the young plants to take a firm hold of the soil particles. Water the newly-planted seed carefully so that they will not be washed away. Many gardens are ruined by careless watering when the seeds are planted.

When the plants come up the soil between the rows should be stirred with a hoe or a rake. If the seedlings are too thick, thin them out. If properly thinned they will grow rapidly and be ready for transplanting in a few weeks.

When you transplant to the garden be very careful that you do not injure the young roots. A small trowel is an excellent instrument to use for transplanting. Some of the seed-bed soil should be removed with each transplanted plant.

Lesson 17: MANURE.

All garden crops require a rich soil, well supplied with humus. Humus is decayed vegetable or animal matter. Barnyard or stable manure is the best garden fertilizer, because it furnishes this humus. In some localities it is impossible to get manures for the garden, and dependence must be placed upon commercial fertilizers.

When manures are selected for your garden care should be taken that there are no elements in them injurious to the soil. Sawdust and shavings in manure tend to make the soil sour. If the manure used comes from stables, all shavings and sawdust should be removed if possible. The manure from sheep, pigeons, and chickens contains a great deal of plant food. These manures are more valuable than the ordinary barnyard manures, but must not be distributed too thickly over the garden.

It is generally customary to work coarse manure into garden soil in the fall so that it will have time to decay. In the spring, well-rotted manure can be worked into the soil with a digging fork. The amount of manure necessary for a garden depends upon the condition of the soil. Poor, worn-out soils will necessarily need more than rich, mellow soils. From 20 to 30 tons of manure an acre is generally very satisfactory. This means about a pound of manure to every square foot of garden space.

Humus may be added to the garden soil by planting some leguminous crop. Cowpeas, soy beans, or vetch are excellent crops for this purpose. Such crops gather nitrogen from the air and store it in their roots. After these crops are spaded into the soil, the nitrogen is "fixed" and becomes available for the young, growing plants. This method of supplying humus is only employed between cropping times and can not be successfully used to any great extent while your garden is being used.

Lesson 18: FERTILIZERS.

Many soils have been in continuous cultivation for so many years that they no longer furnish enough food for plant growth. This food must be supplied by the gardener or plants will not develop as they should.

You may supply this plant food by adding humus, manures, or fertilizers to the soil. Humus is any decayed vegetable or animal matter that we add to the soil to help plants grow. Lawn grass cuttings, rotted leaves, cover crops, etc., make excellent humus for the garden.

Fertilizers are chemical compositions that contain food necessary for plant growth. Most fertilizers are composed of the three elements needed by plants—nitrogen, phosphoric acid, and potash. No definite rule can be given for the kind and quantity of fertilizer to be applied to the garden, as this varies with the condition of the soil and the kind of crop to be raised.

Garden fertilizer may be bought from your local dealer. All such fertilizer is graded and labeled under the direction of the United States Government. A careful selection should be made and only the amount needed should be purchased. From 1,000 to 2,000 pounds of high-grade garden fertilizer may be applied to every acre cultivated. This means about 14 pounds to every 400 square feet of cultivated garden space.

As potash is scarce and expensive at the present time, wood ashes may be used in its place. Unleached wood ashes should be applied to your garden at the rate of 1,500 pounds per acre.

Whenever it is possible, barnyard manures should be used to enrich the garden soil, but in some cities it is impossible to get them. In such cases dependence must be placed on commercial fertilizers.

Lesson 19: HUMUS.

Humus is the decayed parts of animals and plants and contains a great deal of plant food. Every bit of humus should be saved and used on your garden. In the cities we throw away every day thousands of dollars worth of humus that could be used to produce more food. This is one way we might conserve and help our country produce more, because every plant must have food and humus is the cheapest food we can give it. An ounce of humus is said to produce a pound of bread.

The black-leaf mold found in the woods is almost pure humus. This is nature's way of fertilizing her plants. She lets the old leaves and twigs fall to the ground and decay so that other plants may get food. We could help our gardens a great deal if we were to collect all the old leaves and street sweepings and place them on our gardens.

Many of the soils in the South lack humus because the sun has burned it all out. Then the heavy rains come along and wash it away. Old leaves, straw, grasses, any decayed animal matter are excellent for humus. The garbage cans, found at every house in our cities, that are carted away and added to the city dump pile, contain much valuable fertilizing material if we would only use it.

Your garden should have a humus pile for use when needed. This can be started in some convenient corner and added to as fast as the material can be accumulated. Mix old leaves in the pile and allow them to decay.

As your garden is cleared at the end of the year, many of the plants taken out can be added to the pile. No plant should be added that is diseased or has been attacked by insects. These should be burned as soon as the trouble is discovered. Some plants will decay much faster than others. Coarse, woody stems will decay very slowly. These should not be added to the pile if it is to be used in the next year or two.

Many times flies gather about humus piles and are a nuisance. If the pile is covered with 6 inches of dirt the flies will not gather. The addition of dirt does not hurt the humus. As new additions are made to the pile extra layers of dirt may be used to cover them.

Lesson 20: MULCHES.

A mulch is anything placed on the soil to stop the evaporation of soil moisture. Straw and leaves are sometimes distributed over the ground about plants for this purpose. Often the top soil is stirred into a fine dust with a common garden rake or a small shovel cultivator to make a surface mulch.

A mulch of any kind prevents evaporation. Soil moisture is continually coming to the surface and evaporating into the air. The moisture passes up through the soil in the same way that oil climbs the wick of a lamp. This movement of soil moisture is called its capillary action. Capillarity can not take place unless the soil particles are in contact. If this contact is broken the moisture ceases to rise. The making of a mulch breaks this contact and thus destroys the capillarity of the soil.

Plants need the moisture in the soil for their best growth. During the summer months there are usually many very dry spells. At these times we may help our gardens by keeping a good dust mulch on them. This is easily done with a rake or cultivator, and does not take much time. A shower of rain will destroy this mulch, and so after each shower it is necessary to prepare another mulch. Even if no rain falls, there is generally sufficient dew to destroy the mulch after a few days. The maintenance of a dust mulch throughout the growing season is best for most garden crops.

Lesson 21: GARDEN TOOLS.

The number and kind of tools you require will vary somewhat with the size of your garden and the kinds of crops raised. As a general rule it is best to get along with as few tools as possible. There are, however, certain garden tools that are indispensable.

A rake, a spade, and a hoe must be available for every gardener. If the garden is large, a plow is necessary; but generally we can employ a man to plow our large gardens and he will furnish his own tools. It is unwise to limit oneself to only the three tools listed above, however, as many others are labor savers and should be employed.

A wheel hoe with extra attachments is inexpensive and very valuable. The best for general use is one that has a single wheel with a diameter of about 2 feet. A seed-sowing attachment may be purchased as an extra, but this is not necessary in small gardens. The scuffle hoe is a popular tool. This hoe may be either pushed or pulled and is especially valuable on land that is rather loose and free from stones. It is a good substitute for the wheel hoe in small gardens.

A potato hook should be used in your garden work. It is one of the best tools for cultivating around young vegetables. If potatoes are raised the hook is valuable for digging up the tubers.

Trowels are almost indispensable, especially for transplanting young plants. Do not purchase a cheap trowel, as it will break easily and is a waste of money. The trowel should be a strong, sturdy tool.

A garden line is a necessity, as most gardeners like straight rows, and a straight row can only be obtained by use of a good line. The line should have a reel for winding, as it so frequently becomes snarled and tangled if no suitable means are provided to keep it in the proper condition.

Choose a hoe with great care. It should be strongly made and well balanced. It should not be too heavy or too light. Many gardeners employ several hoes of different weights. The hoe should be kept sharp. Sharpening may be done with a flat file as often as necessary.

All tools should be kept clean. Never allow rust to stay on your garden tools. When tools are stored away cover them with a light coating of lard to stop them from rusting. Rusted tools may be cleaned by soaking them in kerosene for 10 or 12 hours and then rubbing them briskly with a rough cloth. Occasional painting helps all tools.

Lesson 22: PREPARING THE SOIL.

Before planting garden crops the soil should be broken up and pulverized thoroughly. Just as early in the spring as possible your garden should be plowed or spaded. Do not work the soil when it is wet, as this will injure it. A good way to tell if the soil is dry enough to work is to press some of it in the hand for a moment or two and then let it drop to the ground. If the soil clod breaks on falling to the ground, it is safe to work the soil.

Many gardens are too small to be plowed; these should be spaded deeply with a spading fork. Deep spading gives more air to the plant and a better opportunity for its roots to develop. After the soil is spaded the clods should be thoroughly broken up and the top soil smoothed off with a rake. It is sometimes well to spade your garden two or three times. The finer the soil particles are broken the better your plants will grow. Harrowing the garden with a coarse rake will greatly benefit the soil.

A liberal dressing of well-rotted stable manure should be worked into the soil. This supplies food for the plant, improves the physical condition of the soil, and helps to hold moisture in dry seasons. If the soil is too acid, lime may be added as this "sweetens" the soil or neutralizes the acid character. Apply about 1,000 pounds of lime to each acre. At this rate, how much lime would be needed for a garden 20 by 40 feet? How much would it require for your garden?

Always remember that it requires more care to properly prepare garden soil than that used for any other crop.

CROPS AND THEIR CARE.

Lesson 23: RADISHES.

The radish is a hardy crop and may be grown in the open all winter along the Gulf Coast. In the northern section of the South it is generally grown in cold frames during the winter months.

VARIETIES.

1. Turnip-shaped or round: Scarlet Globe, Scarlet Turnip.
2. Olive-shaped or oval: French Breakfast, Early Scarlet.
3. Finger-shaped or long: Long Scarlet Chartier, Long White Spanish, Icicle.

PLANTING.

Prepare the soil carefully as soon as it is dry enough to work. Remove all clods and work in a light dressing of stable manure or commercial fertilizer. Smooth the surface with a rake. Sow the seed in drills from 12 to 15 inches apart (about four seeds to the inch is sufficient). Cover an inch deep and firm the soil over the seeds.

GROWING.

When the seedlings have come up, thin out to an inch apart. Keep all weeds out of the rows. If the soil is not rich enough, distribute a light dressing of fertilizer between the rows but do not let it touch the plants. Radishes should be pulled as fast as they are large enough to eat. Successive plantings should be made every two weeks until summer and again in the autumn, when cool weather comes.

Radishes may be sown between the rows of long-season crops.

Lesson 24: ONIONS.

Onions can be produced on almost any good garden soil. They are one of our standard vegetable crops. Buy your onion sets by variety from some reputable seed dealer.

VARIETIES.

