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Making Horticulture Pay

Experiences in Gardening and
Fruit Growing

Compiled and Edited by

M. G. KAINS

Associate Editor American Agriculturist Weeklies

NEW YORK

ORANGE JUDD COMPANY

1909

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NEW YORK

PRINTED IN U. S. A.

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P R E F A C E

THE prime object of Making Horticulture Pay is not to teach the specialist how to make his specialty profitable; he knows that already. Nor is the principal aim to teach mere money making; that has long been over-emphasized on every hand, with the result that people are so attracted by the glitter of gold that they lose sight of the really profitable features of the thing in hand, whether that be gardening, orcharding, or general business.

To make horticulture pay in the largest sense is to realize and establish an improved mode of living, a better appreciation of what is good in life, a deeper sympathy and understanding of the universe as typified by cultivated plants. Hence the dominant idea of this book is to encourage the average farmer and householder to emancipate himself and his family at least a little from the routine still too common in farm living, to make some of the barren spots fruitful, to eliminate some of the drudgeries (work for wage is drudgery, but work for better living is play), and by example rather than precept to spread the good news that the men and women whose farms include orchards and gardens are more than landlords and landladies of dirty acres: they are the real lords and ladies of the land.

In this aim the editor has striven in the following pages to present experiences of actual farmers

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rather than of specialists, and especially experiences of women, because on so many farms the women are the gardeners and small fruit growers, but are usually so modest that it is hard to induce them to write. These experiences have been gathered from very many states so as to show the wide territory over which fruit and vegetable growing is being made profitable. Since the money standard is the one by which the majority of people judge of profit, figures have been presented wherever reliable ones could be procured. Some of these have been supplied by market gardeners and fruit growers, but preference, where there was a choice has been given to "home figures."

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CHAPTER I

Introduction

Ef I had t' git rid uv a grees spot onto my karpit or a gardening spot onto my farm, i ud tackel the grees spot.

—Joe Moggason.

If one really desires to succeed in horticulture, nothing can stop him. The little failures that may appear from time to time with various plants, and in different seasons, always lead to better directed efforts, and consequently better success, provided the desire to have a garden is genuine. Supposing some kinds continue to fail even under the best of treatment, one is not obliged to give up. There are other varieties in abundance and the right ones are sure to appear if one is persistent.

What matter if one has not the "rich garden loam," the "southern exposure," and the other factors that writers on horticulture emphasize so often? They are all secondary to the desire to have gardens and orchards. With the desire, one can succeed in spite of their absence. Why, up in Canada I had a garden, a good garden, one whose fruits, flowers, and vegetables paid me well, on a clay soil heavy and sticky enough to make into brick. In Michigan I had another good one on such light sand that I was almost obliged to sit on it to prevent its being blown away when it was dry, which it was most of the time. In the District of Columbia I had one on mud flats pumped up from the bottom of the Potomac river to fill a marsh. This land was so hard that when first plowed the three-horse team turned it up in clods

as big as my body, and it was so full of poke and bindweed that three years were needed to get the upper hand. But I had my garden—Uncle Sam's garden, rather, this one. Again, in New York state I have had gardens on such steep and stony land that without very careful handling the top soil would journey off to sea whenever there was a rain, and leave nothing but a stone quarry behind, a thing that occurred in spots more than once.

My plantations have ranged in size from a tenth of an acre to 30 acres, but for downright profit the smaller ones have paid more to the square foot in actual money, not to mention joy and good living, than the big ones ever did.

If one really desires to have fruit, vegetables, flowers, and attractive home grounds, neither poor soil, nor lack of time, nor hillsides, not stones—nothing can stop him. He'll have it.

THE FARMER'S OPPORTUNITY

It is the farmers' and village residents' privilege to enjoy abundance of the best fruit and vegetables, but how many realize it? Taking the country as a whole, very few. Why? Is it because of the cost? Surely not. A first-class orchard and berry patch big enough to supply any family with ample fresh and canned fruit for the year can be bought and planted for \$10 to \$20, and the annual cost of care should not exceed 20 per cent of the first cost. Five dollars' worth of choice vegetable seeds, properly planted and cared for, will yield a wealth and variety of food that cannot be bought from the huckster for twenty times that amount. They will, moreover, be fresh and ready when wanted, which purchased vegetables not always are. And as to

flowers and ornamental shrubs and trees, these can be largely found in the woods and fence rows. They are often far better than the costly things offered for sale.

The farmer who has no orchard and no garden must either have a bare table or buy what he needs. To do either is expensive. Fruit and vegetables cost far less than flour and meat. If produced on the place, they cost still less than if bought from the vendor. Hence the more abundant the home supply, the smaller the butchers' and grocers' bills. From this it is evident that doing without garden and orchard is false economy, because one pays out more money to get less than if he used a fraction of the amount as a garden and orchard investment. He is living expensively, but by no means luxuriously; whereas garden and orchard reverse the case and enable him to live luxuriously, with economy.

FARM VALUE INCREASED

There are more ways to make horticulture pay than by growing a big acreage of some fruit or vegetable crops and sending the produce to market. Special emphasis is laid on this home phase of horticulture, because it is least appreciated. A well-kept garden and orchard make every farm worth more than the same farm would be without them. Each is recognized as a permanent asset far more valuable than the original cost plus the annual cost of care. Each yields an average annual revenue with less yearly attention than any equal area on the farm. Hence the increased value of the place. But more important is the fact that well-chosen shade trees, ornamental vines and shrubs and hardy perennial flowers, tastefully arranged about the

place, make a home instead of a group of barns and houses, big and little. A farm with a home on it has an increased value far in excess of the cost of the gardens and grounds that make it a home.

From such a home the rising generation is slower to depart than from the farm where they are absent, and to it those who do leave will return more gladly than to the bleak acres void of either. Therefore, if it be true that human love is reached by the highway to the stomach, and that digestion is better where one is contented and happy, it certainly follows that love of home will rest upon a far more secure footing where gardens and orchards are part of the farm equipment than where they are not. So the farmer who has both is the man who is not only enjoying life as he goes along; but is fostering a love of home, which is the bulwark of nations.

There is still another way in which horticulture will pay, and that is in the opportunity it affords to help one's neighbors. At first this may seem to be limited to giving away a few vegetables, fruits, and flowers, or inviting friends to enjoy these luxuries on the place or at the home table. But soon these hospitalities do their gentle work and one neighbor after another will begin to slick up his place a bit and plant an orchard and a vegetable garden, and, perhaps, a little later, set out some ornamentals. Thus the whole community will get the benefit of one good example. Who can estimate the value to the nation as this influence extends? The way to estimate how horticulture pays is far beyond any little dollars and cents measure, though this must not be dropped from view.

CHAPTER II

Soils and Their Care

It is more profitable to use soil for gardening than for writing autographs on newly scrubbed floors.—Buck McCrawley.

There is no set standard for measuring the qualities or classifying the merits of soils. Some soils are naturally fit for fruits and vegetables, others have to be bolstered up and coaxed and others are altogether out of garden and orchard classes. These last are few. They are too insignificant to serve as drawbacks. On every farm a garden patch and a fruit plantation site can be found. If not already serviceable, it can be made so. Good drainage, good tillage, an abundance of manure and high-grade fertilizers will do wonders. Stubborn the soil may be, but by proper handling in time the most stubborn soil will respond. And sour or hard or light or stiff, these five will prove a general panacea for most troubles and difficulties. In fact, every bit of knowledge gained about soils emphasizes only the more the healing effect of tillage and humus in soil difficulties.

“The real secret of tillage,” writes Prof. C. W. Burkett, “lies in the depth that the soil body is stirred. Shallow spading or plowing will not do the stunt. One must have a deep body of soil, 10 to 15 inches, and this must be so well worked that no clods will be found anywhere. Particularly not down below, because clods resting there, although covered up, will interfere with air and water circulation and with the spread of the roots. A strict

observance of these facts will aid in securing quick growth and a heavy yield.

“The soil all the way down should be fine, mellow, and yet compact. It should be healthy, rich looking, and in good heart. This condition is obtained when lime has been added to sweeten the soil and to keep it sweet when vegetables and stable manure are liberally applied to loosen and liven up, and when fertilizers are injected to stimulate growth and to keep the soil abundantly supplied with immediately available plant food.

“After getting the garden going change the crops around. Do not grow the same crop year after year in the same spot. Garden crops rebel against this hardship just as do field crops. Their roots like change; they enjoy variety just as do live, active men and women. And there are good reasons for this change. Plants differ in their tastes. Grown in the same place for some years they find the soil stale; they grow tired of it. Potatoes do well following peas and beans; melons after potatoes, and cabbage and melons after turnips and corn. Change the little spots, rotate them about, first here, then there, then elsewhere. It all pays, because the change is helpful to the crop.

TECHNIQUE OF HANDLING SOILS

“Try to do the soil work at just the right time. Fall and winter plowing are very helpful. The clods are pounded and broken down by the hard frost that puts the soil in far better physical condition than would be possible by spring plowing. As a rule, too, one wishes to get certain garden crops started early. When tillage is done while the ground is still wet, the land is injured, maybe

beyond help for an entire season. Especially is this the case when clay is more or less prominent in the make-up of the soil.

“But this difficulty is not presented when fall or winter plowing has been resorted to. The surface or top soil has been harrowed and pulverized by frost, the seed bed is aired and dried for early

WEEDERS AND CULTIVATORS

1, Triangular Weeder; 2, Spring-tooth Weeder; 3, Single-row Cultivator; 4, Double-row Cultivator; 5, Single-row Straddle Cultivator.

working, and the storage bed beneath has been filled, thus providing for a good moisture supply. Many seeds may be planted early, much earlier than would be possible if plowing is postponed until spring.

“Stable manure, when employed in garden making, should be added in fall and winter and not in the spring. This allows thorough decay and the residue is better incorporated in the soil. The

earth, too, compacts better, capillarity is improved and better heart is secured. These things mean much in handling the garden and the orchard with ease and satisfaction.

“It is understood, of course, that no neglect will be shown in preparing the seed bed. The closest observance will be given to all details of fining, pulverizing, leveling, and even smoothing the surface earth. And since the soil is to be so full of rich humus material, every precaution at seeding will be taken to have the garden seed covered just right and the soil all about pressed or compacted. Shrewd gardeners use a board or the foot for this purpose. Such are the final touches to complete the work.”

CHAPTER III

Fertilizers and Fertilizing

Most plants thrive best on three-course meals: potash, phosphoric acid, and nitrogen.—All Authorities.

In gardening two factors are essential: First, a soil that is capable of absorbing and holding water without being so compact and tight as to prevent free movement of water in all directions, and, second, plant food. "Probably a typical garden soil would be a sandy loam," writes Dr. E. B. Voorhees, director of the New Jersey Experiment Station. "This kind, however, would be largely regarded as a good place for the plants to grow, rather than as a source of the food required. Hence the second factor, an abundant supply of all kinds and forms of plant food needed.

"This latter may be accomplished by the use of the manures, preferably well rotted, which contain plant food in more or less soluble forms, but which possess, in addition, decaying vegetable matter, so important in contributing to the physical character of soils, more especially in the matter of holding moisture. Hence, any soil well adapted naturally for gardening should either be heavily manured or should have been subjected to green manuring for a sufficient period of time to build it up in vegetable matter.

"Owing to the cost, both in money and labor, of supplying the food requirements through the use of manures only, nowadays resort is made to commercial fertilizers. These not only supply the total

food, but are capable of supplying it in such forms as to enable the plants to absorb it at once. That is, there is no necessity for any delay, in order that the plant food constituents themselves may be made available.

"Fertilizers are, therefore, capable of supplying the needed requirements when other conditions are favorable and may be grouped into three classes, i. e., general, specific, and basic. That is, a general formula would be one that is not made for any specific crop, but which contains both soluble and insoluble forms, with the idea of building up the soil in the constituents, rather than meeting the special requirements of any one crop.

GENERAL FERTILIZER FORMULAS

"The specific formulas are those which are made up for the purpose of meeting a particular need of the crop, at a particular time, and basic formulas may be regarded as those which contain large quantities of all of the best forms of plant food. They are to be used as a base for supplying garden crops with their general needs, with the idea that amendments may be made of nitrogen, or of other constituents, as the conditions seem to require. A general formula, for example, may be made up of a mixture of, say:

Ground bone	250 lbs.
Acid phosphate	500 lbs.
Muriate of potash.....	250 lbs.

"This will supply, not large quantities of nitrogen, but considerable of the minerals, and so fortify the soil in this respect. It should be applied at the rate of 500 to 1,000 pounds an acre, depending upon conditions.

“In gardening, the object is, as a rule, not only to obtain a large crop, but to have it ready as early as possible. Hence, as a rule, soil supplies of plant food are disregarded and formulas are made up and used, containing large proportions of all of the constituents and in immediately available forms, because the purpose is not only to feed the plant, but to see to it that such an abundance of available food is present that under even slightly adverse conditions the plants may not suffer. That is, being in a soluble form, if dry weather comes, so long as there is any moisture in the soil, these soluble forms will be capable of feeding the plant.

“A good basic formula for such garden crops as asparagus, cucumbers, early tomatoes, onions, cabbage, cauliflower, celery, eggplants, melons, peppers, squashes, etc., may consist of:

Nitrate of soda.....	100 lbs.
Sulphate of ammonia...	100 lbs.
Dried blood	150 lbs.
Ground bone	100 lbs.
Acid phosphate	450 lbs.
Muriate of potash.....	150 lbs.

“A mixture of these materials of standard quality would show an average composition of 5.5 per cent nitrogen, 6 per cent ‘available’ phosphoric acid, 7.5 per cent total phosphoric acid, and 7.5 per cent potash.

TOP DRESSINGS

“In many cases it might be necessary during the growing season, particularly in the case of such crops as early beets, early cabbage, melons, and celery, to make additional dressings of nitrate of

soda, preferably in fractional applications of, say, 100 pounds each. That is, the early beets, after transplanting and being properly set, should receive a top dressing of 100 pounds of nitrate of soda every ten days until 300 pounds has been applied, in addition to 800 to 1,000 pounds an acre of this formula. The object of this being not only to give the plant what it needs at the time it needs it, but to guarantee the fullest use of this substance, which is so soluble that, if applied early in the season, a large proportion may be lost by washing out of the soil.

“The same is true of celery, which is not only greatly improved in quality when conditions are made favorable for rapid and continuous growth, but is also largely increased in yield. As high as 400 pounds of nitrate of soda, applied as above stated, in addition to the application of the basic formula, has proved most profitable.

“The application of these concentrated fertilizers, more especially the dressing made after the plants are growing, should be carefully made, so as not to injure the young and tender vegetation. The fertilizer should not be scattered broadcast over the plants when the foliage is wet, but rather applied along or between the rows, and the land immediately cultivated.

“A good plan to follow is to apply the general fertilizer broadcast as soon as the land is plowed, and then worked in during the subsequent cultivation. A part of the special or basic formula may then be applied in the row, and preferably lightly covered with soil before setting the plants or seeding, and the fractional applications of nitrate, ammonia, or acid phosphate applied as before outlined. For most garden crops there is little danger

of using too much, provided the soils are in good condition, the cultivation good and the proportions of the constituents such as to provide an abundance of minerals in available forms."

LIME OR LIMESTONE

Lime is applied to the soil mainly to make heavy soils lighter, to make sour soils sweet, to make certain mineral compounds soluble so plants can utilize them, and to act upon the organic matter and make it release plant food.

As to what form lime shall be applied in, J. C. M. Johnson of Lawrence county, Pennsylvania, writes: "I am confronted with the problem of applying lime to my soil, either in the form of ground limestone or of burnt lime. I have worked out the solution for the conditions on my own farm, where I can buy burnt lime at an adjoining farm at \$2.50 a ton. I must import powdered limestone from Ohio, paying the heavy railroad freight of \$1.60 a ton. If I lived near the works in Ohio and could haul the powder to my farm, the case might be different; or, if I lived near the south Illinois penitentiary at Maynard, I could buy powder at 60 cents a ton.

"The whole question is a chemical one. Its solution depends upon the quantity of the active lime that I would get in a ton. Limestone, or calcium carbonate, is composed in the proportion of 40 pounds of calcium with 12 of carbon and 48 of oxygen. By burning the stone, 44 pounds of carbon dioxide are driven off. That is, all the carbon and part of the oxygen are forced out by heat. The 56 pounds of quick or burnt lime left is called calcium oxide. By adding 18 pounds of water to the 56 pounds of burnt lime we get 74 pounds of slaked

lime, or calcium hydroxide. Thus, 100 pounds of limestone, or 56 of burnt lime, or 74 of slaked lime, contain the same amount of calcium, which is the valuable part in either of the forms of lime mentioned.

“Which shall we use on our land—the ground limestone, the burnt lime, or the slaked lime? As each form contains the same valuable element, calcium, the question is evidently one of cost. In order to answer this, we must ask how much ground limestone is equal to 100 pounds of burnt lime. If burnt lime is worth \$2.50 a ton, and limestone powder is worth \$1.25 a ton at the works, and the freight on the powder \$1.60 a ton, how much do I pay for enough limestone to equal one ton of burnt lime? It is easily seen that a ton of limestone powder costs \$2.85.

“Now, how much limestone powder do I have to buy to get the equivalent of one ton of burnt lime? Of course, we must pay 20 times 179 pounds, or 3,580 pounds. This costs \$5. Thus, if I apply limestone powder, I pay exactly twice as much for my calcium as when I use burnt lime at \$2.50 a ton.

“From this discussion it is evident that the whole question narrows itself down to the comparative cost of each one of the two forms of lime considered. If a farmer can buy limestone powder for one-half what burnt lime costs, and the hauling distances are about equal, it matters little which he applies. Nevertheless, ease of application should be considered, for it costs much more in time, work, and hauling labor to apply 3,580 pounds than it costs to apply 2,000 pounds.

“Whoever is interested in lime, soil fertility, or soil renovation should read what leading authorities say on the subject in various books on soils.

There are, of course, other questions to consider besides the cost and ease of application in connection with the application of lime; for example, some authorities claim that burnt lime depletes the humus in the soil, and ground lime increases the humus content. Such questions are taken up in books on soils. The question I have been considering is one of the cost."

COMBINATION HAND CULTIVATOR AND DRILL

GREAT VALUE OF HUMUS

Humus in the soil has seldom been taken at its full worth. The mission which it fulfills is second in importance only to that which is fulfilled by the presence of plant food in the soil. Humus is helpful in keeping soil in proper physical balance, in binding soils that are much prone to blow, in increasing the power of soils to absorb and hold moisture and in making more effective the action of fertilizers.

When the humus is exhausted the physical condition of the soil suffers. The soil becomes more impacted, less easily aerated, and less easily penetrated by the roots of plants. Some soils so light as to lift with the wind can be kept from blowing, at least in a great measure by simply keeping them stored with grass roots or other vegetable matter buried in the soil. The increase in the power of soils to hold moisture is very great when well stored with humus. When commercial fertilizers are sown on land they will fail to respond properly unless the land is supplied with humus.

Such being the case, every effort should be made to store the soil with humus. It would not be impossible to have excess of humus, but in practice this seldom happens. Humus may be put into the soil in the form of clover roots and of grass roots, of buried catch crops and barnyard manure.

CHAPTER IV

Water and Its Control

The better the drainage, the surer the water supply.

—New England Homestead.

The importance of having the garden well drained is not half appreciated. Of course, if the land is naturally well drained there would be no necessity of doing the thing artificially. But if the land is low or pockety, it is likely to need draining. While water is necessary to crop growing, excess of water is a detriment in several conspicuous ways.

First, the soil is sure to be cold and wet in spring and consequently late; second, it is likely to become dry and to bake during summer, because the water has evaporated, and thus the crops suffer for lack; third, it may become sour and filled with weeds difficult to eradicate, and for both these reasons it would be hard for cultivated plants to get along.

Drainage takes away excess water, makes the soil warmer and earlier, removes the cause of sourness, but, most important of all, it prevents the baking of the soil during summer. In fact, in this last direction it positively increases the amount of water available to the plants during hot and rainless weather, for it insures a steady water flow from below toward the surface beneath which it may easily be held by good methods of tillage.

Upon a somewhat larger scale than the ordinary home garden is the following experience which illustrates not only the importance of good drain-

age, but a simple method of laying tile. Joseph Rennie of Lake county, Illinois, writes:

"I have 15 acres of land devoted to the raising of vegetables, and five acres of that area are drained. My first attempts at draining were a failure. The reason for this I afterward found to be that I had placed the tile only 2 feet deep, and the water never drained out, so that the ground above the tile was dry. An old farmer said to me: 'It isn't the surface water that spoils your crop, it is the suck water.'

"I relaid all the tile $3\frac{1}{2}$ feet deep in the shallowest places, and as much as 6 feet deep in some of the other places. I got a good fall, and all of the tile is below the frost line. I think the frost does not hurt the tile, even when it is not below the frost line, provided the water can all flow out and not get frozen up in the tile. If it freezes in the tile, the tile will go to pieces.

"Part of my tile is laid in quicksand, but it has given me no trouble. In laying in quicksand it is only necessary to get a smooth surface on which to lay the tile, and then pack in around it with the surface soil. The quicksand taken out of the ditch can be used to cover over the top of the surface soil. Some of my neighbors in laying tile in quicksand cover the joints with tarred paper, fearing that the sand will run in around the joints and fill up the tile, but I believe little sand goes in.

"My soil is a sandy loam, and I lay my lines of tile 30 feet apart. Some of my neighbors who have a heavy clay soil lay their lines about a rod apart. My method differs in that I run all of my lines parallel to each other, and each line empties into an open ditch. The other way is to lay one main line of, say, 8-inch tile and have a large number of

laterals, consisting of 4-inch tiles. But the trouble with that comes at the joints. It requires a great deal of close figuring to get the right levels for all these laterals and the main line. Practically the levels over the whole field have to be worked out, or there will be trouble. To get a good job with that system requires the skill of a drainage engineer. With my system each line is by itself, and its levels are the only ones that have to be considered. I can do that figuring myself. One of my lines was 400 feet long, and had but a 5-inch fall, but the levels for it were about perfect."

CONSERVATION OF MOISTURE

Eastern and southern farmers have much to gain by close study of the methods employed in the West to conserve moisture in the soil, because water saving is their problem, also. When an abundant, well-distributed supply of rain prevails, good crops follow. This order of things is not the general rule, however, as every crop grower well knows. To meet the situation so a good supply of soil water may be had, even in dry seasons, is possible if diligent attention be given to the land.

Some of our best farmers like dry seasons, even prefer them to wet seasons; enough water is stored away for maximum yields, weeds are not so apt to bother, and the work of planting and cultivating is made easy and inexpensive. The water storage work must be done during months long before water is demanded by growing crops. Fall plowing does much, winter disking carries the work forward, and a big humus supply completes the job.

If land is in tough sod one cannot expect much water to find its way down; if rolling land is tucked in by a hard, smooth surface layer, water

will find the stream with more ease than the reservoir down deep in the soil. Consequently if plowing, disking, and mulch making are delayed or minimized, the chances are that the warm winds of spring will lick up water so fast that the supply can never be fully replenished.

The secret of water control lies with tillage tools. Lands that are to go to spring crops should be

STYLES OF HARROWS

1, Disc; 2, Spike Tooth; 3, Adjustable Spike Tooth; 4, Spring Tooth.

broken and furrowed. Any way will do, but the water must be held long enough to soak into the ground. Then the disk harrow will take care of future showers and at the same time will blanket in what has already been sent below. Later on this land can be plowed to good advantage all around. The soil will turn better, the team will do more work and the crops will have more water. It is important that close attention be given this water supply matter. It is especially important with lands frozen during much of the winter, because the

greater part of all precipitation is lost to the soil. When better preparation is given the land, the water supply will be regulated, fertilizers will do their work better, micro-organisms will be more active, and, what is more to the point, crop yields will be increased.

CHAPTER V

Function of Cultivation

*Dam the water flowing skyward from the surface soil;
Break the surface, keep it broken. This is paying toil;
For it holds the water surely where the crop root feeds.
Gives the plants abundant moisture to supply their needs.*
—Truefellow.

“Plow deeply, harrow deeply, and cultivate shallow. That is the keynote to success,” says W. H. Riddle of Baltimore county, Maryland, “in raising any crop where the ground should be plowed. The deeper the plowing, the larger the bed to hold the rains as they fall. The deep plowing, say, 8 to 10 inches, prevents washing, more than shallow, as the more water that is held leaves less to run off the surface. To retain the moisture rub or roll and harrow once as you plow. The earth is like a lamp wick, full of pores, and the moisture is drawn up by the sun, as the flame draws up the oil. Leaving the ground open and rough prevents the escape of moisture; closing up the top with fine dirt closes up the pores, so that the moisture cannot escape any more than the oil can be drawn up through the smut on the lamp wick.

“To break up the oil trust we have only to leave our lamp wicks untrimmed, and the oil will always be in the bowl; so to cover the farm with smut in the shape of fine dirt holds the moisture, instead of letting it be drawn up by the sun to fall down as rain somewhere else. As farmers learn this way of holding moisture they will stop fearing drouth.

"Harrow deep, cut the soil positively fine all over 4 or 5 inches deep, so the crop can send out its net-

ROLLER

work of roots all through the ground to take up the available plant food. A clod is not as good as a stone on top of the ground; the latter will prevent the

moisture from escaping, while the clod will not give out any plant food. In preparing for any crop I go over the land and run my foot through, toe downward, in the soil, so that I cannot reach any ground not cut to fine pieces. Until I get it that way I do not want to plant.

"As I have not enough straw, or bags, or boards to cover my ground, I mulch with a blanket of fine dirt and keep the soil mulched, never letting a crust form. This is the whole secret of cultivating any crop. I do not care about killing weeds. I never want to see any to kill, so I kill the seedlings as they sprout. Only those seeds on top or very close to the top sprout and grow. I need only to stir the ground an inch deep; this inch of fine dirt mulch holds the moisture. Those weed seeds deeper down I never want anything to do with. I let them stay there, where they lie down, and they never give me any trouble.

"Now, then, get your ground plowed and harrowed right. Begin three or four days after planting any crop to kill those weed seeds on top as

PLANKER

they sprout. Form that inch of fine dirt mulch by going over the land twice with a very fine-toothed

harrow, if you have not a weeder, or a surface cultivator, whose wings or knife blades shave the ground an inch deep. Failing this, take off those root-murdering cultivator teeth from the cultivators you have, and bolt on the gangs of weeder teeth made to go on any style or size of cultivator, and if not any of these take your horse rake and go over your crop twice before it comes up. These, any of them, will kill the millions of weed seeds as they sprout."

PLANKER

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CHAPTER VI

Fruit Plantations and Their Care

Order your plants with reason, but insist upon their obedience.

—Orange Judd Farmer.

PROPAGATION

Several methods of propagation are so simple that any amateur may practice them. Probably the simplest of all is layering. In this case a new plant is procured without severing a stem from the parent plant. The simplest forms of this method are with the strawberry, which sends out runners that need only be anchored with stone or clod in order to take root, and with the blackcap raspberry, which takes root from the tips of the present season's

LAYERING

A, Black Raspberry; B, Strawberry; C, Grape; D, Quince.

MALLET
CUTTINGS

canes, if these are anchored so the wind does not whip them about.

Modifications of this method are employed with the grape and other vines, currants, gooseberries, etc., which are buried shallow and allowed to remain so for several weeks. The buried shoots readily take root and can be severed so that at least one bud or growing stem is allowed to each little clump of roots. With quinces, gooseberries, and currants mound layering is often resorted to. This consists in piling earth around the bushes to the depth of several inches, and when the stems have rooted, cutting these off with their attached roots, and transplanting.

Propagation by cuttings is so simple with most outdoor plants that anyone can employ it. For instance, blackberries and red raspberries need only to have their roots cut in pieces and these planted in

moist soil in order to secure new plants. Grape vines may be cut into single eyes or two-eyed pieces, and buried for several weeks. Sometimes they are cut with a heel or mallet so as to get a wider area and root surfaces for each stem. As soon as they are rooted, and the tops are growing nicely, they may be transplanted to nursery rows and allowed to grow a season before being set in place. All these plants mentioned are

ROOT
CUTTING

so treated in early spring, and so are currants and gooseberries and many hardy shrubs for ornamental purposes. In many cases the twigs are merely pushed into the ground and the earth firmed about them.

ROOT CUTTING

For indoor cuttings a saucer may be filled with sand and kept moist for such green wood cuttings as geranium, carnation, chrysanthemum, etc. When these have produced roots they may be transplanted to little pots or boxes and transplanted again from time to time as the plants grow, and fill the pots with roots. Always in making green wood cuttings, it is advisable to cut close to a bud at the lower surface, at least one half.

A very convenient method of securing rooted cuttings is to use two flower pots, a large one with gravel, broken pots or other material in the bottom to form drainage, and then a smaller pot with the drainage hole plugged to prevent leakage. This pot is then set upon the drainage and the space between the two pots filled with sand. Finally the inner pot is filled with water and the cuttings placed in the sand around its edge.

FLOWER POT
Cutting Bed

EYE CUTTING

For starting seedlings in the greenhouse or in hotbeds, it is often desirable to use flats, that is, boxes not over 3 inches deep and of any other convenient dimensions. These boxes are filled almost full of soil and the seeds sown therein. They are also useful for pricking out seedlings of such plants as cabbage, cauliflower,

MARKER AND FLAT

tomatoes, peppers, etc. The young plants are put at distances of, say, 2 inches, to develop abundant roots, and to become stocky. In order to get them at even intervals, a marker is often used as shown in the illustration.

SIMPLE METHODS OF GRAFTING

In grafting the simplest method is the cleft. This method is most commonly employed in large trees. The stock or main limb is sawed off at right angles to the direction of its growth. A cleft is made in the end and a scion whittled in narrow wedge shape is thrust into this cleft, which is held open by a wedge until the scion is in place, then the exposed surfaces are covered with grafting wax.

BUDDING KNIFE

This is made by melting one part of tallow and two of beeswax with four of rosin in a kettle, and when melted, pouring into a pail of cold water and working with the greased hands until the stuff resembles taffy.

The two essential points in all grafting methods are to have the growth layer (cambium) of both stock and scion come in contact and to exclude the air. The growth layer is between the bark

and the wood. In order to insure this contact, it is advisable to set the scion at a slight angle across the growth layer in the stock.

Another method often employed is known as the side graft. In this case the cleft is made on the side of a limb and the scion inserted there instead

STYLES OF GRAFTING

A, Shears; B, Grafters' Tray; C, Grafting Wedge; D, Cleft Grafting; E, Side Grafting; F, Saving Girdled Tree; G, Whip Grafting.

of at the end, the limb being sawed off after the scion has made a union. Still another method employed with small-sized trees, twigs and branches is known as the whip. Both scion and stock are cut diagonally across, then split down the center a short distance and then the tongue of one is made to fit into the cleft of the other. Finally the graft

is covered with grafting wax or wound with yarn dipped in wax.

Occasionally it becomes necessary to save trees which have been girdled by mice or rabbits. This is a very simple operation if performed in time. It consists in inserting several scions close together and around the trunk, both above and below the injuries, and then covering the exposed surfaces with grafting wax. These scions soon form connections between the root and the upper trunk and growth goes merrily on.

Budding is a form of grafting in which a bud of the present season's growth is inserted in the stem of another tree, usually a small one, sometimes, however, in upper small branches. There are several styles, the commonest of which is T-budding. In this case a vertical slit is made just through the bark and a cross-slit made near the top. The bark is gently loosened and the bud inserted underneath this bark and then tied with strips of cotton cloth. In a few days, if the bud has formed a union, the string must be cut to prevent strangling. Another method is to make a ring of the bark with the bud just large enough to go completely around the stem of the stock, from which a similar ring of bark is cut. Tying in the same manner completes the operation.

HOW TO SELECT FRUIT TREES

Two of the important questions with the fruit grower today are: Where can I get the kind of fruit trees and select them to my own liking? Orlando Harrison of Worcester county, Maryland, declares there is but one answer to the questions: "Go yourself to the nursery and be convinced whether you

are willing or not to place yourself in the hands of the nurseryman. If satisfied, make up your list of varieties so the nurseryman can tell you whether good or bad, or whether he grows these kinds. Many growers want at least ten times too many varieties and often worthless sorts for their locality, simply because they have noticed the variety well advertised. Confine yourself to few.

“Ask the nurseryman to explain his methods of growing from the seed or seedlings to maturity, and you will then not ask for cheap trees. A visit will convince you that no good nurseryman is sparing either money or effort today in producing the very best trees that can be grown. He must be up to date on practical and scientific problems pertaining to all nursery and orchard work, and to protect himself and you, you will find he is only too glad to impart this knowledge to his customers. A visit to the nursery will convince you.

“Some nurserymen employ the best scientific men for inspection work and fumigation, and for looking carefully into the matter of spraying with the proper materials and at the proper time. These men are assisted by the state entomologist on both scientific and practical points. A visit to the nursery will convince you if such men would pay you. Some nurserymen employ men well posted on varieties of fruit, but the best of all is the experimental farm on the nursery grounds. Eating the fruit will convince you.

“When you are ready to select a good tree you will leave the whole responsibility to the nurseryman and his men, and the only thing for you to do is to select the grade of tree. Convince yourself that his seed or seedlings are the best. See that the roots are not affected with knots or aphids.

Ask where the buds were cut from and about being true to name. By cutting a tree you can tell whether the heart is affected or not.

“Ask the nurseryman not to dig too early, and use great care in keeping the trees from the sun and wind. Don’t be so rigid as to say the peaches must be 8-16 of an inch caliper, and not less than 5 feet high, and the apples must be three-quarter-inch, and not less than 6 feet high, when some varieties will make twice the growth that others will. Too many orchardists insist that trees must be exact in size and shape. You should remember that trees are not molded, but grown, and as varied in sizes as your corn in the field. It is almost impossible to keep in sizes and varieties.

“Many nurseries can show you something worth while any month in the year, if you will make the trip. Yet August and September is the best time to visit them. In January and February you find them grafting, March and April planting and shipping trees and digging shrubs and plants, May and June cultivating trees and picking strawberries, July to September picking peaches and early apples and budding trees in full force, October and November digging and shipping trees and picking apples and pears, December trenching trees and getting them ready for early spring. The nurseryman has a hard business to handle, and a visit to the nursery will convince you the price of fruit trees is far too low.”

STARTING THE ORCHARD

The first few years are the most critical of an orchard’s existence, because neglect is more likely to occur and the injuries done at this time can, in

many cases, never be overcome by subsequent good care. In discussing this question Prof. V. H. Davis of Ohio State University gives his experience as follows: "In my orchard of some 8,000 apple trees and a few hundred each of pear, plum, cherry, and peach, a plan somewhat as follows was pursued in selecting apple, pear, cherry, and plum stock.

"I took trees not more than two years old from bud or graft. In my judgment trees of this age will stand transplanting better than older ones, and in the end will make better trees. Peach trees are large enough at one year and should never be older. Trees were ordered in the fall for spring shipment, at which season, in my case, they were set out. I bought from the large nurseries that grow their own stock and deliver direct from their own grounds. The small nursery in the locality of the orchard is usually preferable for small quantities of plants, but is not available for large orders. I never buy from agents, because I object to paying their commission. The nurseryman who is largely a dealer is also avoided, for every time trees are handled the chance of mixing varieties increases and it becomes more difficult to fix responsibility in case of misrepresentation.

"Nurserymen are responding to the popular demand for low-headed trees, but trees are not low enough yet. The first branches should be not more than 30 inches from the ground and less would usually be preferable. Shipments should be made as early in the spring as weather conditions will permit, and upon arrival the trees should be unpacked and 'heeled' at once. Transplanting should be done as early as the soil will work readily.

PLANTING AND PRUNING

“The roots should never be exposed for any length of time to the sun and wind, and should always go into the soil wet. In the morning, we take up about the number of trees that can be planted before noon and prune the roots. These are placed on a sled or wagon and covered at once with straw, carpet, or burlap and water thrown over the entire bundle until thoroughly wet. Immediately after transplanting, the trees should be well mulched with hay, straw, manure, or any material not too coarse. This mulching is essential, no matter whether the clean culture or the sod mulch system is to be followed. The mulch not only holds moisture around the roots, but keeps the soil loose and mellow. A good tree well planted and well mulched will make a surprising growth the first year. I have measured as much as 5 feet in our own orchard in soil considered poor.

“Pruning is the one operation of the orchard most neglected or improperly done. The roots require little pruning, because 50 per cent or more of the root system is left in the soil, even with the most careful digging. All broken or mangled roots should be cut off smoothly back to solid wood, in order to give the wounds a chance to heal readily. A root much longer than the others may be cut back for the sake of symmetry and ease of transplanting.

WHY TOP IS CUT BACK

“After transplanting, the top is cut back to correspond to the loss of roots. Otherwise the evaporation of moisture from the top may be more

rapid than the broken roots can absorb water, and the tree suffer, if not die. With apple, pear, plum, and cherry from three to five branches should be selected from those on the tree as it comes from the nursery, to form the scaffold branches of the future top. These should be situated alternately along the trunk; never opposite each other, and should be cut back to spurs 5 to 10 inches in length. The others are removed entirely. Each of these spurs will throw out several branches the first season, but the ends of the spurs will usually dry out and begin to decay.

“The second pruning is confined almost wholly to the removal of the dead tips of these branches or spurs. These are cut back to the base of the first new branches, and if the wood shows no decay the wound is left to heal. If, however, there are any signs of decaying wood, the cut is made at the base of the next branch and so on until solid wood is found. Otherwise the decay will run back into the main branches, or even to the trunk of the tree, and eventually cause its death. Every branch that does not mar the general form of the top is left on the little tree during the second season to bear leaves and manufacture plant food.

“Root growth depends upon the leaves just as much as branch and leaf growth depends upon the roots, and the root system, weakened by transplanting, needs the stimulus of all the plant food possible in order to renew the parts destroyed. This renewed vigor immediately manifests itself in growth of top, and the less the equilibrium between root and top is disturbed, the greater will be the tendency to bear fruit so far as the pruning factor alone is concerned. Subsequent pruning should consist largely in thinning out the super-

fluous branches and wayward growth sufficient to admit proper amounts of air and sunshine. Many branches marked for removal the second or third season may very profitably be left until they have borne fruit for several years.

"Mice injuries are prevented by cleaning up all rubbish in which mice might breed and congregate, keeping the soil around the tree for 2 or 3 feet perfectly bare. Frequently a little mound of earth 6 or 8 inches high is piled and tramped solidly around the base of the tree. So far as rabbit injuries are concerned, the removal of all brush, briars, weeds, etc., in which rabbits are most likely to congregate has prevented any serious trouble with me."

COVER CROPS FOR THE ORCHARD

"Tillage burns out the humus and calls for a new supply. It lets the air in, like opening the drafts of a stove. The higher the state of cultivation," writes Prof. G. F. Warren of the College of Agriculture of Cornell University, "the more humus needed. We must supply this either in barnyard manure or by cover crops. Manure is expensive, cover crops are relatively cheap and may be made to furnish the nitrogen and humus at the same time.

"We pay 15 to 20 cents a pound for nitrogen when we get it in a fertilizer bag, but we can get along very well without applying any if we plow under clover. Occasionally the orchard may need humus without additional nitrogen; then we may use rye, wheat, oats, buckwheat, or let the summer grass and other weeds grow as a cover crop. Such a condition does not often arise in practice, for few soils are troubled with too much nitrogen.

“A common mistake is in letting cover crops grow too late in the spring. We sometimes forget that we are raising fruit, not clover. The time to plow is when it will do the fruit the most good; generally this is before the clover has made much growth in the spring. But we do not accomplish all that we expect when we leave the clover so long. Before it blossoms it has in it about all the plant food that it is going to take up. But no matter how small the clover is, the ground should be plowed at the time the trees need tillage.

“Perhaps the following is as near to a general rule as can be given. It agrees closely with the present practice of many of our best growers. Plow the land deep before planting; raise corn or other tilled crops for two or three years, plowing as deep as possible without injuring the roots. Each year a larger space should be left so that corn will not interfere with the trees. Crimson clover may be sown in the corn at the last cultivation and be plowed under early in the spring before it has made much growth.

“After the second or third year the land should be given over entirely to the orchard. It should be plowed early, before the weeds or clover have grown very much, plowing shallower than in the first years. Continue tillage with a cutaway or a spring-tooth harrow until the middle of July or August 1, then sow 15 to 20 pounds of crimson clover seed to the acre, or the summer grass and weeds may be allowed to grow. It is not always necessary to sow clover every year. If the trees are tilled too late in the season, there is danger that they will make too much growth in the fall and be more likely to winterkill. On some of the sandy soils it is not necessary to plow every year.

Some years the soil may be worked up with a cut-away or disk harrow."

MULCHING YOUNG TREES

"On account of the nature of the land at my disposal for nut orchards," writes Dr. Robert T. Morris of New York, "it was necessary to devise some labor-saving plan that would cover the whole ground in a general way. The 200 acres set out to nut trees consist in part of open tilled land, in part of rocky pasture land, difficult of cultivation, and in part of newly cleared forest land with stumps and vigorously sprouting roots. I had previously had some experience with perpetual mulch, and decided to apply this method of treatment to the entire orchard.

