

Home Vegetable Garden

Circular No. 196



COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS

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Table of Contents

	Page
Introduction	3
Early Garden	3
Summer Garden	3
Fall Garden	4
Approximate Time Required to Raise Vegetables.....	7
Flats	8
Cold Frames and Hot Beds	9
Vegetable Cultural Directions.....	9-40
Table of Arrangement of Vegetables in a Garden for a Family of Five.....	20-21
Table Comments	19

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HOME VEGETABLE GARDEN

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A good garden is the cheapest and quickest way of supplying the vegetables needed on the farmer's table. By a good garden is meant one which will furnish the following:

1. A supply of a variety of fresh vegetables from early spring until killing frost in the fall.
2. A supply of certain vegetables for storage in a fresh state for winter.
3. A surplus for canning, freezing, drying, etc.

From the above it is seen that a good garden would include a spring, summer, and fall garden. The summer and fall gardens are dependent on the spring garden, and the fall garden is especially dependent on the summer garden.

EARLY GARDEN

The factors which should be considered in raising an early garden are:

1. The use of good seed.
2. The planting of cabbage, cauliflower, lettuce, and onion seed in the cold frame in October or the securing of the so-called frost proof plants of the above vegetables in early spring.
(Write for Circular 212, which gives details for raising these plants.)
3. Selection of an early soil, preferably with a gentle southern slope.
4. Fall manuring and plowing. Early plowing frequently permits early seeding.
5. The use of a hotbed.
6. The planting of early varieties.

SUMMER GARDEN

The success of a summer garden depends upon: (1) Cultivation and care. (2) Proper selection and arrangement of vegetables in the spring garden.

CULTIVATION.—It is a recognized fact that moisture is the crop limiting factor in Oklahoma and the only summer sources of moisture are rain and irrigation. (Write for Circular on Concrete Tile Sub-irrigation System.)

The average gardener too frequently considers cultivation only as a means of destroying grass and weeds. The main functions of cultivation are to conserve moisture and to keep down the grass and weeds. A soil mulch should be maintained on all ground in the garden not actually occupied by plants throughout the entire growing season.

Too frequently when the harvest season begins, the cultivation of the garden ceases. This is a serious mistake. Results cannot be obtained from growing vegetables where there is competition between them and grass and weeds for moisture and food material.

A wheel hoe is very handy and efficient in a small garden. One of the five-tooth cultivators of a standard make will be found highly desirable. The single horse double shovel, frequently found on Oklahoma farms, is not a satisfactory garden implement. It goes too deep and does not cover enough surface. If a considerable area of onions or similar crops demanding a large amount of hand weeding and thinning is to be planted, it will be almost necessary to secure a hand wheel drill and cultivator.

PROPER SELECTION AND ARRANGEMENT.—The proper selection and arrangement of vegetables in the spring garden is fully explained in the "Table of Arrangement of Vegetables in a garden for a family of five."

FALL GARDEN

The long-lived drought or semi-drought resistant vegetables, planted in the spring garden and cared for during the summer, will go a long way toward making a good fall garden.

Where successive crops are not planted during the late spring or summer, clean off the ground and keep it cultivated just the same as if crops were growing, thus conserving the moisture and keeping the ground clean. Too frequently the gardener is not prepared for the late summer rains. Where cultivation as suggested above is kept up, sufficient moisture, as a rule, will be available for planting and growing additional vegetables in the late summer and fall.

In late spring, it is advisable to plant seed deeper and thicker than in spring plantings.

In planning your late summer or fall plantings, it will be well to take into consideration the period of time required to

grow the different vegetables in order to reap a benefit from them. Note carefully the table showing "Approximate Time Required to Raise Vegetables." The vegetables which are marked tender will not stand frost and should be planted early so they can be harvested before killing frosts. The semi-hardy vegetables will frequently grow after frost, even as late as November.

PRESSING SOIL AROUND SEED.—After the seed drill is opened and the seed planted, press the seed in the soil by walking on them or running a wheel such as that on a garden plow, over them. Cover the seed as usual, leaving the soil loose on top, to act as mulch and conserve moisture. The firming or pressing will bring the moist soil in more direct contact with the seed. The required amount of moisture necessary for germination will be absorbed quicker and more prompt germination of the seed will be secured.

SOAKING SEED.—In the late plantings, it is a good practice to soak the seed in warm water over night. The following day, drain the water off, and roll the seed in dry sand or soil which will absorb the excessive moisture; otherwise, it will be difficult to separate the seed in planting. Do not plant soaked seed in dry soil.