1. White: Southport White Globe, Silver Skin, White Silver King.
2. Yellow: Yellow Globe, Danvers, Ohio Yellow Globe.
3. Red: Red Globe, Red Wetherfield, Australian Brown.
4. Bermuda: Red Bermuda, White Bermuda, Crystal Wax.

PLANTING.

Prepare the soil thoroughly as soon as the frost is out of the ground. Line rows about 14 inches apart. Plant the onion sets from 2 to 3 inches apart in the rows. Cover the sets with 2 inches of soil. About 8 bushels of sets are required for an acre. Compute the amount of sets necessary for your garden.

GROWING.

Onions require thorough cultivation, which is usually done by hand. Weeds must be kept out of the crop as they seriously interfere with the growth of the onion plant. Onions may be pulled at any time after they are large enough to eat. These are known as green or bunch onions. When onions are ripe the outer skin of the bulb becomes dry and the tops fall. If the seed stalks are developed by the plant they should be removed at once as they interfere with the development of the onion bulb.

Onions may be grown from seed either by starting in a hotbed and transplanting or else by drilling the seed in rows in the garden. With rich soil and proper care fair-sized bulbs from seed may be grown in the garden in a single season. The usual method of planting, however, is to use onion sets.

Lesson 25: LETTUCE FROM PLANTS.

Lettuce thrives best in cooler weather. During the winter months, in the northern section of the Southwest, it may be grown in hotbeds. In some sections of the Gulf States it may be grown in the open all through the winter. Lettuce is generally planted in our gardens in the spring or in the fall.

VARIETIES.

Tate's Giant, California Butter Cream, Big Boston.

PLANTING.

To make lettuce leaves crisp and tender the plants should be forced. Successive plantings should be made every 10 days. When grown in the garden, seeds are sown in rows about 14 inches apart and the plants thinned out. The heading plants should be at least 8 inches apart in the rows. If the loose-leaf lettuce is grown the plants may be placed much closer together. For very early plants seeds are sown in a hotbed and plants transferred later to the garden. One-fourth ounce of seed is enough for every 25 feet of row space. Have the soil well prepared and apply a good quality of stable manure, working it thoroughly into the soil. Lettuce planted in the fall may be left in the ground all winter in many sections of the South.

If seed is planted in hotbeds, plants should be transferred to cold frames about February or March and to the garden in April. Place the young plants about 8 inches apart in rows 1 foot apart.

GROWING.

Keep the lettuce bed well hoed. In transplanting plants be careful not to get soil in the head of your plants. Lettuce should be grown in well-drained, rich soil. If plants are left in ground all winter, they may be protected with leaves or boards during excessive cold. Lettuce matures in from 60 to 90 days.

Cucumbers, radishes, and onions make good companion crops, while celery, beans, and tomatoes make good follow crops.

Lesson 26: PEAS (WRINKLED VARIETIES).

Early varieties of peas should be planted from February 1 to March 15, depending upon latitude and the openness of the season. Wrinkled varieties may be planted as late as April 15 in some sections of the Southwest.

VARIETIES.

Telephone, Nott's Excelsior, Mammoth, Long Island.

PLANTING.

Peas require a sandy loam soil for best growth. Like beans, peas are a nitrogen-gathering crop and so do not need to be as heavily fertilized as many other garden crops. A garden that has been well fertilized the previous year will be found suitable for the growth of peas. Plant seed about 2 inches deep, 1 inch apart, in rows 18 inches apart. About two pints of seed are sufficient for 100 feet of row space.

GROWING.

Peas should be cultivated as soon as the rows can be seen and the weeds removed from around the plants. Stake the tall varieties; do not hill them. Peas will mature from 40 to 90 days. Successive plantings should be made about every two weeks. Peas may be followed by okra, corn, pepper, or late tomatoes.

Peas are frequently damaged by the English sparrow. In many cities these pests destroy whole crops. To guard against this depredation, protect the crop with cloth or hang strips of paper streamers over the rows.

Lesson 27: TURNIPS.

Turnips may be grown any time from February to September. The crop requires a rich, well-pulverized soil. Turnips should be grown both as spring and fall crops.

VARIETIES.

Purple Top, White Flat Dutch, White Globe, Milan.

PLANTING.

If the crop is to be raised in the spring, the soil should be thoroughly spaded as early as conditions will permit. Do not work the soil when it is cold or wet. After spading, work in a liberal dressing of barnyard manure. Lay off the rows 18 inches apart, and sow the seed one-quarter of an inch deep rather thickly. About an ounce of seed is sufficient for every 100 feet of row space. After the plants reach 4 inches in height, thin out to about 6 inches apart. The thinned-out plants may be used for greens. If late turnips are grown, the seed is generally sown broadcast on some land previously used for another crop.

GROWING.

The cultivation of turnips is like that of carrots. Weeding and thinning should take place early. All grass should be kept away from the young plants. The turnip plant is very hardy and will withstand several frosts. Turnips may be stored in a cellar or buried in a pit in the yard. All tops should be removed before storing the plant. The turnip matures in from 60 to 90 days and is then ready for eating.

Onions may be planted as a companion crop to turnips if the latter are not broadcasted. Early turnips may be followed by beans in the spring or by tomatoes in the summer.

Lesson 28: CABBAGE.

Along the Gulf Coast region of the Southwestern States cabbage may be sown in the open garden from late September to early January. In other sections of the South, hotbeds or cold frames are used for starting cabbage plants. Seeds should be planted in frames about eight weeks before time of transplanting to the garden. Cabbages will withstand a hard freeze if the plants have been carefully hardened before transferring to the garden. Cabbages are not grown during the summer as they can not withstand the heat.

VARIETIES.

Spring and early cabbage: Jersey Wakefield, Charleston Wakefield, Succession, Early Jersey.

PLANTING.

Spade the soil deeply and break up all clods. Manure may be broadcasted or placed in the opened rows beneath the plant. If the latter is done, care should be taken that the manure does not come into contact with the roots of the tender plants. In order to avoid the danger, place a little manure at the bottom of the row and cover with a light application of soil before the plants are set. Remove plants from hotbed or cold frame and place in rows about 18 inches apart. Distances between rows should be at least 2 feet. After the plants are in the rows, draw the earth up around them.

GROWING.

Cabbages are ready for use as soon as the heads are well formed. The interior of the cabbage plant should be white. It takes about 250 days for the cabbage plant to mature. Cabbages may be followed by fall potatoes, okra, or corn.

CABBAGE PESTS.

The enemies of the cabbage are also the enemies of cauliflower and Brussels sprouts. Radishes, kohlrabi, and turnips are attacked by many of the same pests.

THE CABBAGE WORM.

This is one of the most destructive of our garden pests. The worm is really a caterpillar, velvety green in color and almost the same shade as the cabbage leaves. The adult is a butterfly, almost white in color with dark spots on its wings.

Control: Dust the young cabbages with ashes or road dust to prevent the laying of the eggs. Kill the butterflies as they hover over the plants. Hellebore is a good preventive if dusted on plants after head begins to form. Hot water at a temperature of 130° to 150° F., if poured on plants, will kill the worms and not injure the plants.

CUTWORMS.

These insects attack the cabbage early in the spring and cut off the young plants. In the fall they sometimes do further damage by feeding on the leaves. Sprays will not affect cutworms. They must be destroyed by placing poisoned bait about the plants. This bait is usually made from 1 pound of bran, 1 teaspoonful of Paris green, 1 or 2 ounces of molasses, and one-fourth of an orange, with peel, mashed up. Add enough water to make a paste.

Lesson 29: COLLARDS.

Collards are very popular in the South because they can be grown through the summer months. Collards are a kind of nonheading cabbage. The plant grows a tall, sturdy stem, that is topped by a rosette of tender leaves. Collard leaves are considered especially good for the table after they have been touched by frost.

VARIETIES.

Creole or Southern.

PLANTING.

Collards are grown in the same way as cabbages. Spade the soil deeply and mix in a good dressing of barnyard manure. Open the rows about 2 feet apart. The seeds may be sown in beds or frames and the plants transferred to the garden or they may be sown directly in the rows during late spring. The distances observed in planting should be the same as for kale. One ounce of seed will produce about 3,000 plants.

GROWTH.

The culture of this plant is the same as for cabbage. Keep weeds away from the plant and stir the top soil as frequently as required.

New leaves are continuously formed by the collard plant and are a valuable substitution for cabbage. The best leaves for use are these near the top of the plant; the others are apt to be tough.

Lesson 30: KALE.

Kale or borecole belongs to the cabbage group of plants. Unlike cabbage, it produces no head. It is a hardy crop and may be grown in all sections of the South.

VARIETIES.

Dwarf, Curled, Siberian, Tall Scotch.

PLANTING.

Sow seed as soon as the soil is dry enough to work. About a half ounce of seed is sufficient for 100 feet of row. The seed should be planted about one-half inch deep, lightly covered with soil. Firm the soil over the row. Kale is generally sown in drills, 18 inches apart. Keep out all weeds during growth. Thin the plants to 8 inches in the row.

GROWTH.

Kale is not attacked by the ordinary cabbage pests and requires only the simplest cultivation. The leaves are more tender if picked before they attain full size. If the crop is planted in the fall, and grown for the spring market, the long-growing varieties should be used. The spring crop of kale should be sown after winter kale has become too tough to use.

Kale planted in the spring will continue growth until the late fall. Only severe and repeated freezing will kill the plant. The plant will produce continuously if only a few leaves are picked at a time.

Lesson 31: POTATOES (IRISH).

The Irish potato is a good substitute for wheat and for this reason should be planted in every garden. It is generally customary to plant the main crop of Irish potatoes in a field by itself, as the crop requires much room for growth. However, every garden should have some early potatoes in it. The first crop in the South is usually planted from February to May and the second crop in July.

VARIETIES.

Irish Cobbler, Triumph, White Triumph (early potatoes).
Green Mountain, McCormick (fall potatoes).

PLANTING.

Cut the seed potato so that there will be two or three good eyes in each piece to be planted. These should be soaked in a weak solution of formaldehyde to prevent disease. Do not plant too many eyes to a hill. If too many are planted, there will not be enough room for the potatoes to develop. Prepare the soil thoroughly, as the potato grows beneath the surface, and if the soil is not thoroughly broken up the young tuber can not grow in size. Potatoes require a rich, sandy loam for good growth. If manure can not be obtained, use commercial fertilizer, mixing a light dressing in the bottom of the potato rows. These rows should be opened up about 2 feet apart and at least 5 inches deep. Plant about 1 quart of potato cuttings to every 100 feet of row space. Cover about 4 inches deep. The potato pieces should be at least a foot apart in the rows.

GROWING.