"It seemed to be desirable to confine the mulch to limited areas around the trees, and for this purpose I finally chose galvanized iron netting. This is more expensive at the outset than lath or boards, but it lasts for 20 years or more and in the end is very cheap. My netting is 1 foot high and it encircles a diameter which is estimated to include the root spread of any given tree. The netting stands up like a board up to diameters of 6 or 8 feet, but after that it is supported by yokes of galvanized iron rods stuck into the ground at any desirable points. As the trees grow the diameter of the mulch cage is increased.

"For mulch I use forest leaves chiefly, as they are abundant and handy. Wood ashes are sprinkled over the mulch in March. They force rapid growth safely if used properly. The chief objection to the permanent mulch seems to be in its furnishing a home for field mice, which gnaw

the bark of young trees in winter. My present plan is to surround each trunk near the ground with a collar of tarred roofing paper loosely curved, but I may later choose a galvanized fine wire mesh to insure better circulation of air.

“I do not see why the mulch cage cannot replace laborious and expensive clean cultivation and expensive special fertilization of the ground for all sorts of orchards. It seems to have solved the problem in connection with a few fruit trees on which I have tried it. The trees grew so rank that it was a question at first if they would not spend all of their force in making wood, but plum trees, especially, bore so enormously in addition to making growth, that further experimentation will be desirable.”

CHAPTER VII

Orchard Fruits

Ef i hed a no-'count farm tu sel i ud plant frute treaz onto it soze to raze the price. i ud taik cair ov them soze ever wun ud bee spilin to by. but i ud allais hold fer a hier price.

—Joe Moggason.

TREE PLANTING

“We receive trees many times that are started to leaf out and with very little packing around the roots,” writes Benton Gebhard of Michigan. “The roots are dry and many trees are fatally injured when they get to their destination. Sometimes we immerse these roots in warm water to revive them.

“The roots should be packed in building paper and moss, or partly decayed chaff. The material

TREE-SETTING DEVICES

which holds the moss or excelsior would be a proper material to use in packing the trees. Many nurseries use excelsior and rye straw in packing. You can fill a tub with water with this class of material, and squeeze the water out as much as you can, and you will have most of the water left in the tub. But if you take moss or partly decayed leaves, and fill the receptacle with water, upon taking out the moss or leaves, you will find that half or two-thirds

of the water will be taken out with it. That goes to show the material that will retain the moisture in packing trees for shipment over any distance.

“Another thing to be considered is the treatment and handling after the stock has been received. Many nurserymen are careless about exposing the roots, put the trees on wagons and drive two or three miles in the dry, hot sun, or sometimes in the cold, chilling wind, and this exposes the roots to injury every minute. They then throw the trees into the packing sheds and leave them exposed to the cold or drying atmosphere; with the result that when the planter receives the tree, the majority of the roots are shriveled and injured. They should use the utmost caution in protecting the roots, from the time the trees are dug for packing until they receive the planter’s attention, and we should give them the same care until they are growing in the orchard.

“The nurseryman is not to blame altogether. The planter is to blame in many instances. He receives the trees in a careless manner; he goes after them with a hay rack, and probably waits a day before he gets them, and during all this time the roots are exposed and drying. He seldom thinks of doing anything to protect the roots. The next day they are taken out in the field and thrown in piles, with perhaps horse blankets over them, and perhaps not; and there they are exposed to the heat and drying wind. We have a chilly atmosphere in the north, and these tender roots are injured as much in that kind of weather as in the dry season.

“There are many who have no care against that. The buyers evidently feel the trees were sold by the agent with the agreement to replace what do not

live, and so it does not make much difference. They scatter the trees along the line, with the holes dug a day or so before planting, and then, with the roots injured by drying, they plant. In many cases they slash the tops off. The tree must have a certain amount of life in it to mature the root system, but they have no knowledge of this and lose severely thereby. They cut the roots off too close and plant the trees in the holes in bad weather, and leave them to live or die, and then blame the nurseryman if they die.

“The right way is to get trees as early as possible, and in good condition, and if not ready to plant, heel them in on the north side of the barn; then, if the roots are injured, they will be partially repaired in time for planting. I have set a great many thousand trees having long fibrous roots, and have lost very few of them. The cherry and the Japanese plum must be planted early. They start their fibers at the first touch of warm weather, and if they are moved very much after the fibers are started it is almost sure loss of the tree.

“It would be a good practice to prune the roots before heeling in. If the roots are pruned early, they have a better chance to get started before the tree is planted, and it will be seen that the large roots start sooner than the smaller ones. There are many fibers from the root, if the root is in good condition, and they should be kept in good condition.

“I have practiced carrying tubs or tanks of water on a stone boat, with 50 or 100 trees immersed in water. Then I am careful not to dig the hole until I am ready to plant in it, or at least not long before. Then the earth should be carefully filled in around

fibers of the roots. I select thick or rainy days for setting, and carry our trees on the stone boat, or in our arms, without injuring the roots, where on a hot day they would dry, or on a cold day they would be greatly injured by the chill. I do not puddle. I think under some circumstances puddling would be beneficial, but if the trees are handled carefully, in a sandy soil, the majority of the trees will live. I have known neighbors around me to lose 50 per cent to 75 per cent of the trees set out, when I have received 700 to 800 and lost only a dozen or so. I have known others to lose 50 per cent, and I have not lost 10 per cent at the same time, from the same nursery and the same kind of trees."

WHEN AND HOW TO PRUNE

The question frequently arises, when to prune. Among the earlier horticulturists this question was often answered as follows: Prune when your knife is sharp. This is a comparatively safe method to follow with most plants, but where the problem involves the management of extensive commercial plantations it is not so easy to prune in this miscellaneous fashion. The work must necessarily be done at some particular season and carried on in a systematic manner after some definite plan.

With most orchardists and gardeners pruning can best be done during the winter or early spring months, and where the object is the removal of small branches this season is undoubtedly quite as satisfactory as any other. In fact, pruning during late spring, about the time or just previous to the beginning of growth, is particularly advantageous with the peach, because at that season, as a rule,

all injury to the annual growth from winterkilling will be apparent, and the pruner can take advantage of this to remove all dead or injured branches, and at the same time modify his plan so as to leave a maximum quantity of wood in order to secure a profitable crop of fruit, which might not be possible were the usual practice of removing half the annual growth followed in such seasons.

With apple and pear, which suffer less from winterkilling, the annual pruning can as well be done in March, in the north, as at any other season. With the grape, however, which is likely to produce a heavy flow of sap if the pruning is delayed until late in the season, it is undoubtedly best to do the pruning during the late fall and early winter months.

When the pruning involves the removal of annual growth, rather than large branches, the cut invariably should be made immediately above a bud. If made just below a bud, or in the middle of the space between buds, that portion of the shoot left above the topmost bud invariably dies back to the bud, leaving a blackened, decaying stem, which is of no benefit to the plant and may prove a direct injury in that it provides a means of access for injurious pests.

To facilitate the healing process in the plant, all wounds which are made should be left smooth; that is, if it is necessary to use a saw in removing a large branch, the cut surface should be left smooth and clean, particularly around the edges. The saw should be sharp and leave a clean cut. This in turn should be made smoother by the use of a pruning knife or a sharp chisel. The healing process starts quicker and progresses more rapidly

when this precaution is observed than when a rough and jagged surface is left.

To obtain best results in removing large branches two cuts should be made; that is, the branch should be sawed off 18 or 20 inches above the point of its origin to prevent splitting down and tearing off a considerable portion of the bark. After the weight of the branch has been lessened by cutting away the main part a second cut can be made and the stub held in position until the cut is completed. This prevents the splitting down and tearing off the bark, which is likely to result from the careless removal of large branches.

The evil results of splitting can be overcome frequently by cutting first on the under side of the limb and then upon the upper side, so that the breaking of the tissue occurs near the middle of the wound instead of at one side. When this is the case, tearing and splitting seldom occur.

STORING FRUIT

“After trying many different methods of keeping the winter supply of vegetables,” writes L. Hunt of Orleans County, Vermont, “I have settled upon the following plan as best suited to my needs: Apples I tried in barrels, boxes, and wrapped in paper on shelves. I then tried spreading them out not more than three or four deep on the cellar bottom, which is of soil and dry. Wealthy apples picked early, before they become fully ripe and mellow, will keep until March. Last year some were on hand the first of May. They were juicy and crisp, but had lost their tartness somewhat. I find that all fruit intended for long keeping should be gathered before fully ripe. The flavor is not

so good, of course, but this is more than offset by the increase in keeping quality.

"All cellars for the storage of fruit and vegetables should be as cold as possible without freezing, and should be aired as often as the outside temperature will admit. If inclined to dampness quantities of air-slaked lime should be placed there in boxes or pails. This will absorb the moisture and gases and keep the cellar dry and sweet. From time to time through the winter I sort my apples and take out all that have begun to decay. These I feed to the hens or pigs. The fruit lying next to that which has begun to decay will be injured in flavor and likely to rot."

ADVERTISING FRUIT FOR SALE

At a recent fruit growers' meeting considerable attention was attracted to the exhibit of boxed apples by the uniform packing, but more especially by the way which the exhibitor, Fall Brook Farms, was taking to advertise the fruit. A neat four-page circular showing two full-page scenes on the farm, the other two pages telling of the farm's products, was being handed to visitors. This circular not only described the orchards, but mentioned the other farm products, such as pigs, seed corn and oats, hay, pears, peaches, etc. In discussing the picking and packing, the circular reads as follows:

"All our fruit is handled with care. This costs us more, but it insures you a better product. Fruit is picked by hand into a basket and picked out of the basket when needed for packing. It is not poured out. Apples need to be handled like eggs. All apples are wiped, wrapped singly in tissue paper

bearing our trade mark, and packed in paper-lined boxes. But one grade of fruit is packed in boxes, and that is the best. The number of apples in a box varies with the size; it may be 45, 96, 128, or up to 200. Specify the size you desire when ordering. We guarantee this fruit to be well grown, well packed; and to be in sound condition when it leaves us. If it arrives otherwise you will do a favor by notifying us of the fact at once."

Following this quoted paragraph are brief notes concerning principal varieties the farm has to sell, as follows:

"Baldwin, a good size red apple, a good keeper, and suitable for eating or cooking. Northern Spy, an apple of the highest quality, spicy, red and yellow streaked, excellent for dessert or cooking. Rhode Island Greening, a green apple, sub-acid, and excellent for culinary purposes. Roxbury Russet, an admirable late apple with a russet and green skin, usually used for dessert."

From these quotations the reader will gather valuable hints as to satisfactory ways of disposing of produce. Nothing is so useful in building up a business as a clear-cut policy like that indicated above. The customer very soon learns to know that the farmer can be depended upon, and, with this knowledge, will not be tempted to go elsewhere in making purchases; indeed, he will often place orders ahead. This is well attested by many who have tried the plan.

THE APPLE

The apple succeeds over a wider territory than any other temperate climate fruit; it offers wider opportunity for utility than any other fruit, and it

can be put to a larger variety of uses than any other. Some varieties do better on one kind of soil than other varieties will, but in general apples will succeed well on almost all soils, where agricultural crops are grown. A rather strong, loamy soil, ranging between sandy and clayey soils, should be given the preference, especially where the ground is rather high. Some few varieties do well on extremes, but these cases are rare. Soils rich in humus are not desirable, since they are likely to produce too much wood growth, but a reasonable amount of humus is necessary. This is easiest secured by plowing under a clover sod and by using an annual cover crop of crimson clover, cow peas, or vetches. In special cases the ground may be allowed to stand in grass and mowed once or twice a season, but generally this practice is not looked upon with favor. Clean culture is the more desirable way of managing the apple as a rule.

Most standard varieties should be set 40 to 50 feet apart. Smaller growing standards may be set as close as 30 feet, but usually this is not good practice, because the trees are likely to interfere with one another. Such trees are used as fillers and cut out when they begin to interfere with the permanent trees. By the term "filler" is meant a quick-maturing variety of small growth which bears for several years before the permanent trees come into profitable bearing. The danger with fillers is that they are too often allowed to stand after they begin to interfere with the standards.

Still smaller trees are used occasionally for filling in between the fillers. These are known as dwarfs. They have been grown more or less for 50 years, but only recently have they attracted the attention

of commercial orchardists. See Mr. Powell's article on page 59.

Among the hundreds of varieties it is difficult to select a list that will suit all conditions and requirements. The following sorts are well adapted for home use and local markets and many of them are general market favorites. They cover the whole season.

Early—Yellow Transparent, Early Harvest, Pimate, Early Joe, Red Astrachan, Oldenburg, Chenango, Sweet Bough, Gravenstein, and Porter. These cover the season in the latitude of central New York, from about the middle of July until the middle of September. They furnish a considerable choice of flavors from rather acid to deliciously sweet. For home use at least one tree of each should be in every good-sized orchard.

Autumn—Maiden Blush, Fameuse, Fall Pippin, St. Lawrence, Wealthy, and Hawley. These carry on the season well from mid-September until mid-November.

Winter—Mackintosh, Jonathan, Hubbardston, Grimes Golden, Tompkins King, Wagener, Baldwin, Yellow Bellflower, Tolman Sweet, Northern Spy, and Roxbury Russet will furnish a succession from mid-November until May, or even June, with good storage, as described on another page.

Farther south, Yellow Transparent, Red Astrachan, Benoni, Oldenburg, Gravenstein, Haas, Maiden Blush, Rambo, Pecks Pleasant, Smith Cider, Hubbardston, Grimes Golden, Jonathan, and Winesap will furnish a good succession for the apple season.

In the northwest, Yellow Transparent, Tetofski, Oldenburg, Fameuse, Wealthy, and Golden Russet are recommended.

RENOVATION OF OLD APPLE TREES

Many old apple orchards have declined in bearing because they have not been properly managed. Usually such trees are full of dead wood, water sprouts and interfering limbs which later bear fruit in small amount and of poor quality. Too often such trees are cut down as unprofitable without first giving them an opportunity to redeem themselves. It is impossible to say how each tree should be handled to bring it into profitable bearing again, but whatever is done should not be done suddenly. It should be taken by degrees.

First, in the renovation of the old orchard, the dead wood should be cut out. If large limbs must be removed, they should be taken out part at a time; that is, the limb should be sawed from beneath 18 inches or 2 feet from the main trunk. When the saw begins to stick, it should be withdrawn and the final cut made from above. This will prevent all possibility of splitting down the main trunk. When the limb has fallen, the stub may be removed close to the main trunk. The closer it is the better, since the healing of the wound is much quicker. It is always desirable to paint over wounds larger than an inch in diameter so as to protect the main trunk from decay. Good white lead and linseed oil is satisfactory paint for this purpose.

After dead wood has been removed, the water sprouts should be taken. If there are a great many of these it is desirable to remove only about a third to a half the first year. This will prevent the appearance of new water sprouts at least to a large extent, and the tree will be encouraged to bear earlier than if it is exerting its energy to

produce new wood. None of the gnarly living twigs on the branches should be removed, because these are the ones that bear the fruit.

Frequently old orchards do not get sufficient moisture in the summer. It is not usually safe to plow deeply, because too many of the roots might be injured. A shallow surface cultivation after turning the sod is better than deeper stirring. After the ground has been worked, applications of stable manure and fertilizer may be given and cover crops such as crimson clover sown toward midsummer. The management of the orchard from then forward will be the same as for trees that have been properly managed from the start.

If the trees are of undesirable varieties, or if for any other reason the owner wishes to have different varieties, it is easier to use them as stocks for grafting the desired kinds than it is to plant and care for the new trees. Old trees cleft grafted will begin to bear in three or four years,

FOLDING LADDER

whereas even the quickest maturing varieties of young trees rarely bear at all before five years. The grafting is a simple process which anyone can produce by following the directions given elsewhere. If space is limited and if only a few trees can be grown, two, three, or more varieties may be grown on the one tree. In fact, as curiosities, trees have been grown with even more than 50 varieties upon the one trunk.

Details of orchard management will be found under their various headings.

PACKAGES FOR APPLES

As to packages for apples, W. A. Irvine of Greene county, Missouri, writes: "I used both barrels and boxes last year with satisfaction from both for their special use, but would have used proportionately more boxes than barrels if I could have gotten them. I used both the sawed, smooth on one side, and the veneer boxes, but the latter gave poor satisfaction, as they were too frail and the cost was the same, 10 cents. The sawed box was made of gum wood, which is rather brittle and a cherry color. I would prefer white wood, which they use in the northwest and California.

"Box stuff can be easily handled, and unskilled labor can put it together. In marketing over 4,000 bushels of apples last year, more than half were packed in boxes. All the number ones of Jonathan, Grimes, Winesap, York, Ingram, and Gano, also number two Jonathan, went in boxes. I could have sold number one Ben Davis for 25 per cent more had they been in bushel boxes, instead of barrels. Yellow Bell and Transparent should be packed like peaches, as they are too tender for ordinary packages. They should be picked with extreme care.

"I face both barrels and boxes with the same class and quality of apples they contain. The boxes bulge one-half inch top and bottom to prevent bruising when headed. I use the corrugated straw board mat, top and bottom, both in boxes and barrels. The boxes are stenciled on both ends with name of variety, grade and grower's name and locality. The boxes hold not quite one bushel and weigh from 45 to 52 pounds.

“The only just way to buy or sell fruit is by the pound. I find that the first and most important part is to grow good varieties and quality, and have but little trouble to sell the fruit, if properly picked and packed. I sold my Jonathans and Grimes for 50 cents for windfalls to \$1.50 a bushel box, while I could not get an offer for Ben Davis at 25 cents a bushel. I find that Ingrams sold as readily after holidays as Jonathans did before. The Ingram apple is without doubt the best keeper that grows in the Ozarks, and, with extra care, can be grown to a fair size. I would store all light-colored apples in a cool storage or big cellar, as they require a milder temperature than Jonathan, Ben Davis, or Ingram. One empty barrel cost me the same as three boxes.

“I used a packing table for Jonathan and other fancy apples, mounted on sled runners and drawn behind the wagon with empty boxes. I used the California picking bag and another year will use one-bushel baskets on a double-decked wagon, and pack under a shed adjoining my cool storage, or concrete apple cellar, 32 x 64 feet, roof and all concrete. In March I sold number one and fancy Jonathan and Ingrams for \$2 a bushel box, and there is no reason why we should not get as good prices as others, with the same quality and care.”

MARKETING APPLES

Walter Snyder, a Maryland apple dealer, writes concerning the marketing of apples, that “the apple should be hand picked. When I say hand picked, I do not mean to take a fence rail or a club and knock the fruit down on the ground and pick up by hand, as is the custom prevailing in some sections of our state. Ladders should be provided

so as to reach the topmost limb, and each apple picked and carefully placed in the picking basket carried by the picker, or in the bag or apron suspended from the neck or the body. Next the apples should be carefully emptied under the tree on straw prepared for them. There is a difference of opinion among apple growers as to whether it is best to let them lie a few days in piles under the trees or to put them in barrels immediately, but I am not prepared to express an opinion on that subject.

“My remarks apply more particularly to marketing. For the fall and winter varieties, it is always profitable to double-head. To do this, first obtain new, clean apple barrels of the standard sizes; the standard apple barrel contains the same quantity as a flour barrel, and the dimensions are as follows: $17\frac{1}{8}$ inches diameter of head, $28\frac{1}{2}$ inches length of stave, with 64-inch bulge outside measurement. This standard size was adopted by the then National, now International Apple Shippers' Association in 1897, and has been made the legal standards by most of the large apple-growing states.

“Having secured barrels and before starting to pack, see that one head is securely nailed, giving the nails a slant, so the points will not puncture the apples when put in; turn this nailed head down, loosen the hoops of the other head, and with a slight lick of the hatchet will drop in the barrel; take it out and lay it alongside the barrel. Now you are ready to begin packing. If you are packing such varieties as Ben Davis, York Imperial, Fallawater, Baldwin, Greening, or other kindred sizes, nothing should be put in the number ones under $2\frac{1}{2}$ inches in diameter. If such varieties as Rambo, Grimes Golden,

Romanite, Russet, Winesap, and such sized apples, you can pack in number ones down to $2\frac{1}{4}$ inches.

“To begin packing, select some of the best apples, wipe them off clean and place them by hand with stem end down all around and over the entire head; this is called single-facing. If you wish to double-

BARREL PRESSES

1, Screw Press; 2, Lever Press.

face, place another row of apples by hand on top of the first over the spaces between those on first row. After having faced the barrel, take the balance in baskets (a 4-8 sheep-nose basket is the best), lower the first two baskets down in the barrel, and dump carefully, so as not to disturb the plate. When the barrel is half full give it a gentle shake, and when nearly full a good shake, then fill up to the top, with about half an inch rise; then lay the head on and with the arms resting on the head, shake well.

Now use the press, pressing the head down until it fits into the chine, drive the hoops down, nail securely, take from under the press, turn the barrel over, and mark variety of apple on plated head. It is best to do this as each barrel is packed, otherwise you are likely to get the bottom head marked, which, when opened, does not show the fruit off to advantage.”

KEEPING APPLES IN FARM CELLARS

"I believe we will never find a more satisfactory package in which to store apples in the cellar than the barrel," writes William G. Clifford of Illinois. "It is tight enough to keep out the air, and the apples are thus kept from drying out and wilting. The barrel is of such shape that one barrel cannot be pushed up tight against another and circulation of air thus prevented. For while we do not want circulation of air among the apples in the barrel, we do not want it in the cellar and among the apple packages.

"If the apples get too warm, as they sometimes will when the weather is warm in the fall and early winter, the windows can be opened and the cold night air made to circulate among the barrels. When boxes are used they are often packed so closely that the air does not get in to cool the fruit.

"To keep apples well I find it necessary to keep the temperature down as much as possible during the fall and early winter. In midwinter this will about look out for itself, in this latitude. The man who has only one cellar under his house will have hard work keeping his apples if he has a furnace or any kind of a stove in it, as many farmers have. I have for many years had two cellars, in only one of which any provision for heat is made.

"There is a door between the cellars, and to insure that the door is always kept shut, I have a rope that runs over a block and has a heavy weight at the end. The weight shuts the door as soon as one lets go of it. The windows are small, and late in the fall I put on the second set. Several of these are arranged to open, and these are kept open a great deal on cold days and nights in the fall, to let

BOX PACKING APPLES FOR FANCY TRADE

BARTLETT, THE PEAR FOR THE MILLIONS

in the cold air. It is safe to take chances even with heavy frosts, for the cold would have to be quite severe to cool the cellar sufficiently to do damage in a single night.

“By giving close attention to cooling and aeration I am able to keep my apples much better than I could in the old days when I had but one cellar. However, I have observed, and have found by experience, that only certain varieties of apples will keep well. The most careful handling will not keep the fall apples very long. Most of these are gone long before Christmas, and what few remain seem to have lost a good deal of their flavor.

“Therefore, my advice is to get rid of the fall apples as soon as possible, and put all the effort into keeping the winter apples. Some of the winter apples improve with keeping, and it is not unusual to have apples in March that appear of better flavor than they were in the fall.”

DWARF APPLES

The culture of dwarf apples commercially has not been undertaken to any large extent in our country. For many years, however, dwarfs have been grown in private gardens on country estates where a few choice apples of high quality were desired. Interest has been awakened in trees of a low form, which may be more readily reached for pruning and gathering of the fruit. One reason for the increasing interest in dwarf apple trees is the demand for more high grade fruit. As at present grown and handled on standard trees, there is a too small proportion of fine apples, such as are in demand by the best trade.

There are two types of dwarf trees, the Paradise, which in character is a strictly dwarf tree. It has a small root system and in most varieties does not grow above 8 or 9 feet high. This has been used principally in gardens, and is capable of being trained in various ways and forms upon walls, as is largely done in Europe, and upon trellises in our own country. According to George T. Powell of Columbia county, New York, the Paradise dwarf is well suited to gardens and to places where land is limited and where but few trees of small size may be planted. The trees come into bearing very early, and are desirable on this account. Mr. Powell has had the Cox Orange Pippin set fruit on these trees at one year old, and the Red Astrachan at two years, while at three years he has had as many as 60 apples set on a single tree.

“The other type of dwarf apple with which I am working,” says Mr. Powell, “is that propagated on roots of the Doucin, which, in character, is a semi-dwarf growing from 16 to 18 feet high. This tree gives promise of having value in commercial orchards, for it will have capacity for setting a liberal quantity of fruit.

“The root system being small, dwarf trees need to be planted deeper than standards. The union between the bud and the stock should be set 4 to 5 inches below the level of the ground. With this deep planting the question will arise, Will not the budded stock throw out roots above the union, and change the trees into standards? While we are not far enough along in our work to know about this, we do not anticipate difficulty from this source. From experience with dwarf pear trees, our judgment is that by pruning the size and form of the apple trees may be successfully controlled.

“The influence of the dwarf root of these trees will dominate the stock very largely, even if a few roots should push out from above the union. The deep planting I consider highly important, for we intend to develop trees of bearing capacity, hence we shall increase their size, keeping them low, but spreading out the side branches, giving a heavy bush form.

“In our first planting of a block of 200 Astrachan trees we made this mistake, and at three years from the time they were set, by building up the large bush form, when loaded with fruit as they were that year, we found them tipping over when the soil was very soft and wet after heavy rains. As we were anxious to make the proof of the value of these trees for commercial planting as soon as possible, instead of taking them up and planting deeper, we had them heavily banked to hold them in place, and think they will carry a full crop of fruit through the coming season without difficulty.

“In England and France the Paradise trees are frequently planted 6 feet apart each way. The soil is very heavily fertilized, and the pruning is very close. With this close planting flowers and small fruits are frequently grown between the trees, and this is the reason for the very heavy fertilizing done. We are planting the Doucin, or half dwarf trees, 20 feet apart each way, and the Paradise between one way at 10 feet. Another plan is planting standard trees 40 feet apart each way, and interplanting with Doucin dwarfs as fillers, 20 feet each way. After working with this plan, I am inclined to change the distances, setting standards 50 feet each way, Doucin dwarfs as fillers 25 feet and Paradise dwarfs one way at 12½ feet.

“For Paradise trees only the varieties of highest quality should be planted, suitable for box packing. This would include Esopus Spitzenburg, Jonathan, Newtown Pippin, Cox Orange, McIntosh, Grimes, Chenango, and Fall Strawberry. For the Doucin, a wider variety may be selected, Spy, Baldwin, Rhode Island Greening, Russet, Fall Pippin, Duchess, Wealthy, Twenty Ounce, Astrachan, Bailey Sweet, and other popular kinds, in addition to the list for Paradise trees.”

THE APRICOT

This fruit is managed in practically the same way as the peach. It is far less appreciated on the farm than it should be, mainly because it is frequently planted in places exposed to the sun, which hastens blooming. Often, in such situations, the blossoms are nipped by early frost and no fruit results. It is desirable, therefore, to plant this fruit on northern slopes and places shaded from the early morning sun, so as to retard blossoming. The fruit has a plum-like pit. The foliage is more like the plum than the peach. (See Peach.)

THE CHERRY

In recent years the high prices for which cherries have sold have put this very desirable fruit in the list of luxuries. According to George T. Powell of Columbia county, New York, “this applies particularly to sweet cherries. It has been difficult to get orchards of sweet cherries started and established. There are two kinds of stock used in propagating sweet cherries—the Mazzard and the Mahaleb. The Mahaleb works easier, but the tree

is shorter lived, while the union between bud and stock is not always good. If trees can be had on Mazzard stock they will be much better. It is better to plant small trees, one and two years old. They suffer less in removal from the nursery, and will be more certain to grow.

“The site for a cherry orchard should be elevated and a north or west exposure chosen. Free circulation of air is necessary, as the fruit will rot much less under such conditions. Never plant in hollow or low places, as the fruit will be practically lost every year by rot in such places. The soil should be good, but not too rich, as the trees grow luxuriantly, and their bodies crack and burst on rich soil. They should be branched low in forming the tops of the trees, as they will grow 50 feet high. For two years the soil should be cultivated, or until the trees are well established and are making good growth; after that they will do better to be left in sod, cutting the grass and letting it lie upon the ground as a mulch.

“The trees need only slight pruning, sufficient to give them well-balanced heads. After five years little or no pruning will be required, if they are well formed by that time. The Black Tartarian and Black Eagle are among the finest varieties, but they are half hardy only, and should not be planted where the mercury goes to 12 degrees below zero.

“The Yellow Spanish, Windsor, Robert's Red Heart, Downer's Late Red, are among the best varieties to plant for home use or for market. We have picked 400 pounds of Robert's Red Heart from one tree and sold the fruit for \$40. At present it would readily sell for \$80.

“In picking sweet cherries much injury is often done to the trees by breaking off the slender spurs

upon which the fruit is borne. The yield is frequently reduced one-third or more from this cause. The culture of the sweet cherry may be made exceedingly profitable if its requirements are carefully observed.

"The sour cherries are more universally planted, for they are hardier and more easily grown. They are somewhat dwarfed in character and do not make as large trees. While the sweet cherries require 30 feet space each way, the sour varieties may be planted 16 to 18 feet. These should be two years of age when planted.

"The May Duke is one of the best and most desirable for an early market variety. Reine Hortense is also good, but for the general market and for all purposes the large Montmorency is the most profitable. Sour cherries will do well in fairly rich moist soil. Cultivation will be well for them a part of the time, every other year seeding to clover for a cover crop to occupy the land for one year.

"The sour cherries are used extensively for canning. They are picked in 10-pound baskets and carefully assorted into 8-pound baskets, also in strawberry quarts, and shipped. One cent a pound is paid for picking and women are paid 10 to 12 cents an hour for assorting and packing. The sour cherries sell for 6 to 9 cents a pound, and as 150 trees may be planted upon an acre, and they will, at 15 years, average 100 to 125 pounds to a tree, they are one of the most profitable fruits grown."

Concerning varieties, S. D. Willard of Ontario county, New York, writes: "I have had 30 years' experience in growing cherries, and during this time have found the following varieties best adapted to the clay loam of my farm: Early Richmond,

Montmorency, Windsor, Rockport, Napoleon, Yellow Spanish, and English Morello. Except for removing interlocking or dead limbs I do not prune the trees, which are, however, trained when small so as to form well-shaped heads. When properly opened by judicious arrangement of the branches, so as to admit light and air, there is rarely occasion for spraying.

“On recently planted trees I give no cultivation, because it is the general opinion that bearing cherry trees do best in sod. No commercial fertilizer is given. In the order of ripening, Early Richmond, a sour variety, is first, then comes Rockport, a sweet cherry. Picking is begun usually about the middle of June and the crop is shipped in 8 and 10-pound baskets. The price usually ranges from 5 to 10 cents a pound. Sweet cherries are generally set 25 to 30 feet apart, and sour 20 feet. If possible, a new orchard should be planted in the fall, but if this cannot be done, it is better to buy trees in the autumn and hold for spring planting, as it is next to impossible to have trees dug and shipped in the spring before the buds swell, and the vitality of the cherry trees is always injured if growth is commenced before the trees are dug.”

“As soon as ground is dry in the spring,” says C. K. Scoon of Ontario county, New York, “I use a gang plow in the cherry orchard, going down 2 or 3 inches. Care should be taken not to go deeper than this, as the cherry roots are near the surface. The orchard is harrowed once a week, or often enough to keep the weeds down and a fine mulch on the surface, until the crop ripens. I then sow a cover crop or let grass and weeds cover the ground. For a fertilizer, I formerly used potash and phosphoric acid, but I am convinced that my

soil does not need potash. I now use phosphoric acid only, at the rate of 3 or 4 pounds a tree, sowed broadcast in the spring and harrowed in.

“Of varieties I have found Montmorency and English Morello are the only kinds of special value. They are the only kinds I grow to any extent. Montmorency ripens about July 6 and the other variety about ten days later. Some of my larger trees have yielded 150 pounds, but half of this amount is considered a good crop.”

THE NECTARINE

Nectarines are smooth-skinned peaches, and often come from peach pits or as bud sports on peach trees. Usually they are inferior to peaches, but several varieties are cultivated more for curiosity than anything else. (See Peach for methods of management.)

NUTS

In California the almond and the English walnut are grown commercially, and in the South the pecan has been planted in extensive groves within the last 15 or 20 years. In many of the states the chestnut has been growing in favor for commercial purposes, and, in a few cases, hardy English walnuts have proved profitable. The American and European varieties of chestnuts are generally considered superior in flavor to the Japanese varieties. The Europeans, though larger, are not of as high quality as our best American sorts. These varieties may be secured from nurserymen at moderate cost.

CHESTNUT

Chestnuts, as a rule, do well on light soil. They are rapid growers and make magnificent shade trees if given plenty of room. It is advisable to plant in groves or avenues to insure fertilization of the blossoms. They should be planted not less than 50 feet apart. Many of the varieties come into bearing under ten years, and some of them will even bear a few nuts at five years. They add considerably to the beauty of the home grounds if well placed, and also pay a tribute in the form of nuts, which, in many places, can be sold very readily.

"I have been raising chestnuts for some years," writes Horace Roberts of Burlington county, New Jersey. "When I was a very young man the business was new, so I began in a small way, not putting money in it at all. Such a thing as grafting chestnuts was rare at that time. I went into the pine woods where there were seedling chestnuts, cut trees out of the way, put a fence around a ten-acre plot and let the cattle come in to help do the trimming, in this way working at a minimum expense.

"Where one can raise apples or peaches or nice fruits I think it is not worth while to plant chestnut trees. There is more money in the fruits. My land was not paying anything, so the little care I gave it at that time produced a nice chestnut grove, which makes the farm more attractive and at the same time brings in revenue. Chestnut trees are worth a good deal to the farm as a home maker, because conditions in the farmyard seem to suit them; chickens destroy the weevils and nothing will make a child more attached to its home than

to gather chestnuts as one of the ways to earn a little pin money.

“I have practiced only one form of grafting, viz., the ordinary cleft, the same as is used in grafting the apple. The twigs are cut early in February and put in the icehouse so as to be held back. By April 20, when we are done with other grafting, we start with chestnuts. Many scions die back, but we keep working away year after year until we get a stand. The chestnuts have always paid. I enjoyed the work at once and began to sell wood for grafting, and very soon began to derive revenue from the nuts. The sprouts on which grafting is done are cut about as high up as my eyes; at that height they are about as thick as my two fingers. This size heals over much more readily than larger sizes. In this respect the chestnut is more difficult to graft than apples. I care for my chestnut trees at odd times with ordinary farm help. I was able to buy a large orchard adjoining me a few years ago for a good deal less than the owner had spent on it. It has paid me well.

“Up to the present time we do not understand how to keep or cure the nuts, but are learning. One of our great troubles is the worm. I found in treating the nuts with carbon disulphide it did the work. As soon as gathered the nuts are put in a barrel and a saucer with four or five tablespoonfuls of liquid placed at the top of the barrel, which is then closed up tight. After three or four hours the barrel is opened and the nuts dumped on the packing house floor to air. To be sure, the worms are there just the same, but the buyers do not object, because the worms do not come out and crawl all over their stores.

“By treating and packing the nuts at once the worms do not seem to develop. That simple remedy costs less than 2 cents a bushel as we apply it. Customers come back to us now for more chestnuts even at advanced prices. They are very much encouraged over the business. Last year the revenue would make a good rent for the farm they grew on and a minimum expense on land where I cannot raise anything else. Some neighbors who have gone into the business as a specialty have not succeeded so well. It is much better to feel one's way in this business than to embark in it largely.

“At first the new Japanese chestnuts were a novelty and the bigger they were the better they sold. Bitter nuts sold just as well as the other kind on account of size, but people have learned better, and large nuts are now hard to sell. Our chief varieties are Cooper, Paragon, Numbo, and Scott. Most of my grafting has been with suckers, but if I wanted to start with nuts I would recommend home growing rather than buying nursery trees, because these frequently die. A nice way is to start the native sweet chestnuts in flower pots. Nut trees have tap roots which make them difficult to transplant, but by putting them in pots or kegs one can control the tap root; besides the pots can be set in the garden in convenient places and protected easily during the first year, after which they may be put in their permanent positions.”

ENGLISH WALNUT

Several varieties of English walnut have proved hardy in New Jersey, western New York, Pennsylvania, Ohio, and southward, as well as in California. Some of these varieties are listed by seed-

men, but it is only recently that attention has been drawn to their hardiness. A. C. Pomeroy of Niagara county, New York, has several trees, more than 30 years old. These bring him a nice little sum of money each year. They are the most northerly successful trees the editor knows of.

ENGLISH WALNUTS IN NEW YORK

Mr. Pomeroy writes: "In 1876 my father, while visiting the Centennial Exposition, secured some fine English walnuts from a large tree at Philadelphia. These he planted on his return home. In due time they all produced shoots, and, though at first slowly, they grew into strong, wide-spreading trees which bear profitable crops. The older and full-grown trees bear an average of about 20 bushels annually. The largest of these measures 46 feet across. As walnuts retail at about 20 cents a pound, these crops are worth \$125 each tree in the final market.

"The trees have glossy green leaves, and are cleanly at all times, thus forming beautiful and serviceable shade trees as well as profitable ones. Frost has not hurt our trees, as it does those grown from California or imported nuts. I know of such trees near here 30 years old that freeze back every severe winter. They are only 10 or 12 feet high, and have not borne nuts yet. My brother and I have propagated this variety, which Prof. H. E. Van Deman named Norman Pomeroy in honor of my father. They have often stood temperatures of 10 to 15 degrees below zero without damage.

"Preferably the nuts are planted in autumn. The sprouts will grow about a foot the first year, and for the first three years grow slowly. The first

year is the best for transplanting, as when older, the growth becomes much more rapid. Up to three years of age they rarely exceed 4 feet.

“When set in the orchard they should be set 40 to 50 feet apart each way, and the ground planted to some cultivated crop such as corn or potatoes. Peaches or plums may be used to advantage as fillers. The best time to prune is between fall and spring. Only such branches should be removed from the main trunk as would interfere with tillage. Removal of these will keep the young tree growing erect, and should be continued only until the trunk is 6 or 7 feet high without limbs. If planted in the lawn the ground should be kept spaded 3 feet around the base of the trunk, and during the first summer in very dry weather the soil should be drenched in the evening with water two or three times a week. In the morning the surface should be raked to break the crust. Ordinarily bearing starts at five or six years and continues annually. Transplanted trees start to bear when three or four years set. In my experience trees bear sooner and oftener if planted in groups of three to six. This is probably because the pollen has a better chance to reach the pistils. The staminate blossoms on individual trees open at slightly different times and thus insure better fertilization of the pistillate blossoms.”

OTHER NUTS

Hazel nuts are scarcely ever cultivated in America. They are generally allowed to grow in the fence rows where they yield sufficient nuts to supply home needs. They do best on dry, sandy soil, not too rich.

Hickories of various kinds, butternuts, and American walnuts are rarely cultivated. They all make useful and valuable trees for ornamental purposes or for timber and yield more or less nuts each year. They are rather slow in growth, but are well worth having to beautify the place as well as to add to the variety of fruit for the home table. These nuts all have more or less value in the markets, so that any surplus can easily be disposed of.

THE PEACH

In favorable localities the peach may be grown from Connecticut to Florida and westward, except in the coldest locations among the mountains, to the Pacific coast. In cold localities it is generally placed in sheltered situations where the sun will

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not strike the buds too strongly during winter, and thus make them swell and freeze. The north side of a hill is better than any other exposure in cold localities. Proximity to lakes and rivers is also favorable, provided the trees are not set on low ground.

The peach does best on light soils, but will succeed fairly well on even heavy ones. The trees, as

a rule, are short-lived. Seldom do they last in commercial plantations beyond the tenth year. They come into bearing at three or four years and begin to bear profitably at five. In some localities they bear only two or three good crops before they begin to decline. In others they may last for 20 years when properly cared for. Instances are recorded in western New York where trees have borne fruit for 40 or even 50 years, but commercially such trees would usually not be considered profitable.

In starting a peach orchard, trees one year old from the bud should be given preference to older ones. They should be set 18 to 20 feet apart in the orchards and pruned to a whip so that the scaffold branches may be secured close to the ground. Only three or four such branches should be allowed to grow. These should be well distributed, not in the form of Y-crotches, because these are apt to split when the trees are loaded with fruit. If the branches are well placed, they will make trees with well-rounded tops. Correct pruning will help to keep the form vase-like. Little wood should be allowed on the inside of the tree. Each year the annual growth should be cut back one-half to two-thirds, depending upon the position of the fruit buds. These buds can readily be recognized, because they are blunt, not sharp pointed as the leaf buds are. Normally they appear in pairs with a leaf bud between them on the main stems and also singly on short fruit spurs at various irregular places. The fruit spurs should not be pruned, because they last only two or three years, and do nothing but bear fruit. It is the extending shoots that should be cut back annually. By this annual pruning, the amount of fruit can be kept within

bounds and thus the necessity of thinning can be avoided to a large extent.

From the very beginning the ground should be kept cleanly cultivated until midsummer, when a cover crop of crimson clover should be sown. This must be plowed under early the following spring. If the trees are making too much wood growth in any year, it will be best to substitute rye or buckwheat, for the clover crop is a cover crop. Many peach growers plant tomatoes, potatoes, cantaloups or other cultivated crops in the young orchard for the first two or three years in order to help pay the cost of cultivation. It is disputed among growers whether this is an advantage or a disadvantage to the orchard itself.