LOCATION AND SIZE

Locate the garden where it will be convenient to the house. If there is any choice of soil or slope, the lighter, sandier soils and southern slopes will be found preferable. The land should, of course, be well drained, and if good natural drainage does not exist, some artificial drainage should be provided, as by plowing the ground in the fall in narrow lands. Run the lands across the slope with sufficient fall for drainage. Be careful not to have the garden too large. A comparatively small area, well cared for, will produce more and better vegetables than will the larger area with the care it usually receives. The shape of the garden should be oblong rather than square on account of the greater ease of plowing and cultivating.

MANURING

There are a number of advantages of adding barnyard manure to the garden. Manure adds food material and humus, increases the capacity of the soil to catch and retain moisture, helps prevent the baking or running together of the soil particles, and finally makes the soil much easier to work.

Barnyard manure may, with benefit, be applied to a home garden in almost unlimited quantities. On the lighter soils, and particularly in the drier parts of the state, care must be taken that the manure is well rotted before seeding time in the

spring. This is sometimes difficult to accomplish if the winter is dry. On the clay soils in the more humid portions of the state, coarse, strawy manure will give most excellent results and there is not much likelihood of its being applied in too great quantities. Apply the manure broadcast, and where practical, disk in before plowing. Disking will pulverize the manure and insure an even mixture of the soil and manure.

COMMERCIAL FERTILIZERS

The first essential in fertilizing the garden is the application of organic matter to the soil. The principle methods for applying organic matter are the addition of barnyard manure, decayed or decaying vegetation, and growing and turning under green crops, preferably legumes such as cowpeas.

Commercial fertilizers will give larger net returns where applied to soils containing organic matter.

For the average garden a complete fertilizer will be the most satisfactory. A complete fertilizer is one containing nitrogen, phosphorus and potash, such as a 5-10-5 which contains 5% nitrogen, 10% phosphorus and 5% potash. This fertilizer is a very satisfactory general garden fertilizer. An application of about 3 to 4 pounds per 100 foot row is a good general application.

The fertilizer may be applied in the drill row and well mixed prior to the planting of seed or setting plants. In case of hill crops the fertilizer should be mixed in a hill ten to twelve inches in diameter and several inches deep.

FALL PLOWING

The importance of fall or early winter plowing of the garden where the soil does not blow cannot be over-estimated. Fall plowing, which should be eight to ten inches deep, will turn the manure or trash on the ground under and cause it to rot. Manure, when left on top of the soil during the winter, will lose a large portion of its value. Fall plowing is a means of destroying many insects, especially cut worms. When the ground is plowed and left rough during the winter, it will catch and retain more moisture and will be in a better physical and chemical condition for seeding and plant growth the following spring. Work, as a rule, is not so rushing at this season of the year. One of the most important reasons for fall plowing is that it may be a means of earlier spring planting. Plowing and planting on the same day in the spring often does not work out satisfactorily.

A rain just before the average beginning date of spring gardening will frequently cause a delay of a week or two.

Where the ground is plowed in the fall, often a spring harrowing is all that is necessary for the early spring plantings. Do not overlook the fall manuring and plowing of your garden. If the soil blows, list the ground in the opposite direction from the prevailing wind.

GOOD SEED

Good seed is the cheapest in the long run. Where you have a good strain of a variety of vegetables, save your own seed where practicable.

Seed, in order to be satisfactory, must be free from foreign seed or trash, true to the variety, up to standard and capable of germination. Seed may be readily tested as to its germinating power, either in damp sand or between moist blotters placed between two dinner plates. This should be done in the kitchen or some other place that is reasonably warm. While this is a common practice among commercial growers, it hardly pays for small plantings. For the farm garden it is usually best to buy seed from some reliable nearby seed house, and then rely on the integrity of this house for the quality of the seeds.

One of the essentials to successful planting is to press the soil firmly around the seed. One of the common methods of market gardeners is to step on the hill or row after the seed is planted and then cover the footprints with a little soil to prevent a crust being formed. Where seed are planted with a drill or press wheel attachment this firming will be unnecessary.