Cultivate the soil with a hoe or rake three or four times after the plants appear above the ground. When the plants are 5 or 6 inches high, the soil should be drawn up around them. This is called "hilling." Spray the plants with arsenate of lead two or three times to destroy potato bugs.

Irish potatoes are dug and stored in cool, dry places. Do not allow a temperature lower than 36° F. where Irish potatoes are stored. In the southern sections of the South, it is better to grow a fall crop than to try to keep a spring crop through the summer.

POTATO PESTS.

COLORADO POTATO BEETLE.

A small oval buff-colored black-striped beetle. The grubs or larvae are pinkish in color and quite short and fat. They have black markings over the body. The grub feeds upon the leaves of the plant and does great damage. They are not difficult to kill if spraying is done in time. Generally it will require at least two sprayings of the crop before the "potato bugs" disappear. At the first signs of the presence of this pest, spraying should be done and repeated later, as there are generally two or more generations of the beetle each summer.

Control: Lead arsenate either as a dust or in liquid form. Paris green is also frequently used.

BLIGHT.

There are two blights that affect potatoes, one occurring in the early summer and the other later in the fall. Bordeaux mixture should be used for each. In the early blight, spraying should occur when plants are about 8 inches high. Repeat several times at intervals of two weeks. Spray for later blight about the end of July.

POTATO SCAB.

This is a fungus disease. The spore of the fungus lives over winter in the soil or on the tubers.

Control: Soak seed potatoes in weak solution of formaldehyde. Use one-third pint of formaldehyde to 10 gallons of water.

Lesson 32: GARDEN PESTS.

The most troublesome pests in our gardens are the insects. These are most usually abundant and destructive in gardens that are not well cared for. Clean gardens and watchful care are the best preventives. Every gardener should take pride in keeping the rows clean and the fence corners free from trash.

Nearly all insects pass the winter either in the ground or under trash near the plants they feed on. Rake all rubbish in piles and leave until cold weather comes. Insects will gather in these piles. After cold weather sets in, burn the piles, thus destroying the insects. A late fall plowing or spading of the garden is advisable, as it tends to destroy the insects that hibernate in the ground.

Fungi cause much damage to our garden crops. These fungi are parasitic—that is, they feed on the plant tissues. They attack the different parts of the plant, such as the leaf, the stem, the root, or the fruit. The fungi grow on the parts attacked and cause malformations or destroy the tissues of the plant. This hurts the growth and development of the plant and in many cases completely destroys it.

Fungi are very small spores. They can not be seen separately by the eyes. They do not move about and so are not rapidly spread from plant to plant. The fungi that infect leaves generally cause discolored areas that are readily seen. Sometimes only the discolored spots are serious; at other times the entire plant is affected, causing a wilting and dying of a large amount of its foliage. The usual treatment for this trouble is spraying with Bordeaux mixture.

Fungi affecting roots are harder to get rid of; in some cases the seeds may be treated by soaking in formaldehyde before planting. Rotation of crops helps to diminish root fungi. Diseased plants should be removed at once from the garden.

Lesson 33: SPRAYING.

Many of the insects that attack our garden plants may be killed by spraying. In order to get rid of our insect pests we must know what kind of an insect we are troubled with, how it lives, and how it eats.

There are two kinds of garden insects that are troublesome—the kind that bites its food and the kind that sucks its food. The beetles and the grasshoppers are examples of the biting insects. These may be killed by spraying our plants with some poison.

The sucking insects, such as the butterflies and moths, pierce the plant and draw the interior juices into their mouths. As the mark they leave is very small, it is difficult to detect their work. Exterior spraying would be of no use in killing these insects for their food supply is beyond the reach of poisonous sprays. To rid our plants of these pests it is necessary to use some strong spray that will kill them when it comes in contact with their bodies as they are feeding.

If a powdered poison is to be used on the plants, it may be put on easily with a dust bag. This bag consists of a piece of cloth through which the powdered poison can be sifted. These bags are usually tied to short poles for the protection of the user. If liquid poisons are used some machine must be employed. In some cases a simple waterpot may be used. There are several good hand pumps on the market that may be obtained at small price.

Follow directions carefully when preparing poisons. Always remember that they are dangerous to handle.

*Spraying formulas.***Arsenate of lead:**

One teaspoonful arsenate of lead.
One quart water.

Kerosene emulsion:

One gallon kerosene.
One-fourth pound laundry soap.
One-half gallon boiling water.
(Dilute 1 to 10 parts water.)

Bordeaux mixture:

Unslaked lime, one-fourth pound.
Copper sulphate, one-fourth pound.
Water, 3 gallons.
(Spray without diluting.)

Nicotine spray:

One scant teaspoonful nicotine, 40 per cent strength.
One gallon water.

Lesson 34: ARSENATE OF LEAD.

Arsenate of lead is the most generally used insecticide. An insecticide is any poison used to kill insect pests. This poison is only good for biting insects and should be applied to plants according to directions. There are several ways in which arsenate of lead may be used. Sometimes it is dusted on the plants as a dry powder and sometimes it is sprayed on as a liquid.

If it is used as a dry powder, a bellows, powder gun, or dust bag is used. The bellows and guns may be bought cheaply at drug or hardware stores that deal in garden supplies. The dust bag may be made at home from a piece of cloth thin enough to allow the powder to pass through it. When the powdered arsenate of lead is used, it should be dusted on the plants early in the morning before the dew has disappeared. This moistens the arsenate on the plants and stops it from being blown away by the winds during the day. A liberal coating should be applied to the plants so that they will look whitish after it has been used.

When using the arsenate as a liquid the spray must be mixed according to directions first and care must be used not to get any of it into the mouth. It is better to wear gloves when mixing the spray.

Strength of spray.

3 level teaspoonfuls arsenate of lead,
 1 quart of water,
 or
 1 ounce of arsenate of lead,
 1 gallon of water,
 or
 1 pound arsenate of lead,
 25 gallons of water.

If it is difficult to make the spray stick to the leaves add 1 ounce of resin fish oil soap to each gallon of water. Dissolve the soap in hot water before adding.

Arsenate of lead may be purchased from any store dealing in garden supplies.

Do not leave arsenate of lead about where children can get it. It is a poison.

Lesson 35: KEROSENE EMULSION.

Insects that bite our plants in getting their food can be killed by ordinary sprays, such as arsenate of lead or Paris green. Insects that pierce the plants and suck their juices for food can not be killed in this way. The best way to kill these sucking insects is by spraying our plants with kerosene emulsion or by a nicotine extract of tobacco.

Kerosene will kill any insect that it touches by suffocating it. The kerosene goes through the breathing tubes of the insect and closes them up. Kerosene will also hurt our plants if we put it on without diluting it.

If hot soapsuds is mixed with the kerosene our plants will not be hurt. This mixture is called an emulsion. To make kerosene emulsion you heat a half gallon of water to the boiling point. Slice half a bar of soap into pieces and stir it in the water until thoroughly dissolved. Put a gallon of kerosene in a 2-gallon pail and add the half gallon of soapsuds. Mix thoroughly.

Take a small spray pump and pump the emulsion back and forth until thoroughly mixed. One part of this emulsion should be added to 10 parts of water for final use. Allow the emulsion to cool before using. It will become a jellylike mass and will keep for a long time if stored in a cool place.

If a smaller amount is needed, 1 cubic inch of soap may be dissolved in half a pint of hot water. Add a pint of kerosene and shake hard until thoroughly mixed. When used, dilute with 10 parts of water.

Lesson 36: BEETS.

Beets grow best in a moist, well-drained soil. The red garden beet will grow in any good soil. Best results are obtained, however, from a rich, sandy loam.

VARIETIES.

Crosby's Egyptian, Early Eclipse, Early Blood Turnip.

PLANTING.

The early varieties may be planted as soon as the ground can be prepared. The other varieties should be planted as soon as the soil becomes warm. Line your rows from 12 to 13 inches apart. Seeds are planted by hand or with the drill about 1 inch apart in the rows. After the beets are up, thin them out to 4 or 5 inches apart. The plants removed can be used for greens. Successive plantings should take place at intervals of about two weeks so as to have a supply of tender beets all the season. It is sometimes advisable to fertilize with nitrate

of soda. About 200 pounds to the acre should be distributed three times during the growing season. Compute the amount needed for your garden. Two ounces of seed are sufficient to plant a 100-foot row.

GROWING.

The beet reaches market size in four or five months' time. Beets should be used before they exceed a diameter of 2 inches. Those that are unused at the end of the season should be allowed to grow until frost.

Beets may be stored in a cellar or pit if the air is dry, or may be canned for use later in the winter.

Lesson 37: CARROTS.

Beets and carrots thrive well under the same general garden conditions. Carrot seeds are much smaller than beet seeds and should not be planted as deeply. Another reason for shallow planting is that the carrot seedlings are much weaker than the beet seedlings.

VARIETIES.

Half-Long Scarlet, Early Scarlet Horn, Chantenay.

PLANTING.

Carrots do best in a deep, warm, fairly fertile soil. The addition of humus to the soil previous to planting will greatly aid the growth. Spade the soil carefully and thoroughly mix in the humus. Decaying leaves, lawn cuttings, or any green crop will furnish the humus necessary. If these are not available, coarse barnyard manures should be added to the soil. Smooth off the surface with a rake and open the rows with a hoe handle. One ounce of seed is sufficient for 100 feet of row. Plant seed one-half inch deep in rows 18 inches apart. Sow rather thickly and thin out the young plants to 3 or 4 inches apart. Firm the soil over the seed. Carrot plants may be grown much closer than beet plants.

GROWTH.

Thorough tillage should be given this crop from the start. Weeding and thinning should take place as early as possible. Carrots may be dug in the fall or left in the ground until needed. If dug, they may be stored in banks. Medium-sized carrot roots are considered the best for table use. Plants are frequently gathered before they fully mature. Successive plantings and early harvestings are adopted by many gardeners. It is difficult, however, to get good plants during the hot summer months unless the rows are artificially watered.

Lesson 38: MUSTARD.

Mustard makes an excellent greens crop. It can be planted either early in the spring or late in the autumn. In some sections of the South it may be planted as late as May 1.

VARIETIES.

Giant Ostrich Plume, Large-Leaved Curled.

PLANTING.

Prepare the soil thoroughly as soon as it can be worked. Mix barnyard manure with the soil and smooth off with a rake. Line rows about 12 inches apart. Sow about 10 seeds to the inch. Cover seeds one-half inch deep. Thin young plants to 4 inches apart.

GROWTH.