Rarely is it necessary to give the peach orchard any more strong fertilizer than is furnished by the clover. Nitrogenous manures should not be used. Potash and phosphoric acid are necessary, especially when the trees are coming into bearing. These fertilizers may be given in any amount, depending upon the character of the soil, and the grower's pocketbook.

PEACH PRUNING AND TRAINING

"At the Paragon orchards," writes Dr. J. H. Funk of Berks county, Pennsylvania, "all peach roots are pruned to about 5 inches; the trees are then set about 1 inch deeper than they stood in the nursery. The tops are pruned before or immediately after planting; all side limbs are removed, and the stem cut back to 10 or 12 inches. I prefer a medium-sized tree, as there are no large limbs, but plenty of dormant buds to form a fine,

uniform top. The shoots coming from these buds give the foundation upon which to build.

“Very little pruning is required the first summer, but the following spring is the time to select the foundation branches. Four or five coming from different directions on the stem should be left to form a symmetrical top; all others should be removed, and the foundation branches cut back one-half to two-thirds, according to the vigor. Never leave these limbs in such a position that they form a crotch. This is likely to split and ruin the tree. Very vigorous trees will require some pruning during the summer.

PRUNING
YOUNG PEACH

“If the trees have been properly handled they should be well set with stout, healthy buds, and should produce an average of half a bushel of choice fruit the third season. The pruning now should not be so severe. I thin out the branches that crowd and cross each other, cut back those branches growing too tall, cutting above an outside bud to give spread to the top. Cut the lateral branches just sufficient to cause new growth among the main limbs, thus keeping the entire side of the tree in fruiting condition. Should any portion of the tree become too thick to admit free circulation of air and sunshine, then thin out any time fruit is maturing.

“Future pruning is conducted on the same principles, keeping the top open and spreading, and all bottom and lateral limbs in good fruiting condition. I never remove bottom limbs unless compelled to do so. If pruned as they should be, they will produce heavy crops for many years.

"I have a peach orchard five years old, and trained by this method, that has but few equals. When in its third year it produced one-half bushel of really choice fruit to the tree. The next year it produced three baskets to the tree, and in its fifth year it produced four baskets to the tree. The proceeds from these three crops averaged over \$1,400 an acre, and the orchard is just coming into prime bearing."

As to harvesting, W. G. Gano of Platte county, Missouri, says: "I pick my fruit in peck baskets, picking nothing but the perfect, well-matured fruit, and just as the specimen is beginning to soften, so that by the next morning it is ready for the retail trade. The peach is a perishable fruit, and to enjoy its rich, luscious, saccharine taste, which it can only acquire by fully maturing on the tree, it must have a near market and quick and careful conveyance for the consumer to enjoy all of these qualities, which make it at once the most luscious, healthful, and popular fruit in our market.

"In hot weather I aim to pick each tree every day, and never longer than every other day, and I am from two to four weeks in handling every variety. One year I was four weeks handling my Elbertas, and picked peaches six days in the week. I try to have trusty, experienced men for my pickers, and for the packers I prefer girls."

Concerning varieties, W. A. Cooper of Ottawa county, Ohio, writes: "The hardiest varieties I have tested are Salway, Smock, Elberta, Mountain Rose, Oldmixon, and Lemon Free. The most profitable early sorts with me are Mountain Rose, Early Crawford, and Early St. John, while the most profitable mid-season fruits are Briner, Elberta, Lemon Free, and Francis. Our best late varieties

are Smock and Salway. The most promising newer varieties in this section are Francis and Emma."

THE PEAR

There are two principal classes of pears—the European and the Chinese. All of our finely flavored varieties belong to the former class. The Chinese group contains such undesirable though extensively grown varieties as Kieffer, Le Conte, and Garber. No self-respecting person would have any one of these varieties in his home orchard, and no man who seeks to do unto others as he would be done by will be tempted to plant them. They have been overplanted in many sections, and, while profitable at first, have been growing less popular annually, so that the price paid for them is steadily falling. The Kieffer is often sold in cans bearing the label Bartlett. This is the strongest recommendation for the Bartlett that could be desired. There is no comparison between the two varieties. Of course, if one is living in a section where the European pears do not thrive the Chinese varieties may be used as a substitute for respectable fruit, but no one who enjoys pears will enjoy them.

The European pears do best on a rather stiff soil; the Chinese on lighter ground. The land should be well drained, but well supplied with moisture. Dwarf pears should have richer, deeper, loamier soil than the European, and, if the soil is heavier, so much the better. Standard pears should be set 20 to 25 feet apart each way; dwarfs 12 to 15 feet. Dwarf pears are so made by grafting upon quince roots. By special pruning they may be kept 10 or 12 feet high, otherwise their management is the

same as the standards. It is usual to cut off one-half to two-thirds of the annual growth except on fruit-bearing spurs; surplus shoots should also be removed.

Among the many varieties listed by nurserymen, the following are considered superior: Tyson, Summer Doyenne, Clapp, and Bartlett. These will cover the season in western New York from about August 1 to the middle of September.

Autumn—Boussock, Flemish Beauty, Buffum, Howell, Louise Bonne, Seckel, Duchess, and Sheldon. These carry on the season from mid-September until about mid-November.

Winter—Anjou, Clairgeau, Lawrence, Bosc, and Winter Nellis. These will carry the season until after Christmas with ordinary storage.

For market, Bartlett, Howell, Anjou, and Lawrence are perhaps the most generally profitable.

RENOVATING UNPROFITABLE PEAR TREES

“Do not cut down a pear tree unless trees are growing too near together,” says F. Coombs of Berkshire county, Massachusetts. “Apple trees have their day, and the time comes when they should be removed, but pears are long-lived. They are good for generations, and will bear fine fruit if rightly treated.

“Take a look at the tree you contemplate removing. If its top runs up slim and spindling, cut it down a few feet, more or less. Next with a turf spade cut a circle around the tree as far as branches extend, being careful not to injure the roots of the tree. Remove turf to a width of 3 to 5 feet. Shake out all the loam from the grass roots and cast the

latter aside. Into this space from which turf has been removed, work in very carefully a goodly quantity of finely pulverized old barnyard manure. Put it in lavishly. Work it well in, always being

careful not to injure the roots. Then cover that space all over with fine, rich loam. This may be done in the fall, any time before too much frost. The result will be a good crop of plump, good-sized fruit. The same treatment can be given in the spring after frost is out. There may be some dwarf varieties of pear trees which are short-lived, but the usual pear tree will flourish and produce fine

FRUIT GATHERING LADDERS

fruit to the delight of generations.

“Another important item is that the tree be not overhung by any other tree. Pear trees should stand in the full, unobstructed light. There should be no other trees, or shrubs, near enough to rob them of their root space. If one desires fine fruit, the trees must be allowed all their rights; and must occasionally be fed after the manner indicated. They are richly worth proper attention.

HARVESTING PEARS

"My method of harvesting the pear crop," says Ely Blackwell of Mercer county, New Jersey, "is to make the first picking entirely of number ones, sorting on tree. I use 16-quart tin pails and empty into barrels, facing two layers on the head right from the picking pail, then emptying in the rest, shaking the barrel every time a pail is emptied. Fill as high as staves, carefully placing top layers so head will settle down evenly when screw pressure is applied.

"In about two weeks I make the second picking. Then the orchard is picked clean. The pears now are placed in heaps for sorting under a tent, which we move as needed. We also use tent in picking the first time to shelter barrels and tools. The second picking is sorted in two grades. We get a fair percentage of number ones this time, as some were missed in the first picking and some that were too small are now large enough for first grade.

"This method of sorting on the tree applies only to the fruit picked by my son and myself. If we have one or two helpers, they try to pick number ones the first picking, but the pears they pick are emptied out and my son or myself or a trusty man sorts them over. I never permit any haphazard packing. I always have barrels neatly stenciled, with name of variety and grade, and my own name."

"All kinds of pears will ripen if picked a week to a month before they are ripe. For several reasons it is much the best plan," writes L. R. Johnson of Missouri, "thus to gather and store them away. One is, as they mature they drop easily, and a hard wind often blows off great numbers.

When blown down they are nearly always more or less damaged by being scratched or bruised, gnawed by rabbits, pecked by chickens, and variously injured by numerous other destructive agencies.

“Another reason is that some varieties are subject to rot at the core if left on the tree till ripe, and scarcely any variety is of so good a flavor. In case one wishes to show a few fine specimens at the fair, it is a good plan to tie a paper bag over them to protect them against possible injury until it is time to gather them.

“The time to pick may be known by the pears assuming a yellow tinge. The moment this can be detected they are ready and should be gathered at once. Do not pull or jerk them off, but simply raise them gently so as to bend them back on their stems. They will then snap off without effort; a straight pull will find them very tough and tenacious. Lay them away in a dark, cool drawer on a soft cloth. Wrap each one in a piece of soft paper. The paper absorbs the moisture and keeps them from contact, which disposes to rot.”

THE PLUM

No fruit will replace the plum. It makes the choicest of preserves, and many of the varieties are unsurpassed as dessert fruits. Every farm should have at least a dozen trees of various varieties to extend the season, as Professor Ballou outlines below:

The plum does best in rather strong, rich clayey loam, but even on soils that are rather light it does fairly well, though the tree is less vigorous. In planting orchards, a convenient distance is 16 to 20

feet apart. The ground should be manured regularly and cultivated each year, as the plum, particularly when young, is likely to be injured by weeds. It is desirable that several varieties be planted together to insure fertilization of the bloom. It has also been found useful to plant plums in poultry yards, so that chickens can eat the curculios which attack the fruit. These insects drop to the ground in injured fruit, and bury themselves until mature. They may be caught in what are called "buggers" which are like huge inverted umbrellas mounted on wheelbarrows. On one side a slit is left so the umbrella may be slid under the tree and around the trunk. Then the tree is given a quick tap with a heavy mallet and the insects drop and are caught at the center in a metal box partly filled with kerosene. Early morning is the best time to do collecting.

HARDY PLUMS

"Some 20 years ago," writes A. A. Eastman of Penobscot county, Maine, "I took up plum culture, purchasing many plum trees of different kinds of a nurseryman in New York. I had poor results; trees were short lived, were tender and winter-killed badly. Later I got some horse plum trees and set them out among the others. They grew well, and the next year I grafted them to better sorts. They soon came into bearing, and gave me heavy crops every year for several years, with big profits.

"I can raise better and longer lived trees than I can buy of a nursery company, and they cost me but little labor and no money. The trees soon come into bearing and I get good crops every year. The

varieties I raise are Moore's Arctic, Lombard, Shipper's Pride, Niagara, and Imperial Gage. There are many other good varieties, some very good eating plums, but the trees are tender and do not stand our cold winters. The Burbank is a fine plum and a good growing tree, but the fruit buds are tender and winterkill. The Abundance is another fine plum, but the tree grows so late in the fall the wood does not harden and get ripe. I should not advise people to set it here in Maine."

PLUMS FOR THE CENTRAL STATES

According to Prof. F. H. Ballou, "European varieties of plums succeed well in all parts of Ohio and stand alone in their general excellence for culinary purposes. The following list covers the entire season of nearly eight weeks, during which there need be no break in the succession of delicious plums for table use or for market: Clyman, Czar, Lincoln, Bradshaw, Field, Imperial Gage, Spaulding and Missouri Green Gage, Lombard, Empire, Miller, Bavay (Reine Claude), Monarch, Archduke, Golden Drop, and Grand Duke.

FRUIT LADDER

"No other class of plums approaches the fine varieties of Europeans for firmness of flesh, richness, mildness, and delicate flavor for culinary purposes, but this same firmness of flesh and richness of quality soon cloy the appetite for these fruits in their fresh state. Not so with the finer varieties

of our native plums, which might well be classed with grapes, oranges, melons, etc., and which, while they possess the attributes of delicacy of flavor, juiciness, refreshing sprightliness and healthfulness, do not possess that peculiar combination of solidity and richness of substance which soon satiates the appetite. Indeed, as with grapes, melons, etc., the more excellent varieties of native plums may be eaten freely with relish, enjoyment, and benefit.

“To those who are not familiar with the improved varieties of native plums, and to whom the mention of which recalls to memory the small thick-skinned, large seeded, astringent, yet withal tempting, wild plums of some secluded nook on the farm, the real excellence of a basket of great, brilliantly colored Brunswick, Hunt, or Downing would prove a revelation. It is desirable, if not necessary, that in planting a succession of fruits for the home there be included at least a few trees of such excellent natives as Poole, Pride, Brunswick, Wilder, Hunt, Downing, Reed, and Honey Drop.

“Japanese varieties, while rapid growers and very beautiful in foliage, blossoms, and fruit, are not to be depended upon for regular fruiting in Ohio. While sufficiently hardy in both tree and bud to endure most winters in this latitude, their tendency to bloom early makes them liable to be caught by the late spring frosts. The quality of Japanese varieties, as a rule, is decidedly inferior to that of either the European or native plums, both for their culinary use and for eating fresh from the tree, though a limited number of the Japanese sorts are good for both purposes. The following brief collection of varieties embraces the cream of the list grown at the station: Berger, Red June, Burbank,

Normand, Chabot, October Purple, Apple, Gonzales, and Nona."

CHESAPEAKE PENINSULA PLUMS

"In my plum orchard," writes J. W. Kerr of Caroline county, Maryland, "I depend wholly upon phosphoric acid and green crops turned under, either scarlet clover or cowpeas, or both. Native plums are by far the most profitable with me. Milton, the first to ripen, and ready for market here the first week in July, followed by Wildgoose or Whitaker. These two varieties are similar in every way, ripen at same date, look and taste alike, but I have always thought the latter less liable to speck, and in hot July weather the loss seems less. The finishing up of these carries the marketing to last of July. Then with Mrs. Cleveland to follow carries the picking to August 10 to 15. If these varieties were self-fertile I would not wish to plant any other kinds, but none of them separately or collectively will pollinate themselves or each other. I use both the Smiley and the Newman as pollinators. The Smiley does not prolong the season as above, but the Newman often extends its ripening from August 10 to September 20.

"For reliable crop production, and uniformly paying prices, the above are greatly preferable to any of the Japanese varieties or hybrids that I have tried. I plant 20 feet apart each way, every fourth row a pollinator, branch low, pick as much of the fruit as possibly practical without step-ladders, as pickers cannot make satisfactory wages, by the basket, when not standing on the ground.

"We plow and cultivate as much of the land as we can, but no animal large enough to draw a cul-

tivator can get within 5 feet of the trunk, hence we have overcome what Prof. F. A. Waugh denominates the single tree disease. The varieties above named will average five to eight bushels to the tree, and rarely miss a crop. If they net 2 cents a quart, I am satisfied. If more, which they often do in Baltimore markets, there is no kick! The reader will please observe that I am located on the Chesapeake and Delaware peninsula, and write from that standpoint."

THE QUINCE

The quince is probably the most neglected of the cultivated fruits in America. It is usually allowed to shift for itself. There is no reason why this should be. The fruit is well worth a place in the home garden, and in very many localities there is a good demand in the local markets.

The quince does best on a deep, rich, moist soil, but will do well on any land that will raise corn and potatoes. Liberal annual fertilization will pay well as will also clean cultivation. Usually the quince is grown in bush form, a new stem being allowed to grow from the root each year after the second or third, and an old one being removed when the bush begins to be crowded. The usual distance for planting is 10 to 12 feet.

No fruit will take the place of the quince. It makes the choicest of jelly of all our northern fruits, and, when mixed with apple and pear, forms a marmalade milder than the quince alone, and more piquant than either the apple or the pear alone. At least three quince bushes should be on every farm to supply home needs. When once established, and properly taken care of, the trees

will continue to bear from the time they are three years old for at least 40 years. As the plants cost only a few cents and as cultivation is so simple, no one should be without quinces.

CHAPTER VIII

Small Fruits

Small fruits are the parents of large enjoyment.

—Buck McCrawley.

“My small fruit garden,” writes Mrs. Zacheus McAllister of Maine, “is about 195 feet long north and south by 115 feet wide, with a portion in the northwest corner 33 by 75 feet, taken up by a hen-house, also four rows of red raspberries 140 feet long and three rows of blackberries 75 feet long.

“A part of the first row at the extreme north border is taken up by currants, set under and between plum and pear trees, all set before my coming to the farm nearly 20 years ago. The white currants were bought of a nursery agent, while the red are of more ancient origin. They bore freely for a few years, but the worms troubled them badly, and they were unprofitable for a few years until we sprayed with paris green, and now have little trouble with the worms, as so few mature. After several years I obtained as a premium to a magazine three Fay’s Prolific currants, which bore their first fruit ten years ago. They were so large and nice that I began rooting some by laying down the branches in the early part of the season and transplanting the following year 3 feet apart in the row and rows 4 feet apart. I have never tried rooting from cuttings.

“Ten years ago I set 12 purple gooseberries, from which new ones were rooted in the same manner as the currants, until three rows 36 feet

□ PEAR TREES X GOOSEBERRIES ◇ CURRANTS

PLAN OF FARM GARDEN AND SMALL FRUITS

long were obtained. These have borne every year since. Three years later I procured from a nursery agent 25 plants each of the Loudon and the Marlboro raspberries, which were set 2 feet apart in two rows each of each variety, the rows 4 feet apart. Being set in the fall they winterkilled badly, but spaces were filled in spring, and the rows extended to 140 feet each, and have done exceedingly well. One season they bore over six bushels of fruit, or $1\frac{1}{2}$ bushels to each 140 feet of row. The Loudons come on a week or ten days earlier than the Marlboro. The first were picked July 22 and the last August 19.

"One spring I set six grape vines, Green Mountain, Moyer, Brighton, Campbell's Early, Early Ohio, and Moore's Diamond. When four years old they began to bear plentifully. These, in addition to other vines on the farm, make a nice variety for jellies and for eating.

"Two years ago I set out 50 Red Cross currant bushes, two years old. They all lived and grew beautifully. They have made a good growth for next season's bearing. This variety is very sweet, and is used upon the table very freely, after being stemmed, rinsed in cold water, and sprinkled plentifully with sugar. The Fay's Prolific and native red are used more for jellies. The first currants were picked July 15 and the last August 1, over five bushels in all. I trim the bushes as soon as possible after the fruit is gathered and tie the canes before snow falls, to prevent their breaking down and to facilitate the putting on of the dressing.

RASPBERRIES DO WELL

"I also set 18 Shaffer Colossal raspberry bushes in the fall, that same year, bought direct from the

nursery. This plant, being propagated from the tips, was new to me, and in buying in the fall the plants were small and the roots smaller, but I succeeded in having it come through the winter. Every Monday I watered with wash water and many pailfuls of dressing. I also worked around their roots throughout the summer, and as soon as a shoot was long enough to reach the ground, I buried it in the earth for a new plant, after mellowing up the ground and putting a stone upon the plant to hold it down. In the spring of the second year I set the balance of this row and another between the small fruit trees, which are set 20 feet apart, making two rows 115 feet long, each having 22 plants. From these I raised enough plants to set three additional rows last season, besides many plants which were disposed of. The 44 hills in the two old rows yielded over five bushels of raspberries last year. These two rows of bushes and berries being interwoven with the new growth made a hedge, the handsomest I have ever seen. These purple berries I find more acid than the red, but served with sugar and cream they make a dish fit for a queen.

“One-half the space from the south end was plowed up and set with raspberries. A heavy coat of dressing was applied from the barn cellar and worked in thoroughly with a wheel harrow as soon as the soil could be worked in the spring. The plants were then taken up with a spade from the old rows, moved to the new plot, while the dirt adhered and set while the ground was moist, and they grew and bore as if they had never been moved. About a foot was cut from the tops, leaving them 3 or 4 feet high. A fine crop of berries was secured the first year. This could not be done profitably on a

large scale, but as my three rows were only 115 feet long I did it easily after a rain, and felt repaid for my work.

"This garden plot slopes a little toward the southeast, and is a gravelly loam, and quite rocky. I apply a shovelful of dressing to each hill, keep the weeds and grass down and raise lots of berries. The Shaffer Colossal raspberries are set between and under the plum, pear, and cherry trees, they in turn being set about 20 feet apart. This plot of ground outside the four rows of raspberries 140 feet and three rows of blackberries 75 feet long, I find very profitable as well as a fascinating industry, having made ready sales for all the fruit I could spare."

THE BLACKBERRY

In no essential respect does the treatment of the blackberry differ from that of the raspberry. The plant is a more rampant grower and should have more room. It also needs more careful pruning and pinching to secure best results. Six to 8 feet is the usual distance at which rows are made and 2 to 3 feet between the plants in the row. Preferably, however, blackberries should be set in checks 6 by 6, so that cultivation may be given both ways.

As to pruning, the young shoots should be pinched when they reach a height of 3 feet to 30 inches. This can be done with the thumb and finger during the summer. Shortly after the pinching, lateral branches will appear. These should be pinched when they are 12 to 18 inches long, depending upon the variety. Some varieties bear their fruit buds close to the main stem, others farther out. This feature can be determined only

by observation of the various varieties. As a result of this pinching, the main stems grow very stocky and the laterals strong and more or less rigid. They thus bear their fruit well up from the ground and there is no danger of the stems falling over when the crop is abundant. After fruiting, the canes that have borne should be as light as possible for the maturing of the young canes, which will bear the following season. Three to five canes are enough to allow to grow each year, depending upon the strength of the variety. Large-growing kinds should have the smaller number. The old canes should be removed from the plantation and burned. (See also Raspberry.)

BLACKBERRIES
Grown naturally

In some places it is thought advisable to cover blackberries during the winter to protect them from freezing, but usually it is not necessary in ordinary climates where the above method of pruning is practiced. The winterkilling is largely due to immature wood which freezes. Well-ripened wood is rarely injured by frost except in very cold locations.

Among the best known varieties are Agawam, Ancient Briton, Early Cluster, Early Harvest, Erie, Kittatinny, Mersereau, Snyder, Taylor, and Wilson.

THE CURRANT

In the cooler sections of the country the currant is one of the easiest and most satisfactory small fruits to grow. It is perfectly hardy, makes quick and early maturing growth, comes into bearing the second year after planting, and produces fruit un-

equaled by any temperate climate fruit for making jelly. Some of the varieties are excellent for eating raw, when sprinkled with sugar. The green as well as the ripe fruit is also used for making pies. Combinations of currants with raspberries, blackberries, and other midsummer fruits are highly prized by housewives, who thus add to their preserves flavors differing from all of those that enter in the combinations.

No small fruit is of easier culture. It may be propagated by thrusting a branch in the ground in early spring and making the soil firm around it. The following year this branch should bear a few fruits. It is better, however, to buy well-rooted plants and set them out 4 or 5 feet apart each way and give clean cultivation. This is not the usual practice in home gardens.

Simply because the currant is so easy to grow, it is consequently neglected, allowed to be choked with weeds and to become the prey of the currant or gooseberry worm. No insect is more easily controlled than this, if taken in time. It begins operations as soon as the leaves start to form. The eggs are laid first near the base of the bush, and the insects eat the leaves there first. They usually are not suspected of being present until a large part of the foliage has been destroyed. Hellebore, either dusted or sprinkled on wet, is the common remedy for this insect. A little attention in the early spring will save a much larger amount of attention later, and insure the crop.

The currant does well on almost any soil, but best on rather heavy land. Pruning consists in removing old wood after it has borne two or three crops. New shoots are constantly coming up from the base and one or two of the best

of these should be allowed to grow each year. Preferably the old stems should be cut out at four years old, because the younger wood bears better. Liberal applications of stable manure or complete commercial fertilizers may be given. The soil should be kept cultivated and free from weeds, especially around the bases of the bushes. Work should begin as soon as the ground can be handled. Unlike most other fruits, the currant does well when partially shaded. It is, therefore, well adapted for the home garden.

There are three commercial classes of currants—the red, white, and black. The former two all belong to one species; the latter is distinct. For home use all three should be grown. The whites and reds are more or less alike in flavor, but the black is very distinct, and is not generally liked. It is used principally for making jam. The best known varieties of reds are Cherry, Fay, Red Cross, Red Dutch, Versailles, Victoria, and Wilder. The two most popular varieties are White Dutch and White Grape. Among the black varieties the best known are Black Naples, Champion, and Lee's Prolific.

“During my experience with currants in the last 30 years, I have found Fay, La Versailles, Cherry, and Filler varieties best adapted to this section,” writes J. A. Hepworth of Ulster county, New York. “My main crop consists of Filler, of which variety I have about 50,000 bushes. Heavy clay loam seems an especially desirable soil for this crop. My bushes range in age from three to 15 years. I do not allow any dead wood to remain, but every year, preferably in the early spring or early fall, I trim this all out.

"Fay is the first to ripen, Versailles next, and Filler last. I begin picking the last week of June or the first of July in quarts, paying $1\frac{1}{4}$ to $1\frac{1}{2}$ cents a quart. Fruit is shipped in 32-quart crates to New York, Boston, Chicago, Cleveland, and Buffalo, and sold on commission. Last season I received an average of about 7 cents a quart. I don't sow any cover crop. Number one bushes are best for planting. These I raise myself. The currant bushes are planted between my grape vines."

THE DEWBERRY

The dewberry differs from the blackberry mainly in its trailing habit. The fruit is usually earlier than the blackberries, and thus prolongs the blackberry season. Dewberries are generally tied to stakes or trellises so as to facilitate cultivation. In the fall, the cords are cut and the canes allowed to lie on the ground during the winter. Management is otherwise the same as for blackberries and raspberries. The Lucretia is the leading variety. (See Raspberry.)

"In planting and cultivating the dewberry," says S. H. Strange of Cumberland county, North Carolina, "the land should not be too stiff. We prefer a rather sandy land, though not too poor. The land should be well plowed and harrowed. Mark off the rows 4 by 8 feet, making the furrows about 4 inches deep. We prefer to set the roots in March. Put the plant in the checks and cover about 2 inches deep and apply 300 pounds fertilizer to the acre, or stable manure, if you have it, at the rate of a shovelful to the hill. This will give you vine or cane enough. Cultivate as level as possible and keep clean all the summer. The posts and wire

can be put up in the winter, posts set 40 feet apart. Care should be taken to have the line of posts run exactly with the line or row of dewberries, so the wire when stretched from post to post will be directly over the vines. The vines or canes should be tied up on the wire the latter part of March, one year after they are planted. This should be done very carefully, the hills barred off and fertilizer applied at the rate of 800 to 1,500 pounds an acre. Applying the fertilizer with a disk drill is a good way. Any high-grade fertilizer will do that will analyze 3 per cent ammonia, 12 per cent phosphoric acid, and 10 per cent potash. I give these general outlines, but a man must be governed by local conditions, study his land and feed it accordingly and watch results."

THE GOOSEBERRY

Like the currant, the gooseberry does best in a cool climate. The northern states and, in the south, the mountains, are best adapted for this fruit. Like the currant, also, the gooseberry does best on moist soil. Its chief enemy is the gooseberry worm. (See Currant.) Properly managed gooseberries furnish abundance of fruit, which can be used long before it is ripe, for making pies and jam. Until it is ripe, it is very acid, and often when fully ripe, many of the varieties are still tart. For four to six weeks, or even longer, either green or ripe, it is a particularly valuable fruit for the home garden and the local market on these accounts.

There are two general classes of varieties—the English and the American. The former are not considered as easy to manage as the latter, but usually they are of superior quality. Among them

are Chautauqua, Columbus, Industry, Triumph, Wellington's Glory, Lancashire Lad, and Crown Bob. Among American varieties are Champion, Downing, Houghton's Seedling, Pearl, Red Jacket, and Smith. In all essential respects, management is the same as for currants, which see.

"I usually take two-year-old gooseberry plants," writes Phil Strubler of Du Page county, Illinois, "though one-year-old plants grown from layers will do. I prepare my ground by applying a heavy coat of barnyard manure before plowing it under. After this is plowed under 6 to 10 inches deep I put on the plowed surface, usually with a manure spreader, as well rotted barnyard manure as I can get. This is cultivated and harrowed into the soil as well as possible. I then mark the rows for planting 6 feet apart one way and 5 the other. This is, of course, for field culture. For garden culture, the plants can be planted nearer, say, 5 x 4 feet.

"I always plant in the fall when possible, say, from the middle of September until the ground freezes. If planted in the last two weeks in September there is nearly a year's gain in the growth of the plants the following year. I always draw up the earth around the base of the plants to keep the water from settling around the plants during the freezing and thawing of the following winter and spring. This has a tendency to heave the plants out of the ground. It is well to level the ground around the plants after freezing is over in the spring.

"Get all the growth out of the plants the first two or three years by good cultivation. Keep them clear of weeds; go through with a cultivator about every ten days during the growing season. After the second year they need some trimming, but not

much. In a year or two they need more, and as they grow older an annual trimming is desirable. You cannot expect to grow good crops of gooseberries without plenty of air and light in and around the plants. After the fourth year one ought to be able to grow an average crop of fruit if the bushes have been well cared for."

"The Houghton gooseberry," says S. J. Blackwell of Mercer county, New Jersey, "always bears a full crop of fruit of good quality, although the fruit is small. It is a sure cropper and has long been our standard sort. The Downing fruit is larger and just as good in other ways, with the exception that the plants are rather small. The Pearl possesses a superior flavor, and is a very attractive green and the bush is a strong grower. The Joslyn, when grown here, has large size, but is not very hardy. It has a large number of spines, and holds its leaves well.

"The Columbus is of large size and productive, but not a very rapid grower. It is worthy of trial. The Chautauqua has been grown here for some time, and I would plant this for market were I putting out a berry patch this year. The Mountain Seedling is a very attractive berry, but the quality is poor and the stems hurt its sale."

GOOSEBERRIES FOR PROFIT

Pennel Emerson of Delaware grows gooseberries successfully in fruiting orchards as described below by A. N. Brown of Wyoming county. "The plantation, now 12 years old, is of Houghton and Downing varieties. As the ground was planted closely with fruit trees, the bushes had to be set just where room could be found for them, and still

leave space for the necessary culture. Mr. Emerson considers 4 x 6 feet the proper width to set the plants when starting new plantations in the open.

“The first two or three years light applications of phosphoric acid and potash were given in connection with the crimson clover, which forms the basis of manure furnished to the gooseberries, and which, doubtless, is the greatest factor in the success attained. Crimson clover has been the sole manure, until within the past year or so, when an application of barnyard manure was given in the fall, to aid the clover as a mulch and to furnish additional humus, so that sufficient moisture can be conserved to mature the crop. For it must be borne in mind that the pear and apple trees are now at such an age they require a large amount of moisture.

“This necessitates the plowing down of the clover early in the spring, because of the call for moisture by the maturing clover itself. It was desirable also to prevent injury to the larger root system of the strong gooseberry bushes. To maintain the crop-producing power of this large number of mature trees and vines, culture must begin as early as possible. After the clover is turned under the most intense culture is given, implements best suited for the work being used. After the crop is harvested, or about July 10, the ground is again seeded to crimson clover and the same routine followed. The gooseberries began bearing at two years, and have borne annually since in increasing quantity. Last season over 24,000 pounds were gathered from a scant four acres. This product sold at an average of 6 cents a pound, or \$1,440 from the four acres. The crop is usually sold to Baltimore canners, whose representatives come to

the shipping station for them. The price has never fallen below $3\frac{1}{2}$ cents a pound, and is frequently more than 6 cents. It must be kept in mind that a large crop each of apples and pears was grown on the same ground. What the results in the open under Mr. Emerson's treatment would have been would be speculative, but they probably would be much greater than when grown with the handicap as they are.

"Pickers receive three-quarters of a cent a pound for picking. They can make \$1.50 a day by steady work. The Downing is the larger and more productive. It does not turn red when ripe, as does the Houghton. This fault is an objectionable feature, to the packers especially."

THE GRAPE

In proportion to the amount of care it requires, the grape will produce more pleasure and profit than any other of our temperate climate fruits. It needs only a warm soil and sunny exposure, and, preferably, an elevation above the general lay of the land in order to do well. As to training, stakes or trellises may be used or the vines trained over a porch or window. Pruning consists in cutting off all but one or two buds at each stem each autumn. The new shoots that come from the buds left will produce abundant crops, usually one to three clusters.

Usually the vines are trained to trellises and allowed to extend only 6 to 12 feet, according to the variety. This allows of planting the vines as close as 6 feet in the row for small varieties such as the Delaware, and 8, 10, and 12 feet for the larger growing kinds. Some growers plant large vari-

eties 16 feet apart. Trellises are much more popular in America than stakes. These are made with stout posts and No. 10 galvanized wire, generally. Some trellises are made horizontal and others vertical. Each style has its advocates. Usually two arms are allowed to each vine trunk, and trained in opposite directions at right angles to the main stem. Where the trellis is horizontal, the vines are allowed to droop over the wires. Where the trellis is vertical, the vines are trained upward.

Volumes have been written on the training of grapes, but any grower can evolve a plan to suit

FOUR YEARS IN GRAPE TRAINING

At left, vine as set; next, end of first year; third, end of second year; fourth, end of third year; last, pruned ready for fourth season.

himself by remembering that the buds produced in one year bear fruit the next year, and that the best fruit is produced by the two or three buds near the base of the cane. All the others may be removed. At intervals of three to five years the irregular stubs may be cut out and new buds allowed to take their places and supply new branches.

Unquestionably the most popular American variety is the Concord. It has been proved that it will grow well on a greater variety of soils and

produce better than any other American grape. Worden, somewhat earlier, is considered of better quality, and Moore's Early has been ranked as the very best early black variety. This, however, is likely to be replaced by Campbell's Early, which bears larger clusters of superior fruit. It is a better shipper than Moore's.

Among the red varieties Catawba, Delaware, and Brighton are probably the best known, though Agawam and Salem are also popular because of their excellent quality. Brighton is likely to prove disappointing unless planted in proximity with other kinds of grapes. The berries are often small when the vine is planted alone. The best early white variety is Green Mountain. Another white of high quality is Moore Diamond. Pocklington is a superior white grape. The best known white, however, is Niagara, a late variety, which does well in most sections where the Concord succeeds.

GRAPES IN DELAWARE

According to J. E. Carter of Kent county, Delaware, "the proper soil for a vineyard is a loamy one 8 to 10 inches deep, sloping toward the south, with a good clay subsoil, and good drainage. Give a heavy application of manure, well rotted and plowed 10 inches deep, and harrow until in fine condition. The reason for putting the plant food deep is to keep the roots down, a very important matter, as they have a tendency to come to the surface.

"With a two-horse plow make a straight row as deep as you can, and then come back in the same row, making as deep as possible, and then clean out to the needed depth with a shovel. I make my

rows 9 feet apart and plant 6 feet apart in the rows. The vines are trimmed, leaving two or three buds. Trim the roots to 10 inches, and plant as deep as the vines will permit, leaving one or more buds above ground, after covering the roots with 3 inches of soil. Put a handful of bone around each

GRAPE TRAINED OVER WINDOW

vine, scattering it along the row, and then fill up the furrow. I let my vines run on the ground the first year.

“End poles need to be 10 feet long; put them in the ground $4\frac{1}{2}$ feet. These poles should not be less than 8 inches in diameter at the small end, the middle poles

8 feet long, 4 inches at the small end; put a pole after every fourth vine, putting the pole in the ground 2 feet. Use No. 11 for the first wire, and put it three feet from the ground. Use No. 9 for the second wire, putting it 30 inches from the first.

“The next spring after planting trim the vines to one cane, selecting the strongest, cutting it 12 to 18 inches in length, and tie to a small pole. This is the most important time in the life of a vineyard, for the beauty of the vineyard will depend on the care bestowed on the vines to keep them straight, and all will depend on this summer's trimming and pruning. When vines put out new growth, I select the strongest shoot and tie to a

small pole when it has reached the first wire, pinch the top out and start two lower arms and then carry the center shoot up to the top wire.

“It is no trouble to get top arms, but lower arms must be provided first or there will be trouble to get them; nothing but new wood bears fruit. When the vine has reached the top wire, pinch out the

GRAPE TRELLIS AND VINES

top shoot, so it will make two canes, then take one down each side. In trimming the third year, I get four arms from the main cane, with about ten buds on each arm, and tie each to the vine, using two-ply jute twine.

“The implements used in cultivation after the vines have come into bearing are the one-horse plow; the gang plow, consisting of three small plows attached to one frame or beam; the weeder, the cutaway harrow, and the horse hoe; one-horse cultivator and hand hoe. Clean cultivation is necessary. For my locality, the varieties I have chosen for commercial purposes after several years’ trial with 25 varieties are only four—Moore’s Early, Niagara, Concord, and Delaware.”

GRAPE JUICE

“Every season I make a large amount of grape juice,” writes Mrs. Mary Johnson of Tippecanoe county, Indiana. “In the fall when grapes are abundant, they can easily be purchased in the

country at about $1\frac{1}{4}$ cents a pound. The grape juice purchased in market does not possess the same body as that made from ripe grapes on the farm. I cannot help suspecting it contains a good deal of water and some preservative to cheapen the cost and reduce the amount of sugar that would have to be used to keep it from spoiling. The grape juice I make is used mostly during spring and summer.

"I select perfectly ripe fruit. The riper and sweeter the grapes, the more delicious the flavor of the juice. After washing and stemming, I crush the berries with a potato masher. This, I think, is as good a way as any. There are several small presses on the market for this purpose, but my method answers my need.

"After crushing I put the grapes on the stove to simmer, not boil. Nearly enough water is added to cover the mass of crushed grapes. After the fruit is cooked soft I strain through a jelly bag that has been carefully washed. When the bag has become cool enough to be squeezed without burning the hands, the last of the juice can be pressed out. If the juice were to be used for jelly making, this would not be done, as it would render the jelly cloudy.

"The amount of sugar to be put in depends on how sweet one wants the juice. It is safest to have it very sweet to prevent fermentation. I put the juice up in catsup bottles, using the same precautions that I do in canning fruit. It is a safe rule to use half the quantity of sugar that I have of juice, by measure. If there is too little sugar the juice may ferment and break the jars.

"In canning, one very important thing is to have new rubbers. It is never safe to use old ones, or

OREGON SILVER PRUNE, FOR GOLDEN PROFITS

FIELD OF LUCRETIA DEWBERRIES

even those that have been used once. If the juice is made as I have indicated, and fresh rubbers are used each year, there will be little loss from fermentation. When the grape juice is used, it is diluted to suit the taste."

THE RASPBERRY

There are four classes of American raspberries. Two of these, the white and the red, belong to the same species. The third is the black raspberry, or blackcap, which forms a class by itself. The fourth class is a hybrid between the red and the black. The cultivation of all these is the same except that the black varieties need somewhat more room than the others. All kinds do best on rich soil, preferably strong, deep loam. This gives the best crop. On sandy, gravelly, or stiff clay soils, the plants cannot be relied upon to give good yields. The deeper the soil, the better. Like the blackberry, the stems of the raspberry are biennial; that is, they produce canes one year from a perennial root and bear fruit the following year, then die and new shoots take their places. On this account stems that have borne fruit should be cut out immediately after fruiting, because they are of no further use.

While all these fruits send up new canes from the base of the plant, the reds and the blackberries may send suckers from any point where the roots are broken, so will the hybrid kinds, which will

HOLDING RASPBERRY
WIRES TIGHT

also root from the tips. The stems of the black varieties, if allowed to grow full length, will take root at their tips. These two characteristics of the plant suggest methods of propagation; new blackberry and red and white raspberry plants are secured by digging up the suckers and planting them where desired. New plants of black raspberries are secured by insuring the rooting of the cane tips, during the latter part of summer and transplanting these new plants.

As soon as the canes have reached a height of 18 inches to 2 feet, they may be pinched to prevent their growing taller, to make them stouter, and to

BLACKCAPS PRUNED

make them develop side shoots, which should also be pinched back when they have grown a foot or 15 inches long. This practice obviates the necessity of staking.

Four or five canes are enough to allow grow each year in the hill. Usually red and white varieties are planted about 4 feet apart and the blackcaps 5 or 6 each way. Sometimes, however, they are planted 3 feet apart in the row, or even closer, but then 6 or 7 feet between rows. The plantation properly managed will continue in profitable bearing for five or six years, when it is usually best to start a new plantation, because the fruit is likely to become small and the crop light.

Among the well-known varieties are Brandywine, Cuthbert, Loudon, Marlborough, Miller, and Turner. The two best known yellow sorts are Caroline, and Golden Queen. Among the purple sorts are Columbian and Shaffer. Perhaps the best

known black varieties are Doolittle, Gregg, Kansas, Mammoth, Cluster, Nemaha, Ohio, Souhegan, Tyler, and Eureka.

RASPBERRY PLANTATION

“Red raspberries can be successfully grown in any part of New Jersey, and should be planted in every family garden,” writes Charles A. Umoselle of Atlantic county. “There are tender and hardy varieties as in other plants, so a knowledge of the best and hardiest eastern varieties is essential. It is well to look around and see what varieties are doing best in one’s immediate neighborhood before ordering, being sure to get plants from only reliable firms. This same principle applies to all other plants, fruit trees, etc.

POST FOR RASPBERRY VINES

“I have tested all the leading varieties of red raspberries, and find the Loudon to take the lead in both hardiness and productiveness, with the Cuthbert second. These are both good varieties, good shippers, and also good market varieties. We prefer the Loudon as a table berry, also for canning purposes; it also ships well, making a fine appearance in the box, having a deep red color, which does not fade in canning.