APPROXIMATE TIME REQUIRED TO RAISE VEGETABLES

Kind of Vegetables	Ready for Table
Asparagus, from seed (hardy)	3 to 4 years
Asparagus, from plants (hardy)	1 to 3 years
Beans, bush (tender)	45 to 60 days
Beans, pole (tender)	60 to 80 days
Beets (semi-hardy)	60 to 80 days
Broccoli	110 to 120 days
Cabbage, early (semi-hardy)	90 to 110 days
Carrots (semi-hardy)	75 to 100 days
Cauliflower (semi-hardy)	100 to 130 days
Celery (semi-hardy)	120 to 150 days
Collards (semi-hardy)	100 to 120 days
Corn, sweet (semi-hardy)	60 to 100 days
Cucumber (tender)	60 to 80 days
Egg Plant (tender)	100 to 140 days
Endive (semi-hardy)	90 to 180 days
Horse-radish (hardy)	1 to 2 years

Kind of Vegetables	Ready for Table
Kohl-rabi (semi-hardy) -----	60 to 80 days
Lettuce (semi-hardy) -----	60 to 90 days
Muskmelon (tender) -----	120 to 150 days
Watermelon (tender) -----	100 to 120 days
Mustard (semi-hardy) -----	30 to 60 days
Okra or Gumbo (tender) -----	90 to 140 days
Onion, from seed (semi-hardy) -----	130 to 150 days
Onion, from sets (semi-hardy) -----	40 to 120 days
Parsley (semi-hardy) -----	90 to 120 days
Parsnips (semi-hardy) -----	125 to 160 days
Peas (semi-hardy) -----	40 to 80 days
Pepper (tender) -----	100 to 140 days
Potatoes, Irish (semi-hardy) -----	75 to 100 days
Potatoes, sweet (tender) -----	120 to 150 days
Pumpkin (tender) -----	100 to 140 days
Radish (semi-hardy) -----	20 to 40 days
Rhubarb, from plants (hardy) -----	1 to 2 years
Rutabaga (semi-hardy) -----	60 to 80 days
Salsify (semi-hardy) -----	120 to 180 days
Spinach (semi-hardy) -----	30 to 60 days
Squash, bush (tender) -----	60 to 80 days
Swiss Chard (semi-hardy) -----	45 to 60 days
Squash, late (tender) -----	60 to 80 days
Tomato (tender) -----	100 to 140 days
Turnip (semi-hardy) -----	60 to 80 days

FLATS

In the case of many plants, seeds are ordinarily planted inside and later transplanted to the open ground. For planting indoors there is nothing more serviceable than a "flat," which is a box about three inches deep, 15 to 16 inches wide, and about 22 inches long. Any box may be used, but one of approximately these dimensions has been found to be the most convenient. Leave cracks or bore a few holes in the bottom of the box, so that any surplus water will drain out. Place one-half inch of gravel or cinders in the bottom of the flat, and then fill it with good garden loam soil, well pulverized, pressing it in firmly, particularly around the sides and in the corners. Level and firm the soil. After planting, water, and place in a light warm place. When the plants appear, turn the box from day to day to prevent the plants from drawing toward the light.

A good sprinkler may be made by punching holes in the bottom of a can or small bucket. Punch the holes from the inside, so the small funnels will be in their normal positions

rather than inverted. An ice pick is a convenient tool with which to bore the holes.

On warm days the flat may be placed on a frame built just outside of a south window, so that the plants will have a chance to gradually become accustomed to outside conditions.

It is desirable to have the soil in the box moist. Do not expose the plants any more than is necessary in removing to the cold frame or garden. Have the ground prepared in advance, and transplant as rapidly as possible. Unless the plants are very stocky they should be set somewhat deeper than they stood in the flat.

Seeds should be planted in flats about eight weeks before the time when it is desired to remove them to the open ground.

Seedlings should be transplanted from the seed flat to a cold frame or another flat in three or four weeks and thence to the garden in about five weeks.

COLD FRAMES AND HOTBEDS

For gardening on a large scale the cold frame and the hotbed are necessary, but not for the ordinary home garden. Plants for a whole neighborhood may be grown in one hotbed. The essential difference between a cold frame and a hotbed is that the cold frame does not have bottom heat. The bottom heat is usually furnished by 15 to 20 inches of fermenting manure in a pit, beneath four to six inches of surface soil.

Tile, stove pipe, dirt flues, etc., are frequently used for conduction of heat from a fire box or stove. Steam or hot water heaters are also used.

Write for Oklahoma Extension Circular No. 211, Hotbeds and Cold Frames.

ARRANGEMENT OF VEGETABLES IN A GARDEN FOR A FAMILY OF FIVE

See pages 20 and 21 of this circular for Table of Arrangement of Vegetables in a Garden for a Family of Five with accompanying comments.

