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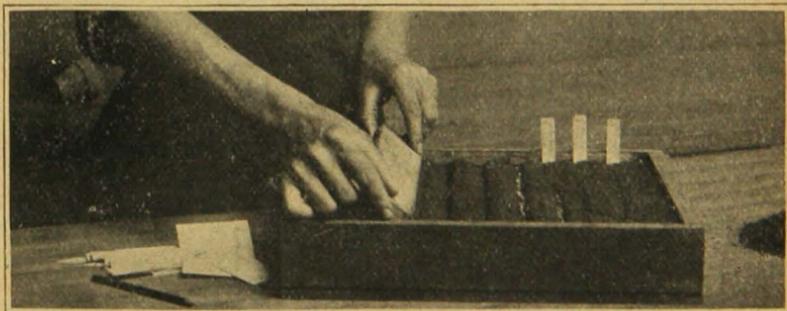
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The Home Vegetable Garden

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Success in gardening depends on several factors, and if even one is lacking results are seriously affected. Every plant is a living organism, but cannot move about in search of food; therefore the work of the gardener is to provide the things needed at the right time and in the right way. Climate is a factor that determines what kind of plants can be grown in a certain region. Fortunately the list of those that will grow in Minnesota is long enough to meet most of our needs. The length of the growing season may be extended by starting some kinds in the house, hotbed, or cold frame, or by using plant protectors in the garden.



A SEED BOX OR FLAT FOR STARTING EARLY PLANTS. USE THE EDGE OF A BOARD TO OPEN FURROWS FOR SEEDS.

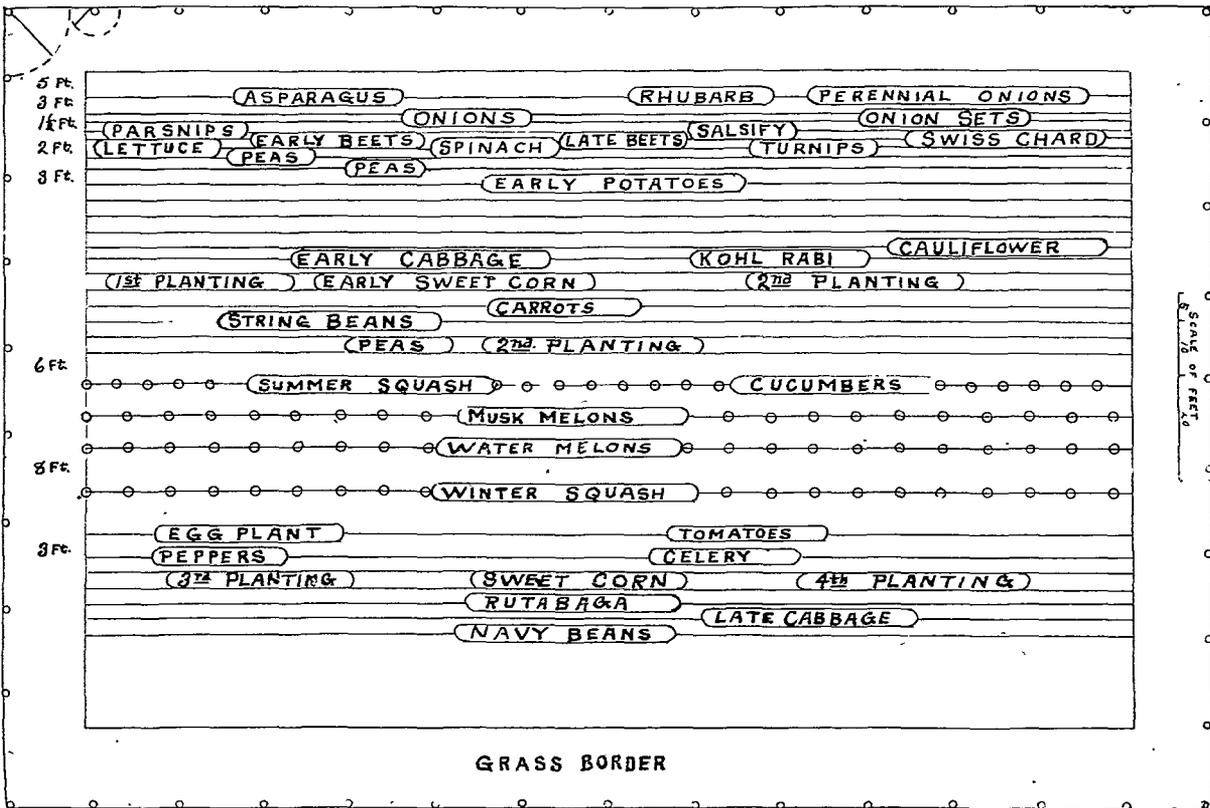
Plans Made in Advance Add to Results

An evening can very profitably be spent working out a plan for the garden before planting time. The plan need not be elaborate, simply a list of the rows, the distance apart, and what each is to contain. In some cases two or more crops may be grown on the same land each season. The plan should be on heavy paper, so that it can be easily handled while planting the garden.

Location and Size of Garden

The garden should be located near the house so that it can be looked after at odd times and the products gathered without too much effort. If the garden is not large enough to include potatoes, sweet corn, and the regular list of vegetables it may be more desirable to have two gardens on the farm: a small one near the house where lettuce, radishes, and similar vegetables may be grown which do not need much room. Sweet corn, potatoes, squash, melons, and others requiring more room can be grown in another place and cultivated with horse-drawn tools.

A GARDEN PLAN SHOULD BE MADE FOR EACH GARDEN. GIVE LOCATION AND AMOUNT OF SPACE ASSIGNED TO EACH CROP.



PLAN OF FARM GARDEN
 SIZE 150 BY 225 FEET

Kind of Soil Desirable

An ideal garden soil has a rich sandy loam surface, with silt or clay subsoil. The surface soil should be from six to ten inches deep and free from sticks and stones, sods and rubbish. The soil must contain a large amount of decayed vegetable matter and a large supply of plant food. Soils lacking in plant food cannot produce crops of any kind, therefore it is necessary to make them productive by the addition of rotted stable manure, hen or sheep manure, or fertilizers manufactured from waste from the slaughter houses and packing plants. Some of the latter products are dried blood, tankage, and ground bone. These are called commercial fertilizers. They are usually distributed before the crop is planted or near the rows of plants and worked into the soil. They should not be allowed to come in contact with the foliage. An application of one pound of dried blood or nitrate of soda for each 150 feet of row once in the growing season may be sufficient. Always observe the growth of the plants or the color of the foliage as a guide in determining whether the plants need more fertilizer, cultivation, or water. All conditions must be properly balanced if maximum crops are to be expected.