“Raspberries are good feeders, requiring a liberal amount of plant food, and responding readily to good treatment. If the soil is not naturally in a good state of fertility, rotted barnyard manure should be applied, and the ground deeply plowed and thoroughly cultivated or broken up with a harrow or clod smasher in a small way, then well spaded up, working in the dressing.

"The plants should then be set in the furrow, with roots well moistened. Some farmers plow the furrow with a two-horse plow and set the plants in the furrows, while others use a line and a spade, opening the holes that the plants are to go into. In either case, care must be taken not to break off the small white shoots coming from crown or roots, as these are to be the future plants. Do not set the plants too deep, or the shoots will not have a chance to get to the surface. Care must be taken not to tramp the soil hard just above the crown, but more from the sides and a little distance away from the plants. The

PRUNING
RASPBERRIES

new shoots then have a better chance to come to the top.

"I always use young plants from new propagating beds, as in setting strawberries, because older bushes from fruiting beds are not desirable, in many cases being exhausted to such an extent as to render them unprofitable. That is where a great many make a mistake in setting out old plants instead of getting strong, thrifty young plants. There are many systems of planting, but I will only suggest a few.

SETTING THE PLANTS

"First method is to plant the raspberries 5 feet apart each way, so as to cultivate with a horse both ways; allow five shoots to each hill. On a large scale I set plants in rows 5 to 6 feet apart, north to south, and from 3 to 4 feet in the row. I plant potatoes every other row north and south the first year, and after that the whole space is

given to the bushes. By the second method, for a small garden, the plants can be set in narrow rows, 1 foot apart in the row, where the work is to be done by hand. I would recommend the rows to be 4 feet apart, the farther the better. Four or five of the thriftiest canes are enough to allow grow and mature each year. The fruit is grown on the two-year-old wood. Cultivation is very important in securing best results.

“Though many people plant raspberries, giving no cultivation or care afterward, expecting them to bear well just the same, you can always tell the successful grower by looking at his patch during the picking season. His rows will be found straight, well cultivated, free from weeds, with plants not too thick in the row, not like the patch of a careless neighbor at this time a thick mass of canes and weeds.”

“We commenced growing berries about 15 years ago,” writes Martin H. Munger of Wyoming county, New York. “We had put 26 acres of land, planting at first two or three acres and gradually increasing. At present we have 12 to 15 acres. The varieties grown are black and red raspberries and blackberries. Our soil is a deep, gravelly loam, rather light and dry. We plant with potatoes, marking 3 feet both ways, and setting the plants 6 feet each way, so that the cultivation during the following years is always both ways, thereby saving much hand hoeing, and, we think, producing finer fruit, although perhaps less in quantity. We aim to cultivate nearly every week one way or the other from early spring until about picking time, after which we give one more good working and then cut out old wood. We usually leave the red raspberry brush without cutting until spring, as it

helps to protect the canes from being broken by the snow. The principal varieties of raspberries grown are Gregg, Cuthbert, and Snyder. The Snyder is not doing as well as formerly, so we are trying other varieties with some success.

"We find a great difference in the durability of the different varieties of blackcaps, Gregg standing from six to ten years, while Eureka will last but two to four. Blackcaps need good, new ground, and blackberries will do very well following blackcaps. We have Cuthberts 12 years old as good as any we have. In fact, none of our Cuthberts have run out. We use a light dressing of wood ashes nearly every year, and sometimes a fertilizer containing phosphoric acid and potash.

"Blackberry bushes are not trimmed as closely as blackcaps, but enough for convenience in cultivating. Red raspberries are not trimmed until spring. We get an average yield of perhaps a quart to the bush, or 50 bushels to the acre, sometimes getting as many as 125 crates to the acre or $2\frac{1}{2}$ quarts to the bush. The crop is usually sold on the local market, which we have tried to please with fine fruit and fair dealings. We have been rewarded with good prices and a growing demand."

As to the pruning of raspberries and blackberries, L. R. Johnson of Missouri says: "The one reason for spring pruning is that the tender blackberries and all the raspberries die back more or less through the winter, and if pruned in the fall would have to be pruned again in the spring to remove dead wood. Some growers wait till the blossoms open in order to measure by the bloom how much wood to leave. And there is good reason in this, for buds do not always form regularly along the

cane, and so many inches of wood cannot always be relied on to produce so many berries.

“In pruning raspberries, first observe how many canes there are in the hill and cut out all over three or four. The number of main canes should be governed by the size and the number and strength of the laterals. I have seen one cane large enough to yield a hill’s average crop. If the canes which were pinched back the year beforehand have sent out several laterals or branch canes, these laterals should be shortened in to 12 or 15 inches, according to their number and vigor — the more laterals the shorter they should be cut.

“Blackberries are pruned much the same. Four feet is high enough to permit them to grow. Slender, late, immature canes should be cut out entirely if there are

longer ones. The Early Harvest especially needs close pruning. It is an immense bearer, and a severe cutting back often makes the difference between profit and loss in the yield.”

YOKE FOR TOTING BERRIES

THE STRAWBERRY

“There are three prerequisites to successful strawberry production—fertile soil, strong, vigorous, fruitful plants, and thorough cultivation,”

writes W. H. Burke of St. Joseph county, Michigan. "Anyone who will observe these points in practice may be assured of success. We find that, in order to produce vigorous and fruitful plants, we must keep the soil up to a high state of fertility. To do this, we alternate annually between plants and field

STRAWBERRY PRUNING

a, Plant as Dug; b, Plant Pruned; c, Plant after Setting.

or cowpeas or potatoes. The latter are still somewhat in the experimental state, although giving, as far as we have gone, every promise of complete success. After we have turned under the peas, or dug the potatoes, we cover the land with a good coating of manure, about 18 tons to the acre.

“As to plants, never accept poor ones, even as a gift; they only encumber good ground and destroy the native sweetness of the grower’s disposition. It is a waste of land, time, and money to work with anything but perfectly developed plants. Having the land in good tilth, the grower should proceed to get the plants in readiness for setting; that is, to prune them by cutting back about one-third of the roots.

“Thrust a dibble into the ground to the depth of about 6 inches, make an opening large enough to take in all the roots, place these in this opening, with care to see that they are as nearly straight as may be; then remove the dibble, and with it press the soil firmly about the plant, using the fingers to firm the soil about the crown. When set, the crown should appear just above the surface of the ground, the shoulder of the roots being barely covered.

“As soon as the plants are in the ground cultivation should begin. This will check the escape of the moisture in the soil by capillary action. In setting the plants the feet of the setters have left deep tracks, which quickly become the avenues of escape for the imprisoned moisture. The dust mulch made by cultivation closes up this avenue, and the moisture must then find its way to the surface through the roots and leaves of the plant; and this means life, health, and strength for the plant. In a small patch this cultivation may be done by hand with a hoe; in a field of considerable size a hand cultivator may profitably be employed, but in a commercial field a 12-tooth will be found the ideal implement for this work. Go over the field after every rain as soon as the earth becomes crumbly. If it doesn’t rain, go over the field once

a week to preserve the dust mulch and thus keep moisture at the roots and bring to the plants a fresh supply of food."

SETTING THE PLANTS

One of the most important things to do in preparing strawberry plants for setting is to trim off the dead leaves and the superfluous roots. This operation is simply done by using a pair of shears and holding the plants across the palm of the hand, the leaves being held between the thumb and forefinger, which are placed around the crown and the roots extending beyond the little finger. The shears are then used to snip off all the leaves an inch or so above the hand and all the roots that extend beyond the hand. If the plants are placed carefully in the hand, so that the crowns are all together, a small handful of plants may be trimmed at once.

The principal object in doing this work is to increase the root system. Every cut made on the root will soon callous over and new roots form at that point, and as the leaf surface is reduced there will be a very small amount of moisture, due to transpiration. The work is best done in a shady place away from the wind, and the plants kept covered both before and after the operation. In fact, after the cut is made they may be thrown into pails of water. In setting, a shorter dibble may be used than where the full roots are allowed to remain. This favors speed in setting.

STRAWBERRY FERTILIZER

"In general," says Prof. W. L. Howard of the University of Missouri, "a strawberry fertilizer

should contain the three principal elements of plant food in about the following proportions: Nitrogen, 3 per cent; phosphorus, 3 per cent; potassium, 7.5. That is, every 100 pounds of fertilizer should contain 3 pounds of nitrogen, 3 pounds of phosphorus, and $7\frac{1}{2}$ pounds of potassium. The phosphorus is placed far above the needs of strawberries, because this fertilizer is likely to take insoluble form in the soil. The ammonia is placed low, as top dressings are made in the spring.

“Top dressings are often made in spring, summer, or fall on established strawberry fields, the materials being worked in by cultivation. Never drop fertilizers directly on the plants. If nitrogen above the needs of the plants is used, there will be an excessive leaf growth at the expense of the fruiting. There is not much danger of supplying too much phosphorus or potassium, so far as injury to plants or fruit is concerned, as only what is needed will be used. The rest is wasted.

“If it is impossible to begin a year in advance, nitrogen may be supplied immediately by using nitrate of soda in spring just before setting the plants, at the rate of 100 to 200 pounds to the acre. The same amount of dried blood will also answer the same purpose, but it is not so readily available and is more troublesome to apply, as it must be drilled in deeply, so as to rot. It does not cost as much as the sodium nitrate. Sulphate of ammonia and cottonseed meal also supply nitrogen.

“Phosphorus may be supplied by using steamed bone meal at the rate of 200 pounds to the acre, drilled in the spring. It will cost \$28 a ton. Rock phosphate at the rate of 400 to 500 pounds an acre, sown broadcast and plowed under with manure or cowpeas in the fall, as stated, would

be very good. Without the decaying pea vines or manure it would not be so efficacious.

"Potash is best supplied by either muriate or sulphate of potash at the rate of 50 to 75 pounds to the acre, applied in spring just before setting the plants. It costs about \$52 a ton. Kainit, 200 to 300 pounds to the acre, would answer the same purpose, but it is not so desirable. Ordinary wood ashes may also be used like the other fertilizers, either in the spring before planting or later about the plants. As much as 40 to 50 bushels to the acre may be safely applied at one time."

MULCHING STRAWBERRIES

"My strawberry plants are covered in winter with lowland hay," says S. H. Warner of Middlesex county, Massachusetts. "I like the long blue-jointed variety the best. It is possible to put it on much more quickly than shorter, finer hay. This covering is raked off about April 1.

"After the fruit is well set short hay is placed in the paths to keep the fruit clean. The plants are set in September and October. The narrow rows are covered with forest leaves and sprinkled with a little earth to keep the plants in place. They make a good cover, but should be parted over the crowns as soon as the plants begin to grow.

"Some people cover with pine boughs. I have tried them, but do not like them for a cover. In the first place it takes too long to do the work, and, when they are removed, in the spring, if the weather is cold many of the plants are hurt unless the branches are taken off very early. The plants start to grow early, and spindle up under this cover more than under hay, and are very tender.

“When one is growing plants only for the fruit it is better to cover with short hay. The cover should not be too heavy. It should be put on just too thick to allow one to see the foliage. In April when the plants begin to grow, I go over the beds and loosen up the cover and let the crown grow through the hay. On high land I use about $1\frac{1}{2}$ tons to the acre. On low land, which heaves more, about three tons to the acre are spread. I do not wait for the ground to freeze, as I formerly did, but cover the beds during the first two weeks of November.”

“The operation of mulching in strawberry culture,” says R. B. Rushing of Illinois, “serves different purposes, depending upon the locality in which the plants are grown. A mulch acts as a protection from cold, prevents freezing and thawing and the consequent lifting of the plants. It retards growth in cold regions by shading the crowns and maintaining a low soil temperature longer than in soil not mulched. It acts as a conserver of moisture, retards weed growth by smothering the young seedlings and finally protects the fruit from contact with the soil.

“The materials which can be used for mulching are various, but their value depends largely upon their freedom from weed seeds and their fitness to protect the plants without smothering them. Whole or cut straw free from grains, strawy manure from the horse stable, and pine straw from the forest are among the more common mulching materials. I always use wheat straw, as it has given me good satisfaction. However, almost any material that will protect the plants will do.

“Experience has taught me that where the ground freezes and thaws several times in the

course of the winter, it is best to put on the mulch as soon as the ground is sufficiently frozen to allow driving upon it with a loaded cart or wagon. Where the freezing of the soil is only superficial or only temporary, if at all, the mulch serves the purpose of a protection from the wind more than from frost, and in such sections the mulch should be put on as soon as active growth ceases. Sometimes it is allowed to remain until after the crop is harvested." I sometimes remove the mulch early and give the plants thorough cultivation before the fruits are more than half grown; then, if it seems desirable to protect the fruit from the earth, the mulch is replaced for that purpose."

As to mulching strawberries, W. W. Farnsworth of Lucas county, Ohio, says: "Our Michigan friends do not mulch strawberries as much as we do, and they have more snow. Their principal market is Chicago, where they find that early berries bring the best prices. The strawberry not mulched will ripen several days earlier than the mulched ones, so a great many having sandy soil do not mulch. Mr. Welch of Douglas plants rows of corn through the strawberries, every three or four rows, I think. He lets the stalks stand, and if they do so, fall over. This protects from the wind, and catches the snow, and at the same time it acts as a mulch. Of this it can be said that it does not rob the soil of moisture as do oats and barley when used as mulch."

PICKING

"Picking strawberries on my place," writes J. F. Thomas of Cambria county, Pennsylvania, "usually begins about June 15 or 20 and continues through

the first week in July, and sometimes later. In some instances largest pickings were made on and after July 4. Boys and girls of neighboring families make up the picking force, 1½ cents a quart basket is the price paid for picking. Pickers are required to grade berries carefully. The largest and most shapely berries go into the first, and smaller ones, as well as large, ill-shaped specimens, compose the second grade.

“When picking has been kept back by wet weather, and there are many soft berries, there is a third grade made which is used for wine, etc. As nearly all the fruit is sold in nearby local markets, there is no necessity for storage facilities. Most of the berries are on sale within an hour after picking. The crop is nearly all retailed from wagon direct to customers. The second grade is sold at about 2 cents less than first grade, and is popular for canning, jam, etc. They are considered more desirable than larger berries shipped in from the south and east, being firmer, of better flavor, and almost entirely free from sand. All sorting and selling is done on the square. Baskets are filled, shaken down, and topped out before packing in crate. Bubach and Glen Mary are the most profitable varieties yet tried. The market here demands large-sized berries, and the two mentioned meet the requirements.

“On account of the late frosts the cultivation of early varieties is not profitable. An experimental patch is continued from year to year in which the newer varieties are grown and watched. After picking is over, the mulch is raked and stacked for use another season. The ground is plowed deeply and sown to Canada field peas, to be turned under in fall for berry patch or other crop the next year.”

THE FRUITED BED

"As soon as we are done picking," writes Mathew Crawford of Cuyahoga county, Ohio, "we plow the bed and harrow it, then sow it to cow-peas and harrow it again. This is the most satisfactory method that we have tried. It destroys insect enemies and fungous diseases before they get well established. The land may be planted to strawberries the next season. Since adopting this plan we have rarely seen any necessity for spraying."

I. A. Thayer of Lawrence county, Pennsylvania, handles his bed differently. He writes: "As soon as the last picker is out of the field, I run the mower over the strawberry bed to clip the tops. After they have dried a day, I shake up the straw mulch and when a breeze arises, fire the straw on the windward side. Then, if I am to fruit the field another season, I run a small plow within 4 or 5 inches of the plants, and not more than 4 inches deep. Into this furrow I put what fertilizer I am to use, usually half rotted stable manure, superphosphate and sulphate of potash, and cultivate the earth back upon it. Then I give frequent cultivation and clipping of the runners so long as the ground can be worked in the fall."

CHAPTER IX

The Vegetable Garden

Good gardeners make good gardens;

Good gardens make good crops;

Good crops make good prices;

Good prices make good gardeners.

—Sol O'Man.

"It is unfortunate that so many farm gardens are ruined at the outset by inferior seed. In the country," writes A. B. Ross of Pennsylvania, "we depend on the country store for our seed far too much, and we are careless. Look out for the gaudily illustrated seed box. If you knew its hoary and shameless record you might believe in total depravity. Old seed, inferior seed, everything that makes the garden third rate, is hidden in the little 5-cent envelope. And, if your congressman gets the government to send you garden seed, vote against him; he hasn't enough sense to be allowed at large in Washington. Just why it is that our great agricultural department does not put out better garden seed, I cannot understand. In our farming work we have had invaluable and most accurate assistance from the government for several years; it would be hard to over-estimate the benefit, but as for the garden seed, we will have none of it.

"As a matter of fact, there is no such thing as cheap seed. Twenty dollars a pound for cauliflower seed the Long Island truckers pay, and are glad of the chance to get it. They could buy for \$5 a pound, but they could not afford to take that

SPADES

seed as a gift. Start in right. Make up your mind to pay a good price for good seed, and pay it without a whimper. There is no use in sowing trouble and disappointment.

“Write for catalogs to reliable seed houses. You will find their advertisements in the better-class farm journals and magazines. When you get the catalogs, get to work. The study of catalogs is much harder work than planting the garden. Apparently seed houses lack sense of both humor and proportion. About everything they advertise is recom-

mended so highly that choosing just which to plant is as difficult as threading a needle in the dark.

FRANKNESS COMMENDED

“I wish to pay a tribute to a man in Iowa for his courage. I have never used his seed, because when I got his catalog I had supplied myself with about all I needed. But his style in commenting on his wares is refreshing. He has not the least hesitation in condemning some of the seeds he lists; and when he has something which he thinks is of high grade, he says so with the same wholesome candor. After all, if you study it out, there is considerable shrewd sense in his frankness. It inspires trust. I wish that some

GARDEN
FORK

of the eastern seed houses would inculcate that same spirit. It would save the poor worried buyer a lot of trouble.

“The safest seed house, however, is your own garret. When you raise something which grades high, be sure to save and cure your own seed; and always try to save an extra supply to provide against the hard luck of a bad season.

“The seed houses are beginning to realize more and more the necessity of growing some of their seed in the north, under invigorating climatic conditions. In comparative experiments I have found that seed from far north gave plants that would make more vigorous growth, yield better quality of garden stuff and resist drouth, frost, and disease better than their southern competitors. Bush beans, for instance, from eastern and from northern seed were planted side by side; a late frost did not seriously injure the one set of plants, but almost totally destroyed the other.

PLANTS FOR TRANSPLANTING

“House-raised plants are never so thrifty as those raised in hotbeds and cold frames. In the latter the growth is quicker, more uniform and the process of hardening off can be begun, as it should be, a month after the plants have made their appearance. Cauliflower, tomatoes, peppers, egg-plants, and onions go into the hotbed; lettuce, beets, cabbage, etc., into the cold frame; although all may be planted in the hotbed if necessary. Larger onions can be raised in this way than from the sets, and of far better quality. Prize-taker for fall use, and Red and Yellow Southport for win-

ter use, is a good selection. Onions and beets transplant readily, and with almost no loss.

“Be careful in the use of water in both hotbed and cold frame. Too little is better than too much. If you water too often, the plants will damp off; that is, wither in the stem and die.

“If you cannot raise a good crop of peas or beans, your garden is probably sour. Air-slaked lime, not water-slaked, at the rate of 25 to 30 bushels of burnt lime to the acre, will correct the acidity. It is better to spread the lime in the fall. Wood ashes, in liberal quantities, put on in the spring, will also sweeten a sour soil, besides adding potash and phosphoric acid, and improving the physical condition of the garden. Never use coal ashes for fertilizer; they have no value. If you have been troubled by wire worms

DIBBLES AND TROWELS

or snails, fall plowing, followed by an application of kainit at the rate of 1,000 pounds an acre, will rid the land of these.

IMPORTANCE OF PLANNING AHEAD

“Don’t wait till the last minute to plan the garden. Plan to get two crops, where possible, in one

season. In the onion bed and between the early beets plant parsnips and salsify. They will not interfere with each other at all. If the corn is checked, bush limas may be planted one way of the hills, and a good crop gathered, without hurting the corn. Some strains of bush lima are immensely prolific, and will furnish fine beans, either for summer or winter use. Turnips also may be sowed among the corn, late in July, after cultivation of the corn has ceased. In the spring the space between the heads of lettuce may be used for early beets, planting alternately lettuce and beets 4 inches apart in the row.

“Here is a list showing how one good crop may follow another: First crop—Peas, bush beans, early cabbage, early potatoes, lettuce, early beets. Second crop—Celery, late cabbage or turnips, late peas, turnips or celery, late peas or turnips, corn, celery, turnips or peas, winter radishes, lettuce, peas, etc., late beets, for fall and winter, to replace early beets as used.

“Do not transplant just after a rain. The ground will cake. If at the time of transplanting it is dry weather, cut back the leaves from a third to a half and be sure to press the earth firmly to the roots, with an oblique downward thrust of the fingers.

“No matter how good the seed and the garden bed, frequent and careful cultivation is needed to bring first-class garden stuff. Generally speaking, rapid growth, without setback, is necessary, and lack of cultivation by retarding growth, tends to make inferior garden stuff.

“The farmer’s main advantage over his city brother is in his ability to have absolutely fresh vegetables; but I have so often seen this advantage carelessly lost that I can’t help calling atten-

tion to the obvious fact that the minute garden stuff is taken from the garden deterioration begins. From garden to pot with all speed; and from pot to table, cooked tender, but not overdone; crisp as becomes a self-respecting vegetable, not waterlogged, flat, and insipid. Boiling in salted water helps to retain both color and firmness; and a vegetable ought to look just as good as it tastes."

GARDEN PROFITS

"During the last seven years I have been engaged in vegetable gardening near Columbus, Ohio, in which city all the produce has been marketed," writes Prof.

WHEELBARROW

V. H. Davis. "All the principal vegetables have been grown with more or less success, but we have always followed the plan

of making a specialty of two or three crops, growing only such others as will fit in with these to the best advantage.

"There is no doubt that a system of close and double cropping, with a very large use of manures, both animal and mineral, is the most profitable plan where sufficient labor and capital are available to carry it out properly. These have been sadly lacking in many cases with our own gardens, but unavoidably so. Our results may, perhaps, be taken as showing the possibilities of certain individual crops under fairly average gardening conditions, rather than the possible yield from a given area of ground.

"No crop has been more uniformly profitable

with us than tomatoes. While we have not always been in the market with the first locally grown tomatoes, ours have usually been acknowledged to be the best. Livingston's Stone is grown almost exclusively. Seed is sown in the greenhouse from February 15 to 20. When the plants are 2 or 3 inches high they are transplanted to the beds in the greenhouse, or preferably to the hotbeds, 6 inches apart each way. This gives room for a large, stocky growth, and, by May 10, the plants are usually 12 to 20 inches high, and showing their first blossoms. We

transplant to the field during the first favorable weather after May 10. Sometimes the plants have to be covered to protect them from frost, but the possible gain in earliness is

BARREL TRUCK

worth the risk. If frost nips these early-set plants we lose only the small money cost of plants and the value of the time required to set; whereas if the plants thrive we gain greatly because of the extra early fruits secured.

“The distance apart will depend upon whether the plants are to be staked or allowed to lie on the ground. Those intended for the early market are usually staked and planted 20 to 24 inches apart in rows $2\frac{1}{2}$ feet apart. The latter crop is usually allowed to lie on the ground, and the plants are set 2 feet apart in rows 3 to $3\frac{1}{2}$ feet apart. In both cases, however, the vines are carefully pruned to one or two stalks. This pruning consists in removing the shoots from the axils of the leaves as

soon as formed. It is necessary to go over the vines about three times in an ordinary season, and in a very wet season perhaps four times. No other work in connection with the crop will prove more profitable.

“We usually begin to pick tomatoes July 5 to 10. All that we can ripen before August 1 usually bring from \$3 to \$7 a bushel. From August 10 to September 1 the price usually falls below \$1, and often as low as 50 cents a bushel. From September 1 until frost destroys the vines the price gradually rises again, on account of the demand for canning purposes. A patch of plants in their prime during the latter period will always be profitable. This late crop usually follows early peas, potatoes, or cabbage. When serious frost threatens, the plants are carefully pulled, put in small piles and covered with straw. Ripe tomatoes may be secured in this way until Thanksgiving. They always bring a good price. The green ones thus saved are also in demand for chowder, pickles, etc.

“Last season we had a total of 1.04 acres in tomatoes, and the gross income from this area was \$410.57. The common idea that tomatoes do best on poor soil is fallacious. We give our tomatoes the best soil we have, and believe results justify it.

“Sweet corn is, in many respects, the second most satisfactory crop we raise. While the income an acre is not as large as with some other crops, the cost of production is very low, requiring no hand labor except picking the ears. Early Cory is grown for very early corn and Country Gentleman, Stowell's Evergreen, and Columbus Market as main crops. Plantings are so made that a continuous supply may be had from the beginning to the end of the season.

“Another crop that all gardeners should grow is asparagus. It is one of the easiest grown and one of the most profitable single crops. It requires a very rich soil, and has the disadvantage of occupying the ground the entire season, making double cropping impossible. We cut \$64.95 worth from 0.35 acre that had stood over 20 years. Another year we cut \$44.94 worth from 0.20 acre of five-year-old plants, or at the rate of \$224.20 an acre. While the yield is not as large as with some other crops, the small amount of care required makes it one of the most profitable.

GRADING ESSENTIAL TO SUCCESS

“Everything we sell is carefully sorted and carefully prepared for the market. The lower the price, the more carefully we try to sort and grade. Our first-grade tomatoes usually bring 25 cents to \$1 more than the average market price. The culls are sold for what they will bring for immediate use, and the demand for this grade is greater than we can supply, for, by our way of growing tomatoes, the percentage of culls is very small, except in very wet weather, when the cracked fruit must go into that class.

“We go direct to the customers, solicit their orders, and, if desired, deliver in the evening of the same day directly from our own wagon. The result is we have built up a list of select patrons, who appreciate perfectly fresh garden stuff, and who are willing to pay a reasonable price for it. Any surplus over and above the amount this list will take is readily disposed of through the usual market channels, where we generally find ourselves in the enviable position of having the buyers competing among themselves for our stuff.

"We set a reasonable price on our stuff from day to day, and people may take it or leave it, just as they choose. The man who cuts prices not only injures himself, but his neighbor also. He will always be expected to cut prices and will probably find difficulty in selling his produce unless he does. In his hurry to sell out and get home his price is often lowered beyond what the supply would warrant, to the injury of every gardener and the benefit of every dealer.

"To illustrate my meaning: A season or two ago cucumbers were selling at 40 cents a dozen, and the dealers were retailing them at 5 cents apiece. A certain gardener came into the market with a quantity and a desire to get away quickly. He sold the load for 20 cents a dozen, thereby establishing that price for this article for the entire market, yet, on account of the scarcity the dealer continued to retail cucumbers at 5 cents each for nearly three weeks. The gardeners lost 20 cents a dozen and the dealer made 20 cents more profit a dozen than supply and demand warranted.

"This is only one of scores of such instances. Farmers are still too willing to ask what prospective customers will give them, instead of reckoning cost of production and percentage of profit and then demanding a reasonable selling price. Of course, it takes courage to break away from the old-established custom and place a value on one's own farm produce, and to refuse to sell for less. But this becomes easier when the stuff is well graded and shows superior quality."

WEEDERS

BREEZY NOTES BY WOMAN GARDENER

“Truckers say that after seed is sown we should either roll, slap, or tramp the ground,” says Mrs. Preston Kuntz of Pennsylvania. “I never do that. This method should be used only on dry and sandy soil. I gently pat with my hand or the hoe; this is sufficient to settle the ground. If a dashing rain comes I loosen the ground with a rake as soon as fit. A heavy soil should not get even the gentle pat. In setting plants I give the soil only a gentle squeeze. I open chicken eggs at the small end, use the eggs and save the shells. In these I sow watermelons, lima beans, etc. When signs of life are showing, I open the other end of the shell to let out the roots. I set them in old calico bags, made about the size of a 5-cent salt bag. When the weather permits I set them in the garden. The bags soon decay.

“I sow onion seed in rows 2 feet broad and 50 feet long. I do not wait for weeds to sprout in hotbed or garden before sowing. Weeds are a blessing. Millions of them come up, but I soon remove them when they are the size of a pin. This loosens the ground around the onions and encourages quick growth. A man could not do this. He is too clumsy. It requires deft fingers. Methods, like authorities, are guides. One must use his own judgment and select what is most suitable. Through my hotbed runs a cement walk. Tender plants started in the house in boxes are placed on the walk during the day and kept in a living room at night. After my garden is plowed there is about 2 feet of ground along the fence left unturned. This I plant to strawberries to save spading. Melon vines are delicate. Flour will kill them, so will a

little too much bug poison. All I did last year was to disturb their enemies. I used old cider, also old sauerkraut. To this I added water. It is good, but I had to go over the vines every day for about one week.

"I never raise seeds. The space they require I replant and find it pays better. Besides, many different varieties mix when planted close. One should not become wedded to one seed company. Try all new varieties and retain the best. Gifts of seeds should not be allowed; their worth is spoiled. When people have to pay for anything they appreciate it and will take better care than when they get something for nothing. We once got two mail bags full of seeds from Washington. We had more packages of seeds than we had people to whom to give them. The mice problem was solved when I found part of the government seeds devoured. I occasionally meet people who show me some of these seeds and ask what they are. Many get seeds they don't want or can't plant. Pole beans, cantaloupes, etc., are seldom grown on small lots. They require much space and trouble. A trucker should know the name of every vegetable he grows. Should also know what the ground contains and what to apply.

GAINING AND RETAINING CUSTOMERS

"Well raised vegetables speak for themselves. A batch of well grown corn suddenly became a little too hard for table use. Wishing to sell, I told the people that the corn was just at the right stage to make the best corn fritters. The corn grates better if it is a little hard. Congratulations are bestowed on beneficial honesty. A person should be frank

and never get angry. My time is precious, and some people are talkative. The best way to handle them is to listen and move quickly before they commence to talk another blue streak. Cheerfulness, with sometimes just a dash of sauce, will help in selling produce. Over-measurement is just as bad as under-measurement. People of good sense know that the best can't be raised for nothing.

"Novelties are expensive, but, as I seldom fail, they pay. Pocahontas, a new sugar corn put out by Henderson, is the earliest and best I have ever had. Burpee's New Bush Lima beans are good. Outermont Beauty melon failed, a fault of my own. Silver Self-Blanching celery is beautiful. Besides, these I tried some new nameless varieties. Among them was Burpee's new lettuce, which is fine. Invincible and Cornet asters are the grandest flowers I raise. The cut flowers put in clean water every day will stay fresh for four weeks.

"From 48 hills I sold \$7 worth of watermelons and \$15 worth of radishes, raised between the melons. From a patch 15 x 40 feet I sold \$40 worth of lettuce and took from the same ground a crop of endive. My largest crop was radishes, which amounted to \$77.25. The garden is 100 feet broad and about 300 feet long. I cleared \$400, including \$25 received as first premium for one display of vegetables. About 100 varieties were raised on this plot of ground."

WESTERN WOMAN'S GARDEN

Mrs. H. M. Woodward of Illinois writes of her profitable garden as follows: "Our plot of ground is 150 x 165 feet, and we have the use of another lot near by which is 50 x 165 feet. Nearly half of

this lot is used as a chicken park, but we have several plum trees of bearing age planted in it.

"As we grow considerable fruit, much of the garden is permanent, but all the vegetables used in the family are grown, with the exception of winter potatoes. Lettuce, radishes, and onions are planted early, a second and sometimes a third planting being made of the first two. As soon as the ground can be worked peas are planted, and as none but those which are planted early are a success here, we plant in this way: Three varieties, an early, a medium, and a late sort, are planted at the same time, thus furnishing a succession for a long time. If the season is cold and backward we sometimes make another planting a few weeks later, using only an early sort.

"Seed of onion, parsnip, carrot, beet, squash, sweet pumpkin, water and muskmelon, string and shell beans and cucumbers are planted in their season, while tomato, cabbage, celery, cauliflower, and parsley are grown in hotbed and cold frame until proper time to plant them in the garden. Peas are followed by celery, winter radish, late cabbage, and cauliflower, all ground being made to raise two crops, if possible.

"Sweet corn is planted like peas, three varieties being planted as early in the season as possible, two later plantings being made of two varieties each, and when the strawberry bed is done fruiting it is plowed under and planted to any early variety of corn. The plan furnishes us with sweet corn for the table from July 20 till killing frost, which is due here about October 15.

"Last season the latest corn was planted July 7, and was ready for use in ten weeks, the last of it being frozen on the stalks just before the middle

of October. An asparagus bed, clumps of pieplant and horse-radish, and a little bed of parsley furnish what is needed of these things and occupy but little space.

"The seedlings raised in the hotbed, and also seedlings of flowering plants, find ready sale at fair prices, so a little revenue is derived from them. As it is necessary to have the hotbeds to grow plants for our own use, it is but little more work to raise extra plants for sale.

"We have 50 grapevines of over 40 varieties, all of fruiting age, ranging in season of ripening from August 25 to October 10; in color, red, white, and black. No idea can be given of the amount of fruit the vines produce, as the grapes were picked for family use and to treat our friends, and no record made of it.

"A new strawberry bed is planted each spring, the other one being plowed up immediately after bearing its first crop. This plan pleases us better than running a bed longer, as we think it less work to plant a new bed than to keep an old one free from weeds and well cultivated.

"Four apple trees of bearing age, Wealthy, Northwestern Greening, Snow, and Whitney No. 20, furnish us with all the summer and fall apples we could use, and two trees of Duchess are almost old enough to bear. Although we do not have the figures to show the money value of our garden, we are sure it is a profitable investment in several ways. Besides the value of the produce during the growing season, we have cabbage, carrots, parsnips, beets, squash, and sweet pumpkins enough to last all winter, besides a large supply of pickles, canned fruit, and jelly, most of which was made from fruit of our own raising."

FIELD FORCING VEGETABLES

The forcing of early vegetables has become a business of considerable magnitude, and a person may well ask, Does it pay, and, if so, can I hope to succeed? "My own work," says E. E. Adams of Essex county, Ontario, "has been growing for early market tomatoes, peppers, cabbage, beans, muskmelons, and sweet corn in the field, not under glass. Plants of all but corn are, of course, started, not in hotbeds, but in glass houses heated by steam.

"In preparing the soil for growing these plants in the houses I usually pile up sods taken from either sandy or clay loam fields, and pile up with alternate layers of fresh horse manure, letting this stand over winter and cutting up fine as early in the spring as possible. This gives a soil containing a large amount of fiber; it does not dry out quickly, and in decomposing feeds the plants for a considerable time.

"The soil for field culture should be fairly rich in humus, clover or well-decayed manure being turned under in the fall. Either of these will be well incorporated in the soil by the following May.

"Tomato and cucumber seeds are sown in moderately rich soil in flats the latter part of February. Tomato plants are pricked out into other soil in two or three weeks, being given at this time a soil space of 4 x 6 inches, and then again moved the latter part of April or first week in May into veneer sections 5 x 5 x 5 inches with no bottoms, or, they can be moved into flats for convenience in handling. The flats I use are 12 x 22 inches inside and 5 inches deep. These flats are placed upon the benches and the plants grown to the desired size, then moved and covered with cotton. I put eight plants to

each tray. This cotton cover keeps cold winds off the plants, and also assists in hardening the plants before being set out in the field.

“I prefer to water thoroughly, being careful to see that all portions of the bench soils or flats are evenly wetted. Water is run on with a half-inch hose with no nozzle, not with heavy pressure, but gently. When transplanting time comes, usually about May 20, it is found very convenient to handle the flats in a wagon, sending them to the field quickly.

“Before setting in the field after plowing the soil, which is a light sand, and after using disk and smoothing harrows, it is well to mark out straight rows and plow furrows about 5 inches deep, in which the plants may be placed after being carefully cut from the flats, giving them $3\frac{1}{4}$ feet in the row, and rows 5 feet apart. These furrows may be filled in at once by a man or a boy following up with a hoe and drawing the soil around the plants.

VALUE OF FERTILIZERS

“As soon as planting is all done about one ounce of nitrate of soda is applied around each plant, care being exercised that none is put on the plants, for where it is so left it will burn them. When it is all on, the tooth cultivator is put on, and the ground cultivated both ways to mix the soda in thoroughly. Cultivation is practiced twice each week, first one way, then the other. Not much hoeing is required if cultivating is done carefully. I generally hoe but once, although no set rule will apply. I have given as a test two applications of soda to find out if it would increase the crop, and I find that there is little, if any, advantage.

"I am of the opinion that with South American guano, which contains 3 per cent nitrogen, $2\frac{1}{2}$ to 3 per cent potash, and about 18 per cent phosphoric acid, built up with sulphate of potash 6 to 8 per cent, is a very efficient, safe fertilizer to use. I used this on a portion of my crop last year, with no barnyard manure, and had very nice, smooth fruit, and a liberal supply. On another portion of the crop I used well-decayed barn manure, with an ounce of soda to the plant, and picked during the fruiting season continuously from this lot. At the last picking, about August 20, I picked an 11-quart basket of as fine fruit as I had at any time during the season. Further tests will have to be made to determine just what fertilizers are the best and most profitable to use on tomatoes.

"Cabbage is started under glass and moved on flats, giving it about 3 x 3 inches space, and watered once a week with manure water, to which has been added 2 to 3 pounds of guano and 1 of soda. If the plants need further watering during the week I give them clear water alone. Cabbage is a gross feeder, and plenty of nitrogen should be given to make good, strong plants. I am fully convinced that a week to ten days can be gained in earliness of the crop if the plants are strong to begin with in the field. The soil should be very rich, well cultivated and conditioned before planting, and immediately after planting soda should be applied around each plant to the amount of at least one-half ounce, and hoed or cultivated in with a fine-toothed cultivator.

"In the course of a week I generally sprinkle about the same quantity of soda in the rows again around the plants, but a little farther away from the stem. Again, about June 1, another sprinkling of about

200 pounds to the acre is made in the centers of the rows and cultivated in at once, or cultivating may be omitted if a shower is on when applying. This dissolves the soda and carries it to the roots quickly.

“One year when my Early Jersey Wakefield cabbage was the finest I ever grew no manure was used, but a light coating was given the previous season for a melon crop, and before planting the cabbage a sowing of guano was made and the soil harrowed several times to mix or pulverize thoroughly. The plants were put in rows 3 feet apart and 2 feet in the row. Nitrate of soda was sown in the rows and cultivated, and in ten days another sowing was made during a light shower. These last-mentioned sowings would amount to about 150 pounds an acre at each sowing.

“Cucumbers and muskmelons are started under glass, the seed being sown in flats, and when in the third leaf are moved into other flats or pots as desired. The soil for these pots is composed of good garden soil, with the addition of about one-third its bulk of well-rotted horse droppings well mixed. Careful watering is required to keep up a steady and uniform growth. At planting time the pots are full of roots and ready to grow without interruption, weather conditions being favorable. I plant in the field about June 10. The soil should have had a good coating of well-rotted manure, or a clover crop turned under and well harrowed down. Growth can be forced by the application of 1 ounce of soda well worked into the soil around, but not close to the plant.”

A MIDSUMMER GARDEN

“My summer garden,” writes Dr. M. R. Sharpe of Maine, “was started more as an experiment than

from any real expectation of its being a success. Some of my neighbors laughed when they saw me after July 4 sowing seed which they believed should have been put in the ground by the middle of May. My results were far better than I anticipated, and in the future I shall be able to get more from a certain plot of ground than ever before, for, in many instances, a succession of crops will keep the ground working from early spring until the frosts come.

“Among the vegetables I planted in the summer were corn, squashes, parsnips, lettuce, wax beans, bush limas, parsley, cucumbers, radishes, endive, spinach, tomatoes, and beets. The corn used was Early Crosby, the seed being dropped July 4, with a liberal amount of hen manure for a pusher. The exceedingly dry summer affected the growth, as it did that of all the vegetables, so I was forced to water the 25 hills planted. This began to bear about September 15, the last mess of some 20 ears being picked October 13, after frost had killed nearly all the other garden truck.

“Two kinds of squashes were planted July 5, the Summer Crookneck and Hubbard. The former did well, escaping most of the ravages of the squash beetle, but the winter squash did not make a good size, the largest being about 9 inches in diameter. The parsnips remained in the ground yet to be dug in the spring. In this section the season is not long enough from July to make a very large growth. Lettuce was sown all through the summer, Denver Market, Black-Seeded Simpson, and Tennis Ball, Hanson and Boston varieties being used. A cold frame was placed over the late plants and I had some fine heads for Christmas.

“Golden Wax beans were planted July 5, again the middle of the month, the last sowing being on August 3. The two earlier plantings did finely, and from the latter I picked a nice lot of string beans. Bush limas, planted July 4, proved to be satisfactory, and bore well. Parsley planted July 5 made fairly good plants in October, just right to pot for the house. Early Cluster cucumbers, from seed of July 4, yielded good returns, and seemed to grow as well as those planted earlier. Radishes galore came from the garden, crops being sown to the latter part of August, the French Breakfast being the favorite for quick growth and sweetness. Endive, too, was another crop continuously in the garden until the heavy freezing weather.