Keep weeds away from plants. Cut leaves when they are about 4 inches long. As the plant reaches maturity quickly, frequent sowings are necessary to have a continuous supply of greens. Do not let any of the plants go to seed. Pull them up as fast as the leaves are gathered. Mustard is sometimes sown broadcast in the garden. When early spring salad is desired, the seed should be sown in September or October. Mustard may be used for salad as well as for greens. The plant thrives on most any kind of soil provided it is rich and has plenty of moisture.

Lesson 39: SPINACH.

Spinach is one of the best greens crops that can be grown in our gardens. Every Southern garden should raise some of this very desirable plant. Spinach is generally used as a spring and fall crop in the South. It is a cool-weather crop and quickly goes to seed when the weather gets too warm.

VARIETIES.

For spring and fall: Norfolk Savoy.

For summer: New Zealand.

PLANTING.

The best crops are grown in the cooler climates of the middle and northern sections of the Southwest. Spinach can be grown during all the winter months in the southern sections of the South. The winter crops are generally protected with straw or leaves in the colder sections. Seeds may be planted early in February and March or in September and October. One ounce of seed is enough for 100 feet of row. Sow the seeds in drills from 12 to 15 inches apart. The plants are not thinned out. The soil in which spinach is grown should be deep, rich, warm, and well-drained. Nitrogen fertilizer should be applied to the soil as a top dressing in the early spring. Successive sowings should be made.

GROWING.

Spinach will not grow well in hot, dry weather. Every effort should be made to conserve soil moisture. If practicable, the spinach bed should be artificially watered during droughts. The plant is ready to harvest as soon as the tender green rosette of leaves has formed, and the entire plant should be removed from the bed. To harvest the plant, cut the root about a half inch below the top of the soil. Take the larger plants before the smaller ones. This allows the latter more time to mature; 60 to 90 days are required for spinach to mature.

Beans or corn make good companion crops to spinach. For the spring-grown spinach, beets or onions make good follow crops. There is no follow crop for the winter-grown spinach.

Lesson 40: PARSNIPS.

Care should be taken that the parsnip seed used is perfectly fresh. Obtain seed only from reputable dealers. Parsnip seed quickly loses its germinative power, and only the best should be planted if good results are to be obtained.

VARIETIES.

Early Round, Guernsey, Hollow Crown.

PLANTING.

Parsnips require a long season for growth and so should be planted as early as possible. They have deep roots and are able to withstand droughts very well. The soil should be deeply spaded and thoroughly pulverized. Add a liberal dressing of manure or fertilizer and thoroughly work it into the soil. Heavy clay soils are not good for the plants as the roots do not develop well in them. The market value of the parsnip depends upon the shape and texture of its root. Sow about 1 ounce of seed to every 100 feet of row space. Place the rows about 18 inches apart. The seed should be covered very lightly with top soil, about one-fourth of an inch deep. Thin out young plants to 4 inches.

GROWING.

The cultivation of parsnips is the same as that for beets and carrots. Keep out all weeds and stir the soil frequently. Thinning should be done when the plants are young and small, as it is very difficult to "pull" the older plants. The parsnip matures in about 100 days. When digging this plant much care must be taken not to hurt the root. It is very difficult to dig parsnips with a spade. Dig a trench on each side of the row and pull the roots out by hand.

Onions or radishes are good companion crops for parsnips.

Lesson 41: PARSLEY.

Parsley is used mostly for flavoring soups or garnishing meats. It is not a common crop in our southern gardens, but might be cultivated more extensively with much profit.

VARIETIES.

Plain Leaved, Moss Curled.

PLANTING.

The ground should be well prepared and richly manured. The crop does not require much room for growth. If it is sown broadcast, about a yard square is sufficient for the needs of any family. The seed should be sown either thickly in drills or broadcasted from February to April. One ounce of seed is enough for 100 feet of row space. The seeds should not be planted over an inch in depth.

GROWING.

Parsley seeds germinate slowly. They can be mixed with radish seed to advantage. If planted in rows, keep soil well stirred to prevent evaporation of soil moisture. If broadcasted, the use of leaves or a cloth screen will prevent this evaporation. It takes from 80 to 100 days for parsley to mature.

Lettuce is a good companion crop to parsley. Carrots or black-eyed peas make good follow crops.

Lesson 42: SALSIFY.

Salsify is a very desirable root crop. Very few southern gardens now cultivate salsify. It is generally used in the same way that parsnips are.

VARIETIES.

Long White, Sandwich Islands, French, Mammoth.

PLANTING.

The soil should be prepared very thoroughly. As salsify is a root crop, deep cultivation is necessary. Break up all clods carefully and thoroughly pulverize the soil. Add a liberal dressing of manure and work it in carefully. Heavy clay soils are not good for growing salsify.

If the soil contains too much clay add a great deal of humus. Seeds should be planted from January to March. About an ounce of seed is sufficient for every 100 feet of row space. The plants should be thinned out to every 3 inches and the rows should be 1½ feet apart. Seeds should be planted about 3 inches deep.

GROWING.

Keep out all weeds and stir the soil frequently. Thinning should be done when the plants are small. Salsify is rather late in maturing, taking from 125 to 160 days. It may be dug and stored or left in the beds until needed, the same as carrots and parsnips.

Lesson 43: CHARD.

Swiss chard is a form of beet grown for its foliage. The leaves are wrinkled, large, and light green in color. The chard leaves are cooked and used in much the same way as spinach.

VARIETY.

Giant Lucullus.

PLANTING.

Chard seed is sown at about the time for planting beets. Chard does not do well in sour soils. If the garden soil is too sour, a liberal application of lime should be worked in. After the lime has been used barnyard manure may be added to increase fertility. Smooth off the surface with a rake. Lay off the rows about 2 feet apart. Sow rather thickly and thin out seedlings to 6 or 8 inches apart. The thinned out plants may be used for early greens, but are not the main crop.

GROWTH.

Keep weeds away from plants and stir soil as frequently as necessary. As soon as oldest leaves have attained their full size, they should be pulled off and used for greens. As the plant continues to grow new foliage, the leaves may be gathered repeatedly. To obtain an early growth, chard plants are sometimes started under glass.

Because the plant puts on new foliage and because the cutting of leaves does no injury to it, chard should be a handy crop in every southern garden. Frequently the leaf stem is cooked, creamed, and eaten like asparagus. Chard is also known as "silver beet" and "spinach beet." With collards and kale, chard is an ideal summer greens crop.

Lesson 44: KOHLRABI.

Kohlrabi is not strictly a root crop but closely resembles turnips in culture and treatment. This plant belongs to the same class as the cauliflower and the cabbage, but shows marked variations from each. Kohlrabi is not generally cultivated, but it is coming into more favorable use in many of our gardens.

VARIETIES.

Early White Vienna.

PLANTING.

Kohlrabi may be planted any time from April to August. About 1 ounce of seed is enough for 100 feet of row space. The rows should be about 12 inches apart and the seed sown in drills. Cover the seed about one-half inch deep. Thin out young plants to about 4 inches. Seed may be sown just as early as the weather and condition of the soil will permit. If an especially early crop is desired, plants may be started in hotbeds and transferred to the garden at about the same time as cabbages are planted.

GROWING.

It is well to have successive sowings of this plant every four weeks. Keep the soil well hoed and remove all rough clods on the surface. It is necessary to keep a good mulch to retain the moisture needed by the crop. Kohlrabi is easily grown and with ordinary care will prove a valuable crop. The plant matures in 90 to 100 days. Lettuce may be grown as a companion crop and parsnips or potatoes as follow crops.

Kohlrabi should be gathered just before it is full grown. If allowed to completely mature, the plant becomes tough. The edible portion of kohlrabi is the fleshy stem that grows just above the ground. If a late crop of kohlrabi is desired, seeds are sown in drills about the time late turnips are sown. The spring crop is the more valuable and the one usually found in our gardens.

Lesson 45: CAULIFLOWER.

Cauliflower requires the same general cultivation as cabbage, but will not withstand the frost as well as cabbage does.

VARIETIES.

Early Snowball, Dwarf Erfurt, Dry Weather.

PLANTING.

Cauliflower is generally planted during April and May, after all frosts are past and the ground has become warm. Prepare the soil in the same way as it is prepared for cabbage. About an ounce of seed is sufficient for every 100 feet of row space. The plants should be thinned out to 1½ feet apart and the rows should be 2 feet apart. The seed should be planted about one-half an inch deep.

GROWING.

The heads of the cauliflower plant should be bleached. This is accomplished by shading them from the sun by tying the leaves together over the head. The cultivation of cauliflower is the same as that for cabbage. Plants mature in from 80 to 100 days. Corn and radishes make good companion crops. Irish potatoes, peppers, or late tomatoes are follow crops.

Cauliflower is generally prepared for the table the same way as cabbage. The plant makes a very delicious dish, the heads alone being used.

Lesson 46: BRUSSELS SPROUTS.

Brussels sprouts are closely related to cabbage and cauliflower. They are miniature cabbages with a very delightful flavor all their own.

VARIETIES.

Long Island Improved, Burpee's Danish Prize, Matchless.

PLANTING.

Seeds should be planted in the seed bed by May and the plants should be in the garden by July. One ounce of seed is enough for every 100 feet of row space. The plants should be thinned out to 1½ feet apart and the rows should be 2 feet apart. Instead of forming a single head, like cabbage, Brussels sprouts form a number of small heads in the axils of the leaves on a main stalk. As the heads begin to crowd, the leaves should be broken from the stem of the plant. Seeds should not be planted over one-half inch deep.

GROWING.

The cultivation for Brussels sprouts is the same as that for cabbage. The plant matures in about 175 days. The sprouts are more hardy than cabbage and may remain in the ground all winter in most sections of the South. The plants can be taken into the cellar, roots and all and set in boxes for winter keep.

Brussels sprouts are not hard to raise if ordinary care is taken of them. The plant repays fully for its cultivation. The sprouts are cooked like cabbage but are much more delicate in flavor.

Lesson 47: THINNING.

When we plant garden seeds, we generally sow them thicker than we wish the plants to grow. All seeds do not sprout, and therefore we sow many of them to get the desired number of plants. Then, when the seeds do sprout and grow, the mature plants will require more room for growth than the seedlings. In order to give the best plants room enough, we remove the others. This removal of plants is called *thinning*.

We generally thin plants in the garden early enough in their growth to avoid injuring the roots of the plants to be left in the soil. When a plant is young, a mere seedling, it has very few roots and can be removed without hurting its neighbors. After the plant has grown to several inches in height, it has many more roots running all through the soil, and its removal will sometimes hurt the roots of adjacent plants. If the roots of the plants to be left in the soil are broken, they suffer and may die.

Plants should be thinned out, whether they are planted in rows or in hills. Thinning is especially needed with some crops, such as the vine crops, while it is not needed with others, such as the salad crops. Crops that are broadcasted are not thinned out except as plants are gathered for table use.