Few Tools Needed



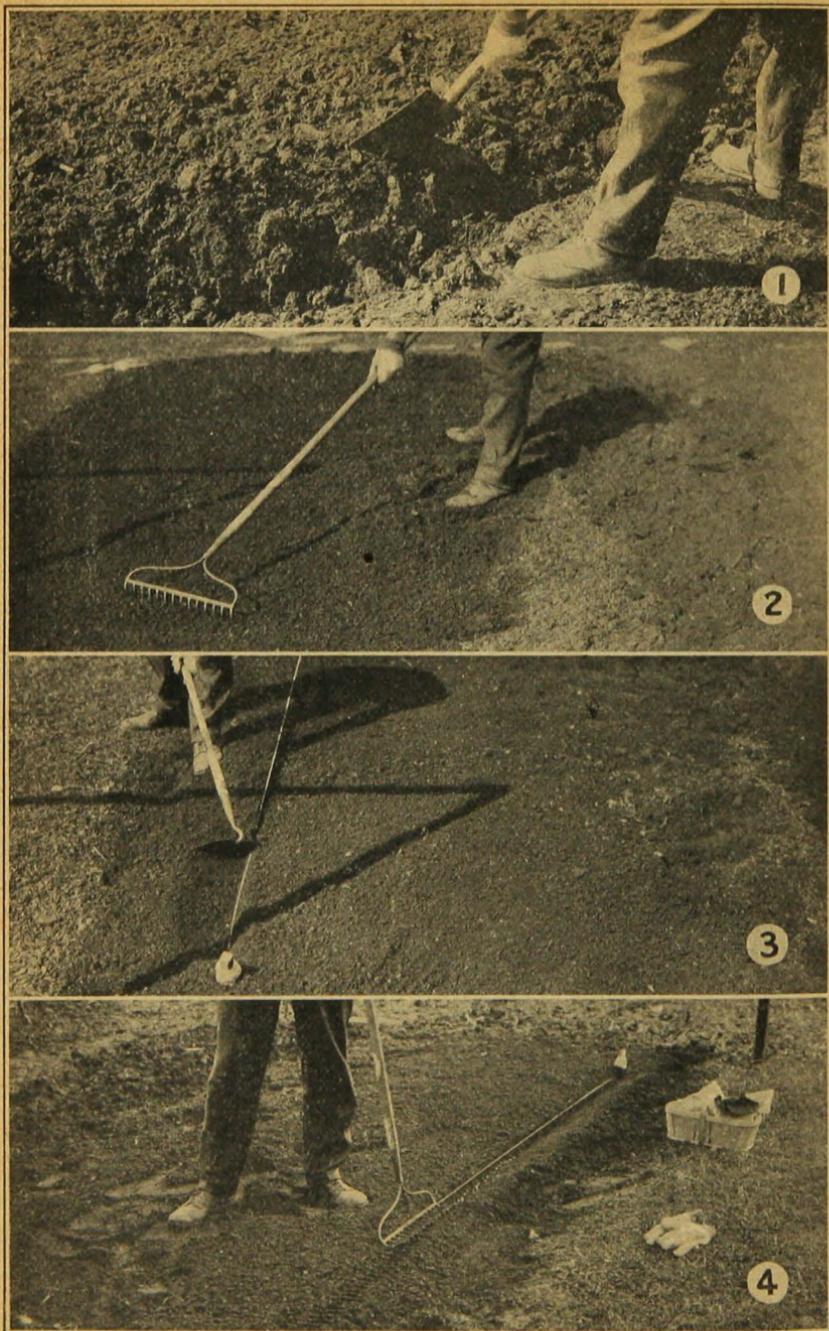
SIMPLE GARDEN TOOLS.

Spading Fork, Hoe, Spade, Rake, Trowel,
Garden Line, and Hand Weeding Hoe.

Only a few tools are needed in the home garden. A spade or spading fork is of first importance. The fork is easier to push into the soil than the spade, but is not so useful for other purposes. Push the spade down as far as it will go unless the soil is shallow and too much subsoil is likely to be brought to the surface. Do not lift the soil too high when turning the spadeful over. A strong rake is needed to smooth the surface, to break lumps, and to stir the soil between the rows. A 13 or 15-tooth rake is best for most purposes. A 6 or 6½-inch hoe is needed in keeping the surface loose. A strong line with two well-sharpened stakes is also needed to mark the rows when sowing seeds or setting plants. The stakes should be about 15 inches long with a long tapering point so that they can be pushed into the soil by hand. Wind the cord on the stakes when it is not in use. A trowel is needed when transplanting cabbage, tomato, and other plants. A small hand weeder is useful for working around plants. In many gardens a wheel hoe is necessary because so much more ground can be covered in the same time. There are many kinds of hand cultivators on the market. Some prefer those having a wheel

about 30 inches in diameter and fitted with a sweep, or weeder. The flat sweep scours easily, and if kept sharp is not hard to push along the sides of the rows. The sweep should not be allowed to rust. It is a good plan to keep it in the kitchen with the knives and forks.

Keep all tools sharp and free from rust. A dull, rusty spade or hoe makes garden work much harder and more disagreeable.



WORKING THE GARDEN SOIL.

1. Spading—The last stroke of the spade is used to break the lumps. In some soils it is easier to use a spading fork. 2. Raking the surface to make an even and fine seed bed. 3. Using the hoe in opening a furrow for small seeds. 4. Using the rake to cover and firm the soil over the seeds.

It Pays to Buy Seeds Early

Do not wait too long before getting the necessary seed. Unless good seed is used, the crop will not be a success even if the weather is favorable and proper care given in every case. Poor seed is dear at any price. Make every seed count. Do not buy too many seed or waste any.

Thoro Preparation of Seedbed Pays

It is hardly possible to spend too much time in preparing the seedbed, but it is not always necessary to use a team to plow a garden less than 50 by 100 feet in size. When the soil is spaded there are no dead furrows and no ends, sides, or corners left untouched. Use the garden rake to smooth the surface.

Seeding Should be Done with Care

Before any seed is sown the land should be harrowed or raked fine, and if necessary rolled or planked. It pays to make the seedbed fine, as this greatly lessens the subsequent labor. Seeds should always be sown in freshly stirred soil, giving them an even chance with the weeds. It is well to sow radish seed with some of the kinds which germinate more slowly. They will come up quickly and cultivation may begin even before the other plants are up. The depth at which seed may be sown varies with the size of the seed. Celery and other very fine seed should be just barely covered with light soil. Carrot, parsnip, and similar seeds may be planted from half an inch to an inch deep; coarser seeds, such as peas, beans, and corn, from two to four inches deep, depending on the soil. If the soil is heavy or moist, shallow planting is best; if dry, the seed must be put in deeper.