“Two sowings of thick-leaved spinach were made after the middle of July, the last being on August 3, both doing well. The tomatoes set out July 4 were from seed planted the second week in May, a good yield resulting, the small ones being used for fall pickling. Beets were planted almost as freely as radishes, furnishing greens and plenty of beets for table use and pickling. Besides the above, two varieties of turnips were planted, mainly as a winter green food for the fowls. Next season I shall plant an early dwarf pea after the early corn, and endeavor to use every foot of ground the entire season. In late planting one crop of weeds is skipped, but the ground should be thoroughly cultivated and frequently to bring the crops to perfection.”

SECURING EARLY PLANTS

Charles Black of Mercer county, New Jersey, tells how to secure early plants for early gardens,

as follows: "Hotbeds and cold frames are easily made and managed. They can be counted on to give so much pleasure and profit that nearly all farmers should have at least one of each to grow plants for his own use. The common hotbed can be used for growing all early vegetable plants and should be prepared ready for the seed six to eight weeks before time to plant in the open ground.

HOTBED YARD

Cold frames can be used for growing lettuce for wintering, for lettuce and cabbage plants for early planting, and for hardy flowering plants, such as pansies and single violets. With slight protection in severe weather, double violets will bloom during mild spells and blossom profusely very early in the spring.

"For both hotbeds and cold frames, a well-drained, sheltered southern exposure, preferably on the south side of a building, hedge, or hill, should

be selected. If none of these are available, erect an artificial one, such as a board fence or corn fodder; in fact, anything that will break the force of wind. For hotbed sash, which are usually 3 x 6 feet, dig a bed 6 feet wide or a little wider than the sash, at least 2 feet deep and as long as wanted. Wall this up with boards not less than 1 inch in thickness. Common slabs from the sawmill will do as well as better lumber. When a permanent bed is desired, the sides and ends can be bricked or stoned up. The north side should be some 18 inches above the surface of the soil and the south side 12 inches, so as to give the sash enough slant to throw off the water easily.

“Across this frame, every 6 feet of the width of the sash, fit in a 2 x 4 scantling, adjusted so that each sash laps halfway on it. These scantlings are to support the sash. If stone or brick is used, these crosspieces should be set in the wall as it is put up, or a wooden sill should be fitted on the brickwork. The walls should be 5 feet 9 inches apart inside, if a 6-foot sash is used. This will allow the sash to rest at top and bottom. If wood is used for the walls, strong stakes should be driven 3 or 4 feet apart to hold the wall in place.

“To make the beds for planting seed it is necessary to have fresh, strawy stable manure. This must be well shaken up and then made into a compact heap under shelter when possible. It should be left in this condition until thoroughly hot, but not long enough to burn and become whitish. In the bottom of the bed spread wet straw, old hay, or leaves a few inches thick. Then put on the hot manure evenly and tread down firmly to the depth of 18 or 24 inches. After it is firmed place on it a layer of good, friable, loamy soil about 6 inches

deep. If not rich and mellow, add one-quarter of well-rotted stable manure. The soil should not be so wet it will pack.

“After the soil is on cover the whole surface of the bed with old carpets, bags, or any material that will keep out cold and retain heat. Let it remain a few days, or until the soil is warmed through. Use a thermometer to determine the heat. When 60 to 80 degrees is reached, plant the seed, marking off the drills 4 to 6 inches apart and about three-quarters

HOTBED

of an inch deep. Sow the seed evenly; peppers, tomatoes, and eggplants 30 to 40 seeds to the inch. Press down the soil firmly, and cover with fine soil a full quarter of an inch. Put on the carpet again, and let it remain until the seed begins to come through. Watch to see that the temperature does not go much above 80.

VENTILATION

“In warm sunny weather the sash should be raised to keep the temperature right. In cold

weather the sash should be covered with something to keep out the cold. The outside of the hotbed should be banked with stable manure or earth. Give the plants all the ventilation possible, but not enough to chill them. This is important, because it will make the plants stocky and strong. When very strong plants are desired a cold frame will be required.

“The cold frame is made similar to the hotbed, but not so deep; 12 to 15 inches will be enough. No heated manure is required, but decomposed manure made as fine as possible and spread about 3 inches deep over the bottom is generally preferred. On this about 3 inches of good soil will prepare the bed for the plants, which, when they are a few inches tall, or, say, four weeks before the time to plant in the open, may be taken out and transplanted as deeply as possible, 4 or 5 inches apart in the cold frame. They should be shaded a few days from the sun and protected from frost and cold. If the soil is at all dry it should be wetted about the time of transplanting, but with caution. If too wet and cold the plants will damp off. These directions apply more particularly to tomatoes, but eggplants and peppers are forwarded by very much the same treatment.

“When they become established give them all the air and sun possible, taking off the sash in favorable weather. Give only enough water to keep growing well. Plants so treated should make strong, sturdy ones, which should be in bloom when ready to transplant in the open ground. When the plants are to be removed a spade is thrust under the manure in the bottom of the bed, and as much earth as possible preserved with each one. They are then put in boxes and taken to the field

as carefully as possible, preferably in damp weather, or just before a rain. They will soon start off and give fruit much earlier than common plants from the ordinary seed bed. The cold frame can be used

ROW MARKER

to sow lettuce for late fall or to plant pansies and violets for winter. As soon as plants begin to appear through the covering this must be removed in favorable weather and replaced in unfavorable. Great care is needed to prevent extremes of heat and cold,

and the plants suffer from too much wet.

"If any plants grow too fast or too tall they should have plenty of air, and water should be withheld; if they wilt in the sunshine, they will not be harmed."

MAKING STRAIGHT ROWS

"To enable one man to mark out straight rows in the quickest possible manner," writes R. J. Dallinga of Summit county, Ohio, "we stretch two strong cotton lines, which cost us about 25 cents apiece, where the first two rows are to be, say, 3 feet apart.

"From a garden drill we remove all the seeding attachments and run the drill wheels

MAKING STRAIGHT ROWS

over the first line from *a* to *a*. Before running back on second line (*b* to *b*) we put the stake of line one from *a* to *c*. When we arrive at *b*, stake of line one is moved from *a* to *c*, which puts the line in position

for marking the third row. Before running the wheel on the third row from *c* to *c*, stake of line two at *b* is moved to *d*, which puts line two in position for the fourth row, etc.

“For long rows we use one measuring stick at each end of the rows and one in the middle. The middle stick is pushed into the ground against the line to prevent the wind from displacing the line. When we plant day after day we do not take up the lines at night, but simply loosen one end to prevent their breaking from shrinkage. The time to wind up the lines would cost far more than they are worth. We can better afford to buy new lines, say, every two years.”

CIRCUMVENTING WEEDS

The long growing season of the south makes it almost impossible, at least impracticable, to keep the garden clear of weeds all summer. No matter how clean the garden may be kept throughout the earlier part of the season, the weeds creep in later on, and in the fall the garden looks more like a weed bed than anything else.

“Last year,” writes A. Jeffers of Fairfax county, Virginia, “we adopted a new plan. We planted watermelons, cantaloups, cucumbers, beans, sweet corn, sunflowers, and several other minor garden crops, all in one patch, and in long rows, to be mainly cultivated with the horse. At the last working, which covered an area of little more than one acre, we sowed cowpeas between all the rows, and worked them into the soil nicely.

“By the time the melons were ripe not a melon nor a melon vine was to be seen, and yet the patch was covered with them, hidden away under the

foliage of the peas. We had no trouble in picking the melons and other vegetables, and by being a little careful in gathering the garden sass for the table, did not at all injure the protecting crop of pea vines.

"In October we finished mowing and taking up the peas and had 40 cocks, nearly a ton of fine forage for the cow. The garden patch was not only free from weeds, but the land is actually better.

"Had we not sown this crop the garden would have been the worst looking patch of land on the farm. On a small part of this garden we sowed, as an experiment, crimson clover with the peas, but the growth of peas was so luxuriant that the clover smothered out."

STORAGE FOR VEGETABLES

In the storage of vegetables for farm use the main requirements are: Correct and uniform temperature, darkness, and the proper amount of moisture. These essentials can best be obtained and maintained in what is commonly known as the root cellar; that is, a cellar covered with earth. Being entirely covered, the outside temperature does not readily affect that inside, thus avoiding the sudden changes that are so injurious.

The earth covering also supplies about the correct amount of moisture for most vegetables and apples. It is just moist enough to prevent withering, but not damp enough to cause rot. Never put a house, barn, or building of any kind over a root cellar if you want the best results. More stuff, many times as much, is ruined by being kept too warm, than is spoiled by being kept too cold. Keep the temperature of the cellar as near 40

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degrees as possible. Never have it warmer than this; and the nearer the freezing point it can be crowded without actually freezing, the better.

Be sure all stuff is thoroughly cooled in the fall before closing the doors for winter. Then keep it dark. Always use a lantern and under no circumstances allow the daylight to enter. Have a thermometer always in the cellar, and should the temperature threaten to go too low, place a lantern on the floor of the cellar for a while. A lighted lantern will raise the temperature of a 2,000-bushel cellar about two degrees in 24 hours.

Take as much pains to keep the cold in, in spring, as to keep it out in winter. To this end, as soon as spring is near, cover the earth on top of the cellar with manure or straw, put on thickly so as to keep the frost in the ground as late as possible. Keep doors shut tight to keep cold in. Thus you have a little storage plant in the spring and early summer; and when others must sell stuff at what they can get, or see it rot or wither, you can hold your goods from four to eight weeks longer, and then sell at your own price.

"By following these directions," writes F. B. McLeran of Minnesota, "I have kept year after year all kinds of vegetables until late into the spring and summer. I have kept potatoes in first-class shape until August, cabbage until June 25, carrots until June 15, beets until August, rutabagas until August, and parsnips until May.

"A word as to construction. I believe the coming age is going to be the cement age. In any event, I prefer the cement root cellar. Floor, sides, and roof all should be of cement. Next to this use stone or brick, and, if you have nothing else, use wood. Place tile under walls and floor. Provide

an outlet. Make doors at least 6 feet 6 inches high, so you will not have to duck your head every time you pass in or out.

“Provide chutes similar to coal chutes so as to chute the vegetables in. Do not carry them in by hand. Provide ventilation. Have double doors, and have them fit tight. I use the same latch as I find on my large ice-box door. If you will faithfully follow these simple directions you will have a successful home for storage for fruits and vegetables.”

ARTICHOKE, JERUSALEM

The tubers of this sunflower-like plant are far less highly esteemed than they should be in home gardens. The plants will thrive in any good soil without any cultivation. They need only be held within bounds. Each year they will reproduce from the small tubers left in the ground at digging. A plot 10 feet square will be sufficient for a winter's supply for each member of the family, or at least one dish weekly between October and April. It is best that the tubers be allowed to remain in the ground and taken up with a pickax as needed. In order to make this work light, it is desirable that the soil be covered with straw so as to prevent deep freezing. The tubers are usually scalloped or boiled and served with cream sauce. They are particularly delicate and well worth the attention of every housewife. They must not be allowed to shrivel, as they lose their flavor in this treatment.

A writer in the *American Agriculturist* says that “Tubers can be secured through any of the large seed houses in early spring. They may be planted

in well-drained, light soils as soon as the ground can be worked. Even on poor, gravelly soils, they yield well. The drills should be 3 feet apart and the tubers dropped 18 to 24 inches asunder. Cultivation is the same as for potatoes, though the plants will succeed with less if the ground is free from weeds. When they shade the soil, they may be laid by. When grown for market they are harvested like potatoes, or left in the ground until needed. Frost does not injure, but improves them, they can be dug with a pickax in midwinter. Unless left in the ground or stored in pits or in sand in a root cellar, they shrivel and lose their quality. Properly grown they will yield 200 bushels of tubers or more to the acre. The White and the Red Brazilian generally yield the largest crops. The crop requires about five months to mature."

ASPARAGUS

According to W. G. Dawson of Dorchester county, Maryland, "Asparagus, when properly grown and carefully packed, is a good paying crop, and probably the most certain of all in the perishable list. This is because the supply rarely exceeds the demand, asparagus being used so extensively in its fresh state and for canning. As to varieties, there is much difference of opinion, but one cannot go far astray in choosing Palmetto, Giant Argenteuil, or Barr's Mammoth. All of these are good, but more depends upon the grower than upon the variety.

"Where one desires to produce the plants for setting, it is best to sow the seed in drills early in the spring, in order that it may germinate and get a start before the grass and weeds come along.

This is very essential, as the plants are tender when young and many will be destroyed in the necessary hand cleaning, even under the most favorable conditions. Frequent cultivation and heavy fertilization will force the growth, which is desirable, as plants one year old are much to be preferred, because they better withstand the shock of transplanting than when older.

"The soil is an important item in locating the crop. Land that crusts after a rain is not desirable, for it will cause the loss of many stalks by reason of crookedness. Therefore, light soil is usually chosen, and wisely. Asparagus is a heavy feeder and a generous supply of plant food will usually bring good results. Farm manure does much to keep the soil mellow as well as help feed the plant, but it is not often possible to do more than manure in the row. After the harvesting is done, and as soon as the land is well worked, some growers sow cowpeas to shade the ground, smother out weeds and grass, and improve the land as well."

T. B. Lutes of New Jersey says: "The net proceeds from one acre of asparagus in a favorable season should be \$100. Some growers, however, who have a retail trade can realize probably \$200 an acre. It all depends on the variety, the demand, and the man. We cut asparagus every day. The fact is, it grows faster than we can cut it. At daylight every morning we aim to be out in the field cutting asparagus. The idea is to get all cut over by noon, as it takes considerable time after it is cut to get in shape for market. We cut white grass, that is, grass grown in earth ridged up for this purpose. In cutting three rows stalks are laid on one row, then the picker-up gathers this

grass in crates that have galvanized wire bottoms, care being taken to keep the heads of the shoots all in one direction.

"These crates are taken to the packing house, where they are first doused in a tank of water several times to remove all dirt, then taken to the packing tables, where they are placed in bunches 8 inches long and about 4 inches in diameter. As soon as bunched, each bunch is placed in water to keep it fresh and plump. Then it is taken out of the water tubs and placed in strawberry crates, placing six in each layer, or 24 bunches to each crate. These crates are then shipped by freight to New York city or Newark, New Jersey, where they are sold by reliable commission dealers and returns made daily. The utmost care is necessary in handling asparagus, especially in very hot weather, and it sometimes happens that it will so heat in shipping that it will hardly sell at any price. To remedy this I always stand the bunches up in crates during extreme hot weather."

BEANS

L. C. Seal of Indiana discusses bean growing as follows: "Did your young bean vines ever promise well, then suddenly yellow up and, perhaps, die, and you could not account for it? Maybe you hoed them one time when their foliage was wet. You should not have done so. Never touch snap beans until the foliage is absolutely dry. It will cause the leaves to drop prematurely.

"Beans are very sensitive to cold and wet weather. It is time, labor, and garden space wasted to plant beans before the spring has come to stay. A few pods gathered from weak, sickly plants are

not to be preferred to a few days' delay in the arrival in profusion of this coveted relish.

"Though beans themselves are gross feeders, under favorable culture and weather conditions, they are nevertheless delicate. Because ground is too poor to grow anything else, it is not infrequently planted to beans. This is unfair to the beans; they, too, like humus. Give them suitable soil, or make the soil suitable through fertilization—a deep, mellow seed bed and plenty of room. More vine, more crop, if properly spaced.

"While blooming and bearing, bean rootlets, which are many and filmy, permeate the soil into middles. Better not cultivate too near the row, nor deeply at this stage of growth. At this point, if possible, stop cultivation entirely. Their own shade mulch may do more than you can do unless you are trying to resuscitate an old row, which has furnished you beans for a week or ten days. Usually it is more economical to remove these vines and plant a second crop, or put it in sugar corn.

"Vines of bush snaps are short lived. Pole varieties continue longer in bearing provided the pods are clipped off as fast as they assume edible dimensions; they will die in the process of maturing seed. No trellis can offer as natural conditions for vining purposes as the stout, old-fashioned barked pole well anchored in the hill. A Kentucky Wonder would crawl 2 feet to climb one. Butter beans are the seedmen's limas. Just now I am much interested in Giant Stringless. They require the whole season in which to mature, and furnish several pickings. Bunch limas are earlier than the pole, but not quite so excellent. The Dwarf Horticultural is a shell-out bean. It ranks with the best, is

medium early and prolific. Seedmen raise the best seeds. That is their occupation."

LIMAS

According to Cora J. Sheppard of Cumberland county, New Jersey, "The ground for lima beans may be prepared at the same time as for the general garden. The hills for beans should be placed 4 feet apart each way. Well-rotted manure should be placed in the hills; half a shovelful to a hill, or a shovelful to every three hills, may be enough.

"If this is not at hand, commercial fertilizer may take the place of it. The poles should be stuck before planting the beans. A rather heavy stick with an iron point on one end is used to make the holes for the poles. No garden is complete without lima beans, and every gardener should own his own bean sticker, and not depend upon neighbors or friends.

"In this section the beans should not be planted before May 10, and the weather must be just about right. If too damp, the beans decay in the ground. Place four beans in a hill, eyes down, and if they come up well two should be pulled out, if the ground is heavy, or there will be too much of a mass of vines. If the soil is light, the four beans can be left to grow.

"To get extra early beans we plant about 30 hills in the cold frame early in the season. First, we melt tops and bottoms off old tin cans, which are then filled with dirt, and closely packed in the cold frame. The seedlings get a good start and are put in the garden about the time other people are planting their beans. When transplanting it is well to water thoroughly before disturbing, in

order to make the dirt stick to the roots. The roots should not be disturbed more than necessary, but the whole mass of dirt in the tin can removed to the garden. In this way we get the delicious lima bean for our table ten days or two weeks earlier than by ordinary planting."

John W. Broadway of Cumberland county, New Jersey, manages somewhat differently. "First, the land should be in a high state of cultivation. Use fall plowed land and apply 15 to 25 tons of good manure an acre after ground is plowed. At planting time apply 400 pounds high-grade fertilizer an acre in hills well spread. Hills $4\frac{1}{2}$ feet each way; thin to two plants, give frequent cultivation, once each way every week until vines reach top of poles, then use binding twine from pole 1. Pole-train vines on string; keep up cultivating during season. The cost of growing is not limited, as results are governed by special care. I claim cost an acre \$125 to \$200 and first year a trifle more, as poles will last three years. My profit last year was \$275 an acre net, as prices were good throughout the season."

"In the garden no one crop has regularly paid me better than the lima bean," writes D. S. Kelsey of Hartford county, Connecticut. "For eight years I supplied the large hotels at Saratoga Springs, New York. All that time I was, so far as I know, the only grower of lima beans in the Adirondack region. Not that I advise people to go north to grow them, but there is a popular notion that lima beans belong to the hot, sandy soils of the South. They will mature anywhere that corn will mature.

"The bean needs plenty of organic nitrogen; that is, stable manure, or chemicals, dried fish, cottonseed meal, blood or tankage; never nitrates

or guano. Rows should always go north and south, that the sun may have full access everywhere. The rows should be $3\frac{1}{2}$ feet apart for the very smallest bush varieties, and 5 feet for the poles, but the hills may be close together, making a kind of hedge row. The south and southeast exposure and sun slope are best, but a skillful gardener will produce an abundant crop on the northeast side of a cold hill.

"As to prices, one can almost make his own. I have received as high as \$2.25 a bushel wholesale, and very seldom as low as \$1. I like sod land, plowed after haying the summer before, with a cover crop plowed in early the following spring plus many harrowings. I use chemical fertilizers only broadcast, excepting a little superphosphate in the hill or drill. Always drill the bush varieties.

"In the case of selecting seed from the dwarf varieties one must carefully avoid any plants that show a tendency to revert back to "running." This is particularly true with the Burpee. Its natural inclination to twine has not been entirely bred out. As a commercial proposition I see no reason why pole limas should be planted any more."

BEETS

Beets are very readily grown on almost any soil, not too sandy nor too heavy, preferably a very rich, well-worked and deep loam. For earliest use the round forms should be chosen. Of these there are many that are of quick growth. They are planted in rows 16 inches apart, as soon as the soil can be worked in spring. Not more than ten seeds should be sown to the foot nor should these be covered more than an inch deep. When 5 or 6

inches high the seedlings should be thinned so the plants are not closer than 4 inches apart; for the larger kinds and slower growing sorts 6 inches is better. The thinnings need not be destroyed, because they make excellent greens. Planted and cared for in this way the crop of early varieties should be ready in about 60 days. Successional sowings may be made at intervals of ten days or two weeks, but usually for home use different varieties are used, so as to do all the planting at once. The beets will remain in good condition for weeks and those that are not used up during the summer may be stored for winter.

Beets may be easily forced by sowing the 'quick-maturing kinds in hotbeds during February or March. There they may be left to mature or can be transplanted while still small. They do best without transplanting. During late fall the beets should be pulled and their tops twisted off. They are not injured by light frosts and frequently are greatly improved by being allowed to remain in the ground until rather late. They may be easily kept in a cold cellar. Generally, however, it is best to store them in pits outside, as they are apt to become dry and corky if the air is not sufficiently moist in the cellar. Among the well-known and highly appreciated varieties are the Eclipse, Egyptian, Bastian's Early Turnip, all of which are early varieties, and Dewing's Improved Blood Turnip, which is a good late variety. There are also long-rooted varieties, which, however, are not as popular as before the turnip-shaped kinds were perfected.

BRUSSELS SPROUTS

Anyone who can grow cabbage can grow Brussels sprouts. Everyone who likes cabbage will

like Brussels sprouts better. But the same carelessness that produces woody, rank-flavored cabbage will have a like effect on Brussels sprouts. People who give the plant a fair trial in the garden and the kitchen soon swell the ranks of lovers of this popular vegetable.

Any garden soil that will grow good cabbage can be relied upon to produce good sprouts. An ample supply of humus and nitrogenous food in the soil is desirable as in the case of any other leaf crops. The seed may be sown at the same time and in the same way as cabbage seed. For very early crops it may be sown in a cold frame in late fall, protected during winter with mats or shutters, and the plants set out as early in the spring as the ground can be worked. For second early it may be sown in the spring and transplanted in April. But since the plant makes most delicately flavored heads during cool weather, the most popular time of sowing is June.

When thus grown the young plants are set out in the garden 3 by 2 feet apart at six weeks old and given clean cultivation for six weeks. From September until hard freezing they need little or no attention unless the season be very dry.

In such cases liberal watering will improve the quality and quantity of the sprouts. The bulk of the picking is done between October and December, though in mild winters, especially on the Atlantic seaboard and in the southern states, some may be gathered until March and even April. For the New York market the east end and north shore of Long Island furnish large quantities as a second crop following potatoes. Generally the plants are cut about December 1 and stored for winter picking. The sprouts are packed in berry

boxes. A packer can put up 125 to 225 boxes a day, and a picker can gather 200 to 275 quarts a day. Yields range from 3,000 to 4,000 quarts, or even more, an acre.

A leading grower, John Young of Long Island, chooses plants of dwarf habit, in which the sprouts grow so closely together as to conceal the stem. For commercial purposes, Mr. Young prefers land that has been in sod two or three years. This he fertilizes with 1,500 pounds high-grade fertilizers broadcasted before the plants are set. Frequently he uses nitrate of soda at intervals during the season.

CABBAGE

"We usually plant six or eight acres of cabbage of several varieties each year," says H. A. Southerland of Ontario county, New York. "During the last five years we have found Burpee's All Head earlier and Burpee's Danish better than any we have ever tried. We have also grown All Seasons, but it gives poorer results than the ones mentioned. Cabbage does well on our clay loam soil, which is low-lying but well underdrained. Following the cabbage, come oats, wheat, and clover. The sod of the clover is turned under for corn, which in turn is followed by cabbage. The ground is plowed as early in the spring as possible, and again thoroughly cultivated up to the time of setting the plants. The rows are marked out 38 inches to 3½ feet apart and the plants set 24 inches asunder.

"For the last two seasons we have used a transplanter with good satisfaction; it cost \$50. After the plants are set we use a two-horse cultivator and go through every few days until the rootlets

get too thick in the middle of the row. The fertilizer we use costs \$30 a ton. It contains 4 per cent nitrogen, 8 per cent phosphoric acid, and 7 per cent potash. It is applied just before the plants are set, at the rate of 400 to 500 pounds to the acre, with a grain drill fertilizer attachment. We have tried using double quantity fertilizer each side of the dead furrow, but find that we cannot get as good results in the dead furrow as elsewhere.

"Our crop last year ran about 15 tons to the acre. This is not a very good yield; the season was very dry during the summer. The prices usually ruled from \$4 to \$8 a ton last year. We cut the cabbage with a long-handled spud, putting four rows in one windrow, then we drive between two windrows, with a man on each side of the wagon. When 5,000 to 6,000 pounds is loaded, the wagon is hauled to the railway and the heads loaded on flat cars or in refrigerator cars. Usually the harvest is finished by November 1. We prefer to sell cabbage to the dealer who will take the risk of storing. Cracked and loose heads are fed to sheep in pasture in amounts just sufficient for them to eat up clean. Our seed is bought in early winter at about \$2.50 a pound. We aim to buy early, as we think we are likely to get better seed. On about three-quarters of an acre one year we raised \$223 worth of cabbage."

INTENSIVE CABBAGE GROWING

"A crop of cabbage," says C. G. Brown of Kent county, Delaware, "can be grown and harvested in 90 to 100 days, admitting, therefore, of two crops in one year. This means intensive culture, heavy feeding, and, for the outlay, very profitable returns. For the first early, we grow Jersey Wake-

field. Because of its hardiness, rapid growth and hard-heading habit, it is, in our experience, unequaled. For second early, we grow the large or Charleston Wakefield, Henderson's Early Summer and Early Dwarf Flat Dutch. The seed is sown for the first early in September in well-enriched beds and when the plants are 2 to 3 inches tall they are pricked out into cold frames, protected with oiled muslin or glass or in the open ground in a place protected from the north and west winds.

"The objection to these wintered-over plants is that, on account of age, many will go to seed. We prefer and have better success with spring plants. These are started in a hotbed under glass in February, and when 2 to 3 inches tall are pricked out into cold frames, and if not too thick in the seed-bed rows, will be ready to transplant in the field by March 15 to April 1, or later. These spring-grown plants will head up earlier and make more heads to the acre than wintered-over plants. The best soil is a good sandy loam that is well supplied with humus, from the growth of former crops of clover or other legumes—a soil that is friable.

"This should be thoroughly pulverized and leveled to prepare it for planting. We use a potato planter, making the rows 3 feet apart, distribute the phosphate in the rows, and make the ridge for the plants at one operation. With the machine, we can do the work very cheaply and rapidly. The ridges are leveled down with a plank drag, which covers two rows at once 3 inches deep. The fertilizer is applied at the rate of 1,000 pounds to the acre, and is home-mixed, medium high grade, analyzing 4 per cent nitrogen, 7 per cent phosphoric acid, and 6 per cent potash. We want strong plants with good root system. They are set 18

inches apart in the 3-foot rows, taking about 10,000 to the acre.

"Cultivation is done early and thoroughly and continued until the cabbage begins to head. When the plants are ready to head and the soil freshly cultivated, we apply nitrate of soda, at the rate of 200 pounds to the acre on the row close to but not on the plants. One application of soda, costing \$5, has increased the yield \$40. When the soda is used the heading will be more general and rapid, and the heads more crisp and tender. Under conditions reasonably favorable, the yield will be from 7,000 to 9,000 marketable heads to an acre, making an average of 8,000.

"As fast as the cabbage is harvested, the stalks are cut and soon decay, and are out of the way of the second crop. The first, or early crop, is usually all marketed by the first of July. The land is then prepared for the second or late crop, as thoroughly and in the same way as for the first crop, again applying 1,000 pounds of fertilizer in the row and 200 pounds nitrate of soda as a top dressing. The plants for the late crop are grown very cheaply in the open ground, by sowing the seed in a well-prepared bed the last of May. The plants will be large enough to transplant to the field from July 1 to 15, putting them the same distance apart as for the early crop, requiring about 10,000 to the acre."

CABBAGE STORING

"Cabbages should be left in the field as long as possible, but it is better to harvest a week too early than a week too late," says Prof. Samuel Fraser of Livingston county, New York. "They must

not be stored when wet nor handled when frozen. Cabbages bruised when frozen are invariably spoiled and will not store. Heads which have not quite reached maturity are the best for storage.

"A deep, double furrow should be plowed on a well-drained piece of land, and the cabbages be placed in it roots down. This will hold three rows of cabbages, two rows being laid on the sides, and the third between them. As fast as they are placed the roots are covered with soil by plowing a furrow on each side. When the soil is frozen it is covered with litter or manure to prevent deep freezing.

"One of the simplest ways is to store in an orchard or some sheltered place, often alongside a fence which has been made tight by a liberal use of straw. The cabbages are stored with their stems on, and are placed head down and as close together as possible. Two or three tiers are often made, the heads of the second tier being placed between the stems of the lower, and so on, the piles being made of any width and length desired. The whole is covered with leaves, salt hay, or straw, and a little soil, rails, brush, or litter.

"Small quantities may be stored by plowing out two or three furrows 10 or 12 inches deep, on a well-drained site, and placing the heads with their stems up, as close together as possible; some prefer to lay them but 1 or 2 feet thick, while others will pile them up 2 to 2½ feet high, bringing them to a point. The pile is then covered with straw, salt grass hay, or a thin layer of straw and then several inches of soil. They are stored before freezing, and when the soil covering them is frozen it may be covered with strawy manure or any other litter to keep the soil frozen until the cabbages are needed for sale.

“Great quantities are stored in cabbage houses. The houses are often built alongside the railroad to facilitate shipment, but a small one can be built on the same principle if desired. The walls are frequently about 8 feet high at the eaves, built with three walls and two air spaces, papered on the outside, with a close boarded and tar papered roof. The building may be 50 feet wide and of any desired length, with a driveway through the center and well provided with ventilating arrangements. The building is divided into compartments or bins, which run across the house, from the driveway to the wall, one on each side. These are 5 feet wide, made of slats on 4-inch studding; this permits of a 4-inch air space all around each bin, the end near the outside wall included.

“When the bins are filled, the driveway may be filled if desired. The heads are cut close, practically ready for shipment, and are piled in the bins, from the floor to the ceiling. The filling is done in cold weather, if possible, and care is required in ventilating to keep the temperature of the building as near 30 to 35 degrees as possible, opening during cool nights, and keeping closed on warm days or when cold snaps occur.

“One or two carloads may be stored in the following manner: Select a dry site, excavate about one-half foot deep and 9 feet wide, and of the desired length. Set posts in each corner and every 4 or 5 feet along the side, letting them project about 4 feet above ground level. Board up the inside, 16-foot boards being useful. Set 2 x 4-inch rafters on the studding, and roof with wide boards, lapping them a little. Cover the apex of the roof with two boards, fastened together like an inverted V. Bank

up the outside of the house, and in cold weather cover the roof with straw."

CANTALOUPE AND WATERMELONS

A warm, sandy soil made rich with stable manure, thoroughly composted, is generally considered the genial home of the cantaloupe, so far as regards the production of a crop. But quality is quite as important a consideration as quantity. To produce a large crop is an easy matter, but to produce melons of high flavor is an art that has never been taught. Whence comes that high flavor peculiar to melons produced in a given section and not in another, although not far distant, is a mystery. We know such is the case with all vegetables and fruits, but why we cannot determine.

As the melon is a sub-tropical fruit, requiring a warm situation and a rich soil, it should ever have the most sunny as well as the most airy situation, and be given every facility for growth possible. In the preparation of the soil haste is not essential, as the seed should not be sown before the middle of May. The soil, when in condition for the most thorough tilth, should be covered to the depth of 2 inches with stable manure, thoroughly composted. Work this in as evenly as possible to the depth of a foot, then mark it out in squares of 6 feet; at the angle of each, dig a hole 1 foot deep and 18 inches in diameter. Put in additional manure to the depth of 4 inches, after being thoroughly packed down, fill the hole with the soil thrown out and raise the hill to the height of 2 inches above the level. When the hills are all prepared, plant in each, say, ten seeds, well scattered, and cover to the depth of half an inch.

When the plants commence active growth, and the dangers from insect enemies are past, throw out all the plants but two, leaving the most vigorous. As soon as the flowers appear nip off the heads of all the leading vines, which produce only staminate flowers. This will encourage the lateral branches which yield the fruit, and will more than double the crop. The object of every plant is reproduction. When that purpose is thwarted by taking away a large proportion of the staminate flowers, the plant sends out laterals, which will set more than double the number of fruits, each of which will contain a much smaller number of seeds, doubly protected by a much thicker covering of flesh. This serves the double purpose of seed preservation and food supply; hence the all-important secret, or consideration in the cultivation of the melon.

The best variety to plant in order to get the best results is that one which does best in the place you have for it. The question of preference is somewhat governed by taste. Some prefer the green-fleshed, others the pink-fleshed varieties. That being settled, the next consideration is which will thrive best in the place you have for it. Observation and experiment alone will determine that.

The all-important work of cultivation is to have the soil worked deep and fine before the seeds are sown. After that, keep the surface always loose, to the depth of an inch. This surface cultivation should follow every shower, and as much oftener as convenient. But there is one consideration of vital importance, viz., always get the best seed without regard to cost. To determine this there is one safe rule, that is, to have at least sufficient to last for five years always on hand. One of the most successful melon growers we have ever known

said melon seed is not fit to plant until it is ten years old, because the older the seed, the lower its vitality, consequently it will produce less seed and more flesh. It, therefore, follows that to have a constant supply of seed that has been tested and known to be all that is desirable is to know that disappointment in regard to quality of the production will be averted. Do not save your own seed, that is the seedman's work. The cost is but a trifle in proportion to its value. Plant a single hill from a new lot each year in advance of the main planting.

Among the popular cantaloupes of the large markets, writes the editor, are the Montreal Market, Rocky Ford, Netted Gem, Emerald Gem, and Hackensack. This last one, however, has been rapidly giving place to melons of higher quality ever since the Rocky Ford crusade, which was inaugurated in the late '90's. The varieties mentioned are popular not only because of their ready salability, but also because of their high quality. They are excellent for home use.

The Montreal Market is, perhaps, the largest muskmelon of high quality grown, specimens often weighing 10 pounds or more. The Rocky Ford is small, weighing 2 pounds. The other varieties mentioned, with the exception of the Hackensack, are round-formed varieties, weighing from 3 to 6 pounds. All these varieties, with the exception of the Emerald Gem, are green-fleshed. There are a number of red or salmon-colored varieties of good quality which command a ready sale in markets where they are known. They are, however, not quite so popular as the green-fleshed sorts. Among the leading varieties are Paul Rose, Osage or Miller's Cream, Emerald Gem, and Banquet.

The Montreal Market is more noted in the north than in the south, but whether this is simply because of gaining its repute in Montreal and other northern markets is not known. It would be well worth any planter's efforts to try all the varieties mentioned in an experimental way, and decide which is best suited for his conditions. So far as quality is concerned, he can make no mistake in the list given.

As to watermelons, probably no variety exceeds in high quality the old Florida Favorite, Ice Cream, and Sweetheart. These, however, are not especially noted in the large markets. They are mostly desirable for home use and the local market. Without sacrificing too much in the way of quality, the grower may find Kleckley's Sweet, Alabama Sweet, Duke's Jones, Triumph, Lord Bacon, and Jumbo to be good ones. They are all superior to Kolb Gem, which for so many years has been a leading shipper from the south, and holds a place among melons similar to the Ben Davis among apples and the Kieffer among pears.

There are other varieties of excellent quality, such as the Gray Monarch, Sibley, and Seminole, which should find a place in any list of good varieties. As to earliness, Sugar Loaf, Rattlesnake, and Memphis hold a high reputation, and for lateness Scaly Bark, Sweetheart, and Boss are also noted.

CANTALOUPE AND STRAWBERRIES TOGETHER

"Early last April," writes W. W. Byrn of Dorchester county, Maryland, "I put about five acres in good tilth for strawberries. Then I struck out

furrows 4 feet apart with a one-horse plow, and immediately covered them by running the same plow on each side, thus making a ridge or list. The object in opening the furrows before ridging was to secure a good, deep, soft soil in which to plant.

“A one-horse spike-tooth cultivator was then passed once lengthwise on the top of these ridges to smooth them down somewhat, but still to leave them slightly above the level. I then used a heavy chain crosswise to mark off these rows in checks $2\frac{1}{2}$ feet apart. A strawberry plant, variety Tennessee Prolific, was placed at each check.

“No fertilizer was used in the furrows under the plants, because the land was good and because I had lost a crop of fruit the year before by too heavy fertilization when managed in this way; so many plants were formed that fruit did not set.

“In planting I used paddles made from a strip of seasoned white oak 8 inches long by 4 inches thick. Three holes were bored close together about $1\frac{1}{2}$ inches from the upper end, and the edges rounded off like a spade handle. The lower end was then pared down to make a sort of blade, which could be easily thrust in the ground. I like these paddles better than anything else I have ever used for planting, because they do not tire the hand, and because they open a large hole in which to place the plant with its roots spread out well and deeply. The field was then cultivated both ways with an ordinary one-horse cultivator, using the narrowest teeth next the plants until they began to make runners, and closing the machine when going between the plants the narrow way. One hand hoeing around the hills was given in May and another in June.

"About July 1, I planted hills of Rocky Ford cantaloupes in each alternate strawberry row, allowing three strawberry hills between the cantaloupe hills. This made the hills 8 feet apart one way and $7\frac{1}{2}$ the other, and still left the wide inter-furrows free for cultivation as before. As soon as the cantaloupes came up about 100 pounds to the acre of good phosphate was scattered around the hills and hoed in. The berry plants began about this time to run freely, so I attached the rolling coulter of the flushing plow to the one-horse plow and ran it 2 or 3 inches deep on each side of the furrows. The plow threw the severed plants out of the way. Next day a cultivator with large flukes threw the earth back in place. One more hoeing and one more cultivation were given to complete the work, except for the pulling of occasional stray weeds.

"The cantaloupes set fairly well and I netted \$25 an acre from the crop and left a fine stand of strawberry plants in condition for a full crop the next year. Had all the fruit matured, I believe I should have netted nearly \$100 an acre. In October I gave the berry plants a top-dressing of about 800 pounds an acre of high-grade phosphate, containing about 10 per cent of actual potash. This experiment has been so encouraging to me that I shall try it again with hopes of better success next time. The cash returns from the cantaloupes have been more than the combined expense for both crops. I cannot see that the future berry crop has been in any way injured by having the cantaloupes planted with it, nor by the trampling in gathering the fruit."

PACKING AND MARKETING CANTALOUPE

W. F. Allen of Wicomico county, Maryland, says: "There is some difference of opinion about picking cantaloupes. It is necessary to pick greener when the fruits are to be several days in transit, but I will give my way of doing it. The first half of the season I pick as soon as the stems can be forced with the thumb to part from the fruit without breaking out a piece of the melon with it; that is, it must come off smooth, and not tear or break the flesh. This condition should prevail before the cantaloupe has begun to turn yellow. A cantaloupe that is in this condition and just right to ship one day will be quite yellow and unfit for transportation the next day. After the season is one-half to two-thirds gone and the weather is very hot, as is usually the case, I find it safe to cut them off with stems after they are full grown and densely netted. It requires careful help to pick a crop of cantaloupes without considerable loss from picking too green or too ripe. In either case, those too ripe or too green should not go in the package. An expert should follow just behind every 15 or 20 pickers to see that they are doing their work properly. Wagons should be ready to take the cantaloupes to the packing shed soon after they are brought out to the end of the rows.

"All handling should be carefully done to prevent bruising and bursting. When the fruits arrive at the packing shed, the packers, mostly women, hurry them into the crates, which hold 45 cantaloupes each. Every cantaloupe should be perfect. One crate, well packed, carefully culled, and in perfect order, is worth three that may be

packed out of the same pile by a careless packer, who will put in a cull or two, and perhaps pack loosely so the cantaloupes can roll about. When a crate is packed loosely or with two or three bad cantaloupes, it is sent back to the person who packed it to be packed over again, then to the refrigerator car.

"As no cantaloupes are picked on Sunday, we have many ripe ones on Monday, so the finest of these are selected for seed. Two or three cars a day during the season is my usual crop. These are shipped principally to New York city, which is one of the best cantaloupe markets when the quality is good, and quantity not too excessive. When this occurs, Boston is my next choice of markets on a venture. I sometimes ship a surplus car to Pittsburg, Philadelphia, Hartford, and Springfield, whichever market offers the best inducements, but never under any circumstances do I ship to more than one firm in one city."

BUSINESS WATERMELON GROWING

According to Theodore Brown of Gloucester county, New Jersey, "The best soil to grow watermelons in is a light sand, or sandy loam, previously occupied by clover sod. Usually, however, melons follow corn or sweet potatoes. The land should be plowed in the late fall or early spring and given a light coat of barnyard manure broadcast. The rows are then marked 8 feet apart with a two-horse plow and a light dressing of well-rotted stable manure or of high-grade fertilizer spread in the furrows. In covering, the row is ridged up well, and let stand until ready to plant, when a sled marker is run crossways, making the

rows 8 x 8 feet. The dropper follows the marker, dropping eight to ten seeds in each hill, being careful to put part of the seed on the side of the mark, so that when covered with a hoe some of the seed will have one-half inch of soil and others from 1 to 1½ inches. The lighter covering will be best for wet covering and the deeper for dry. The first planting is made about April 25 and additional plantings about ten days apart until danger of frost is over and a full stand is secured.