There is a constant struggle between plants to get food, air, and moisture. The fewer plants there are in any given space the better chance each has to obtain all that it needs for growth. We can have too few plants just as we can have too many in a given space, however. The gardener's problem is to utilize every foot of soil to the best advantage, not wasting any or overcrowding his crops.

Lesson 48: WEEDING.

Weeds are among the worst pests that a gardener has. They take up room that should be available for useful plants; they use plant food in the soil that should go to help the growth of our more valuable crops; and they deplete the soil moisture that our garden plants need so much. A weed is any plant out of place. Cotton plants in our gardens are weeds and corn plants in our cotton patches are weeds. In each case the plant is out of place and is occupying room that belongs to other plants.

Weed seeds are easily distributed. Wind and insects help this distribution. In general, weed seeds are very hard to kill. Changes of temperature have little effect upon them. They sprout readily in small amounts of soil and will thrive well even under disadvantageous conditions. Weeds are very sturdy plants.

In order to get the weeds out of our gardens and to give our useful plants room to grow, it is necessary to remove them, root and all. This is most generally done by pulling them up bodily from the ground. It is not enough to chop their tops off with a hoe as many weeds will continue to grow after the tops have been cut off. This destroying of weeds is called *weeding*. Weeding is one of the most important garden operations we have to attend to. In the spring when the crops are young and growing fast, it is very essential that weeds should be removed.

There are several tools called weeders on the market. Some of them may be purchased very cheaply. These weeders are useful in stirring the soil and forming a dust mulch for the protection of the plant. In thinning plants, weeders may be used to dig out the seedlings.

Lesson 49: WATERING.

Do not water your garden with a hose sprinkler. This does more harm than good. If you must water the garden artificially, soak the soil thoroughly, so that the water will sink in and not stay on the surface. When the soil is sprinkled, only the thin top layer is wet and the roots of the plants will come to the surface seeking the moisture. When the first dry spell comes, the plants are killed because the roots are not deep enough in the soil to withstand the drought.

If the garden must be watered artificially, remove the nozzle from the garden hose and allow the water to flow down between the rows. The roots are the parts of the plant that need the moisture, not the leaves.

Make furrows along the sides of the plants and allow the water to run through them. This will mean the use of a great deal of water. If a hose is not used, water may be turned into the furrows from a can or watering pot. Some gardeners use a waterpot alone, and do not make furrows. When this is done the nose of the waterpot should be held close to the ground so as not to wash the soil. For small areas this latter method is best.

When plants are transplanted the soil should be thoroughly soaked before the plants are put in. When sowing seeds in hot weather, it is advisable to soak the soil well before planting.

Some gardens are too wet. Plants will not grow well in soil that contains too much moisture. The water in the soil takes the place of needed air and strangles the plant. When the ground is too wet there is but one thing to be done. Some system of drainage must be used.

The simplest and least expensive plan for draining a garden is to dig a series of parallel ditches about 15 to 20 feet apart. These ditches should be deep enough to lower the water in the soil sufficiently to give the roots room to develop. About 2 feet is a sufficient depth for most garden conditions. The ditches should not be level but should all slope in the same general direction so that the water will run off.

Lesson 50: BEANS.

Beans thrive best in a rather warm, sandy loam soil. They can not stand much cold and should not be planted until all danger of frost is past. When the soil becomes warm it is time to plant the first crop; this should be followed by other plantings every ten days or two weeks.

VARIETIES.

1. Bush beans—Stringless Green Pod, Refugee, Hodson's Kidney Wax, Currie's Rust Proof Wax.

2. Lima beans—Pole Type: Seibert's Pole Lima, Carpentieria Lima. Bush Type: Landreth's Bush Lima, Dreer's Bush Lima.

PLANTING.

Prepare the soil as soon as it is warm enough. Break up all clods and smooth the surface. It is not necessary to fertilize heavily as the bean is a nitrogen-gathering crop and runs to foliage if too much fertilizer is in the soil. Bush beans should be planted 3 or 4 inches apart in rows about 2 feet apart. Lima beans are planted in hills, from 8 to 10 seeds to each hill. After the plants come up, they are thinned out to three or four to the hill. The hills should be from 4 to 5 feet apart. One pint of seed of most varieties of beans is sufficient for a 100-foot row. Bean seeds ought not to be covered with more than 2 inches of soil under any circumstances. If the soil is wet, about 1½ inches will be sufficient.

GROWING.

Remove all weeds from the young plants and keep the soil stirred. Frequent shallow cultivation will help plant growth. All varieties of climbing beans should be stuck with stakes or poles. Chicken wire is sometimes used to train up pole beans.

Lesson 51: TOMATOES.

The garden tomato is generally raised from plants grown either in the house or in the hotbed. In the southern section of the South, the early plants may be grown in a cold frame under canvas, but in the northern section, hotbeds must be used. Many people sow the seed in shallow boxes in the house and transplant when the plants are 4 or 5 inches high. If only a few plants are desired, this is an excellent method to follow. Plants are generally transferred to cold frames in March and to the garden in April or May.

VARIETIES.

Early tomatoes: Earliana, Early Jewel.

Medium tomatoes: Greater Baltimore, Beauty, Acme, Stone.

(If the tomatoes are to be canned the Stone variety is generally preferred.)

PLANTING.

When plants are about 2 inches high, thin out so that they will stand about 2 inches apart. The thinned-out plants may be transferred to other boxes. Tomatoes may be set in the garden as soon as all danger from frost is past. Prune the young plants to one or two stems. Set 18 inches apart in rows 3 feet apart. Have the soil well pulverized and thoroughly mixed with good stable manure. Drive stakes near each plant so that it may be trained on them. If the plants are not pruned and staked, they should be set not nearer together than 4 feet. It is much more advisable to prune and stake, however, as the plant will produce better fruit.

GROWING.

Keep weeds down and stir the soil frequently. As the plant grows taller it should be fastened to the stakes to prevent dropping. Fasten the plant with inch bands of cloth. This will prevent cutting the stems. Remove all shoots, starting at axils of the leaves. The plant matures in about 110 days.

TOMATO PESTS.

CUTWORMS.

Cutworms are most destructive to our young tomato plants. In a small garden, where few plants are used each plant may be protected by a collar of paper about its roots. This collar should be about 4 inches long and at least 2 inches in diameter. The tomato plant is first set in the collar with the soil firmed about it; then the plant and collar are set in the garden, care being taken that the whole plant is set well into the soil at the base.

DISEASES.

Tomatoes are affected by many fungus diseases that attack the leaves, stalks, and fruit. spraying with Bordeaux mixture will generally eradicate all fungus troubles.

Lesson 52: TRAINING TOMATO PLANTS.

Tomato plants should never be allowed to trail on the ground. Contact with the ground will cause brown rot to occur in the tomatoes. It requires only a little care to train up tomato plants, and the resulting benefit is well worth the effort expended.

Tomato plants may be trained to a single stake. Drive a stake 4 or 5 feet long into the ground beside each plant. Prune off all suckers near the roots, so that there will be only one sturdy stalk. Tie this stalk to the stake with strips of cloth. Do not use ordinary wrapping twine as this is likely to cut the growing plant. As the plant grows taller, tie it up with other strips of cloth above the first strip.

Barrel hoops may be used to train the growing plants. Drive three or four stakes into the ground about equal distance apart around the plant. These stakes should be about 4 feet long and placed far enough apart that a barrel hoop may be fitted over them snugly. Fasten one hoop to the stake about 18 inches from the ground and a second one about 30 inches from the ground. Pinch off the weaker stems, leaving only three or four leaders to grow up. Tie these to the first hoop with strips of cloth. Train the plant to grow inside the second hoop. When the leaders reach the second hoop, tie again.

Tomato plants are often trained on trellises. To erect a trellis, drive down a stake beside each plant. These stakes should be in a straight row along the line of plants. Have the stakes project about 4 feet above the ground. Fasten three or four strands of strong, light wire to the stakes, having the first wire about 18 inches above the ground. Pinch off the suckers about the roots and tie the leaders to the first wire. Train the branches along this wire, tying them if necessary. When the plant is tall enough to reach the other wires, train in the same way as each wire is reached.

Box trellises may be made if deemed advisable. Drive four stakes about the plant in the form of a square. Nail strips to these stakes about 15 inches from the ground. Train the plant over these strips.

Lesson 53: SWEET CORN.

Sweet corn is a very important table vegetable. It can be grown to advantage in those home gardens that have room for the cultivation of the larger vegetables. Corn can be canned if desired and kept for winter use.

VARIETIES.

Early: Golden Bantam, Adams Early.

Late: Black Mexican, Country Gentleman, Stonewell's Evergreen.

PLANTING.

Sweet corn should be planted on rich land. Spade the soil deeply and thoroughly with a spading fork. Break all clods and mix in a liberal dressing of barnyard manure. Corn has a great many small roots that spread out through the ground and therefore the soil must be broken up very fine so that these roots may have a good chance to grow. Plant the seed as soon as the soil is warm and make four or five successive plantings every two weeks. A pint of seed is sufficient for 200 feet of row. Four or five seeds should be planted 2 inches deep in hills about 3 feet apart. After the plants have grown about a foot, thin out to two or three stalks in each hill.

GROWTH.

Sweet corn is cultivated in the same way that field corn is. Keep weeds away from the young plants. Hoe the soil about the cornstalks frequently. Gather the ears for table use when they are filled out. This is about the time when the silk on the cob begins to die. Corn loses its sweetness if not used directly after picking.

POP CORN.

A couple of rows of pop corn should be added to each home garden. This crop will be found valuable for winter use. It is grown in the same way as sweet corn and requires the same cultivation. The best varieties to plant are: Rice, Pearl, and Yankee.

When two gardens are adjacent, corn rows should be planted next each other. This gives a far better chance for the corn to develop than when planted alone in a single garden.

CORN PESTS.

EAR WORM.

This is a large caterpillar more abundant in the South than it is in the North. It feeds on the insides of the shucks and destroys the kernels near the tip. Sometimes it ruins the whole of the ear. The ear worm comes from the eggs of a moth that are laid on the silks of the corn ear. Generally only one caterpillar reaches the inside of the ear. Early in the season the caterpillars feed on the unopened tassels.

Control: Dust powdered lead arsenate on the silk where it enters the ear. This should be done as soon as the eggs are seen.

SMUT.

This appears as a swollen, blackish mass on the ears. These black masses break open and release millions of spores. These spores may remain through an entire winter and infest the next crop. The black masses should be cut from the ear and burned at once. This must be done before the mass bursts and releases its spores. Rotation of crops will act as a preventive by starving the spores during the succeeding year, when no corn is grown.