Seeds Should be in Drills or Hills

Planting in drills means that the seeds are dropped or plants set at irregular intervals in the row. Planting in hills means putting several seeds or plants together at regular intervals, not raising or mounding the soil. Sometimes an extra amount of manure is put several inches below the surface where cucumbers, melons, squashes, and similar crops are to be grown. A few inches of soil is put over the manure before the seeds are planted. In large gardens some crops are planted in hills so that the cultivator may be run both ways to save hand labor.

Plants Should be Started Early

Many of the tender vegetables, tomatoes, peppers, and similar ones, and others for early use, should be started in the kitchen or hotbed early in March. The soil should be brought inside in the fall. This soil need not be very rich but should be light and friable. If at all heavy it can be made light and friable by the addition of leaf mold (decayed leaves) and sand. Small boxes, called flats, are filled with soil and firmed by pressing the surface with the edge of a board. The top of the soil should be at least an inch below the top of the flat to permit thoro watering. When the soil is ready, trenches for the seeds are made by pressing the edge of a board down about a quarter of an inch. Celery or other very fine seeds may be scattered on the surface and a very thin layer of sand or light soil dusted over them. A piece of burlap or other coarse cloth laid over the surface before sprinkling will prevent the seeds washing out of place, or the box may be put in a pan of water.

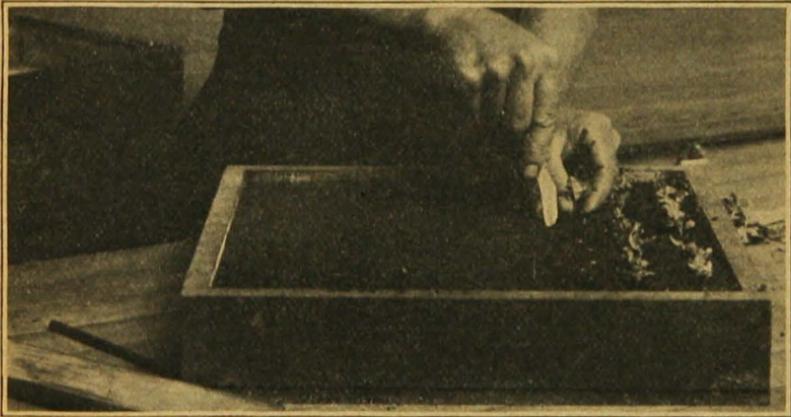
Seedlings must be transplanted before they grow tall and spindling. Transplanting checks their growth and helps develop a strong plant with a good root system. The little seedling should be lifted out of the ground by pushing a knife or dibber under the roots. Never pull the plants out because the roots are always injured by so doing.

Hotbed Lengthens the Season

A hotbed is an important factor in garden work. In it such early vegetables as lettuce and radishes may be grown and all kinds of tender plants started. Sometimes plants may be grown and sold to neighbors.

A hotbed consists of a frame of wood or concrete from 10 to 24 inches deep, covered with a glass sash. Extra heat is supplied by a layer of fermenting horse manure from one foot to three feet deep inside the frame. The simplest hotbed is made of boards or planks 10 or 12 inches wide put together to form a frame the size of the sash to be used. This frame is put over a layer of horse manure about two feet deep that has been piled on the surface of the ground. This is much easier than digging a pit for the manure, especially if the work is to be done when the ground is frozen. A concrete frame may be used if the hotbed can have a permanent location.

Regular hotbed sash are made with the lower end partly cut away and without cross bars, in order that the water may run off readily. These sash are glazed with panes 8 by 10 or 10 by 12 inches, laid like shingles on a roof, with the lower edge of each overlapping the upper edge of the one next below. Storm sash are often used, but as the panes are larger, the loss is greater when one is broken.



TRANSPLANTING YOUNG SEEDLINGS IN A FLAT. A SMALL DIBBER IS USED TO FIRM SOIL AROUND ROOTS.

Select a place for the hotbed that is sheltered as much as possible from the west and north winds. It should be near the house and the water supply. The south side of a barn or other building or a tight fence is usually a good place.

The hotbed should be started early in March. A pile of fresh horse manure two feet thick and somewhat larger than the frame to be used is spread on the surface of the ground. The frame is placed on the manure with the south side or end a little lower than the north. Manure is then packed around the sides of the frame to protect the bed from cold winds. The manure will give off too much heat at first, and it will be necessary to wait four or five days for the temperature to go down. The soil may be put on at any time. It should be from 4 to 6 inches deep. Thoroughly smooth the surface before sowing seeds or transplanting plants.

Often some of the seeds can be planted in the house and the small plants transferred to the hotbed as soon as it is ready. If this plan is followed, the hotbed need not be started so early.

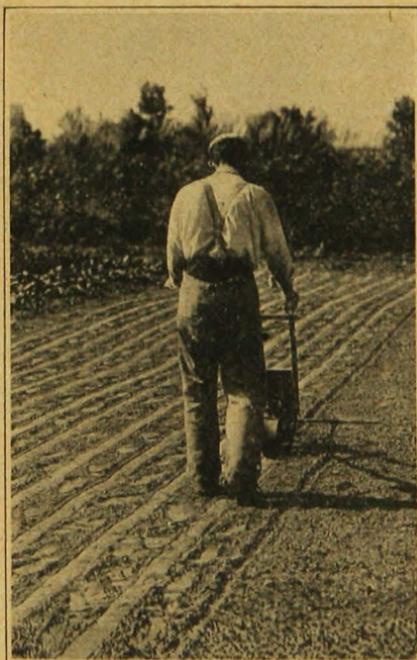
During the summer the hotbed may be used for cucumbers, celery, or some other crop. By planting a hill of cucumbers very early in the center of each sash and allowing the vines to occupy all the space when the early crops are removed, cucumbers for table use may be produced much earlier than from vines grown in the open field. Celery plants may be set late in June and allowed to remain in the bed until there is danger of severe freezing. During the early fall the plants may be covered with boards or other material. It is possible to make good use of a hotbed from March to December.