VEGETABLE CULTURE DIRECTIONS

ASPARAGUS

Too little attention is paid to permanent plants in the average farm garden. One plant that belongs to this class and that can be grown in most parts of Oklahoma successfully where the ground is properly prepared, good plants secured, and cared for afterwards, is asparagus.

After asparagus has reached the proper age it will afford an early annual crop each year. Asparagus is a vegetable that in some instances is not relished by the average person, but for which taste can be advantageously cultivated as it comes at a season of the year when vegetables are fairly scarce. Again, when good asparagus is raised, the surplus can usually be disposed of to advantage and profit.

In the first place, asparagus requires a good, rich, loose soil as it is a rather gross feeder, and requires a loose soil for the best development of tender, shapely tips. From a home garden standpoint, it is advisable to dig out a trench in which to set the asparagus, to one side of the garden where it will not be disturbed in the annual plowing, and place several inches of good, rich soil in the bottom of this trench. You can mix rotted manure with this soil.

Secure good strong one year roots, or crowns as they are frequently called. Set these crowns in rows about two feet apart in the row. Spread the roots out well and cover with three or four inches of good, loose, rich loamy soil, firming the soil about the crowns and leaving a loose mulch on the top. Keep the asparagus cultivated throughout the entire growing season up until fall or until the rains begin.

When winter approaches, cut off, rake up and burn the tops, and apply a good mulch of straw manure. Where good strong roots have been secured you may cut a few tips for the table the second year, but do not continue the cutting too late, for the crowns will not develop so well and you will not get the crop you otherwise get the second spring from the setting. During the height of the cutting season, after the second or third year, all the shoots should be removed each day. Removing the shoots every other day early in the season and at the close of the season will be sufficient. The shoots are removed by cutting them off below the ground and just above the crown. In cutting be careful not to cut so deeply as to injure the crown. A butcher knife, preferably with the point broken off square and sharpened, is a good tool for cutting asparagus. Remember that the nourishment must be stored for the production of

the tips the next spring, and so liberal cultivation and manure are very important in growing asparagus.

VARIETIES: Mary Washington, Pametto, and Conover's Colossal are good varieties. Mary Washington is generally most rust resistant.

BUSH SNAP BEANS

Beans will not stand any frost and do not grow well until the soil is fairly warm. The first planting should be made between April 10 and April 20, and successive plantings may be made every two weeks until the first of June. If the first planting is killed by frost, it is not a serious matter as the other planting will assure a crop. If the soil is moist enough to germinate the seeds, a fall crop of beans may be grown by planting during the latter part of July and until the middle of August. In many parts of Oklahoma the bean does poorly on account of the hot dry winds that are apt to come during the blossoming period. These winds prevent the pods from setting. The early plantings should be the large ones as they are more likely to give best results. Depend on your canning supply from early plantings. Plant in rows about two and one-half to three feet apart. The plants should stand about four inches apart in the row. Beans are frequently subject to two diseases, anthracnose (pod spot) and blight. For this reason, one should obtain disease free seed. The saving of your own seed afterwards is a good idea.

Bush beans may be planted in late summer and successive plantings may be made up to within eight weeks of frost. Pole beans may be planted within 10 weeks of frost.

In the late plantings of beans it is advisable to plant three to four seed in a place. In this way the seedlings will assist each other in pushing through the soil, especially if a crust is formed over the seed after planting. After bean seeds have been planted a few days, it is almost impossible to break a crust over them without destroying the seedlings.

VARIETIES: Bountiful, Burpee's Stringless Green Pod, Giant Stringless Green-pod, Stringless Black Valentine, Refugee No. 5, Black Wax, and Top Notch Wax.

BUSH LIMA BEANS

The culture of the bush limas is about the same as for the snaps with the exception that the first plantings should be a little later.

VARIETIES: Burpee's Bush Lima, Henderson Bush Lima, Baby Fordhook Bush Lima.

POLE SNAP BEANS

All the varieties of pole beans are more tender than the bush beans, and for this reason should be planted about two weeks later. They should be planted in hills in rows three to four feet apart. The seed may be placed in hills in the row or distributed in the row depending upon the kind of support to be used. Where post and wire trellis are used, distribute the seed three or four inches apart in the row, or near the base of corn plants; or three to four seed to a hill two to three feet apart in the row where stakes are to be used as supports.