Lesson 54: OKRA.

Okra is a southern crop. It requires a long, warm growing season. Okra is a favorite dish in the South, being cooked alone, with tomatoes, or in soups. It is easily canned and keeps well.

VARIETIES.

White Velvet, Perkins Mammoth, Long Podded, Lady Finger.

PLANTING.

Prepare the land thoroughly after all danger of frost is over and the soil has become warm. Apply a good dressing of barnyard manure and work into the soil. Two ounces of seed is enough for every 100 feet of row. Plant the seeds 4 inches deep in rows 3 feet apart. If the tall varieties of okra are used, the rows should be from 4 to 5 feet apart. Thin the plants in rows to 2 feet apart.

GROWTH.

Give frequent cultivation until the plants are full grown. This cultivation should be shallow to save the roots from being cut by the hoe. The pods are used for food. These should be gathered just before they ripen, and the plant will continue to bear until killed by frost. When the okra pod is cooked it becomes sticky and has a peculiar flavor that is much liked by many people.

Lesson 55: THE CARE OF THE GARDEN.

Much of the waste in gardening is due to carelessness after the garden has been successfully started. It is comparatively easy to plant a garden, but requires patience and continued care to bring it to a full harvest. We ought not to waste anything while there is such a demand for food products. Every plant we have in our garden that is neglected and allowed to die is just so much loss.

You should take pride in keeping your garden well cultivated during the summer months. The soil should be stirred after each rain in order to keep it from caking up and to prevent the soil moisture from escaping. Do not work the soil when it is too wet, however, as this will

hurt the growth of your plants. When the soil is dry enough to crumble in your hand it is plenty of time for surface cultivation. Use a rake or garden hoe to stir the soil. It is not necessary to go very deep; just break up the top soil.

The continued cultivation of the topsoil destroys all weeds and insects likely to injure the plants. While the plants are small this cultivation may go on very close to the young plants, but as the plants grow larger and their roots expand through the soil, the cultivation should be shallower. Care must be taken not to cut the delicate roots.

Frequent soil cultivation makes plant food more readily available to the plant. It allows heat and moisture to pass to the plant roots. Plants must have a great deal of food, moisture, and air while they are growing.

The following suggestions will aid you in caring for your garden:

It is sometimes rather hard to sow very small seed. If dry sand is mixed with the seed in about the proportions of 5 to 1 it will not be so difficult to do the sowing. Mix the sand and seed thoroughly to get an even distribution.

Have all garden crops well and properly marked. An easy way to do this is to dip a wooden marker in white-lead paint and write the name of the crop on it before the paint is dry. Such signs will last right through the season.

Many garden crops can be kept growing through and after the frost period if they are protected. Cover the plants with a liberal amount of hay or straw during the cold nights. Newspapers are very good for this purpose, but must be fastened down so that they will not be blown away.

Cut off the heads of your cabbage plants instead of pulling up the plant by its roots. If this is done, new leaves will be formed in a short time.

Stand melons on their ends so that they will ripen evenly, or place a board beneath them to raise them from the ground.

It is well to have a small patch of herbs in the garden. The usual crops of this kind are thyme, sweet marjoram, summer savory, dill, and lavender.

Lesson 56: INTENSIVE CULTIVATION.

The problem of the successful gardener is intensive cultivation. To make every square foot of your gardens produce three or four crops a year is well worth striving for. It is a fascinating problem and its solution brings rich rewards. Its neglect is one of the important causes of our garden failures.

Every short-season crop should be followed immediately by another, instead of allowing the space occupied to go to weeds. When rows stop bearing, plant something else; don't let them go to weeds. First learn when each crop will mature and be prepared to supplant it with another. Have a definite program for your cropping just as you have a program for your daily occupations. Learn all you can about the habits of the plants you cultivate, their needs, and their length of life.

Some crops are known as "short-season" crops, these may be harvested early and then replaced by other crops. If these are well chosen they in turn may be followed by still later crops. For instance, radishes, onions, spinach, and lettuce are all "short-season" crops. When the radishes are through, plant summer lettuce. This will mature before August 1 and may be followed by snap beans that will grow until frost time. Early peas gathered in May or June can be followed by bush beans. These beans will all be gathered by the first part of August and may be followed by turnips which will grow until November or later.

This method of growing several crops on the same soil is intensive cultivation. Besides giving us a larger revenue from our garden, it kills weeds and keeps the soil in the best of conditions. If the garden is not to be planted in vegetables during the winter, sow it down to vetch or rye. These crops will improve the soil for the coming spring.

Lesson 57: ALL-SEASON CULTIVATION.

Cultivation is the one indispensable thing for successful gardening. It should start when the seedlings first appear and be kept up until frost comes.

Gardens can get along with less moisture if they are regularly and thoroughly cultivated. Once a week is none too often to cultivate the garden soil. Besides keeping down the weeds, this regular cultivation helps to hold the moisture in the soil and allows air a freer entrance between the soil particles.

The amount of cultivation necessary will vary some with the type of soil employed and the kinds of plants cultivated. Those plants that are grown for their leaves, such as cabbage and cauliflower, will need all the water they can get. Others will not require as much. Light sandy soils do not need as much cultivation as the stiffer clay soils. If these latter soils are not frequently cultivated, surface evaporation will take place rapidly and the crops will suffer from lack of sufficient moisture. All surface crusts, generally formed after a shower, should be broken up.

A garden rake is the best implement for surface cultivation. Early in the season deep cultivation is advisable, but later, when the plants have developed their root systems, it is unsafe to cultivate very deeply. If the tender roots are torn or cut the plant suffers and may die.

When cultivating the garden, practice what is known as "level cultivation." Do not bank the dirt about the plants; keep it as level as possible. There are many good reasons for this. "Hilling" about plants tends to dry out the soil as more of it is exposed to the air than would be if it were left level. When hoeing hills to kill weeds there is great danger of cutting the plant roots. This is less likely to occur in level cultivation. It is sometimes advisable to hill tall growing plants to help them withstand the wind, but otherwise all garden cultivation should be level.

For limited areas, a small hand weeder is the only tool needed for cultivation. For larger areas, the usual garden wheel hoe is advisable. Always use the tool that will produce the desired result with the least expenditure of labor.

Lesson 58: SQUASH.

There are two kinds of squash that are grown in our gardens—the bush variety and the running variety. The bush varieties require much less room for growth than the running varieties. The squash is very prolific and so not many plants are necessary in any one garden. Five or six hills of each sort will generally furnish enough squash for the ordinary family.

VARIETIES.

Summer squash: Pattypan, Summer Crookneck.

Winter squash: Delicious, Hubbard.

PLANTING.

The squash requires the same kind of soil and cultivation as the muskmelon and cucumber. The bush variety should be planted in hills about 4 or 5 feet apart each way. The running varieties should be planted in hills from 8 to 10 feet apart. Seed should not be planted until all danger from frost is over and the soil has warmed up some. Plant four or five seeds, 1 inch deep in each hill.

GROWING.

There should be frequent cultivation until the vines are well grown. The squash will mature in about 120 days. After the summer squash is gathered, beans may be used as a succession crop.

SQUASH PESTS.

Squash is so closely related to the cucumber that it has many of the same insect enemies. The chief enemy of the squash that is not so generally prevalent in other crops is the squash bug.

SQUASH BUG.

This is a rather large bug with a long body and piercing mouth parts. It is black in color and gets its food by puncturing the stems and thicker leaves of the plant and drinking the juices. It is very active, especially when young. The young have gray bodies and black legs. Squash bugs generally occur in groups. They winter in the field under rubbish.

Control: Insecticides have little effect on this pest. The adults may be attracted under small boards laid on the ground in the fall and then destroyed. Cleaning up will reduce the pest.

Lesson 59: PEPPERS.

Pepper plants are grown in hotbeds and then transferred to cold frames to harden them. The plants are ready to set out in the garden by April at the latest.

VARIETIES.

Sweet: Golden Queen, Bull Nose, Chinese Giant.

Hot: Cayenne, Red Hot.

PLANTING.

Do not transplant until the soil is warm. Place the pepper plants in rows about 18 inches apart. There should be at least 2 feet between rows. About one-half pint of pepper seed will raise all the plants necessary for the garden.

GROWTH.

Keep weeds away from the plants and stir the topsoil as frequently as needed. If the soil is warm and mellow, the plants may be started early in boxes and transplanted when danger of frost is past. The pepper plant is not attacked by insects or diseases readily. Protection from enemies is seldom needed. Peppers are generally followed by turnips.

The smaller peppers are much hotter than the larger ones. The smaller ones are used for flavoring pickles or for making pepper sauce. Peppers are frequently dried for winter use.

Lesson 60: CUCUMBERS.

Cucumbers are easily injured by the cold. They grow best in a rich, mellow soil. If an early crop is desired, the plants should be started in a hotbed and transferred later to the garden. Two or three weeks may be saved by using this method.

VARIETIES.

White Spine, Davis Perfect, Everbald.

PLANTING.

Cucumbers are usually planted in hills. When all danger of frost is past, prepare the soil thoroughly and open the hills a foot deep and 2 feet across. Fill each hole two-thirds full of barnyard manure and mix in a spadeful of soil. Cover this with about 3 inches of soil. Drop 8 or 10 seeds on the hill and cover with an inch of fine soil. If the cucumbers are planted in rows, open the furrows about 5 feet apart. Scatter manure along the furrow and mix with soil. Plant the seed about 2 inches deep. Thin young plants to 12 or 18 inches apart in row.

GROWING.

Cucumbers should have frequent cultivation until the vines are well grown. Protect the plant from the cucumber beetle by spraying with arsenate of lead or by covering the hills with cheesecloth. Air-slaked lime sprinkled over the plants will help to keep off pests.

If cucumbers are planted in hills, the waste land between the plants may be used by sowing rows of bush beans. As fast as the beans mature, gather them and remove the plants as soon as the crop is gathered.

CUCUMBER PESTS.

CUCUMBER BEETLE.

The cucumber beetle is small, green, and has three black stripes down its back. It appears very early in our gardens, and the adult feeds upon the young plants, cutting them off near the ground. The larvæ of this beetle are rootworms. They live in the roots but do not cause enough damage to be noticed as the adults do.

Control: In small gardens a larger number of seeds may be planted to each hill, and the attacked plants may be pulled out. Cover the plants with a box or flowerpot until well grown. The beetles disappear as soon as the plants attain a considerable size.

SQUASH VINE BORER.

This pest attacks cucumbers as well as squashes and melons. It is the caterpillar of a moth that has brilliantly colored wings.