Cold Frame is Useful

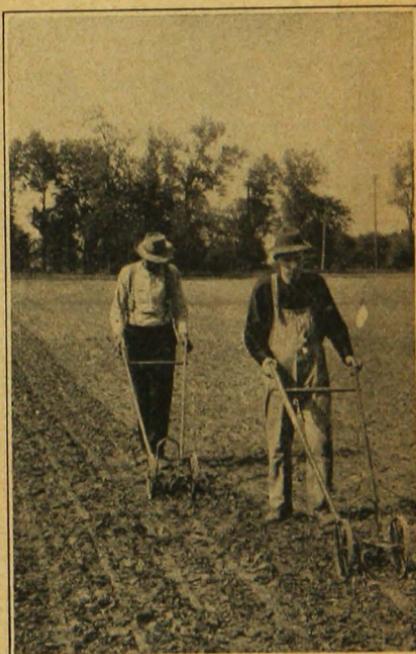
A cold frame is made in about the same way as a hotbed except that no manure is used to furnish artificial heat. Cold frames can not be started until very cold weather has passed, the first of April is probably early enough.

Plants Started Inside Must Be Hardened

If plants started inside are to be transplanted to the garden, it is necessary to harden them, or, in other words, to expose them to the open air gradually, in order to harden the tissues. About ten days before they are to be set out they should be put in the open air during the middle of the day, or the hotbed sash may be taken off a little while each day. Reducing the amount of water helps to check growth and makes the tissues firmer. Cabbage and cauliflower plants treated in this way will be able to withstand light frosts; and tender plants, as tomato, pepper, and egg plant, will be improved.



WORKING A SEED DRILL.



KILL THE WEEDS BEFORE YOU SEE THEM. HAND CULTIVATORS STIR THE SOIL QUICKLY.

Early and Frequent Cultivation Needed

The bugbear of cultivation seems to be responsible for most of the garden failures. This ought not to be so, for very little labor is needed to keep a garden in good condition and free from weeds if the work is done at the right time. The best time to kill a weed is before it appears above the surface of the ground. Stirring the soil with a rake or similar tool destroys thousands of weeds that are not seen.

Succession and Companion Crops Profitable

Nearly all parts of the garden can produce more than one crop during the season. Succession cropping means that one crop follows another in the same place. Companion cropping means that two or more crops are grown near together while small, and that as one matures, additional room is provided for the later crop. For instance, radish seed are sown with carrot seed. The radishes are soon out of the way and the carrots have all the room. Many combinations are possible and profitable. Keep a crop growing all the time.

How to Transplant Successfully



WELL ROOTED CELERY PLANTS READY FOR TRANSPLANTING IN THE FIELD.

Success in transplanting depends on several conditions; good healthy, stocky plants which have been well hardened off must be used, and the soil must be in good condition. Before the plants are moved the soil around them should be thoroughly soaked with water, and some of it should be taken up with the plant. It is also a good plan to cut back the tops of plants like cabbage and celery from a third to a half in order to prevent more evaporation taking place from the leaves than the roots can stand.

In setting out plants, see that the roots are put in fine, moist soil and well firmed, so that the small roots may find moisture quickly and be able at once to take hold of the soil.

Plants go into the field in much better condition from pots than from a seedbed. As pots are

expensive, berry boxes, tin cans with the ends melted off, or paper pots may be used.

Thinning is Often Necessary

In the home garden, seeds are sometimes planted thickly in order to be sure of a full stand. This method is not desirable, as the extra plants are, in effect, weeds and must be removed or the remaining plants will be weakened. A better way is to use only the best seeds and then space properly in the row. If the plants are too thick, thin as soon as they are large enough to handle. In many cases the thinnings can be used on the table.



OVERHEAD SYSTEM OF IRRIGATION IN OPERATION.

Plants Must Have Water

All plants must have a sufficient supply of moisture in the soil at all times. More water is needed for large ones, especially in dry weather. If water is applied, wet the soil thoroly to a depth of several inches. The following day when the surface is again dry, cultivate thoroly to form a dust mulch. This means that the surface is loose or dust-like, not hard or covered with a crust. It is usually best to apply water in the late afternoon or evening so it can soak in during the night. A good dust mulch prevents loss of moisture by evaporation.

CULTURAL DIRECTIONS

Asparagus

Asparagus is a perennial and one of the first vegetables to appear in the spring. The plant food used to produce the appetizing spears was stored by the plant in its roots the preceding summer and kept in cold storage all winter. It takes from three to four years to get a bed established, therefore it can be used only in permanent gardens. A bed should last for twenty years. It must have an abundant supply of manure or fertilizer every year.

Asparagus is propagated from seeds sown similar to beets but the rows should be two feet apart, in drills, and cultivated thoroly for one or two years.

A permanent bed is made by setting strong one or two-year old roots in trenches five or six inches deep. The plants are commonly set 14 to 18 inches apart in the row with the rows from $3\frac{1}{2}$ to 5 feet apart. The plants are covered three inches deep. During the summer the trench is filled gradually by the cultivator. After the second season the stalks may be cut up to the last of June. After the last cutting each year a heavy application of manure should be applied and the tops allowed to grow to manufacture food for storage in the roots for the following year.

Beans

All varieties of beans require a warm climate, a light soil, and full sunlight. Dwarf or string beans are the most important for the home garden. They should not be planted until about May 20, because late frosts are likely to kill them. Never cultivate beans or work among them when they are wet, because there is danger of spreading diseases. In large gardens the common pole and dwarf Lima beans may be grown successfully if they are given a warm and protected location.

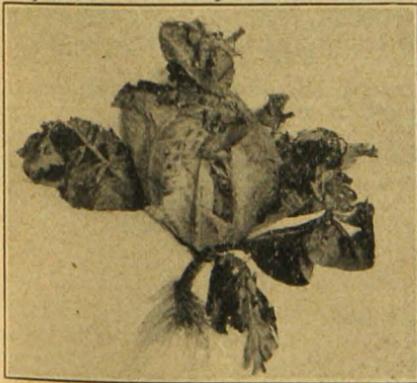
Cabbage

Cabbage is one of the important leaf crops and is very easily grown. Cabbage for early summer use is usually started in the house or hotbed and the plants are set out very early. Before the plants are set in the garden they should be hardened off. The seed of late varieties may be started in the garden or in a small seedbed and then transplanted.

Cabbage worms are very troublesome unless paris green or arsenate of lead is used before the worms get too large and numerous. When white butterflies are seen in the garden, it is time to begin to spray the plants.

Cauliflower

Cultural methods are about the same for cauliflower as for cabbage. The plants are somewhat more delicate and cannot stand so much dry or hot weather. The so-called head must be shaded from the sun by fastening the leaves together over it as soon as it forms in order to blanch it. Care should be taken not to tie the tops too closely because some ventilation is needed. Only firm white heads are desirable. Cabbage worms are troublesome and must be carefully looked after before the heads begin to form.