VARIETIES: Kentucky Wonder, Blue Lake.

POLE LIMA BEANS

The culture and requirement are much the same as for the pole snap beans. The speckled lima, is especially good for the drier portions of Oklahoma.

VARIETIES: Jackson Wonder, Florida Butter and Sieva.

BEETS

The beet is one of the best vegetables for both early and late gardens in Oklahoma. It will stand a fairly heavy frost and also drouth with but little injury. Because of this and on account of slow germination the seed should be planted in early spring. The last of February to the first of March, depending on whether in the southern or northern part of the state, is the proper time to plant beet seed.

Plant the seed at one side of the garden in three-foot rows and drill thickly in the row. Begin to thin when the plants are about three or four inches tall and the first thinnings may be used for greens. The tops of the later thinning may be used for greens and the small beets for baby beet pickles, which are becoming very popular. Finally, thin the beets to six inches apart. Frequent shallow cultivation is important in order to make a steady growth, so that the beets will not be stringy or tough.

Beets will stand fairly heavy frost where planted in summer and hardened naturally in the fall. The beet is one of the best vegetables for late gardens. The seed germinates slowly. It is frequently advisable to soak the seed in warm water over night.

VARIETIES: Detroit Dark Red, Early Wonder.

BROCCOLI

Broccoli is a member of the cabbage family and can be grown along with cabbage and cauliflower. The same cultural

directions as those given for cabbage will apply to broccoli. It will withstand a light frost which makes it a good vegetable to grow in the fall. For a fall crop plant the seed in late June or July and transplant to the garden from the first to the middle of August.

The edible portion of broccoli is the fleshy flower stalk and the young flower buds before the flower opens. Broccoli should be cut before any of the flowers are opened enough to show yellow color. After the central flower stalk has been cut other stalks arise from the central stem which may in turn be cut, and which makes the vegetable usable over a long period of time. A few plants in the garden will supply the average family all of the broccoli they will want during its producing season.

VARIETY: Italian Green Sprouting.

CABBAGE

Cabbage does better in a cool, moist climate, and for this reason must be grown very early in Oklahoma. The seeds should be planted rather thinly about one-fourth inch deep, in a flat in the house about January 20. Cabbage will stand a low temperature, and if the soil is in the proper condition, the plants may be set in the open by March 5 to 10. The plants should be set deeply, almost to the leaves, two feet apart in rows three feet apart. The soil should be pressed firmly about the roots of the plant. Plants for late cabbage should be started in a bed where they can be watered. June 20 to July 1 is early enough to start them so that they may be set in the garden about the first to the middle of August. If the weather is dry and hot when the transplanting is done, the plants should be shaded in some manner for a few days. Only the early varieties should be grown.

Cabbage plants will withstand considerable cold if properly grown. Taking advantage of this characteristic, earliness may be secured by growing the so-called "frost-proof" plants. By this method seeds of any variety are sown in cold frames about the tenth of October and wintered over in the frame. With protection during extremely cold weather the plants will survive the winter and may be set out in the garden the last of February or the first of March. Lettuce makes a good companion crop for early cabbage. Secure copy of Oklahoma Extension Circular on growing frost-proof plants.

The growing of fall cabbage in the central and western portions of the state is rather difficult, the two principal difficulties being the green cabbage worm and the growing of plants to be set out in the late summer.

The best way to control the worms is with arsenate of lead or Paris green.

Plant the seed in a place which is protected from the southwest winds and the sun. The north side of a building is a good location. Prepare a good seedbed and plant the seed in rows in June or the first part of July. Grow the plants slowly and by the middle of August good, tough plants should be available. Transplant the cabbage plants to their permanent growing place the first to tenth of August. Set the plants deeply, firm the soil well about the roots, and water thoroughly. Finish filling the hole with loose soil to form a soil mulch. If it is hot and dry at transplanting time, shading for a few days may be necessary. Watch carefully for worms throughout the entire growing season. Cabbage for the table should be available in October. Harvest and store in a soil kiln or cellar the last of October or early in November.

VARIETIES: (Early) Golden Acre, Early Jersey Wakefield (Wilt resistant) Marion Market, Jersey Queen (Midseason) Charleston Wakefield, Early Round Dutch.

CARROTS

It is surprising to find so few carrots growing in the average home garden, which is due partly to the fact that many think they do not like carrots. Carrots, where planted and cared for, are available from spring through the summer and winter, and therefore deserve a place in every garden.