“When the young plants come up they are dusted with a mixture of air-slaked lime, plaster, and tobacco dust, to keep off the striped beetle. This application is repeated every few days until the plants have rough leaves. Bordeaux mixture is considered a sure preventive for fleas. At least once each week the plants are cultivated with a horse hoe or riding cultivator, and when they come in rough leaf are hoed and thinned to three or four plants in the hills. When they start to vine only one plant is left in each hill. The last cultivation is given just before the vines meet, turning the vines in each alternate middle, harrowing and then turning them back, harrowing remaining middles, then laying the vines out carefully by hand. Usually clover seed is sown just previous to this last cultivation.

“The varieties popular in this section are Dark Icing, doubtless the best melon for home use, but too tender and sweet for market purposes, and Kleckley Sweet, one of the new very sweet ones. For market purposes, a melon that will not bruise in handling and will cut solid slices, tough enough to stand up and look nice on the table, is in demand. Dixie, Sweetheart, Pride of Georgia, answer these requirements. When sufficient melons are ripe to

make a picking, the ripe ones are cut with stems about 2 inches and piled along roads laid out at convenient distances through the fields. They are thence loaded into wagons and taken to the car or to the city market.

"From \$15 to \$20 a hundred for large fruits are the highest prices realized for melons at the car, often the price drops to \$8 or \$6, and sometimes the fruits cannot be sold. Twenty to 30 years ago melon growing was an important industry in this section, many farmers then growing from 5 to 20 acres each, and usually realizing from \$50 to \$100 an acre; but competition with southern growers, on cheap land, with cheap labor, and low freights, has made the profits uncertain, and today very few melons are grown here except for home use or local trade."

CARROTS

Carrots are used both for table vegetables and for flavoring soups and stews. They are of the easiest culture. The seed is sown in rich, mellow soil, preferably with a few radish seeds to mark the rows and kept cleanly cultivated until they get a good start. If sown as soon as the ground can be worked, roots can be secured by the latter part of May or early June. For the small early sorts 14 inches between the rows is sufficient, but for the late, large-growing kinds 18 inches is preferable. It is desirable, however, to use the small growing kinds exclusively, because they are much more easy to dig than the long ones. The plants are thinned when about 4 inches tall to 4 or 6 inches apart. Storing is the same as for turnips. Carrots are often forced in hotbeds and cold frames for the early market. They are as easily managed as

radishes for this purpose. Among the best known varieties are Short Scarlet, Danvers, and Oxhart.

CAULIFLOWER

"I own 40 acres in the suburbs of Chicago and value this land at \$5,000 an acre," writes Sivert Howelesen of Cook county, Illinois. "The least profit these 40 acres have ever returned me was \$3,000 annually. My principal farming has consisted in vegetables to supply the Chicago markets, mainly cauliflowers, and also spinach, cabbage, cucumbers, radishes, and other crops in season. I have been particularly successful with cauliflowers, and the following is the way I have managed:

"The seeds are sown in drills in the hothouse early in March. This hothouse is made into a cold frame after the plants have been out of the ground several days. They are transplanted in May to the fields, where they are placed $2\frac{1}{2}$ feet apart, the plants themselves being 18 inches apart in the row. When there is any danger of worms of any kind, I place the plants close together, because the loss will then be less in proportion to the acreage planted. When the first crop has been taken out of the hothouse, I immediately sow other seed, generally getting three or four crops each season to keep the market continuously supplied between July and the first frost.

"My soil is a black loam. I use no compost or commercial fertilizer. Twenty-five loads of manure an acre is about the usual amount applied. I get this manure from the city stables and the cost, when I figure the cost of team and man and the great distance from the sources of supply, amounts to \$2 a load.

“I practice clean cultivation, mainly to keep the weeds down and yet aim to conserve the moisture; sometimes cultivating as many as three or four times a season, using a one-horse cultivator. In order to utilize the land to the utmost, I plant celery between the cauliflower rows, planting just at the time when the cauliflowers are being set out.

“As soon as the heads commence to form I draw the outside leaves together and tie them to keep the sunlight off the heads. This should be done as soon as the head can be seen and I usually leave the leaves tied until the head is cut out. When treated in this way the heads will nearly always be snowy white. Otherwise they become brown, and, if kept long in the field unprotected, will become yellow and the heads will spread, losing their crispness and delicate flavor. Late in the season I find immature heads do best if put in cold frame or cold cellar to mature.”

“I have grown cauliflower for three years,” writes L. P. Fisher of New Hampshire. “I have tried the Snowball variety. Cauliflower will do well on ground that has been worked for a year or two. The soil should be rich and well pulverized. It has been my experience that cauliflower will not do well when transplanted, and for that reason it is best to sow as many hills as you wish to cultivate. When the plants are up they may be thinned to one in the hill.

“In regard to blanching: I go over my crop twice a week on the average, and tie the tops over the heads where there is danger of sunburn. In a very few days after this is done the heads are ready for market. I have never had any trouble with the heads rotting, caused by tying the tops over them.”

As to cauliflower cultivation in Missouri, Prof. J. C. Whitten of the state experiment station, writes: "With the first warm days of March or early April, the plants should be transplanted to the open ground. The richest soil obtainable should be selected for the cauliflower plantation. Two or three hundred loads of old, decomposed manure will not make the land too rich. It is important, also, to secure a moist soil and yet one in which good drainage may be secured. A moderately heavy clay loam, sufficiently well drained so that water will not stand on it, is best.

"In transplanting they should be removed with as much of their roots remaining as possible and some of the outer leaves should be broken off to lessen the amount of evaporation before the root system is established. The plants are usually set 18 inches apart, in rows 3 feet apart, so as to admit of cultivation one way with a horse. Frequent and thorough cultivation is of the utmost importance.

"As warm weather approaches, plant lice often attack the cauliflower. These are best kept down by the use of tobacco. If tobacco stems from the cigar factory, or fine tobacco dust is scattered along the rows, in early spring, the plant lice are not likely to appear. It is always better to prevent their appearance by an early application of tobacco, than to attempt to get rid of them once they have become abundant. If lice appear on the plant, the best remedy is to dust them with fine tobacco.

"As the plants begin to head the outer leaves should be drawn up and tied so as to cover the head. This bleaches the head and prevents injury by the bright sunlight. In preparing for the market the outer leaves are usually trimmed to the rim of the head and the cauliflower packed in small boxes.

WINTER FORCING

“Cauliflowers are also frequently forced in winter in greenhouses or in hotbeds. For forcing, the seeds may be planted at any time in winter as previously described. The plants should first be transplanted 4 inches apart in a hotbed. Frequently water and ventilate as much as is possible without injury from cold weather. At first they may be kept warm enough so the growth will be moderately rapid, but the amount of ventilation and exposure should be gradually increased so as to promote a strong growth and short stems.

“When the plants have reached as much development as they can make without crowding planted 4 inches apart, they should be permanently transplanted to the larger hotbed. In this permanent planting they should be set 18 inches apart each way, with about 8 inches of very rich soil above the hotbed compost. Lettuce or radishes can be grown as a catch crop between them. If radishes are grown, the seeds should be sown in drills 4 inches apart and in four or five weeks they will be ready to be removed for market.”

CELERY

“Celery seed should be sown out of doors as soon as the soil is in first-class condition to work. The seed bed should be thoroughly pulverized and raked very finely to give the small seeds a chance to start. Two or three square yards of ground,” says Irving C. Smith of Wisconsin, “is plenty to grow plants for yourself and to give your friends. Don’t be afraid to cover the seed. There is an old threadbare theory that celery seed will not come up if covered. This

is not true. The seed grows with much more certainty if covered reasonably, one-fourth to one-half inch. If sown broadcast, rake it in and press the soil down with a board.

"The soil may be any good garden soil. The essentials are a soil that will not bake, plenty of fertility, and water. Here, again, we often hear the statement that celery must have a muck bed to be a success. I have grown celery for over 20 years on a sandy loam, varying all the way from a sharp sand to a black loam with very little sand in it. Given the required amount of fertility and moisture, the loam soil does better than the muck. The quality of the muck-grown stock is not nearly up to that grown on loam.

"An old strawberry bed which was well manured and plowed when set makes a very fine celery bed. As soon as the berries are off, spread on a liberal dressing of well-rotted, fine manure and plow; then another dressing of fine manure on top, disk very thoroughly and drag. Do not begrudge a little work here, as good preparation is a necessity to good success.

"At this time the plants should be, if you have taken good care of them, about 6 or 8 inches high, and the size of a large lead pencil. Pull only the largest plants and clip the roots to 3 to 4 inches and the tops to 4 to 5 inches long. Wet at once to prevent wilting. It is important that celery be set in straight rows, so draw a line up taut where the row is to be and set plants close to it.

"The plants should be 5 to 6 inches apart in the row and the rows $3\frac{1}{2}$ to 4 feet apart. In setting use a common garden trowel to open the hole and be sure it is as deep as the root is long. Set the plants in so only the root is in the ground and pack

the soil very firmly. Water enough so the soil is wet as deep as the roots go. If weather is cool or damp for a few days, only one watering is necessary, but if very hot and dry it may be necessary to water once or twice more to insure a good start.

“Cultivate thoroughly as soon as plants are started and keep it up all the season. Do not throw dirt into the hearts of the plants, when cultivating or banking. When plants are a foot high comes the first banking. Straighten up the leaves with one hand and draw earth up to the plant with the other. This makes the plants grow erect and fills out in the heart. The banking should be repeated as the plants grow, until the row is banked to a foot or 15 inches high. A part of it may be left with only enough banking to hold the stalks up straight. This will keep longer than the fully banked and blanched.

“Now that you have the crop grown, care must be taken not to spoil it in harvesting or storing. The digging of the celery should be deferred until the latest date possible. If it can be left till the afternoon of the last warm day, when you see that a sharp freeze is at hand, so much the better. With a tile spade or shovel, dig under the plants so as to cut off the roots 1 or 2 inches below the leaf stalks. Pull off all the small, half-grown stalks from the outside of each plant.

“If you have a cool cellar with an earth floor, take the celery there and set it up straight, throwing a little earth against the roots of each row as it is set up. Pack rather loosely, but not so loosely as to sag over on one side. The temperature should be as near the freezing point as possible. If cellar has a brick or cement floor, a little earth may be brought in, or the celery packed in boxes in the

field by putting a little earth in the bottom and packing as above. Boxes should be about as high as the celery. These can be carried and stored in the cellar.

"It is an aid to keeping if a part of the leaves are trimmed off before digging. This can be done with a sickle by clipping off both sides of the row. Pack the different varieties separately, as the white sorts are ready to use first."

PREPARING CELERY FOR MARKET

"The cleaning and dressing of celery should be done in the cellar or pit," continues Mr. Smith. "First hold the head in the left hand with the root toward you and with the other hand pull off the outside leaves, using the thumb mostly, turning the head at the same time from right to left so the part that is stripped off will be up, giving you a chance to see what is done. When the head has been worked once around it should be finished. Then turn the root from you and cut off to a point, making four to six cuts to a head, cutting from you as if whittling a stick to a point. The knife is held in the hand all the time. When two are working together, I usually have one clean off the waste and lay the head down for the other to trim the roots. All yellow, decayed, or green stalks should be removed, even if the heads are left a little small by so doing, as a medium-size, well-blanchd head will sell better than the same head with one or two green stalks still on it.

"My washing room is in the basement of the packing house, where I have a large kettle in a brick furnace for heating water, a box tub with plug hole in bottom for washing, and a table for the

unwashed celery. The tub should be about 30 inches wide, 42 to 48 inches long (big enough for two washes), and 15 to 18 inches deep. It is necessary to have 12 to 15 inches of water in the tub so the sand and other dirt may settle to the bottom, else your water is very quickly too dirty to use.

“The water should be 90 to 100 degrees, or about blood heat, to get best results. Dump a box of celery in the tub with the butts toward you. Hold the head to be washed in left hand about half out of the water, and brush it down with a soft scrub brush (one with bristles similar to a common shoe brush is best), running the brush down to the leaves each stroke. This keeps the brush fresh and clean, and saves the necessity of dipping it; also brushes off the rotten particles which may be clinging to the leaves. Turn head as in first dressing, from right to left, so washed surface comes up. Sometimes it is necessary to push out a stalk from the head a little to get the dirt out from the inside. Have a quarter or third-inch mesh, square wire sieve at hand to dip out the leaves and floating particles from tub after each box is washed.

“Now comes the tying. The tyer must be careful or everyone will not get equal value. I have found three heads to the bunch the best method for our trade. The reasons are, the retailer does not have to cut bunches, and so sells three stalks many times where one or two would go if sold loose. Then, too, one can, by tying three in a bunch, make bunches so nearly even in size that there is little occasion to sort it over to get the biggest, and so saves much breakage and loss to the retailer.”

"My last crop of winter celery," writes Solon P. Powell of Hancock county, Ohio, "yielded about 1,200 dozen to the acre, and sold in the local market for 30 cents a dozen. The stalks are put up in bunches of 12 each and delivered to the grocers in our town, where there is no market house. Generally the crop is finished by January 15. Early celery is taken direct from the field and the winter crop is first trenched until ready for use.

"Winter celery is stored in earth trenches and in cellars where there is no danger of freezing. Earth is used out of doors and straw in the cellar. All the culls are sold, the demand is so great. The trimmings are fed to cows and chickens. Butter needs no coloring matter when cows eat celery leaves when fed green, as trimmed."

"We have secured 2,400 dozen salable heads to the acre, but usually count upon 2,000 dozen," says B. B. Overhiser. "These we ship by express, retail at 35 cents, or wholesale for 28 cents. In car-load lots we sell at 20 cents a dozen. Our boxes hold six to 12 dozen. Most of our celery is marketed by November 15, but frequently we hold some in storage for Thanksgiving. For winter use we put the stalks in cold frames, bank with earth, and cover to keep out the frost. We usually require about 5 pounds of seed, which costs about \$2 a pound. Most of our surplus young plants are sold in March."

"Among the varieties I like the White Plume for early," writes Frank S. Wells of Michigan. "The plants grow rapidly and are easily blanched. In the fall the stalks and leaves become white without earthing up, but they are improved by banking. The variety does not keep as well as some other kinds, however.

THE CELEBRATED SNOWBALL CAULIFLOWER

A WEALTH OF BLESSINGS FOR WHICH TO BE THANKFUL

"The Golden Self-Blanching is not as early as the White Plume, but it is superior in quality. It is readily blanched, becoming a clear golden color, both stalk and leaf; but it is a dwarf in its habit of growth and should have rich ground and care to be satisfactory. However, it is well liked.

"The Golden Rose is a sport of the Golden Self-Blanching. I tried it last year, but it was not satisfactory.

"For winter celery I grew last year the French Success. It is a much more vigorous grower than the others mentioned, and seems to stand dry weather better. It is slow to blanch, but is good when it is at last ready for use."

STORING CELERY

Celery will stand repeated frosts without injury, but it is ruined if it is once frozen. Hence it must be stored for the winter before too cold weather sets in. C. O. Ormsbee of Washington county, Vermont, says: "I have tried a great many methods of keeping it through the winter, none of which has been perfectly satisfactory, but I have had by far the best success with the following method:

"I make a box 1 foot deep and 4 feet wide and as long as may be necessary or convenient. This I place where it is to remain and select a location where the temperature will be as near 50 degrees as possible, and where there will be just barely light enough to enable one to read.

"I put a layer of sandy loam or rich garden soil 3 inches deep in the box and saturate it thoroughly with water, pouring on all that the earth will contain and perhaps a little more. I allow the celery

to remain in the trenches as long as I dare risk the danger of freezing. Then I dig it, strip off the outer worthless leaves, and set the roots well in the wet earth in the box, crowding the bunches as close together as possible. In this condition the celery will take root and grow sufficiently to last through the winter or at least longer than if stored in any other manner."

According to Alexander Huth of Hampden county, Massachusetts, "Celery seed for the early supply should be sown broadcast about February 15 in a moderately heated hotbed, or in shallow boxes filled with good garden loam lightly pressed down. Cover the seed with soil about one-eighth inch deep and press it down firmly. Set the boxes (if they are used) in the house near a sunny window where the temperature averages about 70 degrees and water freely. A single hotbed sash 3 feet wide and 6 feet long is large enough to start 20,000 plants. After the second or third leaves have appeared the plant should be transplanted in other boxes or put in moderately heated hotbed or a cold frame that may be covered on cold nights.

"Set the plants about 1 inch apart in the row and 3 inches between rows, and should the first two or three days after transplanting be very bright and warm, a little shading during the middle of the day will be advisable.

"After the plants have made a growth of 5 to 6 inches they should be set out of doors in a well-manured and thoroughly prepared soil. In the home garden where space is generally limited, the young plants can be set in well-prepared rows 5 or 6 inches apart in the row between some early crop, such as early peas, spinach or radishes."

CHIVES

This hardy little onion-like plant grows in thick tufts from small oval bulbs, scarcely larger than a hazel nut. The hollow, abundant grasslike leaves are used for seasoning soups, stews, salads, etc. The plants are propagated by dividing the tufts and planting them in ordinary garden soil. Chives are often used for edging beds, partly because of their pretty green leaves and also because their purplish flowers are very attractive in the late spring or early summer.

COLLARD

The Georgia collard, extensively grown in the south for greens, is a loose-leaved variety of cabbage. The term collard is more or less loosely applied to young cabbages that have not formed heads. Seed is sown in midsummer from June to August for succession and the plants transplanted to rows of 30 inches apart and 1 foot apart between the plants.

When properly blanched, the collard is sweeter and more delicate than northern grown cabbage. Cultivation is practically the same as for cabbage. Blanching is done by tying the leaves up in somewhat the same way as the leaves are tied over heads of cauliflower.

CORN—SWEET

"The man who grows sweet corn for market usually appreciates the possibilities of a continuous crop fresh from the field from early July to October," says Prof. V. H. Davis of Franklin county,

Ohio. "I have grown this crop for home use and in a small way for local markets for years, and the methods employed may be suggestive, and, perhaps, profitably followed by others.

"While sweet corn will grow well on almost any type of soil containing a fair amount of fertility, I prefer some elevation and a southern exposure, with soil somewhat sandy or slightly gravelly for the first crop. Such a soil will dry out and warm up early, and can be broken and thoroughly prepared before planting time.

"I usually make the first planting of Early Cory during the first warm spell after the middle of April, and use plenty of seed. If the crop escapes the late frosts, I will secure corn for home use or for market from ten days to two weeks earlier than my neighbors. If the frost catches it I have lost only a little seed and some labor. The patch is immediately replanted and I still have corn as early as my neighbors, and usually before. A liberal application of a complete fertilizer on rather thin land, high in nitrogen in some quickly available form, will usually give good returns in size, quality, and earliness of ears.

"On good soil an application of nitrate of soda along the rows and worked into the soil just after the corn is well up has given better and larger ears from four days to a week earlier than was secured without its use. With this first planting I usually plant pumpkins, which generally prove decidedly profitable in themselves. All early sorts can be planted close together. I prefer rows about 30 inches apart and two or three stalks in hills from 18 to 24 inches apart in the rows. The later sorts are planted the usual distance.

“About May 1 a planting of Country Gentleman, Stowell’s Evergreen, or Columbus Market is made, and at intervals of about ten days two or three more plantings are made. The last planting usually follows early potatoes, and should be made by July 20. For this crop I plant Early Cory, or some of the early sorts. If early frosts do not come this crop will be ready for use during the latter half of September or the first part of October, and not only finds a welcome on the home table, but a ready sale upon the market. A few years ago I sold nearly \$40 worth in October. We find a ready sale for the early and the late crops in small towns of 1,000 to 5,000 inhabitants, but for the main crop the larger cities must be looked to for a market. If the stover is cut as soon as the corn is pulled it makes a splendid feed for all kinds of farm stock. In this vicinity the very early and very late crops usually bring from 10 to 15 cents a dozen; the larger markets from 15 to 25 cents.”

“I have been interested in growing sweet corn for the past six years,” writes D. L. Collins of Genesee county, New York. “Evergreen and early Minneapolis have been satisfactory varieties. All early maturing varieties do well here. My family prefer Metropolitan for table use to any other. My soil is of a sandy loam and we grow for home use only. We usually plant corn on the same land two years in succession. Our garden plot is prepared after the usual manner, but stable manure is kept 12 to 18 months in a sort of compost heap until thoroughly rotted before putting upon the garden.”

“For nine years,” writes John H. Taylor of Middlesex county, New Jersey, “we have averaged 5,000 ears of sweet corn and sold the crop for \$1 a hundred. Each year we plant from one to four acres,

and have found that Cosmopolitan for early and Stowell's Evergreen or Burpee's White Evergreen for late give the best results. Generally the crop is shipped in barrels, sometimes to New York, but usually to our local market, where the sale is, as a rule, satisfactory. What few culls we have are fed to pigs, and the stover to cattle.

"The soil is a sandy loam. No special crop rotation is practiced, although the same land is not cropped with corn oftener than once in four years. Being a truck farm, it is inconvenient to practice ordinary crop rotation. About 360 pounds to the acre of 3-6-8 commercial fertilizer is used. This costs \$31 a ton. It is applied 2 to 4 inches from the hill at planting time, or immediately after.

"Early in April the land is plowed, and until the seed is sown, is harrowed to get it in fine condition. As soon as the season will permit, we plant by hand in check rows 3 feet or 3 feet 10 inches apart. Usually the latter distance is the more profitable. Four or five days after planting, a weeder is run through the field, and as soon as we can see the rows a one-horse cultivator is started. At the third cultivation a two-horse riding cultivator is employed as long as we can get over the corn.

"Sometimes we use nitrate of soda as a top-dressing during the latter part of summer, so as to force the plants a little. About a tablespoonful is applied a few inches from the hill and then cultivated in."

CORN AFTER STRAWBERRIES

In the fruit section of Atlantic county, New Jersey, corn is not a popular crop. The soil is sand or gravel, somewhat leachy and often dry. Corn

requires an abundance of plant food and moisture, and on these light soils is very exhausting. J. E. Homa, however, has given much attention to growing corn, and each year puts in six or seven acres. His corn land is low and has plenty of moisture; it is rotated in grass, strawberries, and corn, grass, like corn, being an unusual crop in his locality.

"Strawberries are picked two years. The beds are fertilized with 600 or 700 pounds of fertilizer each year, applied early in the spring. The two-year-old beds are not cultivated in the spring, and the entire surface becomes covered with a sod of grass and strawberry plants. After picking, usually about June 15, the land is plowed about 6 inches deep, broadcasted with 700 pounds of fertilizer, costing about \$28 a ton, harrowed until fine and marked out in rows about 4 feet apart each way. The land is not furrowed out for planting, but a man makes a little hole with a spade, drops the grain in it and covers it with the foot, doing all the work quickly and at one operation.

"The field is then repeatedly worked with a weeder until the corn is several inches high and then cultivated every week or ten days as long as a horse can get through. Generally, it is hoed once, but with a careful man to cultivate little hoeing is needed. The variety is a hybrid of yellow dent of local selection, maturing in about 110 days."

This practice will furnish a valuable hint for raisers of sweet corn. Such quick-growing varieties as the Corys and the Crosbys should prove very profitable where there is a good market, and even some of the slower growing sorts, such as Country Gentleman, should be made to pay where the seasons are not too short.

CORN—POP

Concerning popcorn, C. J. Richardson of Lake county, Ohio, writes: "I do not know of any farm crop that is as constant and steady in demand as popcorn. The price has remained about the same one year with another for the past 15 years. I have averaged about a ton of popcorn each year, and have no difficulty in selling it at a good round figure. Our soil seems to be well adapted to this crop. We plant as early as possible, on ground on which we have grown Hubbard squashes the year previous.

"We cultivate regularly so as to keep the corn free from weeds. We use a hoe very little. We usually plant by hand, using a hoe, dropping three grains in a hill, 3 feet apart, rows running both ways. We get the best results this way. We never cut until the corn is thoroughly ripe. Popcorn stalks make an extra fine fodder. Farmers in planting popcorn should be sure to let it mature on the stalk before it is cut or husked. We husk it about six weeks after it is cut and put it in cribs especially prepared for it, and it is left in these cribs a year before it is sold.

"To sell to advantage in large quantities one must be very careful, as there are many sharks in the field, who will take advantage of one if he is not on the lookout. If popcorn is sold at retail, one must be careful that it is well cured and pops regularly, otherwise there will be great difficulty in selling to the same individual the second time. I usually test thoroughly by popping some, and then know exactly in what condition it is. We give good, round weight or measure, and are careful not to misrepresent our corn. In this way our trade is being built up regularly."

CORN SALAD

Corn salad is a small plant, the seed of which is sown in fall and covered with straw during winter like spinach for spring use. It may be used in the autumn or in spring, as desired, as a salad or as greens. Usually it is broadcasted in beds of rich soil and given an occasional top dressing of nitrate of soda. It is scarcely a rival of spinach, because it does not grow so large and is not quite so fine flavored.

CRESS

Cress, or peppergrass, is a pungent salad, which may be had from seed within three weeks of sowing. It is planted very thickly in drills and clipped with shears. Rarely does it grow more than 4 or 5 inches tall before running to seed; if cut not too close to the ground, two or three cuttings may be made. When it begins to flower it becomes too strong for eating as a salad. Often it is used for making greens like spinach.

CUCUMBER

A deep, rich loam, retentive of moisture, is best adapted to the cucumber, and preferably it should be well exposed to the sun. Seed should be planted only after the ground has become warm, or, for very early fruits, on sods or in berry boxes in the hotbed and transplanted after all danger of frost has passed. For outdoor planting, from the middle to the last of May is usual in the north. The land is laid off in furrows 6 by 6 feet and a shovelful of well-rotted manure or compost placed in the hills.

About a dozen seeds are planted in a ring at each hill, and when the plants have become sturdy the poorest ones are thinned out, leaving two to four plants to the hill. Three is the usual number.

For table use cucumbers are gathered while still green, but almost full grown. For pickles some are gathered when very small; others when about one-third to one-half grown. There is considerable demand for the small size at pickle factories. For pickling the beds should be gone over every two or three days so the fruits will not be large. No cucumbers should be allowed to go to seed in the pickle field, because the plants immediately begin to die off. If gathered frequently, young cucumbers can be secured until frost. Cucumbers are frequently raised by the acre for pickle factories which pay a stated price by weight or by number.

For home use small cucumbers may be stored in salt or salt brine as gathered. A common formula is 7 pounds of salt to a bushel of cucumbers in a brine. When packed in salt the cucumbers shrivel. They can be freshened by soaking in water and then putting in vinegar for making pickles. In this way they can be kept for several months, but usually they deteriorate during the spring following harvest unless put in vinegar. Probably the best known variety is the White Spine.

CUCUMBERS ON LONG ISLAND

According to the late C. L. Allen of Long Island, "The soil that suits the cucumber best is a lively, sandy loam, and the deeper the better. A light, sandy soil, if shallow, or a heavy loam or clay, had better be given up to some other crop. New soil is usually considered the most desirable, and, if

other conditions are favorable, it is. But new land alone will not yield profitable returns, however lavish nature may have been in its preparation. The most profitable crops ever grown here were from a lively, deep loam, and as a second crop, the first being early peas. As soon as the peas were gathered the ground was cleared, plowed deeply, and made as fine as the disk harrow could make it. The land had a liberal dressing of well-rotted manure before plowing.

“After harrowing the ground is marked out with a small plow in rows 4 feet apart each way. At the crossing of the furrows, which marks the hills, a shovelful of well-composted manure is worked in and covered slightly with soil. From six to eight seeds are dropped in a hill. A small handful of complete fertilizer, with an equal amount of nitrate of soda, is then strewn around the hill, at the rate of 200 pounds to the acre. None of this manure comes within 3 inches of the seeds. Cover the seeds not deeper than one-fourth inch with soil made fine and pressed firmly over them with the hoe or the feet. This completes the first important step in cultivation.

“As soon as the first two leaves appear the battle commences. There will be weeds on every side, and bugs on every plant, if they are neglected; cultivation, however, should be so thorough that no weed will ever show itself. A cultivator should go over the ground once each way, before the plants appear, and just as the weeds break through the soil. The surface should be stirred frequently by the cultivator, or at least soon after every rain. This is necessary to prevent evaporation. As soon as the plants are nicely growing, and thinned out to four in the hill, lay aside the cultivator. In its

place use a fine rake, which should not stir the soil deeper than 1 inch; otherwise the damage is irreparable, as the roots run just as far as the vines, and to cut them off is to destroy the plant's effort to reproduce. It would be just as good policy to cut off the leaves as its roots. In either case the damage is proportionate to the amount of root breaking done.

"The plants will have made but little growth before insect enemies appear, and a constant warfare must be kept up. For the destruction of lice, tobacco dust is generally effective, and for the striped beetle paris green in very small quantities is a specific. Before the plants begin to flower, spraying must commence. To wait until blight begins is fatal; it is to risk the crop. Until the crop is secured, the only safe way is to spray after every hard rain. The ends of the vines should be pinched off soon after they begin to flower, to encourage growth of laterals, which produce fruit.

"Some Long Island growers plant every fifth row, running east and west, with corn, which affords partial shade. They assert this is a great benefit. Most cucumbers grown here are for German pickles, and are picked when 4 to 5 inches long. These bring about 50 per cent more than the small ones, which are put up in bottles with vinegar. The German pickles are put up in casks with dill and weak brine, and must be used soon, as they will not keep long. Although the large cucumbers bring nearly double the price of the small ones, it is a question whether it is not more profitable to grow the smaller size, because of the greater number the vines will produce.

"Intense cultivation, which means systematic cultivation, is profitable, as the yield is from 300,000

to 400,000 an acre. They usually bring \$1.50 a 1,000. Some years they bring double that. To get \$600 from an acre one must work. He can afford to. A man must go over his field of cucumbers early every morning regardless of the weather, or some will get too large. The picklers do not like this. But more than that, if they grow too large and begin to turn whitish or yellow, the plants will think the object of reproduction has been accomplished and will cease bearing. On the other hand, if cucumbers are kept constantly cut when small, the vines will continue to bear for a longer period."

CUCUMBERS FOR PICKLING

As to gathering and pickling cucumbers, H. E. Colby of Iowa writes: "The cucumber harvest begins about August 1 and continues until the frost destroys the vines, usually about October 1. During the greater part of this time the entire field must be picked each day or two. The cucumbers are gathered into small crates, each one holding about two pecks. These crates are loaded into the wagons and taken to the pickle factories. The picking should not be done during the heated part of the day, if it is possible to avoid it, because if the vines are disturbed at that time they have a tendency to wilt, thus injuring the yield and the fruit.

"The fruit is graded according to size, the smaller ones being the more choice. Anything under 3 or 4 inches in length is classed as first grade. These bring the best price, and are used for choice bottle pickles, and for the higher grade bulk pickles. The choicest of the first grade are slender and average about 1 or 2 inches in length. The larger ones, those over 4 inches, such as are used for dill pickles, are second grade and bring a smaller price.

They run a much smaller number to the bushel, are much easier harvested and delivered, and naturally yield more pounds to the acre than the first grades, so the difference in net returns is not great. Most factories will use only a limited amount of the seconds, thus forcing the farmers to raise the first grade.

"To undertake to estimate a yield is very much like guessing on a horse race. One can always be much more sure of his statements after harvest. But to give plenty of range I should say that from 100 to 500 bushels to the acre would be a fair figure. Of course there may be fields that will not come up to 100.

"If a man contemplates planting a cucumber crop for the pickle factory, he will find that the cultivation will be very easy, but he must be prepared for a rather strenuous job of harvesting. However, the average man is not prone to complain because his harvest is large.

"Cucumbers may be pickled at home almost as well as in the factory. The process is simple and can be easily learned. The work will, of course, be on a smaller scale, but the profits are large as soon as a market is found for the finished product. The same system of picking and grading prevails whether the pickling is done in the factory or at home."

EGGPLANT

The seed of this plant is sown earlier than tomato seed, because the seedlings are rather slow growing. Usually it is started in the hotbed or greenhouse and planted 2 feet apart in rows 3 feet apart after the ground is thoroughly warm in the latter part of May or early June. Fruit can be expected

about the middle to last of August. The best varieties are New York Purple and Long Purple, the latter being the earlier. Management in the hotbed and in the field is the same as for tomato.

SUCCESS WITH EGGPLANT

“On May 16 I planted about one-third acre of eggplants, or about 1,200 plants, on a rich sandy loam,” writes Charles Black of Mercer county, New Jersey. “I put a small shovelful of well-decayed manure under each plant. The seed was sown in a greenhouse about February 1. The plants were transplanted while small in 2-inch pots. When they had made fair-sized plants, they were transplanted again in 4-inch pots and grown until ready to set in the field. They had constant cultivation up to August 1. We began cutting July 14, and gathered 535 half-bushel baskets, or about 6,500 eggs. These sold for about \$210, or about an average of 40 cents a basket in local markets. The price ranged from 20 cents to \$1.50 a basket. Owing to extreme drouth, about 100 plants yielded but little, being too close to a row of trees. There were no less than 50 baskets left lying on the ground at the end of the season. I have grown eggplants many years, but this is my best success.”

ENDIVE

Endive is used as a salad during the late fall and winter. It resembles dandelion in habit and growth and has a similar bitter taste. It is sown and managed in the same way as lettuce. For early summer use the seed is planted in the spring and for late use in July. Usually the leaves are blanched

by being tied lightly above the crowns of the plants when the plants are nearly full grown. About three weeks is needed for this process. It is best that the plants be tied only in small numbers at a time for home use, because the hearts are likely to rot shortly after being blanched, particularly in warm weather. At the approach of severe cold weather the plants may be set in boxes in a cold cellar, where they will continue to produce white leaves until mid-winter. One of the best known varieties is Green Curled.

GARLIC

Garlic is grown for the "cloves" or little bulbs which form a head at the top of the stems. These are inclosed in a white or rose-colored skin. These cloves are planted in early spring like onion sets. Good rich soil is essential. After the heads are well formed these are gathered with long stems and woven into braids for drying upon pegs. The cloves are used for flavoring.

GROUND CHERRY

The ground cherry resembles the tomato in many respects, but bears its small, cherry-like fruit in a husk. The fruits are used for preserves and sauces. When once planted, the plants usually supply abundant seedlings for years after so that seed need not be bought more than once. The plant never becomes a pest, since it is easily destroyed. Cultivation is the same as for tomatoes, except that the seed is sown in the open ground about the latter part of April or early in May. About 30 to 36 inches is sufficient distance to leave between plants.

HERBS

No home garden can be complete without herbs. These supply a variety of flavors which can be secured from no other plants. They are especially useful for seasoning soups, stews, salads, and dressings. They may be used, therefore, fresh or dried. If dried, they must be kept in glass so that their flavors may not be lost in the air. Preserving in vinegar is also a good way to keep them. The most popular are parsley (which see), sage, sweet basil, sweet marjoram, spearmint, summer savory, thyme, winter savory, and balm. Little need be said concerning their cultivation, as they do well with almost no attention, but a few remarks may be suggestive.

Balm, a perennial, grows about 18 inches tall. Seeds are sown in the spring where the plants are to stand from year to year.

Sage, a perennial, grows readily, about 16 inches high, from seed sown in early spring. It is hardy and comes up well for several years in the same place.

Sweet Basil, an annual, about 1 foot high, is sown indoors during March or April and transplanted when the weather has become mild, or it may be sown in open ground in the early spring.

Sweet Marjoram, a perennial, is generally grown as an annual from seed sown in the early spring in any good garden soil.

Spearmint, a perennial, is most readily propagated from its creeping rootstocks. It does best in moist soil. Sometimes it becomes troublesome as a weed.

Summer Savory, an annual, about 10 inches high, is grown from seed sown in early spring where the plants are to remain. It may be transplanted.

Thyme, a perennial, is grown from seed sown indoors or out in early spring.

Winter Savory, a perennial, 12 to 16 inches high, is cultivated like summer savory. It is not hardy in the north unless protected.

HORSE-RADISH

William F. Miller of Camden county, New Jersey, says: "Horse-radish is started by setting out roots as early in the spring as the ground will permit. In taking up horse-radish there are always several small roots radiating from the main or tap root, used largely for grating. These small roots are cut off and used for starting new beds. Roots as large as a lead pencil, and larger, are taken off and used to good advantage. They are cut into lengths 4 to 6 inches and taper at the top or thick end; that is, they are cut on a slant and not square off.

"These are put in the ground so the thick end is upward, and 2 or 3 inches deep. This is to prevent any water from accumulating on the end of the plant, thus causing decay. Horse-radish delights in a rich soil and is ready for market by October. It can be left all winter and marketed in the spring if desired.

"I know of but one variety, and it is as hardy as dock when once started. Usually two to five plants can be cut from each root during harvest, besides having roots for sale. I started with 1,500 plants and in three years set out 40,000 besides selling a considerable number. The cost of horse-radish sets or plants ranges from \$2.50 to \$3 a thousand roots. When set out, the rows should be about 3 feet apart and plants about 15 in the row."

KALE

Kale is cultivated in practically the same way as cabbage until the plants are set in the field; then it is managed like turnip. The leaves are used for greens. As a rule, they are coarse flavored and stringy. They do not compare with spinach or Savoy cabbage as greens. Their market season is late fall or early winter.

KOHL-RABI

Kohl-rabi is grown for its thickened stem, which looks like a turnip growing above ground. For early summer use it is preferred to early turnips in many sections. It should be sown like turnips where it has to mature, and should be used while young and tender. When it grows old it becomes tough and woody. Among the best known varieties are White and Purple Vienna.

LEEK

The leek is managed like the onion and upon the same kinds of soils. It is grown for its leaves and stems which later are usually blanched toward the close of the season, by having the earth drawn up around them. Commonly the seed is sown in early spring and the seedlings transplanted about the beginning of summer. The plants are set in shallow trenches so as to allow of each blanching by drawing earth up toward them. They are stored in the same way as celery and marketed like spring onions. The Large Flag is one of the best known sorts, Scotch Flag, or Musselburgh, is also a favored variety.

LETTUCE

Of all salad plants, lettuce is probably the most universally popular. It is rarely used for any other purpose than for salads. Its cultivation may be carried on by means of hotbeds, cold frames, and the open ground throughout the whole year. The greatest demand for it is in the spring when the appetite craves something fresh and succulent. Seeds are frequently started under glass in February or March and the seedlings transplanted into the flats, and placed in cold frames for hardening off so as to be transplanted to the open ground as soon as the spring opens. Successions may be made by sowing seed in the open ground at the time when seedlings are transplanted and at intervals of ten days thereafter until May.

For home use, it is essential that only a small area be planted at a time, because the plants quickly run to seed in hot weather, and as soon as the seed stalk begins to grow the leaves become too bitter to be relished as salad. Frequently lettuce is grown between rows and plants of early cabbage and cauliflower, so as to occupy the space and thus get two crops off the same land with almost no additional work. The lettuce is removed long before the other crop needs the ground. Plants should not stand closer together than 4 inches in the row. It is customary, in home gardens, to sow rather thinly, and to thin out the little plants when they are about 2 inches high, using the thinnings for a first salad and leaving the plants about 2 inches apart for about two weeks until they begin to crowd again, then removing each alternate one. Like all crops grown for their leaves lettuce needs abundant nitrogenous food in the soil and will

respond well and quickly to light surface dressings of nitrate of soda.

There are several classes of lettuce, the principal of which are heading, cutting, and cos. The heading varieties form heads resembling cabbage. The cutting sorts do not form heads. They have loose leaves. The cos varieties are especially adapted to withstand hot weather; they produce elongated heads of very superior quality. Then there are special varieties in each of the first two classes adapted for forcing and for outdoor planting. Among the best known heading varieties are White Tennis Ball (or Boston Market), Hanson, and Black-Seeded Tennis Ball. Among the cutting varieties are Black-Seeded Simpson and Grand Rapids. For summer use Salamander is a good heading sort. All of the cos varieties are good.

George Tong of Hennepin county, Minnesota, grows head lettuce in hotbeds as follows: "Plants were started about March 1 in an ordinary hotbed and were well aired to get hardy plants. The hotbed into which they were transplanted was made the last week in March, making a bed of hot manure 8 feet wide and 18 inches deep on top of the ground. Frames were made as for ordinary cold frames, except that they were deeper, 18 inches back and 10 inches front.

"These frames were set on the manure. After the mass had settled well and had been trampled evenly 5 inches of rich soil was put on. This was covered with about 1 inch of rotted sheep manure and thoroughly mixed with the soil. The bed was then marked so plants would stand 8 inches each way, putting in about 40 plants to the sash.

"Our sashes are made 3 x 6 feet, using 2 x 2-inch stuff, with a crossbar of the same in the middle.

Common sheeting, costing 8 cents a yard, was tacked on this frame with large headed tacks. Plants were set out the last day of March, and it seemed as if to test the value of the plan a cold snap came; on the morning of April 2 the thermometer stood at 16 degrees above zero. Cabbage and cauliflower plants set in a well-protected cold frame were frozen badly, while this bed, with only a slight protection of wild hay, came through without a bit of frost.