CAULIFLOWER PLANT WITH TOP TIED TO BLANCH.

Beets, Carrots, and Turnips

Beets, carrots, and turnips are important root crops and easily cultivated. They may be planted for early use as soon as the soil can be worked, in rows 14 to 18 inches apart. Beets and turnips should be thinned out when about 5 inches high, and the thinnings used for greens. Use the early crop during the summer and can the surplus. For winter use, a second lot of seed should be planted about the middle of June.

Celery

There are places in Minnesota where celery is grown to perfection. It is a special crop and requires much attention. Celery seeds are fine and somewhat difficult to start. It is usually best for those wanting only a few hundred plants to buy them. The soil should be made very rich by the application of a large amount of rotted manure or fertilizers rich in nitrogen. Early celery plants can be set out late in April or early in May, late varieties not until the last of June. Just before the plants mature, earth, paper, boards, or other material should be placed against the leaf stalks to keep them white. Lack of space prevents giving more specific directions.

Swiss Chard

Swiss chard belongs to the same family as the beet. It is planted in about the same way, but must be thinned to eight or ten inches apart. The leaves and leaf stalks are used as greens, or late in the summer the large leaf stalks can be used the same as asparagus. A few feet of row will furnish an abundant supply.

Cucumbers, Melons, Pumpkins, and Squashes

The culture of cucumbers, melons, pumpkins and squashes is very similar, altho the products are very different.

These crops require warm weather and a light soil, well enriched and well drained. They are easily injured by frosts, consequently must be planted late to escape the late spring frosts, and varieties must be selected that mature before time for early fall frosts.

The plants may be started in boxes or pots under glass and transplanted to the field when the soil is warm.

These crops may be planted near fences or trellises where they can be trained up. They must have full sunlight. From 6 to 12 seeds are planted in each hill, and when the plants appear they are thinned to from one to three plants to a hill. Sometimes some of the seeds are planted deeper than others so that if those planted near the surface are killed by frost the others will take their places.

There are two general classes of pumpkins, pie and stock. Many persons use well-matured field pumpkins for culinary purposes, altho pie pumpkins are considered superior.

Several classes of squashes are grown in Minnesota. The bush group consists of those varieties, Scallop and Crookneck and others, that are grown for use in summer and used before the rind hardens. Hubbard is the standard representative of the winter group. There are other good varieties, but those mentioned are standards. Practically all of the late varieties can be used before the rind hardens. Many prefer an immature Hubbard to any of the summer varieties.

Eggplant

The eggplant is closely related to the tomato. The methods of culture and of starting the plants are about the same. The seed is sown in flats or boxes under glass. Plants are transplanted, sometimes more than once, to avoid crowding and to make them more stocky. They are set in the open ground when the weather is warm and all danger of frost is past. Give eggplants the warmest spot that can be found, providing, of course, that the soil is well fertilized.

Kohl-Rabi

Kohl-rabi is sometimes called turnip-rooted cabbage, because it is closely related to cabbage. The culture is about the same. It should be used when less than 2 inches in diameter, or before the flesh becomes woody. For early use, plants may be started indoors.

Lettuce

Lettuce is a leaf or salad plant that is always in demand. It is of easiest culture and grows practically everywhere. There are two classes of lettuce, the loose-leaf and the head. The loose-leaf varieties are easily grown and can be grown when necessary in partial shade. Lettuce is a cool weather crop and therefore thrives best in the cool weather of spring and fall. The head varieties do not form good heads in hot weather.

For lettuce the soil must be moist, and well cultivated. In the home garden very little space is required to supply all needs. For very early use the seed is sown under glass or in the house and the plants are transplanted outside as soon as the land can be worked. Like cabbage, the plants must be hardened off before setting in the garden. Set the plants from 4 to 8 inches apart in rows 12 to 18 inches apart. At the same time sow some seeds in drills the same distance apart and one inch deep. This will prolong the season several weeks. Later sowings in July or August will provide a supply during the early fall.

Onions

Onion seed loses its vitality within two years; consequently the seed used should be fresh and should always be tested before sowing. The surface of the soil must be level, smooth, free from all rubbish, and in perfect condition for seeding. In a small garden the seeds are sown in drills about 1 inch deep and from 12 to 16 inches apart. In larger gardens a seed drill is used.

Thoro and constant shallow cultivation is needed from the time of seeding until the bulbs begin to form. The early stirring of the soil prevents a crust from forming and destroys the weeds before they appear above the surface. Early, close, and careful cultivation will save time in hand weeding. Hand weeding is the most expensive operation connected with onion growing. Unless the land is free from weeds it will be necessary to go over the patch two or more times.

In early September the tops of well-matured onions should be nearly flat on the ground.

The tops are then cut off and the onions thrown into shallow slatted crates, and in about ten days will be ready for storage.

Onion Sets

There are several types of onion sets. Some are grown from seed while others are produced in the place of seed in some plants, or by a division of the bulbs under ground. Seed or bottom sets are grown extensively in some places from seed sown very thickly. The sets should be not more than three quarters of an inch in diameter. Larger sets are likely to send up a seed stalk instead of developing a large bulb. Mature onions can be produced earlier by means of sets than from seed, because the sets can be planted earlier in the spring. Sets should be about 3 inches apart in the row, and the rows should be from 12 to 18 inches apart.

Parsnips

The culture of parsnips is practically the same as that for beets and carrots except that the drills should be farther apart—about 18 inches—and the soil rich and mellow.

Parsnip seed loses its vitality very quickly, therefore seed grown the preceding year should be used. Sow some radish seed to mark the row for early cultivation. Thin out the smallest plants to prevent crowding. Each plant should have at least two inches of space in the row.

Parsnips may be dug in the fall and stored the same as beets and carrots, or they may be left in the ground over winter.

Peas

Peas belong to the legume family, the same as beans, and like them they contain a large amount of protein. Peas, unlike beans, are not easily injured by frost; consequently they may be planted as soon as the ground can be worked. They grow best during the cool days of spring and early summer. In hot, dry weather the pods do not fill so well.

Peas are sown in drills. Furrows from 18 to 36 inches apart and from 2 to 4 inches deep—depending upon the season—are made, and the peas distributed evenly along the bottom of the furrow at the rate of from 8 to 12 seeds to the foot; which means from one to two pints to each 100 feet of drill. Early peas should not be planted so deep as later ones. It is a common practice to sow two rows, called double rows, near together rather than to have all the rows at equal distances.

Peppers

The culture of peppers is practically the same as that of tomatoes and eggplants. The seeds are started under glass, and plants are set in the garden after danger from frost has passed. The soil should be light and well enriched with rotted manure.