Control: It is very hard to rid the garden of this pest. Hill the vines and encourage the plant to throw off roots. As this insect hibernates in the soil, fall plowing is beneficial by destroying the winter homes.

DISEASES.

Several leaf-spotting and wilt fungi attack the cucumber. Bordeaux mixture will check most of these. If plants of the previous year were infected with these pests, spraying should take place early with the new crop as a preventive to their reappearance.

Lesson 61: MELONS.

MUSKMELONS.

VARIETIES.

Rocky Ford, Netted Gem, Jenny Lind, Paul Rose.

PLANTING.

Muskmelons are planted in much the same way as cucumbers are, except that they are given more space. Prepare the hill by adding a rich dressing of barnyard manure. Plant 8 or 10 seeds in the hill, spacing hills about 6 feet apart. Thin out to four plants to the hill. If melons are planted in drills, the rows should be 6 feet apart and the plants thinned out to 4 feet apart.

WATERMELONS.

VARIETIES.

Kleckley Sweets, Florida Favorite, Tom Watson, Georgia Rattlesnake.

PLANTING.

Watermelons require more space than either cucumbers or muskmelons. Plant watermelon seeds in rows 10 feet apart or in hills from 8 to 10 feet apart. Thin plants in the rows to 3 feet apart. Prepare the soil in exactly the same way as for cucumbers.

Both muskmelons and watermelons are important truck crops. They grow best in sandy soils and warm climates. If the growing season is short, the melon does not grow very large and is not of a good quality. Field melons are so common in the South that gardeners do not take the trouble to raise them in their home gardens. They should be grown, however, whenever there is room enough for their cultivation.

Lesson 62: POTATOES (SWEET).

Sweet potatoes are not usually considered a garden crop in the South. They are generally cultivated in extensive tracts by themselves. However, it is advisable to have a few plants in the garden for early summer use. Sweet potatoes are not raised from seeds but from slips or small plants.

VARIETIES.

Pumpkin Yam, Nancy Hall, Big Stem, Big Stem Jersey, Triumph.

PLANTING.

Only well-drained land should be used for planting sweet potatoes. The planting is generally done in ridges. Plow or spade the soil well and break all clods. Mix in a dressing of stable manure or commercial fertilizer. If a plow can be used, two furrows are generally thrown together for a ridge. If no plow is available, these ridges must be made with a spade. Potatoes should be in the ground by April. About 100 plants are sufficient for every 100 feet of row space. Set plants 1 foot apart in ridges 2½ feet apart. Plant from 4 to 6 inches deep. The roots planted are generally those that are too small for marketing. If an early crop is desired, the roots must be bedded for five weeks in a hotbed before setting in the garden.

GROWING.

Sweet potatoes grow well in dry, hot weather. After the plants are once established, little further attention need be given them. Keep weeds away from the very young plants.

Sweet potatoes, like Irish potatoes, are dug and stored through the winter. It is best to dig the potatoes before there is danger of a hard frost. Digging should occur when the soil is perfectly dry. After digging, allow the roots to lie exposed for three or four hours to thoroughly dry them. After they have become dry, place in a warm, well-ventilated room. Many people in the South bank their potatoes in the ground.

Lesson 63: RUTABAGAS.

Rutabagas or "Swedish" turnips require a much longer growing season than the common turnip. They are a fall crop and should not be planted in the South before July, as they do not withstand the summer heat well. Their cultivation and harvesting are the same as for the turnip.

VARIETIES.

Purple Top.

PLANTING.

Prepare the soil carefully, break up all clods, and add a good dressing of barnyard manure.

Line off rows about a foot and a half apart. The seeds are sown in drills and the plants are thinned out later. About one-half ounce of seed is enough for every 100 feet of row space. The seed is planted about 1 inch deep. When the plants have reached 3 or 4 inches in height, they should be thinned out to 6 or 8 inches apart. The thinned-out plants are used for greens.

GROWING.

Keep the soil stirred. Remove all weeds from young plants. The plant matures in from 60 to 80 days. The rutabaga is very hardy and will grow right through the usual southern winter.

Parsnips make a good companion crop to rutabaga. These may be planted between the rutabaga rows. After the rutabagas are harvested, peas may be planted to follow.

Lesson 64: STRAWBERRIES.

Although strawberries are not generally considered a garden vegetable, being termed a fruit, nevertheless they are very common in many home gardens and you should have several strawberry plants in your own garden plot. Strawberries are planted in beds and it will be necessary for you to set aside a part of your garden for their cultivation as they form a permanent crop.

VARIETIES.

Early: Excelsior, St. Louis, Premier.

Medium: Barrymore, Marshall, New York.

Late: William Belt, Gandy.

Fall-bearing: Progressive, Superb.

PLANTING.

Strawberries do well in any good garden soil that is fertile and light. Plants are generally set out in the late summer or fall. If good, hardy plants are transplanted to the garden in August, a crop of berries will be ready the next year. Spade up the selected strawberry bed carefully and smooth off the surface with a rake. Set the plants about a foot apart in rows 3 feet apart. Spread the roots of the plants out carefully and firm the soil about them. The bed should be well watered before the plants are set. After the plants are in and the soil has been firmed, scatter a layer of fine soil about each plant. This acts as a mulch and prevents moisture evaporation.

GROWING.

Keep a mulch on the bed during the growing season. The bed should be watered every evening until the plants are well started. Pinch off the runners as fast as they get long so that your plants may become hardy. Do not let the bed "mat up" too much.

When fall comes cover the plants with a mulch of old manure and fallen leaves. Renew your beds every two years to keep a fresh growth. Mildew and rust sometimes attack your plants. Spraying with Bordeaux mixture will eradicate these.

HARVESTING.

Lesson 65: WHEN TO GATHER VEGETABLES.

If you take good care of your garden all through the season, following directions given in this manual, you may expect to gather a good crop. This table tells you when to gather several kinds of vegetables that you will grow.

Crop.	Time to gather.	Remarks.
Beets.....	When young.....	Beet greens, when tender, make a delicious dish.
Brussels sprouts.....	After frost.....	Cold improves this vegetable.
Cabbage (early).....	When three-fourths headed.....	May be left until frost.
Carrots.....	When young.....	Should always be gathered young when used for soups.
Chard.....	When outside leaves are about 1 foot high.	Cut lightly at first. Midribs of leaves can be used like asparagus.
Kohlrabi.....	Before skin hardens.....	The bulb should be about two-thirds as large as a baseball.
Lettuce.....	While leaves are tender.....	Small young lettuce leaves make best salads.
Lima beans.....	While still green.....	Pods should be spongy at the tip.
Melons.....	When they crack around the stem.....	Let your melons ripen on stem if possible.
Potatoes.....	When vines are dry.....	Harvest a few at a time except at end of season.
Radishes.....	When young.....	Radishes get tough and spongy with age.
String beans.....	When they snap readily.....	Tips should be soft and easily bent or twisted.
Shell beans.....	When pods are well filled.....	Do not let them dry on vines.
Sweet corn.....	When it has just come to milk with blackened silks.	Should be used as soon as picked.

Lesson 66: MARKETING VEGETABLES.

After the home table has been supplied with all the vegetables that it needs we should sell our extra products as fast as they are ready for the market. Our home needs must be supplied first before we attempt to sell to our neighbors. You should not only supply your family needs and pay for the cost of your garden, but you should make a neat profit on the vegetables you raise. It would be an excellent idea for every gardener to invest his vegetable profits in war-savings stamps.

Most selling from our village or city gardens is done by peddling among our neighbors. This will encourage thrift and business system upon your part. To sell our vegetables readily there are a few rules that should be followed:

1. Gather your vegetables when they are ripe and ready for the market. Do not pick half-ripe fruits; choose only those that are ready for a quick sale.
2. Grade your vegetables according to size and quality. Do not have a mixture of varying sizes and varying qualities.
3. Make your display of fruit attractive. Customers will buy quicker and pay better prices if the goods offered for sale look neat and clean.
4. Do not place the best vegetables on top while poorer ones are hidden beneath. It would be better to separate the kinds and sell them separately.
5. Be honest. Do not claim for your goods what they will not show. Try to keep your customers by honest dealings.
6. Whatever containers are used for selling or displaying your vegetables, make them attractive.

Lesson 67: STORING VEGETABLES.

The storing of vegetables is a food conservation measure that is as important as any with which the gardener has to deal. We must save and use every product we can, and we must eliminate all waste.

Potatoes, carrots, onions, beets, turnips, and many other of our garden products may be preserved for winter use by storing. The best results from storage will be obtained if care is exercised regarding the proper temperature and ventilation needed, the requisite amount of moisture necessary, and the quality of the vegetables when first placed in storage.

Some vegetables may be stored on our pantry shelves while others require cellar accommodations, and still others should be kept in outdoor pits. Frequently many neighbors will join together and erect a pit or storage cellar for their vegetables. This is known as community storage. This cooperation upon the part of several gardeners will reduce to a minimum the individual storage expense and will expedite the handling of products.

If cellar storage is used, care must be exercised to see that there is sufficient ventilation and that the requisite temperature may be easily kept. The cellar should have a good dirt floor, or, if it has a concrete floor, the floor should be covered with 3 inches of sand. This floor should be kept slightly moist. Beets, celery, cabbage, parsnips, turnips, and potatoes may be stored in the cellar.

A mound-shaped pit is the best form for outdoor storage. To construct this, dig a hole in the ground 6 inches deep and as wide and long as necessary to contain the vegetables to be stored when placed in a conical pile. Before putting the vegetables in the pit it should be lined with hay or straw. Cover the piled vegetables with several inches of same material used to line the pit. Finally, cover the mound with 4 or 5 inches of dirt. As the cold weather approaches add 10 or 12 inches of dirt to the covering of the pit.

Lesson 68: DIGGING AND STORING POTATOES.

The potato is one of our most valued foods. It ranks next to wheat in importance, and many European countries use it as the principal article of diet.

Every garden should have several rows of potatoes growing in it, and great care should be taken that the potato bug does not injure the plants. One or two sprayings with arsenate of lead will keep the plants free from these pests.

When the vines are dead the potatoes should be dug with a fork or trowel. A regular tined potato digger is excellent for this purpose. This garden implement may be bought at any supply store. When digging with a fork, care should be taken that the potatoes are not injured by jabbing the fork into them as you pull them out. Cuts and gashes greatly decrease the value of the crop.

Potatoes should be dug on a dry, sunny day and allowed to lie on the ground for a few hours. After drying for a while, gather them carefully into baskets or boxes and carry them to the cellar or shed. Do not leave potatoes on the ground overnight under any circumstances. The moisture in the night air injures the potato.