Carrots should be planted in late February or early March. Drill the seed thickly one-half inch deep in rows three feet apart. Thin the plants when a few inches tall, but not necessarily to a stand at first as the small carrots removed from time to time can be eaten. However, do not delay thinning so late that the ones left will suffer. Finally, thin to four or six inches apart.

Many winter carrots will remain, uninjured, in the open ground; however, for convenience, harvest them in late fall and store in a soil pit.

Fall planting of carrots should not be necessary as a supply should be available from the spring garden. Carrots will stand hard frost and freezes after up and well started. Carrots have stood in the ground during unusually cold winters. They will continue to grow pretty well through October. The seed should be planted the last of July to the first of August. Where a favorable season prevails, the better results will be from the earlier planting.

VARIETIES: Chantenay, Danver's Half Long, and Morse Bunching are good varieties.

CAULIFLOWER

Cauliflower is rarely grown in Oklahoma because of the hot weather. This vegetable is a cool-natured plant. In order to grow it successfully, it is necessary to take advantage of the early season. Plant the seed in a cold frame and winter the plants as is done with the co-called frost-proof cabbage, lettuce, etc. The plants may be set out in the open ground about the first of March in a well prepared sandy loam soil. In this way, cauliflower can be grown successfully, especially in the eastern part of the state, but not quite so easily in the central portion. In the western part of the state it is still more difficult. Unless the plants are grown as suggested above or started in a hotbed in January and transplanted to a cold frame and thence to the open ground, they cannot be set in the open ground as early as the frost-proof plants.

VARIETIES: Snowball and Erfurt.

CELERY

The weather is too dry and hot for much success with celery in Oklahoma. However, where irrigation is practical some growers have been quite successful. Plant the seed rather thinly in flats about the 15th of March, and cover about one-fourth inch deep. Set in the open about April 20, six inches apart in three-foot rows. Press the soil firmly about the roots. For winter celery sow the seeds in a bed about May 1, and transplant to the field in July. The soil for celery should be very rich.

VARIETIES: Golden Self Bleaching and Giant Pascal are good varieties.

COLLARDS

The collard is a member of the cabbage family which is raised largely in the south. It does not form a solid head, but only a loose cluster of leaves. It withstands the hot weather of Oklahoma better than cabbage, and frost is supposed to improve the quality. It is grown in the same way as cabbage.

VARIETY: Georgia Southern or Creole is the common variety.

POPCORN

In a good many localities of this state, there is an opportunity for the growing of popcorn from a semi-commercial standpoint as well as for home use. The soil requirements of

popcorn are practically the same as for the average field corn. Popcorn is a little more sensitive to cold than field corn, and for this reason should be planted a week later. Cultural directions do not differ materially from those for field corn. Sometimes several grains of corn are placed in a hill and the hills are spaced quite far apart; however, it is preferable to have the stalks standing singly about 12 to 15 inches apart in the row. Popcorn, as a rule, is more drouth-resistant than the average field corn.

VARIETIES: Dynamite or South American Yellow, Hybrid Japanese Hulless, and White Rice are good varieties.

SWEET CORN

It is useless to try to grow any but the early varieties in a greater part of the state. About March 15 to April 15, plant four or five grains in hills three feet each way, or plant separate grains each eight inches apart in three-foot rows. Two or three later plantings should be made at intervals of 10 days, so that a loss of the first planting will not be serious. Cultivate often.

VARIETIES: Sencross, Golden Cross, Bantam, Stowell's Evergreen, and Country Gentleman are good varieties.

The planting of a late crop of corn, especially in the drier and warmer portions of the state, is frequently a risk. However, where space is available, a limited planting is advisable. Plant early-maturing varieties when the season is right in June or July.

Mexican June and Squaw are good fall varieties.

COWPEAS

Cowpeas may be used as a substitute for shelled beans in the soft stage and again as a dry bean. Cowpeas are drouth resistant and may be planted in May, June, or up until the middle of July.

From a garden planting standpoint they are frequently planted between Irish potatoes and after the potatoes have been dug the peas occupy the ground. They are frequently planted after some early vegetable crop has been harvested. For the maximum yield of peas plant the seed in rows and cultivate as for any other garden crop.

VARIETIES: Black-eyed and Cream or Brown Crowder are the most common varieties.