There are two classes, the very hot, pungent-fruited varieties like Long Red Cayenne and Red Chili, used for seasoning purposes; and mild, or sweet-fruited varieties like Bull Nose, Ruby King, and others, used for salads.

Pe-tsai (Chinese Cabbage)

Pe-tsai is one of the vegetables introduced from China about 30 years ago. It must be grown in early spring or late fall when the weather is cool. In this respect it is similar to head lettuce. It may be used as greens, or as head lettuce.

The seed may be sown in a hotbed and the plants set in the garden as soon as the ground is ready. It is not injured by a light freeze. For fall use, seed may be sown in August. In some places it is grown in hotbeds and greenhouses. When the heads are large they may be stored in a cool cellar for winter use.

Potatoes

A large garden should include potatoes. Unlike most of the garden crops, the seed used is the tuber, or the part used for food. Tubers of medium size are cut into from three to five pieces and each piece must have at least one good eye. Early varieties can be planted as soon as the soil is ready. Plant one piece in a place about three inches deep. Keep well cultivated.

Radishes

Radishes are easily grown and may be planted almost anywhere and at any time during the growing season. When grown in large quantities, the seed is sown in drills, about an inch deep. In home gardens all the early radishes needed can be grown in the same row with beets, carrots, parsnips, and similar crops. Early radishes mature in from three to six weeks. Several plantings are necessary to keep up the supply.

Rhubarb

Rhubarb is so easily grown that it is often planted in a corner and neglected. The same plants, if given an open space, plenty of manure, and some cultivation will produce large crisp leaf stems. A half dozen hills properly cared for are often worth more than three times that many grown in fence corners. When left in the same place too long, the roots do not produce so well as when taken up, divided, and reset in a good place. It takes a small root about three years to become established so that it can maintain itself and supply stalks for the use of the grower.

Fresh rhubarb for winter use may be had by growing it in a warm cellar. Strong roots are dug in the fall and allowed to freeze. A few weeks before rhubarb is wanted these roots are set in the bottom of a barrel or box and some earth or damp straw packed about them, then put in a warm dark place. The stalks will not be so large as those grown in the open, but they will be of high quality.

Sweet Corn

Sweet corn is one of the standard vegetables for summer use, canning, and drying. Care is necessary in selecting good seed of strains adapted to the needs of the family.

The question of varieties has been largely solved by the extended use of Golden Bantam. This variety is fairly early and of good quality and consequently has become the chief variety for the home garden.

Soil for corn should be fine and well enriched. For early corn the lighter soils are preferable. Corn can not stand frost, so it is necessary to delay planting until the soil is warm and danger of frosts practically over. Some home gardeners plant a few hills early, and in about ten days plant another lot of seed a few inches from the first hills, and a little later another lot. If the first planting is lost, possibly the second will survive; if not the third planting will be ready to grow. In order to have roasting ears for a long season several plantings should be made at intervals of about two weeks up to July 1.

Corn may be canned successfully by the cold pack process. Plenty of good canned corn for winter use will help to solve the problem of having a variety of food for the table.

Tomatoes

The tomato is a genuine American plant. Perhaps this is the reason it is grown so extensively and considered so important. In the boys' and girls' canning club work, the tomato is one of the first vegetables to be used. It is one of the warm-weather crops, consequently can not be exposed to freezing conditions.

The common method of growing tomatoes in the field is to let the vines spread over the ground. Another way, and a better one for the small garden, is to train the plants on stakes or trellises. One of the best supports is a stake 6 feet long and about 2 inches in diameter. These stakes are driven into the ground beside the plants. Only one or two branches of each plant are allowed to grow and they are tied to the stake with strong cord or raffia. The cord should be first tied to the stake with a clove hitch, then looped about the plant and tied in a square knot. This plan of training the vines takes more time than allowing them to spread out on the ground, but there is much less loss from rots of various kinds, and ripe tomatoes may be had a little earlier.

Early fall frosts often cause the loss of many tomatoes. It pays to protect some of the best plants from the first frosts by covering with papers or cloth, as it often happens that several weeks of good tomato-growing weather follow the first cold snap. Before hard freezing weather is expected, the plants may be pulled and hung in the cellar or some other safe place and in this way the tomato season may be extended several weeks.

GOOD VARIETIES GIVE BEST RESULTS

Special attention should be given to the kinds and varieties of vegetables grown. Novelties occasionally become standards, but it is not wise to try them unless one has ample time and space available. The following varieties are recommended for Minnesota. In the colder parts of the state it may not be possible to grow some of the vine crops such as melons, squash, and tomatoes. In such regions the root and leaf crops should be depended upon almost exclusively.

- Asparagus—Washington, Palmetto, Reading Giant.
- Bush Beans, Wax—Wardwell, Pencil Pod, Golden Wax.
- Bush Beans, Green—Bountiful, Refugee, Stringless Green Pod.
- Pole Beans, Green—Kentucky Wonder.
- Pole Beans, Shell—Horticultural.
- Lima Beans—Dwarf preferred, except in favored locations.
- Beets—Detroit, Eclipse, Egyptian.
- Cabbage, Early—Wakefield, Copenhagen.
- Cabbage, Late—All Seasons, Danish Ball or Holland.
- Carrots—Chantenay, Danvers Half Long.
- Cauliflower—Erfurt, Snowball.
- Celery, Early—Golden, White Plume.
- Celery, Late—Winter Queen, Giant Pascal.
- Celeriac—Erfurt.
- Corn, Sweet—Golden Bantam, Crosby, Stowells Evergreen.
- Cucumbers—Boston and Chicago Pickling, White Spine.
- Eggplant—New York Spineless, Black Beauty.
- Endive—White and Green Curled.
- Horse Radish.
- Kale—Dwarf and Tall Curled Scotch.
- Kohl-Rabi—Vienna.
- Lettuce, Leaf—Grand Rapids, Black Seeded Simpson, Iceberg.
- Lettuce, Head—Big Boston, Hanson.
- Muskmelon—Gem, Osage, Irondequoit, American Beauty.
- Onion—Red, Yellow and White Globe.
- Onion Sets—Any color or kind.
- Parsnip—Hollow Crown, Guernsey.
- Parsley—Moss Curled.
- Peas, Early—Alaska, Thomas Laxton, Marvel (Dwarf), Suttons Excelsior.
- Peas, Late—Telephone, Champion of England, Senator, Profusion.
- Peppers—Bell, Ruby, King, Cayenne.
- Potatoes—Early Ohio, Irish Cobbler, Triumph, Burbank, Russet, Green Mountain, Rural New-Yorker.
- Pumpkins—Long or Round Pie.
- Radish—Scarlet Globe, Icicle.
- Radish, Winter—Half-Long and Round Black Spanish.
- Rhubarb—Victoria, Linnaeus.
- Rutabaga—Purple Top, Yellow Swede.
- Salsify—Sandwich Island.
- Spinach—Long Standing, Bloomsdale.
- Squash, Summer—Scallop, Crookneck.
- Squash, Winter—Hubbard, Delicious, Table Queen.
- Swiss Chard—Lucullus.
- Tomatoes, Early—Earliana, Bonny Best, Chalks Early Jewell.
- Tomatoes, Late—Stone, Golden Queen (Yellow).
- Turnips—Purple Top, Egg.
- Watermelons—Kleckley Sweet, Dark Icing.