"The sashes were removed every day, unless it snowed or the thermometer stood below 40 degrees, but were covered every night where there was danger of frost. Scarlet Globe radishes were sown between each pair of rows, and were sold at a good profit ten days before we could pull from outdoors. A few sashes were planted to Grand Rapids lettuce, which was ready to cut May 20, while plants set outdoors were not ready until two weeks later.

LETTUCE VARIETIES

"In 1886 Peter Henderson wrote that he had never seen cos lettuce in the markets. Now there is not a day during the season when it is absent, and there is not a first-class city restaurant that considers its menu complete without romaine, as the class is popularly known. This is due solely to the merits of the varieties which have long been justly popular in home gardens. They are more tender and more crisp than ordinary lettuces, and have more elongated heads, being usually conical, and from 8 to 10 inches high and 5 or 6 inches in diameter.

"Like other varieties of lettuce, the seed may be sown in hotbeds or cold frames, or in the open ground, either for transplanting or thinning where sown. The soil should be well supplied with

humus and nitrogenous plant food. Most of the varieties are improved by having the outer leaves drawn together and tied loosely over the head, but some varieties are said to be compact enough to render this tying unnecessary. It is characteristic of the cos varieties to become annual residents in the gardens of those who give them a trial.

"Lettuce is easy to grow. For first early I would make a bed in the fall and cover it with about one-half inch of well-rotted manure. About February 1 I sow the seed broadcast, not too thick, and draw the back of the rake over it just to hide the seeds from the birds. If sown in rows and covered with soil the seed will not likely come up. One great hindrance in getting good lettuce is sowing seed too thickly. By transplanting some good plants, about the first dry spell in April or later, and about 5 or 6 inches each way, and cultivating, I get fine lettuce. The best kind is a matter of choice. I have had the best success with the Grand Rapids, but it is not a head lettuce."

"Last season, under rather unfavorable conditions, I grew some of the finest lettuce I have ever seen," writes John E. Vail of Decatur county, Iowa. "This was secured by using rectangular troughs in 16-foot lengths about 24 inches at the base and 18 inches high and wide at the top. They were covered with cheesecloth so arranged that it could be quickly lifted from the rows. This method gave most marked results over open air growth. It is cheaply applied and will hasten the development seven to 20 days."

LETTUCE GROWING UNDER GLASS

"A greenhouse and a system of cold frames in some well-sheltered place will be found a profitable

investment, the area of glass subject to circumstances. My experience for some years," writes Frank S. Miller of Franklin county, Ohio, "has been with a forcing house or houses of 10,000 square feet and 400 cold frame sashes 3 x 6 feet. The forcing houses are used exclusively for vegetables. About September 1 lettuce is sown in one of the cold frames and transplanted 1 x 2 inches apart. As soon as it has become well established with good fibrous roots, it is transferred to the forcing house, having been previously fertilized with well-decomposed manure, or, in its absence, fresh horse manure, spread evenly over the bed, which is then given a good watering. Either turned under carefully has given satisfactory results, and will serve for two crops. The distance apart in permanent beds is 8 x 8 inches.

"The best variety for winter forcing, in my experience, is Grand Rapids. If possible, never let the plants wilt after setting in permanent beds. After 48 hours root formation will have commenced. Afterward water freely. As soon as the surface soil is in proper condition loosen it up well, as a fine, well-pulverized soil prevents rot and also lengthens the intervals several days between watering.

"Supposing the gardener to keep on hand a constant supply of young plants, repeat the above program until the house is full. In five or six weeks the first planting should be ready for market. As soon as a bed or portion of a bed is cut, work the soil over and replant. Three crops can be grown, making the returns from a house very remunerative. We use Grand Rapids, a hardy and satisfactory variety, in preference to head lettuce. The latter kinds are more susceptible to rot, and,

unless conditions are favorable, do not always head well. This in brief is the system practiced by most growers in the vicinity of Columbus."

MUSTARD

Mustard is a quick-growing salad which may be ready for the table within three weeks of sowing. It is managed precisely the same as garden cress, or peppergrass.

OKRA, OR GUMBO

Okra is cultivated for its green pods or its immature seeds. The former are sliced and used in soups; the latter are cooked like peas. It is largely grown in the south, where the seed is planted 2 inches apart, in rows about 2 feet apart, in rich warm soil, at the same time the beans are planted. Dwarf Green and Long Green are the best known varieties.

ONION

As to growing onions for market, Henry Price of Hardin county, Ohio, says: "I like loam or muck soil best for onions. On hard ground, the crop is uncertain. This type of soil dries out so easily that the ground gets hard, and when you weed the land the weeds break off instead of pulling out. And more than this, the onions will be small, too small for a good market. Now, the real secret of onion growing lies in the preparation of the soil. The seed bed must be fine and mellow and compact. I like muck land, which I roll and rub until it is solid. A smooth surface is left so the row marker

on the onion seed drill will show plainly, enabling the driller to make straight rows. After rolling the land, I sow fertilizer, using a drill. Some successful onion growers sow fertilizers broadcast after plowing and before harrowing or rolling the land. I use a brand that has a small amount of nitrogen, from 8 to 10 per cent of available phosphoric acid and from 8 to 10 per cent of potash.

"In planting, run the onion drills so as to make the rows 14 inches apart. This allows cultivators and weeders to pass through without difficulty. The seeds should not be sown over 1 inch in depth, and less than that is better. As soon as the sprouts come through so you can see the rows, begin wheel hoeing. I usually run my cultivators between rows until weeds begin to come. Then I set the wheel hoe to straddle the row and plow close to save as much finger weeding as possible. After the working has begun, the onions should be cultivated once a week and weeded so as to keep them clean until laid by.

"Pull white onions while tops are yet green and standing; top them at once into crates and leave them in the field in single rows not over four crates high. Cover the top crates well with onion tops, boards or some other thing that will turn sun and rain from them. After about ten days the onions can be taken into the sheds or sent to market. After the tops of red and yellow onions begin to fall, pull them out of the ground and lay in wind-rows. Begin to top in about five or six days."

A NEW ENGLAND ONION FIELD

"Last year," says G. M. Hubbard of Franklin county, Massachusetts, "I raised 11 acres of onions,

securing an average yield of 669 bushels an acre. Four acres made gross returns of 3,000 bushels of yellows, an average of 825 bushels to the acre. Another tract of five acres returned 3,176 bushels, an average of 635 to the acre. This last tract of land was not stocked, and the seed proved to be poor.

"I use Connecticut-grown seed and prefer the late varieties. I fertilize my land thoroughly, favoring a low-grade fertilizer. I use a ton and a half an acre, and about 500 pounds high-grade bone, containing $5\frac{1}{2}$ per cent ammonia and 20 per cent phosphoric acid. I usually apply the fertilizer before sowing the onion seed. If my land is not full of weed seeds I prefer to apply some fertilizer during the summer so as to facilitate rapid growth."

"The average yield of my last crop," writes Willard Jones of Madison county, New York, "was 500 bushels an acre. The maximum yield of one lot was 900 bushel crates. The price received was 50 cents a bushel for the firsts, and 25 cents for the little ones, that is, not less than $1\frac{1}{2}$ inches in diameter separated by screening. A common way of putting the crop on the market is to pack in bushel crates, draw to the railroad siding and dump in bulk, returning to the onion crib with the crates for other loads. We have sold some onions packed in 100-pound sacks. The local buyer pays for the sack. Harvesting is over by November 1. Six rows of onions are pulled and thrown loosely into one windrow and left about a week to dry, then the onions are hand-clipped and put in crates by girls, boys, and women. In the field the crates are stacked up, ten in a heap, for a few days, when they are cribbed and ready for screening.

"I have never sown a cover crop after onions, because this would interfere with cultivation in the following season. The green stuff or roots would tear up the onion seedlings. I have never found it profitable to store onions for the winter market. The shrinkage and waste takes the extra price, and the extra care and labor makes it unprofitable for me to store. Culls and rubbish are generally thrown on hard land and plowed under, though sometimes they are pitched on brush heaps and burned. This is always done when onion maggots have been prevalent."

GIBRALTAR ONION

Concerning the Gibraltar onion L. C. Seal of Bartholomew county, Indiana, writes, "The Gibraltar onion is claimed to be the largest onion in existence, standing in a class of its own. It is a rank grower on congenial soil and has coarse blades of a glossy, olive green. The layers of flesh are thick, solid, juicy, snow white, and very mild in flavor. Probably its only fault as raised in this country is its inclination to early decay. It cannot be classed as a keeper, but it can as an 'eater,' and must be consumed in season. As a table onion it cannot be excelled.

"By February 22 the rank heat in my hotbed was subsiding, and I sowed the seed in drills 1 inch apart and rather thickly. It came up fairly well, giving me from six to ten plants to the linear inch. Prizetaker and Great Cardinal seed were sown in the same bed at the same time, but did not come up well.

"After two weeks, when the bed had reached the minimum temperature of 68 degrees, I resowed the

latter two and they came up freely. ' This is proof that Gibraltar onions enjoy a higher temperature than other varieties. The Gibraltar plants grew like magic. By April 6 I had sheared their tops the second time, and they were quite stocky. I at once began setting them in the open bed, which I had prepared for them in the family garden. This was underdrained, sandy soil, well manured in the fall and prepared in the early spring with a top dressing of hen manure and wood ashes. Slightly dressing off the rootlets to balance the sheared tops, I set them 6 inches apart and 12 inches asunder.

"Our spring was a moist one with warm days and cool nights, and my Gibraltar plants acted as though they had never been moved, although they had to take a few light frosts. From that time on they received the same care and culture that I gave the other varieties later. They kept up their vigorous growth and July 13 I made a note in my garden diary that they had commenced to bottom. The hot, dry weather seemed to contribute favorably to their bulbous growth.

"While they did not ripen quite evenly, it was of small consequence, and favorable to my retail trade. I pulled the last one September 10. The aggregate weight of my special bed of Gibraltar onions, 10 x 12 feet, was 76 pounds, the largest specimen weighing 13 ounces. The others ran from 3 to 9 ounces, the bulk of them weighing 6 to 8 ounces apiece. An 8-ounce Gibraltar is a beauty, and two of them will separate an onion lover from his nickel on sight. I received the uniform price of 5 cents a pound for them, and sold again and again to the same customers. A few plants I had left were set out in the market garden in less fertile soil, and made a nice lot of onions, though not so large."

POTATO ONION

"Last November," writes J. G. Orsburn of Kentucky, "I planted 125 acres in potato onions. The land was well manured with chicken and stable manure mixed. It was broken deep and close, and harrowed nicely. The rows were laid off $3\frac{1}{2}$ feet with a garden plow, and the onions were covered 4 or 5 inches deep to keep them from freezing out of the ground in winter. No more attention was paid to them until the opening of spring, when the ground was dry enough to work. Then I cultivated shallow, and kept it up every ten days, or after every rain, until the onions had matured. The cultivation was done with a garden plow and was never more than 3 inches deep, which left the onions a good, firm seed bed. I harvested them in July, and the plat yielded at the rate of 300 bushels an acre. The onions were as large and fine as any I have ever seen. The soil is designated as Miami silt loam."

GROWING ONION SETS

According to B. F. Stetzer of Cumberland county, New Jersey, "Onion sets are grown from seed sown about April 1. To get the ground in good shape for any kind of an onion, large or small, you should sow the ground in the fall with crimson clover, about the middle of August, and plow it under in the spring just before the time of planting. After you have plowed sow broadcast three-quarters of a ton of fertilizer to the acre, harrow in well and smooth over with a smoothing plank. It will level the ground nicely and smash out all the small lumps of dirt the harrow fails to do.

After this is done, go over the ground and fill in the low places with a hand rake.

“The ground will now be ready for sowing the seed. To make the first row to sow the seed in I usually take a one-quarter-inch rope, with a stake attached at each end, and make a line. Then take a rake handle and go down the line, making a small row about three-quarters of an inch deep. There is a reversible attachment or marker on the drill to make the rows after the drill is started. Regulate the drill to sow about 60 pounds of seed to the acre, and cover lightly. If the soil is heavy you should use one ton of fertilizer to the acre and 70 pounds of seed. Do not use any manure, on account of foul seed; the clover, after being plowed under, and the fertilizer will be all that is needed.

“Onion sets are sown in rows 12 inches apart, and cultivated with a two-wheel cultivator, using two blades and a one-wheel cultivator with the onion harvester attached. Do not go deep in the soil when cultivating. I usually cultivate once a week. Be very careful not to allow crabgrass to get into the field of onion sets; if this grass gets the best of a field of sets one might as well plow it under, as it will cost more to get the grass out than you would derive from the sale of the sets.

“When you gather the sets, usually about the middle of July, according to the size, you should run the onion harvester under them, so as to raise them out of the ground. Go deep enough so as not to cut the roots. If the tops are long they should be twisted or cut off. This is done so it will not require so many crates to store them in, and it will save time and a lot of hard labor when cleaning them. Shake the dirt off well and put the onions in the crates to dry, about one bushel to a crate.

These crates are put in long rows on the field, with the edge of one crate resting on the other to keep the bottom off the ground as much as possible. Allow the sets to dry.

IMPORTANCE OF DRYNESS

“If it looks like storm, the crates must be piled up one crate on top of the other, about 16 or 18 crates high. After the crates are piled I take another made especially for this, and turn it bottom upward over the pile to keep the water out. The top crate is made watertight, and when placed in position should be slanted a little to allow the water to run off. The sets should never be allowed to get wet after being gathered. If they do it will turn them greenish, and have a tendency to decrease the price. Crates so piled should be taken down again and put in rows as soon as convenient after the storm.

“Leave them spread out in the field until about September 10, then clean them, thoroughly rubbing them between the hands. After they are rubbed they should be carted to the barn and run through a fanning mill. This will take dirt out. The principal thing to do is to get the onions too large for sets out at the time of getting the dirt out. These are sold for stewers and picklers. The stewers are about the size of a 25-cent piece, and larger. The picklers are smaller, but not as small as sets. I usually use a seven-eighths-inch screen fanning mill to get these picklers and stewers out. All that don't go through I sell, sorting them out by hand.

“The picklers I ship to New York commission merchants to be sold on commission late in Octo-

ber or early November. They will bring good prices if shipped at this time, as the commission men sell from \$2.25 to \$3 a bushel hamper. The stewers are also shipped to the commission merchants about the same time, but sell for a little less than the picklers. The New York market is always better than any other in the sale of onions.

"If sets are good in the fall I generally dispose of part of them; if not, I keep them in my onion house until February 1 or March 1 and sell when there is a demand for them at good prices. They usually sell in the spring from \$2.50 to \$4 a bushel. I have received as high as \$6 for the Silver Skin sets in the spring. These are the only sets to grow for market, as they will always command a higher price than any other sets grown.

"When storing sets in the fall to keep until spring, the crates should be cross-piled in a perfectly watertight and dry building. When piling put a 1-inch block between each pair of crates on each corner to give plenty of air space. Also leave space between piles lengthwise to go through and examine at leisure. The building in which the sets are stored should have many windows in it for ventilation. In case of warm weather these windows must be thrown open to allow the air to circulate and to prevent heating. If the sets should become warm they will start to grow. This should be prevented if possible. Never handle an onion set while it is frozen, or it will rot."

PARSLEY

The leaves of parsley are used for flavoring and garnishing. The crop is managed in the same way as parsnips, except that the leaves are gathered

whenever desired and the roots allowed to remain where they are until the seed stalk begins to grow the following spring. For winter use the roots may be taken up in the fall and planted in pots or boxes and kept in the kitchen window. Among the best known varieties are Double Curled and Fern Leaved. Often parsley is used for edging flower beds, because of its attractive dark green foliage.

PARSNIP

Cultivation of the parsnip is practically the same as that of beets and turnips. The seeds are sown in drills in rich friable soil in the early spring. As they are slow to sprout, it is desirable to plant a few radish seeds at the same time to mark the rows where the parsnips are. These radishes can be removed when weeding the bed after they have served this purpose. A quick-maturing variety of radish is desirable, since it is out of the ground early.

After the parsnip plants are 4 or 5 inches tall they should be thinned to stand 4 to 6 inches apart; and kept clean cultivated until the leaves shade the rows. Parsnips are perfectly hardy and may be allowed to remain in the ground over winter. They may be gathered at any time with a pickax or dug in the spring. If they start to grow in the spring their flavor becomes impaired, and they often become woody in the center. Usually they are placed in pits or root cellars like turnips. Hollow Crown or Student is the best variety for table use. The turnip-rooted sorts are sometimes cultivated on light soils.

PEPPER

Peppers are grown in practically the same way as tomatoes and eggplants, except that they should be planted about 2 feet apart in rows 3 feet apart. Among the best known varieties are Ruby King, which is a large, smooth, bright red, mild flavored sort, and Cayenne, which is long, slender, and exceedingly pungent.

PEAS

According to D. S. Kelsey of Connecticut, any good land, stable-manured the previous year, or full of half-decayed sod, will do for garden peas. He says: "I plow late in the fall and harrow thoroughly in April. Late peas collect their own nitrates on such land, and for them any good superphosphate is a complete manure, but for early results (and I aim to secure our market and keep it by being two to five days ahead of competitors) nitrates must be supplied. The land is then too cold to favor the nitrifying processes and to insure success. To lengthen the season we use in the drill 600 to 1,000 pounds of 4-5-10 complete fertilizer of our own mixing. The nitrogen is nearly all organic.

"As a source of nitrogen, well-decayed horse dressing may be broadcasted in partial substitution, or a little pulverized poultry dressing applied directly in the drills. We plant in single rows (north and south always), 36 inches apart, 4 to 5 inches deep, covering 2 inches and filling these drills gradually in subsequent cultivations. Run the weeder every five to seven days from planting till vines are 6 inches high; then the cultivator

weekly. A quick start and continuous rapid growth is our motto for all such crops. The same rules and methods will rush turnips or even sweet corn through as a second crop following peas.

"We pick every morning (the same rows two or three times a week), beginning promptly at 3.30, hiring school children, who go to bed at sunset, for this purpose. A pod thus picked, and kept cold and wet as found at sunrise, will keep its contents perfectly sweet and fresh for two or three days, although marketing immediately should be the rule. It is bad policy to sell wilted pods to one's regular trade.

"Yield? Oh, 100 to 200 bushels an acre, according to season, land, and kind. I mean the kind of man. Bushing? Usually it does not pay. We sometimes wire a field, using split cordwood stakes every rod on each row. One wire 15 inches above the vines. When not rushed we mow and dry the vines promptly, then thresh and store. Peas make excellent winter fodder. Otherwise rot them, but never burn. They are a highly valuable mulch for any purpose."

EDITOR'S EXPERIENCES

"My father," writes the editor, "grew the old Champion of England and Blue Imperial garden peas when I was a boy, because they were, in his opinion, of the choicest quality. He would not grow any of the round, smooth-seeded, very early sorts, because of their lack of flavor, nor would he try any of the dwarf wrinkled varieties, because he classed them with the very early kinds. When I had a garden of my own, I wished to avoid the work of brushing the rows, so determined to try

American Wonder, Premium Gem and Bliss Ever-bearing. These three varieties were such a surprise to both my father and myself that from that year afterward not a single tall-growing variety was grown in our garden.

“Since then I have grown many of the important dwarf peas and have found that American Wonder is still unsurpassed in quality and is, perhaps, the hardiest of the wrinkled varieties. It requires a rich soil and extra cultivation to get the best results from it. If I were restricted to one variety, American Wonder would be my choice. Next to this variety I think I would place Nott’s Excelsior. It is an excellent cropper and compares favorably in flavor with the best of both the dwarf and the tall wrinkled kinds. Because of its productiveness, it has become exceedingly popular among market gardeners, with whom it has largely replaced even American Wonder, because it is a trifle earlier. The old Premium Gem is almost entirely replaced by these varieties. Sutton’s Excelsior, one of the newer varieties, is somewhat later than Nott’s, but has large pods usually containing six or seven big peas of excellent flavor. It is a strong candidate for public favor.

“In growing peas it is essential to know that the Dwarf Wrinkled kinds are somewhat less hardy than the round, smooth-seeded varieties. They cannot be sown, as a rule, quite so early, because the ground must have warmed up a good deal before they will germinate successfully, and if sown too early they decay. The round-seeded kinds can be sown almost as soon as the ground can be worked. and they will come up remarkably well, but no one who has a discriminating taste will enjoy these extra early peas, because they lack flavor. There-

fore, for home use, it is well to confine one's self to the early dwarf wrinkled kinds. If one is supplying a demand he cannot do better than to educate his regular customers and his grocer into a just appreciation of high quality. This may seem like wasting time, but each succeeding year the demand will increase, and people will be asking for peas weeks before they can be secured.

"Anybody who can grow anything can grow peas, because they will do well on any kind of soil, even rather poor, if it is well drained. The ground should be plowed deeply, harrowed smoothly, and the rows struck off 3 feet apart for the dwarf kinds; tall kinds should be planted in rows 5 or 6 feet apart, because very frequently they grow 6 feet tall. The seeds are generally dropped about an inch apart and covered about 4 inches deep. Unleached wood ashes or some other fertilizer rich in potash are usually applied before harrowing. Phosphoric acid is also needed, but no nitrogen is needed, because the peas secure sufficient from the tubercles on the roots. Clean cultivation is all that is necessary until the vines would be injured by the cultivator.

"With strains of peas that have been carefully selected for market gardeners practically the whole crop can be gathered at one picking and the vines pulled up and fed to stock. In such cases the ground may be at once fitted for a crop of late cabbage, string beans, or other vegetable that matures in short time. Thus, the ground may be used for two crops in the season."

PENNSYLVANIA PEA GROWING

According to T. L. Wall of Clearfield county, Pennsylvania, a good clover sod makes an excellent

basis for a crop of garden peas. Says he: "For the earliest crop I select a warm, well-drained eastern or southern slope, plow and prepare the ground in March if possible. As we are 1,600 to 1,700 feet above sea level, and about latitude 41 degrees, it is necessary to be ready to go to work the first day it is fit, if the frost is out of the ground.

"After plowing I first use a clod crusher to level the ground and then apply a $3\frac{1}{3}$ -10-5 fertilizer, made according to my own formula from nitrate of soda, dried blood, acid phosphate, muriate and sulphate of potash, at the rate of about 1,800 pounds to the acre. One year I applied about half of it where the row of peas was to be, cultivating it or harrowing it in thoroughly, thus putting the ground in the best condition possible early in the season.

"The rows are staked out $3\frac{1}{2}$ to 4 feet apart. Four feet is best unless the furrows are made very straight. A single shovel plow is used. A furrow is first made a little to one side of the row of stakes and peas planted by hand, in it, using a quart to a 230-foot row. The shovel plow is then run close above, and just near enough to cover the peas nicely in the first furrow about 1 inch deep. In the second furrow made in covering the peas in the first, peas are planted as in the first furrow, and covered with the plow in the same way. Thus a double row is made with about 6 inches between. In this space in the row, small sharpened locust stakes are driven every 15 to 20 feet as soon as the peas are up, so that the rows can be plainly seen. On these stakes, poultry netting is stretched and fastened at upper and lower edges with staples.

"For Alaska, my favorite early variety, a 12-inch wire is used. For Gradus and other kinds of about

the same height, 24-inch wire is necessary, but above that width the cost of wire is too great, so I rarely plant the high-growing kinds. The remainder of the fertilizer is applied, between the rows about the time the wire is put up, and cultivation will follow. One or two applications of nitrate of soda are made before the vines reach the top of the wire netting to keep up the growth and to keep the color a dark green. Other plantings are made the same as the first, according to season. The second and later plantings are of the best varieties—as Gradus, Senator, Yorkshire Hero, and Improved Pride of the Market. Later plantings are covered 2 inches or more.

“Alaska is selected for the earliest planting on account of its extreme hardiness. It does not often rot in the soil, and its quality is good if growth is quick and peas are picked just as soon as they are large enough. For putting on fertilizer a distributor is run by hand, very much like a wheelbarrow. Any quantity can be applied in a width of 8 to 30 inches between or along rows. I do my own marketing and by having peas ready to sell early in June I have practically no competition. Peas come in nicely with strawberries, the two forming an irresistible temptation to the average housekeeper.

“Some may say that a machine planter could be used to advantage, but I have not seen a machine that will plant the double rows as I want them. A machine that would plant peas 1 inch apart in double row, with 5 or 6 inches of space between, would be very convenient. As soon as the crop is off, early in July, usually, the vines are removed and fed to stock. The stakes and wire are taken

down and stored away for next year. The ground is well cultivated and red clover is sowed.

"The land on which I grow peas is an old field that was farmed in wheat for many years until the soil was practically exhausted. I first lined it with some fertilizer and succeeded in getting a fair catch of red clover. I have never used any barnyard manure on it, depending entirely on commercial fertilizers and clover. The heavy application of fertilizers insures a good catch of clover. I usually mow the clover twice a year and plant again in peas.

"The land is now set in young cherry and pear trees, only a little extra room being left for each row of trees, the rows of peas being planted 4 or 5 feet from the trees. The trees reach out their roots and get a share of the fertilizer and seem to enjoy it. I find that the peas do better after they have been grown a year or two on the same ground, with crops of clover the years between. Whether this is because the nitrogen-gathering bacteria become more numerous after repeated growing of these leguminous crops, I cannot say with certainty."

RADISH

Radish seed is sown in drills in the earliest spring and for successional plantings at intervals of a week or ten days. By allowing 4 to 6 feet of the drill to each member of the family, and making five or six sowings at intervals, there should be a sufficient supply until early summer. During summer the plants are apt to become woody and strong and to run to seed quickly. The rows may be only 6 or 8

inches apart. Some of the varieties can be ready for the table in three to four weeks.

Winter radishes are managed in the same way as turnips, the seeds being sown in July or August and the roots gathered in autumn and stored in pits or cellars. They are coarser and not as highly appreciated as the early radishes. If only a fall supply is desired, it is best to sow the early spring varieties in successional plantings between September 1 and October 1. In cold frames radishes may be easily secured until after New Year's with very little trouble.

Among the best known early varieties are French Breakfast, Scarlet Turnip, Deep Scarlet, and Scarlet Short Top. The best known late ones are White Strasburg, Rose, and White Spanish.

RHUBARB

"About 12 years ago," writes W. T. Suter of Pennsylvania, "I began to sit up and take notice that rhubarb would make a fair side dish for our general meal of market goods. The following spring's inventory showed about 150 hills of worn-out and grass-grown rhubarb roots. These were divided and laboriously transplanted by marking out as for corn, and with a shovel digging holes 12 to 14 inches deep, in which to plant the roots.

"These roots grew wonderfully and by dividing part of them each season I soon had all our small market demanded. But it was soon evident that there was too much labor connected with the transplanting, and we were too busy in the spring, so we tried the following method, which seems to give maximum results with minimum labor:

“In November, with a strong team and plow, we turn out the oldest or poorest roots for transplanting. If the ground is wet, we set the large roots on edge and allow them to dry a day or more, perhaps a week. The soil is then removed with a pick by striking the side farthest from the crown. The roots are divided by breaking apart and some must be cut with a heavy knife or hatchet. Our aim is to have two or more uninjured eyes in each plant.

“Any soil that will grow corn will do for rhubarb, but the freer it is from grass roots the better, and it must not contain quack grass. Prepare the soil as for wheat, then with a two-horse plow draw furrows 5 or 6 feet apart, as deep as you can plow, going twice to the row. The land will now be ready for the roots, which should be set about 3 feet apart, eyes up and enough soil drawn in by hand to hold the roots in place.

“The setter is followed by a man with a shovel, who places four or five shovels of soil on each plant in a mound, leaving the furrow open between the hills. These open places are filled with manure and some put over the mound, after the ground is frozen enough to bear a team. Level culture is given in the spring. Large weeds and seed stalks are promptly removed. No hoeing is required. Old plantations are cultivated after the crop is marketed.

“Transplanting rhubarb can be done as successfully in the fall as in early spring. The ground works better, we have more time, and the plants get an earlier start in the spring. After first season's growth we mulch liberally in November and December with coarse manure or litter of almost any kind.

KIND OF STALKS IN DEMAND

“If we want nice, straight, pink, plump rhubarb, we shake up this coarse litter in the spring as soon as the stalks begin to show, and pile it around and over the hills. If the work is well done, the results are remarkable. Instead of a green stem 4 or 5 inches long, and with a broad leaf, we have a pink stem 8 or 10 inches long and a small leaf similar to that grown in a rhubarb house.

“This very early rhubarb is the product that we work for. A pound of early rhubarb is worth as much as five pounds later, and sells much better. We begin to sell outdoor rhubarb as soon as it gets 6 or 8 inches high, and continue as long as there is a sale for it. This varies according to the supply and abundance of fruit, etc. The sales greatly diminish as soon as strawberries and cherries become plentiful. The prices vary from 2 to 10 cents a pound according to season. The first is bunched in pound bunches and sold at 10 cents retail. A little later it is sold at 8 cents and then as low as 5 cents. As the rhubarb grows, the bunches are gradually increased in size, until at canning time they weigh 2 or 2½ pounds and are sold at 5 cents or six for 25 cents. At this time, the rhubarb is 12 to 24 inches high, and is very little work to prepare.

“One year the sales from about one-half acre reached \$158.30. That season opened March 21, which is very unusual in central Pennsylvania. The following year the season opened April 20 and sales from about the same area reached only \$103.60. The third year, with the aid of a dozen sash, sales reached \$163.75. In the winter of the fourth year we fitted up an old greenhouse 20 by 38

feet by removing sash and covering it with straw and leaves, thus making very little heat necessary. The house was perfectly dark. Rhubarb was grown here that increased sales to \$253.75. We think 40 to 50 degrees better for rhubarb forcing than a higher temperature.

"Bear in mind that nearly all of this was sold locally in a town with a population of about 9,000; after the first few days we could have sold much more had we had a larger population within our reach. We now have about 1½ acres in rhubarb, but most of this is to produce roots for winter forcing."

RHUBARB FOR WINTER

Few people realize that with comparatively little trouble a bountiful supply of rhubarb for the ordinary family may be had from the middle of January until the outdoor product is available.

Dig up a dozen or 15 crowns, at least two years old, lifting as much of the root system as possible without shaking off the soil. Do this before the ground becomes frozen hard. Place the crowns on some well-drained spot and cover slightly to prevent their drying out, and allow them to freeze solidly. When in this condition take them up and place closely together in a dark corner of an ordinary cellar or cave. Fill the spaces and cover to a depth of 1 to 2 inches with any good garden soil, then thoroughly wet down with water. If the cellar is dry, one or two more waterings may be necessary, but often the first one will be sufficient.

In two to four weeks the stalks will be large enough to use and the supply will continue from the same crowns for two to three weeks. By

bringing in half a dozen crowns at intervals of three to four weeks a constant supply may be secured. The best temperature is between 40 and 50 degrees. If the temperature is higher the crop will come on quicker, but the stalks do not last as long. The old crowns should be thrown away after forcing, as they have exhausted themselves in the production of the crop in this artificial way. New crowns may easily be kept coming on by sowing a little seed each year in very rich soil and cultivating until at least two years of age.

SALSIFY, OR VEGETABLE OYSTER

Salsify is grown for its tap roots, which are cooked and served like carrots and parsnips. The cultivation is the same as for parsnips (which see). The best known variety is the Mammoth Sandwich Island.

SPINACH

Spinach is an annual plant whose leaves are used in late fall, early winter, and spring for greens. There are two principal classes of this vegetable, one with round seeds, the other with prickly. The latter are considered the hardier, though the former are esteemed more highly for table use.

Frequently this crop is sown between early spring crops such as peas and cabbage, and is removed before these plants require all the ground. The plants are cut at the surface of the ground when needed for use. A push hoe is a convenient tool for cutting.

SQUASH

There are several well-defined groups of squashes. Among the best known are Scallop and Crookneck, which form bushlike plants about 4 or 5 feet across, and the running squashes, which include the late varieties. The bush squashes are early sorts. Squashes are planted in rich soil, the summer varieties about 6 feet apart and the winter sorts 8 or 10 feet. Six or eight seeds should be placed in each hill, and when the plants have grown well, the poorer ones should be thinned out, leaving only two plants to the hill. Early kinds are often started on inverted sods or in berry boxes, cold frames or hotbeds, and then transplanted to the fields.

Summer varieties are not grown for fall use, as they do not keep well, and also because they are not fit to eat after the skin becomes hard. Winter squashes can be used at any time, but are usually allowed to mature. Invariably they should be gathered before frosty weather, as even a slight frost injures their keeping qualities. They are often placed in piles in the field, and covered with the vines at night, until they are thoroughly dry and the skins have become flinty. At least an inch of the stem should be cut with each fruit. This serves as a handle. The fruit should always be handled with the greatest care to prevent even slight bruises. Among the early varieties are Summer Crookneck, Bush Scallop, and Boston Marrow. The late varieties include Hubbard, Marblehead, Essex Hybrid, Bay State, and Winter Crookneck. This last variety is not of as good flavor as the others. It is about equal to pumpkins.

Squashes expected to keep well must be gathered carefully just before the first frost. Leave the

stems on and do not bruise. If frost nips them ever so little, they begin to decay, at first slowly, but soon they will be ruined. After they are gathered it is best to store them in an outbuilding until danger of freezing approaches. They should then be taken to a cool, dry, airy cellar, and placed upon shelves, being careful that they do not touch one another. Squashes gathered and taken care of in this way will keep good until nearly spring.

Francis C. Kiner of Illinois writes: "The best luck I ever had storing squashes and pumpkins was in a cellar adjoining a furnace room. It was very dry and the windows were all kept open until there was danger of frost entering the cellar. The squashes were gathered just before frost without bruising, care being taken to leave all the stems on. They were set on shelves about 4 feet up from the cellar floor. The windows were left open for a while every warm day during the winter to air the cellar.

"These squashes kept nicely until January 1. Then some of them began to speck. When I wanted one to use I looked them over and used the ones that were beginning to show signs of not keeping very well. By this method none went to waste. A number of them kept until spring. The squashes were the Hubbard, the Hester, the Marlow, and sweet pumpkins. There was a fine lot of them, and I do not know that our family ever enjoyed anything better than they did those squashes. The Hester squash, especially, is a fine keeper, and, if cooked right, is equal to sweet potatoes."

TOMATO

To grow tomatoes requires no especial skill. In fact, there is no plant in field or garden except the

weed that will submit to gross neglect and still flourish as will the tomato, and if we were content to grow a supply for home or market during the months of August and September no especial instruction or costly manipulation would be required.

On this subject W. J. Ritterskamp of Indiana writes as follows: "I find that to grow tomatoes very early, say, to have them commence to ripen during the first half of June while prices are high, three things are absolutely necessary. First, an early variety, then an early start, and lastly an early situation.

POTTED TOMATO PLANT

"There is not much to say or write about early varieties, as we are still looking for the ideal one. Those we have are either too small or the shape is not desirable. When people are asked to pay from 35 to 50 cents a dozen for tomatoes they demand fruit that has the color and shape to please the eye, and quality is of secondary importance. I have found but one variety, Chalk's Early Jewel, that combines size, shape, color, and firmness in a high degree, but unfortunately it is not one of the very first early.

"Of the first earlies Maule's Earliest is my choice. It is a very prolific large red tomato, and,

if one is willing to throw out half for culls, the others will make a very salable grade of firsts. The quality is of the best, and as this variety is so very prolific, I believe that the one-half retained as firsts will measure up equally with the entire crop of Acme, Dwarf Champion, or Dwarf Stone.

"I sow seed of Chalk's Early Jewel in greenhouse by February 1. When plants show the true leaf I transplant the seedlings 2 x 2 inches on the benches. As soon as they crowd each other I transplant again, using 4-inch flower pots for 1,000 or more. The others are set 3 x 4 inches, either on the benches or in a hotbed. I keep the temperature rather low, 45 degrees at night, lettuce temperature. This makes nice plants by May 10, that have fruit set the size of persimmons.

"Those set in flower pots are moved into glass-covered frames the last week of April. The glass is taken off in mild weather and left off at night when I am sure that frost will not get them. This hardens the plants and it would take quite a little frost after they have been set in the field seriously to injure them. Muslin-covered frames will often answer for this hardening off.

"I want to caution against over-watering while the plants are under glass. It is much safer to keep the plants rather too dry than too wet. When the plants grow thrifty, with a purple hue at the lower part of stem, one may feel safe that they have light and water according to their needs. If overcrowded and over-watered the plants will grow up spindling and with bleached stems. Such plants will never do well if they do live.

"I prefer high land sloping either to east or south for early tomatoes. Sandy soil would be best, but I have none but clay loam. This I make rather

rich by plowing under stable manure, 20 loads an acre being ample if the soil is fairly rich naturally. Plow the ground and prepare as for corn, then set plants 4 x 4. Those grown in pots will scarcely wilt after setting.

"I am not prepared to say whether or not it pays to stake and prune our early tomatoes. In a wet season I lose considerable fruit by rot when not staked. On the other hand, I get more fruit and less of it sunscalded where I let the vines fall and grow as they will. Staking will give ripe fruit earlier. The large growers near Jacksonville, Kraft, Lyndale, and Morrill in Texas stake thousands

TOMATO TRELLIS

of acres and prune to a single stem. This stem they clip just above the third flower stem soon after the fruit has set.

"When I market my early tomatoes I use full-size one-gallon baskets, four to the crate, grade the fruit closely and wipe every specimen with a moist rag. One active girl will wipe 12 to 15 bushels or enough to fill 25 to 30 crates in a day. This past season I marketed Jewels in the Indianapolis market at 71 to 75 cents a crate, when Tennessee stock was freely offered at 30 to 40 cents a crate.

"I pick when the fruit begins to color, say, three days before it is ripe, and, if for shipment, pack and

ship at this stage. If for home market I wipe and pack, then hold them until fully ripe.

"There are several advantages in picking tomatoes at this stage. I have no cracked fruit, or, as they are called, leaky packages. The energy of the plant can go toward ripening the next largest specimens, and last, but not least, I always have a goodly supply on hand and need not to go in bad, rainy weather to pick for next day's sales. I consider an early start with an early variety on early land, with proper grading and packing, the key to success with early tomatoes."

EARLY TOMATOES

Mrs. C. Browning of Rhode Island gives the following successful plan for raising early tomatoes in southern Rhode Island, where fruit ripens the middle of July, fully a month earlier than formerly: "First, get the best seed; Maule's Earliest we like best. As early as March I have ready a shallow box of sifted loose soil, chip dirt, or leaf mold and sand, with a little fertilizer mixed in. Press hard and wet thoroughly. Scatter the seed on and cover about twice the depth of the seed; cover with a pane of glass and set behind a stovepipe, if possible, where the soil will not get cool, and keep sprinkled with warm water.

"The plants should be well started in three or four days, and ready to set in the sunny window. When four leaves are well grown, transplant to larger, shallow boxes or 4-inch paper pots, that can be bought for 10 cents or less a dozen. We used them last year and found them very satisfactory. By the middle of April we set the potted plants in a cold frame, letting them get used to the air gradu-

ally, closing and covering at night. We cannot safely set in the ground before May 20. It is better to wait if the winds are cold.

“Ground that has been spread with stable manure and plowed and harrowed is best for the early fruit. Dig the holes deep; stir in a handful of potato phosphate. Soak the plants well with water, loosen from the pots and drop them carefully into the hills; cover to first leaves. Keep well hilled up for the first few weeks. For later picking plant Chalk’s Early Jewel or Acme.”

“Last season,” writes John E. Vail of Decatur county, Iowa, “I grew some beautiful tomatoes under a cheesecloth frame covering about 3 feet square by 4 feet high, the sticks projecting so as to permit driving a short distance into the earth. The size of the fruit was very uniform, and when specimen baskets were packed they would rival those of the seed catalogs. The best and most uniform variety was Chalk’s Early Jewel. Maule’s Magnificent was the largest and showiest, but varied more in size.”

TURNIP

There are two classes of turnips popularly grown in this country—the purple and the yellow. The former is more popular as an early variety than the latter, which is of finer flavor, and is the leading fall and winter kind. Both crops are essentially cold weather plants, and, therefore, cannot be expected to do best in summer. The seed is sown, therefore, in early spring, or about midsummer so that best growth can be made during cold weather.

Friable, rich, sandy loam is best for both crops. Preferably, the land should have been in sod the

previous year, or at least not planted to any vegetable of the cabbage family, such as mustard, cabbage, cauliflower, etc. The rows are usually about 15 inches apart and the seed sown thickly and then thinned to 2 or 3 inches between the plants when these have grown about 6 inches high. Late turnips are usually grown after some early crop has been harvested. They follow peas, snap beans, and similar crops very well. Among the purple varieties are Early Flat, Early Milan, Redtop, Strap Leaf and White Egg. Among the later kinds, which usually take four weeks longer to mature, are Purple Top Swede and White Rock. Like other varieties, turnips should be stored for winter use in pits or root-cellars as described elsewhere.

WATERCRESS

Watercress is an aquatic plant whose long-leafed stems are used largely as a salad. It is of the simplest cultivation where the soil is very moist. It does best, however, in running water or the edges of brooks. All that is necessary is to sow seed along margins of the brook and let the plants take care of themselves. After once being started the plant readily propagates itself either from seed or by slips of the root. These slips may be pushed in the soil and allowed to take care of themselves. Often watercress becomes a nuisance where it clogs the flow of small streams. It is in its prime during late fall and early spring. When it begins to flower it is rather too pungent for popular taste. In many places where the streams do not freeze severely this plant may be had all winter in perfection.