CUCUMBER

The cucumber will not withstand frost, but nevertheless must be grown early to be a success here. Cucumber plants are very difficult to transplant and for this reason it is not very practical to start them inside. By using paper pots, or tin cans with the bottoms melted out, the plants can be grown separately in the hotbed and removed to the field without disturbing the roots. They may be started in this manner about March 25. The seeds may be grown out of doors about April 10 to May 1. Hills one inch high should be made four or six feet apart each way. Eight or 10 seed should be scattered over the hill and covered about one-half inch deep. As soon as the danger of insect injury is over, thin to two or three strong plants.

VARIETIES: A & C, Woodruff's Hybrid, and National Pickling are good varieties. Mincu (small size, sets in clusters, very productive) is good for pickling only.

EGG PLANT

Egg plant deserves to be raised more commonly in Oklahoma gardens. It requires a long growing season and should be set in the open ground soon after danger of frost is over. Plant the seed in a flat about one-fourth inch deep during the last week of February. About April 25 to May 10 set these plants in rows three feet apart in the row.

VARIETIES: New York Improved, Black Beauty, and Florida High Bush.

ENDIVE

Endive is a leafy plant used for garnishing and for salads. It is grown in the spring or in the fall. Plant quite thickly in rows three feet apart and cover about one-half inch deep. Thin the plants to about eight inches apart. Make the spring planting about the last of February or the first of March, and the fall planting during the latter part of August. Endive is usually blanched by tying the outer leaves together for a few days.

VARIETIES: Green Curled and Moss Curled are good varieties.

HORSE-RADISH

Horse-radish is grown from pieces of the root. These pieces of root may be set almost any time during the spring and early summer. Place them 18 inches apart, in rows three feet apart, in an upright position, the small end down. Cover about three inches deep. After the first year the tops will be so large that the plants will need very little cultivation. Com-

mercial growers usually plow out the plants when they are one year old, sell the larger roots, and save the smaller ones in damp soil for replacing the bed the next season.

VARIETY: Maliner Kren.

KALE OR BORECOLE

Kale is a leafy member of the cabbage family that is grown for garnishing and for greens, in both spring and fall. Plant three-fourths inch deep in rows three feet apart the last of February or early part of March. Thin the plants to about 12 inches apart. Kale will usually remain in the open without harm until January 1 in this climate. It can usually be made to live through the winter by mulching with straw. Kale is a semi-hardy vegetable and will stand rather hard freezes. It is a good vegetable for fall and early winter greens. Plant the seed in early August. In case of a mild winter, or if the plants are mulched heavily with straw, they will stand over winter and give extra early salad in spring.

VARIETIES: Dwarf Green Siberian and Dwarf Curled Scotch.

KOHL-RABI

Kohl-rabi is related to cabbage and cauliflower and requires cool, moist conditions for its best development. The edible portion is the swollen above-ground stem which looks somewhat like a turnip. As the stems get older, they become less palatable. The cultural directions are practically the same as for cabbage. Start the seed early and set in an open rich soil as soon as can be done.

VARIETIES: White Vienna and Purple Vienna are good varieties.

TABLE COMMENTS

Naturally the kind and amounts of different vegetables to be planted will be governed very largely by the individual tastes of the members of the family. In addition to the vegetables listed in the table, or in place of the same ones, the average gardener frequently has field plantings of Irish potatoes, sweet potatoes, winter squash, pumpkins, cantaloupes, watermelons, corn, beans, etc.

The above garden was planned more especially for a farm garden, but the general suggestions as to kinds and arrangement of vegetables, so far as space will permit, apply to the town garden.

Careful note should be taken of the vegetables beginning on one side of the garden; these are long lived vegetables, or perennials—asparagus, rhubarb, horse-radish, and winter onions, as indicated in Group I in the table of plantings. Group I is followed by Group II on the same side of the garden, beginning with spinach and ending with salsify (oyster plant). It should be noted that the vegetables included in Group II are planted at the first spring planting in the garden.

Group VII, beginning with onions and ending with radishes, should be planted on opposite side of the garden on the same date as the vegetables in Group II are planted. Group II consists of long-lived semi-drouth-resistant vegetables which will remain in the garden from the time they are planted until freezing weather in the fall or early winter. Vegetables in Group VII are short-lived and remain in the garden from a few weeks to several months.

The seed of vegetables in Group IV, namely egg plant, pepper, and tomato, should be planted in a hotbed or in a box in the house at the same time as the first spring planting of seed is made in the garden. In three or four weeks these seedlings should be transplanted to a cold frame. Set the plants four inches apart each way in the cold frame. In about six weeks, set these plants in the open ground, leaving a four-inch cube of soil around the roots, so the plants will not wilt when transplanted.