GARDEN PLANTING TABLE FOR MINNESOTA

| | Length of Row in Feet for Average Family of Four | Seeds or Plants Required for 100 Feet of Row | Distance for Plants to Stand | | | Depth to Plant | Time to Plant Seeds or Plants | | Ready for Use After Planting | |
|-------------------|--|--|------------------------------|------------------|----------------------|----------------|-------------------------------|-----------------|------------------------------|-----------------|
| | | | Rows Apart | | Plants Apart in Rows | | Hotbed | Open Ground | | |
| | | | Horse Cultivation | Hand Cultivation | | | | | | |
| Asparagus, plants | 100 | 60 to 80 | 3 to 5 ft. | 2 to 3 ft. | 18 to 24 in. | 5 to 7 in. | ..... | Early Spring | 2 to 3 years | |
| Beans, bush | 100 | 1 pint | 30 to 36 in. | 18 to 24 in. | 5 or 8 to 7 ft. | 1/2 to 2 in. | ..... | April to July | 40 to 65 days | |
| Beans, pole | 50 | 1/2 pint | 3 to 4 ft. | 3 to 4 ft. | 3 to 4 ft. | 1 to 2 in. | ..... | May and June | 50 to 80 days | |
| Beets | 75 | 2 ounces | 24 to 36 in. | 12 to 18 in. | 5 or 6 to 7 ft. | 1 to 2 in. | ..... | April to August | 60 to 80 days | |
| Brussels Sprouts | 50 | 1/4 ounce | 30 to 36 in. | 24 to 30 in. | 16 to 24 in. | 1/2 in. | ..... | March | 90 to 120 days | |
| Cabbage, early | 25 | 1/4 ounce | 30 to 36 in. | 24 to 30 in. | 12 to 18 in. | 1/2 in. | ..... | March | 90 to 130 days | |
| Cabbage, late | 50 | 1/4 ounce | 30 to 40 in. | 24 to 36 in. | 16 to 24 in. | 1/2 in. | ..... | Seed Bed May | 90 to 130 days | |
| Carrot | 100 | 1 ounce | 24 to 30 in. | 16 to 24 in. | 2 in. | 1/2 in. | ..... | ..... | April to June | 60 to 90 days |
| Cauliflower | 40 | 1/4 ounce | 30 to 36 in. | 24 to 30 in. | 16 to 20 in. | 1/2 in. | ..... | March | April to June | 100 to 130 days |
| Celery | 30 | 1/4 ounce | 30 to 36 in. | 18 to 24 in. | 3 to 4 in. | 1/2 in. | ..... | March | May and June | 100 to 150 days |
| Celery | 100 | 1/4 ounce | 3 to 6 ft. | 18 to 36 in. | 4 to 8 in. | 1/2 in. | ..... | Mar. or April | May and June | 120 to 150 days |
| Corn, sweet | 400 | 1/4 pint | 36 to 42 in. | 24 to 30 in. | 24 to 36 in. | 1 to 2 in. | ..... | ..... | May to July | 60 to 100 days |
| Cucumber | 40 | 1/2 ounce | 4 to 6 ft. | 4 to 6 ft. | 4 to 6 ft. | 1 to 2 in. | ..... | April | May and June | 60 to 80 days |
| Eggplant | 20 | 1/2 ounce | 30 to 36 in. | 24 to 30 in. | 18 to 24 in. | 1/2 in. | ..... | March | June | 100 to 140 days |
| Endive | 20 | 1 ounce | 30 in. | 18 in. | 8 to 12 in. | 3/4 in. | ..... | ..... | April and July | 90 to 120 days |
| Horse-radish | 20 | 70 roots | 36 in. | 24 to 30 in. | 15 to 20 in. | 3 to 4 in. | ..... | ..... | Early Spring | 1 to 2 years |
| Kale | 15 | 1/4 ounce | 30 to 36 in. | 18 to 24 in. | 18 to 24 in. | 1/2 in. | ..... | ..... | July and August | 90 to 120 days |
| Kohl-rabi | 25 | 1/4 ounce | 30 to 36 in. | 18 to 24 in. | 4 to 8 in. | 1/2 in. | ..... | ..... | April and May | 60 to 80 days |
| Leek | 25 | 1/2 ounce | 30 to 36 in. | 14 to 20 in. | 4 to 8 in. | 1 in. | ..... | ..... | April and May | 120 to 180 days |
| Lettuce | 35 | 1/2 ounce | 30 in. | 12 to 18 in. | 4 to 6 in. | 1/2 in. | ..... | March | April to September | 30 to 90 days |
| Muskmelon | 100 | 1/2 ounce | 6 to 8 ft. | 6 to 8 ft. | 5 to 6 ft. | 1 to 2 in. | ..... | ..... | May and June | 120 to 150 days |
| Okra, or Gumbo | 25 | 2 ounces | 4 to 5 ft. | 3 to 4 ft. | 24 to 30 in. | 1 to 2 in. | ..... | March | May and June | 90 to 140 days |
| Onion, seed | 100 | 1 ounce | 24 to 30 in. | 12 to 18 in. | 2 to 3 in. | 3/4 in. | ..... | March | April | 130 to 150 days |
| Onion, sets | 40 | 1 quart | 24 to 36 in. | 12 to 18 in. | 2 to 3 in. | 2 to 3 in. | ..... | ..... | Autumn and Spring | 60 to 120 days |
| Parsley | 5 | 1/4 ounce | 24 to 30 in. | 12 to 18 in. | 4 to 6 in. | 1/4 in. | ..... | March | Early Spring | 90 to 120 days |
| Parsnip | 50 | 1/2 ounce | 30 to 36 in. | 18 to 24 in. | 2 to 3 in. | 3/4 in. | ..... | ..... | April and May | 125 to 160 days |
| Peas | 300 | 1 to 2 pints | 30 to 36 in. | 30 to 36 in. | 1 in. | 2 to 3 in. | ..... | ..... | March to June | 40 to 80 days |
| Pepper | 15 | 1/2 ounce | 30 to 36 in. | 18 to 24 in. | 15 to 20 in. | 1/2 in. | ..... | March | May and June | 100 to 140 days |
| Potato | ..... | 5 pounds | 30 to 36 in. | 24 to 36 in. | 16 to 24 in. | 4 in. | ..... | ..... | April to June | 90 to 150 days |
| Pumpkin | 40 | 1 ounce | 8 to 12 ft. | 8 to 12 ft. | 8 to 12 ft. | 1 to 2 in. | ..... | ..... | May and June | 100 to 140 days |
| Radish | 25 | 1 ounce | 24 to 36 in. | 10 to 16 in. | 1 to 2 in. | 1/2 to 1 in. | ..... | March | March to September | 20 to 40 days |
| Rhubarb, plants | 40 | 33 roots | 3 to 5 ft. | 3 to 5 ft. | 3 ft. | 2 to 3 in. | ..... | ..... | Autumn or Early Spring | 1 to 3 years |
| Rutabaga | 40 | 1/4 ounce | 30 to 36 in. | 18 to 24 in. | 6 to 8 in. | 1/2 to 1 in. | ..... | ..... | June | 60 to 80 days |
| Salsify | 25 | 1 ounce | 30 to 36 in. | 18 to 24 in. | 2 to 3 in. | 3/4 in. | ..... | ..... | Early Spring | 120 to 180 days |
| Salsify | 40 | 1 ounce | 30 to 36 in. | 10 to 16 in. | 1 to 2 in. | 1/2 in. | ..... | ..... | April and September | 30 to 60 days |
| Spinach | 150 | 1 ounce | 30 to 36 in. | 10 to 16 in. | 1 to 2 in. | 1 in. | ..... | ..... | ..... | ..... |
| Squash, bush | 10 | 1/2 ounce | 3 to 4 ft. | 3 to 4 ft. | 2 to 4 ft. | 1 to 2 in. | ..... | March | May and June | 60 to 80 days |
| Squash, late | 50 | 1/2 ounce | 7 to 10 ft. | 7 to 10 ft. | 7 to 9 ft. | 1 to 2 in. | ..... | ..... | May and June | 120 to 160 days |
| Swiss Chard | 20 | 2 ounces | 24 to 36 in. | 18 to 24 in. | 3 to 6 in. | 1 in. | ..... | ..... | April and May | 60 to 120 days |
| Tomato | 75 | 1/2 ounce | 3 to 5 ft. | 3 to 4 ft. | 3 ft. | 1/2 to 1 in. | ..... | March | June | 100 to 140 days |
| Turnip | 75 | 1/2 ounce | 24 to 30 in. | 18 to 24 in. | 1 in. | 1/2 in. | ..... | ..... | April and July | 60 to 80 days |
| Watermelon | 100 | 1 ounce | 8 to 12 ft. | 8 to 12 ft. | 8 to 10 ft. | 2 in. | ..... | ..... | May and June | 100 to 120 days |