If you have taken care in selecting your seed potatoes, and have tended to their cultivation properly, the better your potatoes will keep. If you have soaked the seed potatoes in formalin before you planted them and have sprayed your vines with arsenate of lead, you will probably have tubers free from rot and blight.

Before storing your potatoes, sort them over carefully, picking out all the injured ones. These you can use at once, as they will not keep well. Store the good potatoes in boxes, barrels, or bins in a fairly cool, dry cellar.

Nearly half the potatoes we raise annually are lost by improper handling. This is unnecessary and is too great a waste to be tolerated.

Lesson 69: THE FALL GARDEN.

Every southern home should have a good fall garden. Just because cold weather is coming is no reason why we should allow our garden plots to go to weeds and become unproductive. The fall season is really another spring, and our gardens would be increased in efficiency by using this season of the year in growing suitable vegetables.

The fall is also the time to lay the foundation for next year's garden. If we keep our garden soil under cultivation all the time it will be more mellow and more suitable for spring use. If we clean up all trash and remove all dead crops, putting in their places growing plants, we will reduce our troubles from insect pests. Insects hibernate through the winter in trash or just beneath the soil surface. If we destroy this trash and keep the soil stirred, we kill off most of the hibernating insects.

The late garden work consists of three things:

1. Taking care of crops on hand.
2. Replacing gathered crops by others.
3. Preparing for next year's work.

We should endeavor to place a fall crop in the space of every gathered crop. Keep the land working. We should also select our fall crops with an eye to our next year's plantings. It is well to have a definite plan for our fall work, just as it was important for us to plan definitely for our spring and summer work. July is about the first month in the South when serious attention should be given to the fall garden.

Study your local situation carefully and plant only such crops as are suitable to your needs. Aim to supply your own table just as long as it is possible to raise plants during the colder season. There will probably come a time later when it will be too cold to grow anything in the garden. Until that time comes make the garden work every minute of the day and night.

Lesson 70: BETTER GARDEN VEGETABLES.

Our home gardens should furnish us with fresh vegetables all the year around—very much better vegetables than we can get in any of our markets. In order for us to have the best in our gardens it is necessary that we learn all we can about growing, caring for, and harvesting our crops. Most plants are better when used at a certain period of their growth. The good gardener learns when this time occurs and gathers his products accordingly.

We must also know how to grow our vegetables to the best advantage. We need the best we can produce, and it takes knowledge and skill to produce the desired results. There is always something to learn about growing vegetables.

If we would have good vegetables we must remove the weeds from our gardens. Leave no vines, shrubs, or half-grown vegetables to offer homes for insects. Dig out all grass by the roots; do not be content with simply hoeing off the tops. Most of the grass appearing in our gardens must be dug up, root and all; no other way will kill it. Do not have any loose stones in your garden; these interfere with its cultivation.

Gather all the refuse and place it on your compost pile. Do not burn anything unless it is so infested with insects that it is dangerous to leave in the garden. Spray such plants as need protection and are not hurt by spraying and the methods employed in using it on plants.

Study the habits and needs of every plant you cultivate and try to make conditions just right for their proper growth. Give your plants plenty of room, air, and water. Keep a mulch on the surface of the soil to stop evaporation.

Do not step on plants; use the paths. Have your rows straight and your paths clean. A well-kept garden is as pretty as a flower bed. If you have room about your garden, you ought to plant hedges of flowers to make the place more attractive.

Try to have better vegetables every year than you had the past year. If you sell any of your vegetables, select for this purpose only your best. Cultivate a reputation for honesty just as you cultivate your vegetables. Never be satisfied with a poor product; always strive for something better.

APPENDIX.

JUDGING THE HOME GARDENS.

The fairest way to judge a garden is to visit it while it is in operation. The judges can then see the conditions involved in making it successful, and can estimate pretty fairly the various points to be considered. Such an estimate is difficult at best, and the following score card is offered simply as a suggestive guide, which any set of judges may modify to suit themselves. Any such modifications should, of course, be agreed upon in advance.

Score card for judging home gardens.

A. General appearance.....		20
Arrangement of rows.....		5
Freedom from weeds.....		5
Cultivation and care.....		5
Proper thinning.....		5
B. Choice of vegetables.....		15
For home use.....		5
For marketing.....		5
For canning.....		5
C. Freedom from pests.....		15
Spraying for insects.....		5
Spraying for disease.....		5
Other remedial measures.....		5
D. Evidences of.....		15
Continuous cultivation.....		5
Companion cropping.....		5
Succession cropping.....		5
E. Care of tools.....		10
F. Value of produce.....		15
Used at home.....		5
Sold in the market.....		5
Used for canning.....		5
G. Accuracy of garden records.....		10
Total.....		100

SUGGESTIONS AS TO ORGANIZATION.

The following suggestions are submitted to teachers and supervisors in the hope that they may be helpful in promoting the organization of the unit companies of this Army:

Number of members in a company.—Ten to one hundred.

Age limit.—Any child old enough to plant and cultivate.

Requirements for enlistments.—The signing of an enlistment sheet in which the pupil agrees to raise one or more food crops and to keep records of his work and the results, reporting them to the teacher or garden supervisor. These sheets will be furnished by this office.

A company.—The maximum number of soldiers in a company is 100.

Officers.—Each company to have a captain and one or more lieutenants, the latter depending upon the number of soldiers enlisted.

Insignia.—For the private, a bronze and black enameled bar with U. S. S. G. on it; for the second lieutenant, a bronze bar with one star in the border; for the first lieutenant, a bronze bar with two stars in the border; for the captain, a bronze and black enameled double bar. These insignias will be furnished by us upon request, stating the number of enlisted garden soldiers.

Aim.—The aim of this Army is to nationalize and unify the great work now being carried on among the school children of America.

GARDEN RECORDS.

Every gardener should keep an exact record of his expenditures and receipts. The following samples of accounts may be used by the teacher for this purpose. Small blank books may be obtained and the children directed how to rule them off into the various accounts needed.

Date of planting.	Names of vegetables, flowers, and fruits.	Dates of harvesting.

WORK DONE.

Date.	Number of hours.	Kind of work.	Cost.

COST OF GARDEN.

Date.	For fertilizer, seeds, tools, etc.	Cost.

VEGETABLES USED AT HOME.

This record should be kept to conform to the standard measures of your local market. The teacher should get local market quotations every few days and help the children enter true value on this form. Children should be taught to read market reports and keep themselves informed as to values.

Date.	Baskets.	Name of vegetables, flowers, and fruits.	Value.

CANNED PRODUCTS USED AT HOME.

Date.	Number.		Name of vegetables or fruits canned, preserved, or pickled.	Value.
	Quarts.	Pints.		

CROPS SOLD.

Date.	Quantity.	Name of vegetables, flowers, and fruits.	Cash received.

TOTAL RECORD FOR GARDEN YEAR.

COST OF PRODUCTION.				MONEY VALUE OF PRODUCTS.			
1. Your own work,hours, at 8 cents.....				1. Value of products used at home.....			
2. Horse labor,hours, at 15 cents.....				2. Value of products sold.....			
3. Cost of seeds and plants.....				3. Value of canned products for home use (look up market price).....			
4. Cost of manure and fertilizer.....				4. Value of canned goods sold.....			
5. Cost of cans, jars, and labels used in canning.....				Total.....			
6. Other expenses.....				Expenses deducted.....			
Total.....				Net income.....			

LESSONS IN GARDENING FOR THE SOUTHWESTERN REGION.

The following 40 lessons in gardening are suggested as a suitable course for schools that can devote only two lessons a week to the subject from January to June. The list is based on the Garden Manual for the Southwestern Region of the United States School Garden Army. Each lesson can easily be taught in a 15-minute recitation period in any grade above the third. The Lessons in Gardening for the Southwestern Region will be furnished garden teachers free on application to the United States School Garden Army, Bureau of Education, Washington, D. C.

- Lesson 1. First Catch Your Rabbit.
- 2. How to Choose Your Garden.
- 3. How to Plan Your Garden.
- 4. Companion Crops.
- 5. Succession Crops.
- 6. Small Garden Plans.
- 7. Large Garden Plans.
- 8. Selection of Crops for Garden.
- 9. The Seed List.
- 10. Buying Garden Seed.
- 11. How to Prepare Your Garden.
- 12. Humus.
- 13. Manure.
- 14. Fertilizers.
- 15. Mulches.
- 16. Radishes.
- 17. Onions.
- 18. Lettuce.
- 19. Turnips.
- 20. Beets.

- Lesson 21. Seed Testing in the Schools.
- 22. Weeding.
- 23. Thinning.
- 24. Tomatoes.
- 25. Peas.
- 26. Potatoes.
- 27. Sweet corn.
- 28. Cabbage.
- 29. All Season Cultivation.
- 30. Rotating Your Garden Crops.
- 31. The Care of the Garden.
- 32. Garden Pests.
- 33. Spraying.
- 34. Kerosene Emulsion.
- 35. Cabbage Pests.
- 36. When to Gather Your Vegetables.
- 37. Selling Your Vegetables.
- 38. Storing Your Vegetables.
- 39. Types of Marketing.
- 40. Judging Home Gardens.

LESSONS IN CARPENTRY FOR THE SOUTHWESTERN REGION

The following lessons in carpentry are presented as a guide to the student in the study of the subject. The first lesson is on the subject of the square and the second on the subject of the level. The third lesson is on the subject of the plumb line and the fourth on the subject of the try square. The fifth lesson is on the subject of the marking gauge and the sixth on the subject of the marking knife. The seventh lesson is on the subject of the marking plane and the eighth on the subject of the marking chisel. The ninth lesson is on the subject of the marking bit and the tenth on the subject of the marking saw. The eleventh lesson is on the subject of the marking file and the twelfth on the subject of the marking rasp. The thirteenth lesson is on the subject of the marking sandpaper and the fourteenth on the subject of the marking brush. The fifteenth lesson is on the subject of the marking cloth and the sixteenth on the subject of the marking paper. The seventeenth lesson is on the subject of the marking tape and the eighteenth on the subject of the marking string. The nineteenth lesson is on the subject of the marking wire and the twentieth on the subject of the marking cord. The twenty-first lesson is on the subject of the marking thread and the twenty-second on the subject of the marking twine. The twenty-third lesson is on the subject of the marking cord and the twenty-fourth on the subject of the marking rope. The twenty-fifth lesson is on the subject of the marking cable and the twenty-sixth on the subject of the marking wire. The twenty-seventh lesson is on the subject of the marking cord and the twenty-eighth on the subject of the marking rope. The twenty-ninth lesson is on the subject of the marking cable and the thirtieth on the subject of the marking wire.

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