CHAPTER X

Spraying

Siantifick fellers sez spraying makes frute temptin tu look at an tu eet. ef so, addum must uv sprayde er eve nevvver ud wanted the ferbidun frute.—Joe Moggason.

“Fruit growers, as a rule, understand that fungicides should be used as preventives, as when the spores have germinated and have penetrated the tissues the fungus has passed beyond the reach of a surface application. While some benefit may derive from spraying after the fungus is at work,” writes Prof. L. R. Taft of the Michigan experiment station, “it is largely, if not entirely, in the way of preventing the spread of the disease to other parts of the plant or fruit.

“In a general way, then, it can be said that the only way to obtain perfect results from spraying is to make the first application before the attack, and renew it sufficiently often to keep all parts of the trees covered with the fungicide during the period of activity.

“So far as the insecticides are concerned, early sprayings are also necessary, as nearly all of the more troublesome insects injure plants by eating the foliage or other exposed parts. Although they can generally be held in check after the effect of their work has been noticed, it is better to apply the remedy just before the larvæ are likely to appear.

“As a rule, it is advisable to spray, not only apples, but all other fruits just before the blossoms

open. This application will not only destroy many of the curculio, canker worms and other leaf-eating insects, but if done at just the right time the blossoms and blossom stalks can be coated with bordeaux, and can thus be saved from the attack of fungi, to which they are subject if cold, wet weather prevails.

"A second application should always be made within a week after the petals have fallen. In cases where the first application was made at exactly the right time and it has not been washed off it will, perhaps, be fully as well to wait four or five

APPLE CALYCES

a, Ready for Spraying; b, Too Late.

days after the petals of a given variety have dropped, but it should by all means be completed within a week, and the sooner the better after the petals are off, unless one can be sure that the young fruits are well coated with the fungicide. So far as the codling moth is concerned, the best time for making this application will be after the stamens have had time to dry up and be-

fore the calyx lobes close.

"The third application should be made about two weeks after the second, or within three weeks from the time the petals have fallen, having in mind the importance of keeping the fruit and foliage covered with the spray mixture, and it may be desirable in some cases to shorten the period between the sprayings. This will be made at about the time that the first larvæ of the codling moth hatch. Eggs will have been laid upon foliage and fruit over a period of perhaps three weeks, and will hatch in about ten days from time they are laid.

“This third spraying, then, should suffice to destroy practically all of the first brood, and, if the second spraying was properly done, the larvæ that are not destroyed while making their way to the calyx will be poisoned when they attempt to eat into the fruit at that point. One should have in mind the importance of keeping all parts of the trees coated with bordeaux and an arsenite at this time, as a protection against fungous diseases and the codling moth, as well as other leaf-eating insects. If this third application is washed off before July 1 it should be repeated.

LATE SPRAYING

“At least one other application should be made to protect late varieties of apples from the second brood of the codling moth and from the attack of apple scab. The second brood of the codling moth does not, as a rule, hatch before the middle of August. The season may make a difference of ten days at any given point, hence no positive date can be fixed, especially as it is not uncommon to have the moths appear over a period of two to three weeks. They generally continue to deposit the eggs for a week or ten days.

“A fifth application is recommended for the codling moth to be given to winter varieties of apples from August 10 to 15. For this spraying it will generally suffice to use only an arsenite, except in cases where they are very subject to the attack of apple scab, and where the weather is favorable for its development, especially if the fruit and foliage do not seem to be well covered from the fourth spraying.

“For the spraying of grapes, pears, cherries, and European plums, exactly the same treatment is recommended so far as the first, second, and third applications are concerned. For Japanese plums

APPARATUS FOR COMBATING PLANT FOES

1, Powder and Vaporizing Bellows; 2, Garden Spray Cart; 3, Orchard Spray Pump and Barrel; 4, Vaporizing Gun; 5, Knapsack Sprayer; 6, Hand Pump for Bucket.

the only change would be a slight reduction in the strength of the bordeaux, using only 2 pounds of copper sulphate, where 3, or perhaps 4, pounds might be used upon the other fruits.

SPRAYING STONE FRUITS

“For the spraying of peaches the substitution of 2 pounds of copper sulphate in 50 gallons of water is recommended in place of the first application of bordeaux. The spraying must be done during the latter half of March or the first half of April as preventive against the attack of the leaf curl. An application of weak bordeaux and an arsenite can also be made to advantage within a week after the fruit has set when the curculios are troublesome, or in the case of varieties whose fruit is subject to the attack of brown spot and other fungous diseases. Other sprayings are seldom desirable on account of the danger of injuring the foliage.

“The only exception would be in the case of the early varieties of peaches and plums and sweet cherries, which should be sprayed with either a self-cooked mixture of lime-sulphur or with a diluted solution when the fruits are about three-quarters grown, provided the conditions are favorable for the attack of brown rot.

“In the case of grapes that have been seriously injured by black rot, it is often a good plan to spray the vines while dormant with copper sulphate solution, 2 pounds in 50 gallons of water, or with bordeaux when the blossom buds first show, following it up with the first, second, and third applications mentioned above. As a rule, this will suffice. If there is much rot present the latter part of July upon unsprayed vineyards, and conditions are favor-

able for its spread, another application, which would be the fifth, if the above recommendations are followed, can be often made with profit. For this spraying it will be well to use no more lime than of copper sulphate, and a somewhat smaller quantity might be employed, thus lessening the danger of spotting the fruit. The same practice may also be followed when bordeaux is used upon winter varieties of apples and pears, or upon late varieties of plums after the first of August."

LATEST WORD ON SPRAYING

"Investigators of plant diseases have recently advanced important new ideas on spraying fruit trees," writes Prof. F. C. Stewart of the New York experiment station. "In circular No. 1, of the bureau of plant industry, W. M. Scott announces that he has devised a cheap and easily prepared lime-sulphur mixture which can be used on peaches and other fruit trees during the growing season without injury to foliage or fruit. He calls it the self-boiled lime-sulphur mixture. His experiments made in Missouri show it to be highly efficient in the control of peach rot and scab. The best proportions of lime and sulphur have not been determined definitely.

"The mixture that gave the most promising results was composed of 10 pounds of sulphur, 15 pounds of fresh stone lime, and 50 gallons of water. The lime is slaked with a few gallons of hot water. The sulphur is added immediately and thoroughly stirred into the boiling lime. The only heat used is that generated by the slaking of the lime. After boiling ceases, enough water is added to make 50

gallons. The mixture is then strained through a 20-mesh sieve and applied with a spray pump.

"If this new fungicide proves to have the qualities claimed for it, it will certainly be a great thing for peaches and may be useful for other fruits. However, we warn fruit growers against using it extensively until they have thoroughly tested it on a small scale. In the past, heavy losses have sometimes resulted from the use of new spray mixtures. It is best to go slowly with these new things. We understand that Mr. Scott made further experiments in 1908, but the results have not yet been published.

"Prof. A. B. Cordley of the Oregon station also has a lime-sulphur mixture, which he claims can be safely used on the foliage of fruit trees. He calls it the stock solution method of preparing lime-sulphur mixture. He makes a stock solution of lime and sulphur, which gives a hydrometer test of 1.27. Each gallon contains 2.38 pounds of sulphur. Diluted with 15 parts of water this did not injure the foliage of apple, pear, plum, grape, potato, and celery, but did injure the peach. He states that apple trees sprayed three times with this mixture gave 79.3 per cent of scab-free fruit, while unsprayed trees gave only 19.9 per cent, and trees sprayed with bordeaux 49.1 per cent of scab-free fruit. Moreover, the fruit sprayed with lime-sulphur was free from spray injury, while 39.1 per cent of the fruits receiving bordeaux showed spray injury.

"While we do not question the veracity of Professor Cordley, we cannot believe that the lime-sulphur mixture, in any form, is really more efficient than bordeaux for the control of apple scab. A mistake has been made somehow. Our advice to

apple growers is to continue to use 3-3-50 bordeaux as in the past.

“Probably many fruit growers have been alarmed by Colorado station bulletin No. 131, on arsenical poisoning of fruit trees. It is stated that in Colorado apple trees suffer from a disease in which the crown of the tree is girdled, the bark on portions of the trunk dead and sunken, and most of the roots dead. Dr. Headden, the station chemist, who made an investigation of this trouble, concludes that it is due to arsenic in the soil. When trees are sprayed with arsenate of lead or arsenite of lime, these substances eventually find their way into the soil and accumulate there.

“According to Dr. Headden, the alkali in the Colorado soil renders the arsenic soluble, so that it may be absorbed by the apple roots. That arsenic in soluble form is extremely poisonous to plants is well known. Dr. Headden analyzed the soil under dying trees and found it to contain arsenic in dangerously large quantities. He also found arsenic in the wood of diseased trees. He holds that spraying with arsenical compounds is responsible for the death of the trees.

“In the minds of eastern orchardists who read this bulletin, the question will naturally arise, Does this apply to orchards in the east? In the past it has been assumed that, in our soils, the arsenical compounds used in spraying retain the insoluble form and so are not harmful to the trees.”

CHAPTER XI

Ornamentals

A flower garden will grow more good thoughts, kindly acts, smiles and pure joy to the inch than the best acre on the farm.

—American Agriculturist.

The one thing necessary to make most farms attractive is ornamental planting around the house and buildings. The plants used need not be expensive, they need not demand much attention, they need not be imported, they need only to be appropriate to their positions. A great many mistakes are made in planting trees and shrubs by scattering them in a meaningless way over the ground. The one thing to remember in planning an ornamental garden is to have the whole thing form a picture; that is, every plant should be in such a position that it will form part of the frame in which the main feature of the place, the house, is rendered more beautiful and homelike.

If the shrubs and trees are scattered over the lawn, each one will claim its individual share of attention and will detract from the house itself; whereas, if they are grouped around the borders of the place so as to leave the main portion of the yard in grass, the effect will be greatly improved, because the lawn will give a restful air to the place. No matter how large or how small the yard may be, the planting of ornamentals should be at the sides except for such necessary trees, vines, etc., as will partially shade the porches and windows of the house itself. Even these trees should be placed

so they will not produce an undue amount of shade upon the house, and thus render it gloomy from the inside. Too often trees are planted close to the building without regard to the size they will attain when full grown. It is folly to plant Norway spruces, sugar maples, white oaks, and similar

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large growing trees almost within arm's length of the building. They cannot attain their best development and are sure to cast too much shade.

OBJECTIONS AGAINST BEDS

For best effects flower beds should not be used. If they are used at all, they should never be in the

center of the lawn. Their proper positions are at the base of the building wall, along the fence and in angles of walks. The principal objection to the flower bed is that it is not attractive during more than half the year, and it requires much more attention than the well-planted flower border. Many people who have been depending upon beds for blossoms and not receiving a reasonable return for the labor expended, will rejoice in the wealth of bloom that can be secured with a tenth of the work in the flower border.

Too often the beds are filled with plants that have been struggling through the winter in the windows, and which suffer more or less from the changed conditions when put out of doors. When turned loose, they become victims of wind and sun and it is usually midsummer before they begin to be attractive. All this time they receive far more attention than they are worth, and far more than would be necessary to bestow upon a natural plantation of several times the size. The natural plantation produces flowers because it wants to. By proper selection of varieties, it will start when the bluebirds begin to sing and will continue all through the season until Jack Frost comes to stay for the following winter. Even during the winter, many of the trees and shrubs are attractive because of their colored bark and fruits; so that instead of having a mud hole on the lawn for six or eight months of the year, one has the restful and pleasing border to look at for twelve months.

THE BEAUTIES OF BORDERS

The chief beauty about the border is that one can change it continually and add to it at frequent in-

tervals whenever the opportunity presents. In many sections it is not necessary to buy a single plant for such a border. The woods and fence rows are filled with plants that can be had for the digging and that will repay transplanting. Among the shrubs that grow wild in many places are rhododendrons, viburnums, alder, elder, azalea, magnolia, sweet briar, judas tree, spice bush, thorn, spiræa, flowering raspberry, juniper, laurel, mahonia, burning bush, sumac, dogwood, various small cherries, and scores of others.

Shrubs should be planted at intervals and in groups so that different parts of the plantation will be attractive at different seasons, and also so that there will be plenty of room among them for hardy perennial plants. These perennials will be found far more effective, attractive and far less troublesome than annuals, because, with ordinary attention, they will remain interesting for years. It is a great mistake, however, to grow this class of plants continuously in the same place. They should be moved to new ground at intervals of several years. As a rule this can be very easily done in the spring. The way to know when it is time to move any kind is to note when it begins to fail in its present position. As soon as it ceases to thrive it should be mowed.

LIST OF HARDY PERENNIALS

Among the immense list of hardy perennials that anyone can grow the following can be procured for very insignificant cost, even if they do not grow in the woods, fence rows, or neighbors' gardens: Columbine, larkspur, peony, perennial poppies, wild asters, goldenrod, gasplant, snapdragon, coneflower

(golden glow), perennial pea, hop, yucca, phlox clematis, anemone, iris, sacaline, gaillardia, bluebells, shooting star, hellebore, moss pink, lychnis saxifrage, perennial chrysanthemum, funkia, babies

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breath, sedum, blazing star, beard-tongue, Joe-Pye weed, cardinal flower, forget-me-not, eulalia, Arundo Donax, candytuft, English daisy, Canterbury bell, bleeding-heart, hollyhock, zebra grass, fragrant balm, coral bells, bloodroot, and hundreds of others.

In addition to these, are the many bulbous plants which may be relied upon to produce flowers principally in early spring and summer. These must usually be purchased. Preferably they are almost all planted in the autumn for blossoming the following spring, but may be allowed to remain in the ground from year to year as long as they thrive. Among the general favorites of this class are crocus, daffodil, hyacinth, jonquil, narcissus, tulip, crown imperial, glory-of-the-snow, snowdrop, snowflake, and squill. There are also other bulbs and plants usually classed with such by seedsmen which should be planted in the spring and taken up in the autumn for storage where they will not freeze. Among these are gladiolus, tiger flower, zephyr flower, canna, dahlia, elephant's ear, and tuberose. Besides all these there are scores of other plants of the bulbous class from which to select. Among them are the harebells, lilies, begonias, lily-of-the-valley, and many other general favorites.

Now all of these plants mentioned can be grown with far less attention than geraniums, carnations or any other plant moved from the cellar or the house window to the garden and coddled for weeks to induce them to bloom. Not that the writer has anything to say against any house plant. He is a lover of plants in general, but for the busy farmer's wife and daughters who have to make the best use of their time, the writer believes that far more enjoyment can be secured at far less expense both for labor and outlay of money from the plants in the above lists than from any house specimens placed for the summer in a flower bed.

House specimens should be given a position by themselves where they will be sheltered from the

wind, and where they will rest up for the following winter's work in the windows. They should not be made to do double duty both summer and winter. The border should supply armfuls of bloom all season through and should not look bare if bouquets are cut in abundance. If the soil is good and plenty of plants are put in, there will not be a minute of daylight when the flower border will be unattractive.

One of the principal beauties of the plants mentioned is that they do not require any special care in growing. All that is necessary is to put them anywhere desired, firm the soil around them and let them go. But if a few do not grow, there are plenty more in the woods and fence rows to take their places, and one can be adding plants to the flower border from time to time all through the season. The writer knows one man who has just such a border stuffed full of all kinds of things. He takes frequent walks and will often dig up a plant in midsummer, using only a dead limb for a spade, and, if necessary, carrying the plant home in his pocket. With such rough treatment, of course, some plants die, but it is surprising what a beautiful and attractive border he has—almost all of it wild plants gathered in the neighborhood.

ANNUALS LOSING POPULARITY

If one must have annuals, let these be planted in rows like vegetable crops in some part of the garden where they will not interfere with the general effect of the place, and where they can be clipped for bouquets without spoiling the looks of the garden. As a rule, annuals used for cutting are not attractive after the plants have been cut, hence the ad-

visability of having them separate from the main garden. Most of the annuals, even the general favorites, are rather a bother to have in good condition. They demand too much time and attention, but very few women will be satisfied to do without some of them. Among the most popular are sweet peas, balsams, China aster, mignonette, marigold, nasturtium, pansy, morning glory, verbena, petunia, cosmos, stock, besides a host of others from which to choose, but the hardy perennial herbs and the shrubs are of so much less bother and afford such a wonderful variety of color and form that the annuals are decreasing in favor wherever the other plants mentioned are becoming known.

If any farm woman will plant part of her yard to the hardy stuff and love it enough she will find that in five years she will be growing almost none of the annual flowers, and will rely upon hardy borders for bouquets as well as outdoor ornamentals.

TREES FOR THE FARMSTEAD

In most farm gardens there is room enough for at least a few trees. These should be well chosen and planted as early as possible after the site for the house has been determined. If the house is already in place and trees are not around it, they should be planted in spring or fall at the earliest chance. Every year these will be growing more and more attractive until they become full grown, when they will add to the homelikeness of the place more than any other one class of plants.

BEST TREES TO PLANT

Among the most popular and best for planting around the house are: Basswood, chestnut, Amer-

ican elm, horse chestnut, sugar maple, locust, honey locust, white pine, Norway spruce, Kentucky coffee tree, various magnolias, yellow wood, catalpa, golden chain, great laurel, red maple, white oak, pepperidge, sweet gum, whitewood, paper birch, yellow willow, mountain ash, maidenhair tree, shadbush and Judas tree. Many of these are highly attractive because of their flowers, others are interesting because of their color and almost all are beautiful in their foliage. Many of them can be secured in nearby woods and often from nurserymen at very reasonable prices.

One thing about planting trees around the home is to avoid using too many. It is better to use two or three of one kind in a group than to scatter the specimens over the place and thus give a nursery effect rather than a home effect.

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VINES GIVE HOMELIKE EFFECT

The home idea can also be accentuated by the use of vines. On brick and stone work, nothing is so satisfactory as Boston ivy. It requires no supports, since it clings to the bricks. Contrary to the popular belief, ivies which cling in this way do not produce dampness in the house; they draw

moisture from the walls through their tiny root-lets along the stems. For a porch climber which will produce a deep shade, the Dutchman's pipe is the most satisfactory. Its huge leaves, as big as dinner plates, its hardiness and rapid growth, commend it to every one. In localities not too cold and on the north sides of buildings English ivy is an excellent climber upon brick and stone work,

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but where exposed to the sun during winter it is apt to be injured.

An excellent porch climber, also useful for training on tree stumps and posts, is the trumpet creeper, which has large orange-red blossoms. Wistaria is another porch climber of much the same class, but with clusters of lavender colored

blossoms. There are many honeysuckles useful not only for their pretty flowers, but for their perfumes. Perennial pea is excellent for training over rocks and on trellises. The moonflower is an interesting climber for a porch pillar. The variegated variety of Japanese hop is particularly attractive when trained against a dark background.

Besides all these, there are numerous less well-known climbers, such as actinidia, various species of clematis, akebia, silk vine, scarlet running bean,

the canary-bird flower, cinnamon vine, and bitter-sweet. These will do well on almost any soil and situation and will add greatly to the attractiveness of the house as the principal object in a farm home picture

SMALL HOME GLASS HOUSES

As an adjunct to many farm homes, a small conservatory or greenhouse will add greatly to the wife's and daughter's enjoyment of flowers during the winter. Such structures need not be costly nor large. An area 10 by 15 feet will supply all the needs of the household, both for flowers and for such small winter vegetables as parsley, radishes, young onions, peppergrass, lettuce and many other plants, and often mushrooms can be grown underneath the benches.

Such glass structure may be placed in the angle of the house on the south side where the walls will form the rear and at least one end of the structure itself. This will greatly reduce the cost of construction. Perhaps the simplest kind to make is a lean-to on the veranda. All that is necessary in such cases is to fill in the spaces between the posts with glass sash. Of course better results can be gained if the roof is also of glass, but no one need take off the veranda roof to make a conservatory. It is better to place the conservatory somewhere else. The veranda should be not less than 5 feet wide to get satisfactory results. Eight or 9 feet would be much better. The framework should be permanent as should also the roof, except where only temporary sashes are employed. In such cases the conservatory will probably be less warm than where permanently put up.

In a permanent conservatory it is advantageous to have a coil of pipe from the furnace so as to keep the place warm and thus make it possible to grow more tender plants than can usually be grown in temporary structures. There should be a door going to the outside as well as in to the dwelling from the conservatory. Preferably these doors should be opposite each other. It is also advantageous to have part of the wall between the dwell-

PERMANENT PLANT PIT AND HOTBED

ing and the conservatory made of glass so the plants can be seen from the living room. Ventilation can be very simply secured by having a hinged window either at the top of the vertical frame or in the roof of the permanent structure.

Often a cellarway can be utilized for growing hardy and half-hardy plants by replacing the doors with glass sash. This will be particularly useful in starting plants early in the spring, and thus will replace the hotbed and cold frame to a large extent.

In severe weather it may be covered with carpet to protect the plants from the cold. By opening the door into the cellar below the temperature will be kept fairly even, especially if there is a furnace in the cellar.

Another very satisfactory plan of growing hardy plants without heat is to have a permanent plant-pit built of brick, and sunk 4 or 5 feet in the ground. In the bottom can be placed such plants as should be kept for winter—dahlias, cannas, geraniums, etc. Across the pit on a level with the ground surface should be a floor covered with 6 or 8 inches of soil in which lettuce, pansies, violets, young onions, cabbage, and any other semi-hardy plants can be grown during the winter to supply the home table with crisp salads, blossoms, and early spring plants for transplanting.

FAVORITE PERENNIALS

“The great mistake in growing hardy perennials,” writes the late C. L. Allen of Long Island, New York, “is the almost general opinion that when once planted they can forever remain in the same place without further care or attention. This is a fatal error from the fact of its being in direct opposition to the universal law that the rotation of crops is an agricultural necessity. The period that some plants will thrive in a given locality much longer than others, as is the case with arborescent plants, many of which require centuries to perfect their growth, does not detract from this principle in the least.

All of our herbaceous plants require frequent changes of locality, because they have taken from

a given soil a certain active principle essential to their growth, and will no longer thrive in that place until nature, through her own resources, has restored the elements essential to their growth. Space will not permit our going over the whole list of those desirable plants, so we shall give cultural instructions for only a few of the most essential, with the understanding that these rules, with slight modifications, will apply to all. As a rule, it is safe to conclude that when any plant ceases to thrive vigorously, a change of soil is an absolute necessity as is also a division of its crowns or tubers.

PHLOX

“Perennial phlox is one of the most useful of our hardy plants, not only because of the great variety of color and marking of their flowers, but because of the fact that with proper care and attention they will keep in flower much longer than almost any other of this class of plants. They should be taken up every spring and the plants separated to a single shoot, and not returned to the same place in the border. The distance, however, from where they grow need not be great. When rootbound the phlox will not produce such magnificent trusses of flowers as when occasionally separated.

“Phloxes are gross feeders, requiring strong soil, made rich with well-rotted manure, which should be thoroughly incorporated in the soil. In light soils, to get satisfactory results, a sufficient mulch of coarse litter to keep the soil moist and cool is essential. The single plants should be set 6 inches apart each way, in clumps or rows in the border, and when the flower buds appear, cut back, say, one-half of the plants, just

below the flowering buds; this will cause them to throw out flowering branches at the axil of each leaf and keep up a succession of flowers until the chrysanthemums appear.

“If the first flowers are cut for table decoration, the plants quickly throw out new branches, which will keep up a succession. When the plants are allowed to remain undisturbed, the flowers will soon grow smaller and lose vigor and intensity of color, simply from the want of nourishment from both air and earth.

HARDY CHRYSANTHEMUMS

“So far as cultivation goes, chrysanthemums and the phloxes require the same general treatment. The former should be set singly as soon as they show growth in spring, and given a good, rich, and deep soil which should have a liberal mulch if the soil is naturally dry and sunny. Set the plants 1 foot apart each way; when 6 inches high, nip the tops from all. Side branches will quickly appear, making vigorous growth. About the middle of July nip the terminal bud from each branch to cause plants to become strong and bushy; and when season for flowers arrives, plants will be loaded.

“If large flowers are required, disbud as is the custom of the florist with the more tender sorts. By leaving only the terminal bud to each branch the flowers will be double the size of those on the plants where all the buds are allowed to perfect their flowers. We must, however, say we are not in happy accord with the disbudding process. The chrysanthemum is the culmination of the season, and we like to encourage the plant to produce as many flowers as possible without regard to size.

LARKSPURS EASY TO GROW

“There are but few plants in the garden so generally useful as the delphiniums; in fact, they are indispensable, and are grown with the least possible trouble. They will grow anywhere, and with a little trouble the flowers can be had nearly the whole season. The old clumps will come into flower in early June, and by cutting half the plants down to, say, within a foot of the ground, before they show flower, a new growth will soon be made to keep up a succession. In early spring sow a few seeds in small pots in the house, or in a hotbed or greenhouse, and they will come into flower just before the frost, a few degrees of which does not injure them. We prefer growing a few seeds annually to the division of clumps, as young plants do much better than old ones. When the old plants begin to wane, throw out and replace with young ones. The delphiniums will show by their flowers a just appreciation of all the care and attention paid them, and they fully deserve all they get.

“*Dictamnus fraxinella*, the well-known gas plant, so called because its flowers, on opening, emit a gas that may be readily ignited by holding a lighted match over the flowers during the evening, when the gas is emitted most freely. This plant will thrive almost anywhere and under all circumstances. It seems to delight in neglect, and in a solitary position, whether in shade, or in partial shade, and in soil too poor, seemingly, to sustain plant life. This plant can be propagated only from seeds, which must be sown as soon as ripe. Plants of the *Dictamnus* have been known to live in one place for 75 years.”

The foxglove family is old and well known. The

most common is *Digitalis grandiflora*. These plants are the most showy and intensely beautiful as well as the most easily managed, hardy perennials. They will remain long undisturbed, and can be removed without injury. They are propagated readily from seed, which should be sown like common garden annuals. Their long season of flowering is an excellent feature for border plants.

CAMPANULAS AND IRISES

“The campanulas are the old-fashioned flowers of our childhood, worthy of a place in every garden. They thrive in almost any situation, even under the shade of trees. *Campanula grandiflora*, now called *Platycodon grandiflorum*, of which there are two varieties, one with white, the other with purple flowers, is a charming plant. It comes into flower after the others have completed their work, thus keeping up a succession. One of the virtues of this species is that it can be removed without injury or remain for a long period without removal. The Turban Bellflower, another late flowering sort, is one of the most useful. The flowers are salver-shaped, and very large for the size of the plant, which grows only 6 to 8 inches tall. It is a charming plant for the border. There are many species, all desirable and of easy cultivation.

“Where there is plenty of room the iris should be largely grown in the herbaceous border. A collection of well-assorted species will furnish flowers at least from May until July. If there is but little space it can be more profitably filled with other plants. However, there is one species, *Iris Kaempferi*, that should be found in every collection of choice plants. The flowers are large and vary in

color from white to dark maroon and purple, both single and double, with every shade of markings in blotches, stripes, and pencilings. The iris will grow in almost any soil, but prefers a lively loam and a moist or wet situation. It will thrive in a marshy soil or beside a brook.

“In ordinary seasons in this climate the flowers will not come up to expectations unless the soil is moist. Deep cultivation is also desirable, as the roots will go down at least 2 feet in search of moisture, if it is not provided for them nearer the surface. To secure moisture in a dry location a liberal mulching is needed. Unlike most plants so fond of damp situations, the iris dislikes shade and thrives best in a hot, airy place. Propagation is easily effected by division or from seed. The former method is preferred, as a bed of seedlings gives but a small proportion of choice flowers. Division should always be made in autumn, and it is best not to let the clumps die out in the centers. In the ordinary garden the best results can be obtained only by deep cultivation, heavy manuring, and deep mulching. With such treatment the open border will show clumps of plants bearing flowers that rival the orchids.

PEONIES NEED SPACE

“While the peony belongs with hardy, herbaceous plants, its treatment is so different from those noticed that I will briefly call attention to some of its peculiarities. It will not do well in a crowded border, where other plants thrive luxuriantly, but must have an open, airy situation, a good, strong soil, and an abundance of plant food. It should never be disturbed as long as it produces its flowers

freely, which it will do if left entirely alone. Division of its tubers, the only means of propagation, is an injury rather than an aid to its flowering. I have known clumps that have not been disturbed for 40 years to produce their flowers in abundance annually, and have seen old clumps, divided with care, and seemingly under the most favorable conditions, to stand still for a number of years without producing a flower. Propagation, or division, should be done in October when the plants are at rest and the roots, or tubers kept out of the ground as short a time as possible. Usually the plants will produce a few flowers the second season. If so, success is assured, and an annual display of flowers certain."

PLANTS FOR HANGING BASKETS

"Two of the most important classes of flowers," writes Laura Jones of Kentucky, "are pot shrubs and hanging basket plants, because they are useful, decorative, and are all-the-year-round plants. With proper care they are always permanent with us. Some of the pot shrubs can be kept from six to eight years, if properly pruned to keep in low shrubby shape. If allowed to grow tall and straggling, there is little room for them in either window, or garden, or veranda. Only when they are kept in shrubby shape do they bloom well, as the long, straight branches do not produce flowers.

"The best flowering shrubs that will flower in the window and in the late winter and early spring are the *Azalea indica*, or the Chinese azalea, which blooms about Easter. This is a beautiful flowering plant. It comes in colors of pink, crimson, white, rose color and the variegated pink and white.

“The abutilon blooms well, both in the house and on the veranda, and, if properly pruned, produces 50 flowers. All flowers of the shrubs are produced on the tips of the new branches, and new branches must be forming for flowers. The only rule I know as to pruning is to cut back each individual branch when it is becoming too long and unshapely. The foliage of the variegated abutilon is very attractive, even when not in bloom; the green and white sorts are also very beautiful. Dwarf varieties are preferable to the tall sorts.

“Hibiscus blooms well in the window if given warmth and sunlight. It produces very gaudy flowers, but is not so large in winter as on the veranda in summer. It blooms well in the window. In time it grows into a large shrub, so after I have given it a big tub placed on casters, it can be rolled from place to place. This is a good idea for all large shrubs, as they can be conveniently moved without waiting for man's convenience.

“One of the most fragrant and beautiful plants for late winter or spring blooming is the bouvardia. Though an old shrub, it is very little known, but when once grown, one is not willing to be without it again. The long tubular flowers of *Bouvardia Humboldtii* are pure white, single, and very fragrant and beautiful. There are both double and single varieties, and in colors of pink and rose. The double sorts are short and not nearly so pretty as the waxy, tubular flowers of the single sorts. This shrub requires a rest during a part of the year. If to flower during the summer, withhold water during the winter, and if during the late winter and spring, withhold water during the summer.

“No window garden is complete without one or two hanging baskets, and the veranda has an un-

finished appearance in summer without one or two of these. The *Asparagus sprengeri* is one of the most useful of greens, either for hanging baskets or pots, but no hanging basket plant will succeed without plenty of moisture, and this least of all. One of the most beautiful specimen plants of this I have ever seen, 3 feet in length, and with the very strongest of fronds, was grown in water. The basket was placed in a large crock, strong wire was placed around the crock, and this suspended from the ceiling. The crock was kept constantly filled with water, and this gradually soaked up into the basket. Tin or porous receptacles are best, and the water should be allowed to soak up through the draining holes. The wire hanging baskets, with the moss, dry out so quickly that hardly anything will be a success in them."

PANSIES IN WINTER

"Let me tell you," says C. L. Meller of Wisconsin, "how I have obtained rather inexpensive, though very pretty floral decorations from the pansy, and that without going to a florist. You can have pansies any winter month in bloom if you will follow directions, and if you have a pansy bed, or can get a few plants from one.

"Remove the winter covering from the bed and dig up a few plants, roots and all, nor hesitate even though the ground is frozen solid. Then take the plants into the coolest part of the cellar or basement, there to thaw the ground out thoroughly, but not too rapidly. Leave the plants there for a week at least, taking care, however, that the ground does not become too dry and hard. When the soil around the roots has warmed somewhat, and is

just dry enough so it can be worked easily, place each plant in a 5 or 6-inch flower-pot. Do not pack, but firm the soil well around the roots. Then saturate each pot with lukewarm water. If you have not dug up enough dirt with the plants to fill each pot, get a few shovelfuls from the richest field on the place and mix about one-fourth sand with it. Warm it like the other soil. This ought to make excellent potting soil.

“After the plants have been watered allow the surplus water to drain off and place them in a warmer but not a much lighter place for a few days more. After this, place them in the warmest, sunniest window in the house. In about three weeks from the time they are placed in the window they ought to be nicely in bloom. As soon as a blossom shows signs of wilting, cut it off to give the buds a better chance. There is one drawback to the pansy used in this manner; plant lice are very apt to attack it, but seldom until at least two crops of flowers have been produced. When the lice do make their appearance, the best remedy is to throw away the pansies, when the lice will likewise disappear and will not bother your other pansies.

STRAWBERRIES FOR DECORATION

“Flowers may be secured from strawberries in a somewhat similar manner. They should not be dug up, however, until after the ground has been frozen for at least two weeks. There is not as much need with them to thaw out the ground gradually, and they may be placed directly in the sunlight. The strawberry plants will not bloom as soon as the pansies, but flowers you are sure to get. You may place one plant in a 6-inch pot or three

plants may be crowded into an 8-inch pot. You will find that they make a rather pretty centerpiece for the table, with the vines almost completely hiding the pot and the white flowers standing out against the green background.

“Should you desire to bring one of these plants into bearing, you can do so only with diligence and care. In the first place, you must be sure to select plants having perfect flowers, such as the Senator Dunlap. Then when the plant is in first blossom it will be best to cross-fertilize. This is accomplished best by means of a fine-haired brush, preferably one of camel’s hair. This is brushed over all the flowers in succession so that the pollen may thus be transferred from one flower to another.

“It will help toward success with the strawberry plants if you feed them occasionally, say, every 15 days, with a weak solution of nitrate of soda, the material for which may be bought for 5 cents at any drug store, and every week with liquid cow manure.”

WINTER CARE OF OUTDOOR PLANTS

“Generally a few thrifty geranium slips have been started early in the fall to produce flowers during the winter,” writes Cora B. Williams, “so there remains the work of preserving the old plants which have spent their vitality in almost perpetual bloom throughout the summer. Repotted for the sitting-room windows these old plants are unsatisfactory for the very good reason that they have become exhausted and, therefore, require a season of rest. But after a long rest during the winter, they will be just what is needed to set out in the ground in the spring.

“The brilliant and free blooming scarlet salvia,

also called *Salvia splendens* and scarlet sage, so popular both in town and country, can be placed in boxes of soil, set away in a warm cellar and kept until spring to use for flower beds and borders. If potted early and well started in its new quarters before winter sets in, the salvia makes a beautiful winter bloomer. Like the petunia, it requires plenty of moisture to be kept in bloom.

“All plants which are to be placed in boxes of soil for the winter should be carefully taken up, allowing a good portion of soil to adhere to their roots, and placed in the soil provided for them, then set away in a warm cellar where they will not freeze, and where a little light from the windows can fall upon them. They should not be put in a damp place, but in as dry a place as possible. Too much dampness will cause the plants to decay. When the soil in the box becomes very dry the plants will need a slight watering, which is all the attention they require. There are more plants killed by dampness than by dryness in the cellar.

“A much easier method, but not always reliable, is to take them up without breaking them, shake the soil from the roots, hang them in the warm shade for a day or two until they become dry, then transfer to the cellar, where they should be suspended from the ceiling by means of twine. They should be placed in a medium light and dry place where they may remain until spring, when they should be set out early in the ground, where they will soon make flourishing plants. Small slips will not keep in this way. Of course, it is essential that these geraniums be kept in a cellar where they will not freeze.

“The bulbs of tender annuals are easily cared for. They must not be allowed to freeze, and must

be entirely dry before being put away. *Caladium* bulbs should be preserved in dry sand in the cellar. Bulbs should be dug without injuring them, allowed to remain where the warm wind will blow over them long enough to dry them thoroughly, then tied up in paper sacks and hung in the cellar, or in a closet where they will not freeze.

“With a little work during fall the flowers can be safely stored away, and with the coming of spring, will be ready to reward the labor expended upon them by giving a profusion of flowers.”

FAVORITE HOUSE PLANTS

“Nearly everybody keeps house plants, more or less,” writes Mrs. E. B. Murray of Saranac county, New York, “but how few have flowers all the time or even more than now and then, and yet it is a comparatively easy thing if one only knows how. As to quantity and selection it is a matter of taste and room. I used to grow over a hundred plants every winter, and fill every window full. Of course, I enjoyed it, but no one else did. My husband used to protest vainly that the house was like a swamp, not a window to sit by or look out of, and I see now that I was very wrong; what should have given pleasure was just the reverse. Now, I save one good window, and do not crowd the others.

“There are, of course, all kinds of windows. Mine are warm and sunny—too warm. I find there is nothing, nor do I believe there ever will be, better than the dear old geranium. Just look at the varieties to choose from! It will grow with neglect and under very unfavorable circumstances, but give it what it needs, sun, warmth, enough water, and small pots, and see what it will do! I

prefer small plants, started in early summer, grown in little tin cans, for pots in my windows dry out so I can do nothing. I like small plants, because I can have so much greater range of kinds and color. I have nearly 40 now, all different, one or two sweet scented, three or four ivy or ornamental leaved. Did you ever try any new ones? Just send next summer to some reliable seedsmen and florists for a dozen, and see how you enjoy them, also what a revelation they will be to you.

"Abutilon is another fine plant for warm, sunny windows. I have known plants to bloom for nine months, and scarcely a day in that time without one or more of their showy, bell-shaped flowers. I prefer the yellow, but the pink is beautiful. Of these I have three. Cyclamen is another good plant, if managed right, but do not let it lie down in summer, or it is almost impossible to start again. Cinerarias are beautiful, grown from seed in the early summer, and kept growing vigorously all the time. Magnificent is the only word to call them when in bloom. Their time of blooming comes toward spring, and if kept out of the hot sun, they last for weeks. The richest blues and purples I have ever seen are among their colors. Certainly one or two pelargoniums also should have a place. They can be kept upstairs if warm enough until after the holidays. Then bring them into sunlight and warmth. When in full bloom they more than repay all care spent on them, and some of the newer varieties are simply gorgeous.

"Dutch bulbs deserve a chapter or a book to themselves. Those who have grown them need no urging or instructions. But for those who never have made their acquaintance there is in store a perfect revelation of their beauty, if given a trial.

PROPER
A. & E. COLLEGE

If I could grow only one flower in winter, it would be a bulb, and if only one bulb, it would be a hyacinth. My bulb closet gladdens my whole heart every time I look at or think of it. I have 50 hyacinths, double and single red, white, and blue, 12 parrot tulips, 12 Roman and Paper White narcissus, 12 Mammoth Yellow crocus. Given a good bulb and right conditions, it is sure to bloom, but it must not have fresh manure in the soil, nor be too wet at the start or it will rot. It requires six to eight weeks in utter darkness to make the necessary roots. But some thrifty woman says, bulbs cost so. No, not so much, when you can get mixed ones by the dozen for 50 or 60 cents, and even cheaper, by express. This means hyacinths, as others cost less."

BULBS FOR THE HOUSE

"Upon the care we give our plants and bulbs during the fall depends in a great measure the joy we will get from them in the year to come," writes H. Hunt. "Neglected then, they will be so weakened by the long, cold winter that a whole season will be required in which to recuperate, or we must mourn the loss of them entirely.

"Bulbs and plants that are to go into the house or cellar should not be left out too long, as there is danger that the frost will penetrate to the roots enough to destroy their vitality. Plants to be potted should be lifted early and left out of doors in the pots until thoroughly established therein. The foliage should be sprinkled daily, and gradually accustomed to the temperature of the room in which they are to remain. A judicious thinning of foliage is desirable, as no plant can carry as dense

a growth of leafage indoors as it will carry outdoors. Dahlias, cannas, and the like should be marked before the foliage freezes. A strip of zinc, with the name written in pencil, is a good way. After the foliage is killed by the frost, the tubers will ripen if they are left in the ground for a time, but they should not be left in after there is danger of the soil about the stalks freezing. Such bulbs should be lifted on a warm, sunny day, and left to dry out thoroughly before being stored away. If the storehouse is very dry it is well to pack them in dry sand, but I have had the best success by storing them in the vegetable cellar. Placed in a bin, like potatoes, they will keep perfectly where potatoes will keep, and begin to sprout in the spring at about the same time that potatoes begin to sprout.

“Bulbs that live over winter need care also. If they have been growing for years, undisturbed, they often become matted together in large clumps and, therefore, throw up but few flower stalks. When this is the case they should be lifted in the fall, divided, and reset if possible in a new place. Those newly set, or long set, should be covered with a thick mulch of well-rotted manure to protect from the cold and to furnish fertilizer for the coming spring. Over this may be placed a protection of straw or evergreen boughs, or leaves, if needed. Where snow falls early and remains all winter, it affords a good covering for such bulbs. It is the alternate freezing and thawing that kills, not the steady cold.”

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