Several plantings of many of these vegetables may be made to maintain the supply. For example there may be 2 of bush beans and beets, from 3 to 5 of corn, and so on.

SPRAYING CALENDAR FOR SMALL FRUIT AND VEGETABLE PESTS

| PLANT | PEST | SPRAY | FIRST SPRAYING | SECOND SPRAYING | REMARKS |
|--------------------------------|---|---|---|-----------------------------|---|
| Cabbage Cauliflower | Cabbage worm | Arsenate of lead (3-50) or paris green (1-50) Dust with the powdered form or with wood ashes | When worms appear | Repeat when necessary | The poison will stick better to the leaf if used in soapy water. With cauliflower, great care must be taken if the plant is heading. |
| Celery | Early blight Late blight | Bordeaux mixture (5-5-50) | In seed bed | Repeat when necessary | Destroy diseased parts. If severe, dip plants in bordeaux. |
| Cucumber | Downy mildew Cucumber beetle | Bordeaux mixture (5-5-50) Arsenate of calcium one part, land plaster 20, dusted every 12 days from time plants are up | When vines begin to run Dust as soon as in- sects appear | Repeat when necessary | The adult insects do not seriously injure cucumbers in cold frames, nor do larvae under field conditions. |
| | Larvae or grubs | Tobacco extract on roots | | | |
| Currant | Currant worm Leaf spot | Arsenate of lead or hellebore Bordeaux mixture | When insects appear As leaf buds break | Repeat when necessary | When berries begin to turn, use hellebore. |
| Gooseberry | Currant worm Mildew | Arsenate of lead or hellebore Potassium sulfide (liver of sulfur) | When insects appear As leaf buds break | Repeat when necessary | Same as for currant. When mildew is abundant, spray every ten or twelve days. |
| Muskmelon | Anthracoese Leaf blight | Bordeaux mixture (5-5-50) | When vines begin to run | Every 10 days to 2 weeks | |
| Potato | Blight— Early and late Beetle | Bordeaux mixture (5-5-50) Paris green (1-50) or ar- senate of lead (3-50) | When plants are eight inches high As soon as beetle eggs hatch | Repeat when necessary | Vines should be well covered with bordeaux mixture throughout the season. This usually involves spray- ing every ten days or two weeks. Three sprayings with bordeaux even in years without late blight, will pay a profit. |
| Raspberry and Blackberry | Anthracoese Gray bark disease (Spur blight) Fruit worm | Resin-bordeaux mixture Arsenate of lead | Before leaves open When young sprouts are 3 inches high | | Cut out and burn diseased canes; keep old canes cut out. Protect with bordeaux mixture until canes are at least two-thirds grown. Cultivate close up to plants soon after berries are picked. |
| Strawberry | Leaf blight | Bordeaux mixture (4-4-50) | Before blossoms open | After fruit is picked | Cut off and destroy diseased leaves in fall or spring. |
| Tomato | Tomato worms Leaf mold Leaf spot Black rot | Arsenate of lead (3-50) Bordeaux mixture (5-5-50) | When worms appear Just after the fruit sets | Repeat when necessary | Vines should be well covered with bordeaux mixture throughout the season. Provide good ventilation. |

Wherever arsenate of lead is mentioned, the paste form is meant. If the powder is used, take one half the amount.

In almost every case, an insecticide can be combined with a fungicide, and it pays to make the combination when possible.
Never spray when trees are in full bloom.