The vegetables included in Group III beginning with okra and ending with beans (bush), will not be planted until danger of frost is past.

By studying the Table of Arrangement of Vegetables in the garden, it will be readily noted that the vegetables are arranged according to the time of planting and in order of length of time that they will remain in the ground.

Note the time of the planting of the different groups; for instance, Group I is planted in fall or winter, Group II, early in spring, etc. Beginning on one side of the garden with radishes, lettuce, etc., the old plants may be cleared off as the harvest season is over the ground kept cultivated for later plantings. Thus, all the vacant ground in the garden will be on one side until the later plantings are made.

The number of rows show the proportionate amount of plantings of the different kinds of vegetables.

Sweet potatoes (Group V) will be set in open when danger of frost is past. The first planting of corn (Group VI) is about two to three weeks later than lettuce, etc.

Group	KIND OF VEGETABLE	No. of 100 ft. rows	Amount of seed required	COMMON VARIETIES	Spacing		Depth to Cover Seed	Approximate Yields to expect	TIME TO PLANT
					Of Rows	In Rows			
I	Asparagus	1	50 Crowns	Mary Washington	4 ft.	2 ft.	4 in.	40 lbs.	} Fall or Early Spring Early Fall
	Rhubarb	1	50 Crowns	Victoria, McDonald, Linnaeus	4 ft.	2 ft.	3 in.	100 lbs.	
	Horse-radish	1/4	22 Roots	Maliner Kren	3 ft.	18 in.	3 in.	12 lbs.	
	Winter Onions	3/4	1 Quart	Tree (sets)	3 ft.	8 in.	3 in.	75 lbs.	
II	New Zealand Spinach	1/2	1/2 oz.	New Zealand	4 ft.	2 ft.	2 in.	20 lbs.	} Feb. 22 to March 10
	Swiss Chard	1/2	1/2 oz.	Lucullus, Fordhook Giant	3 ft.	10 in.	1 in.	70 lbs.	
	Carrots	1	1/2 oz.	Chantenay (Red Core), Fanvers	3 ft.	3-4 in.	1/2 in.	100 lbs.	
	Parsnips	1/2	1/2 oz.	Hollow Crown	3 ft.	3-4 in.	1/2 in.	60 lbs.	
	Parsley	1/2	1/20 oz.	Moss Curled	3 ft.	3-4 in.	1/2 in.	6 lbs.	
	Salsify (Oyster Plant)	1	1 oz.	Sanwich Island	3 ft.	3-4 in.	1 in.	50 lbs.	
III	Okra	1	1 oz.	Dwarf Prolific, Clemson Spineless	3 ft.	12 in.	1 in.	60 lbs.	} April 1 to April 20
	Beans—Pole Snap	1	1 Lb.	Kentucky Wonder, Blue Lake	4 ft.	3-4 in.	1 in.	50 lbs.	
	Beans—Pole Lima	1	1 Lb.	Jackson Wonder, Florida Butter	4 ft.	3-4 in.	1 in.	30 lbs.	
	Beans—Bush Lima	1	1 Lb.	Henderson Bush Lima	3 ft.	2-3 in.	1 in.	20 lbs.	
	Cucumbers	1/2	1/4 oz.	(Slicing) A and C, Colorado	5 ft.	3 ft.	1/2 in.	75 lbs.	} April 10 to May 1
	Squash	1/2	1/4 oz.	(Pickling) National, Mincu					
	Watermelons	1	1 oz.	White Bush, Yellow Straightneck	5 ft.	3 ft.	1/2 in.	80 lbs.	} March 20 to April 25 Suggest making successive plantings of snap beans
	Cantaloupes	1	1 oz.	Dixie Queen, Kleckley Sweet, Stone Mt.	8 ft.	4 ft.	1 in.	30 melons	
	Beans—Bush Snap	1	1/2 oz.	Hale's Best No. 36, Hearn's of Gold	8 ft.	4 ft.	1 in.	120 melons	
	Beans—Dry Shell	2	2 Lbs.	(Gr'n) Bountiful, Stringless Greenpod	3 ft.	2-3 in.	1 in.	120 lbs.	
				(Wax) Top Notch, Sure Crop					
				(White) Great Northern, Robust	3 ft.	3-4 in.	1 in.	10 lbs.	
IV	Eggplants	1/4	1/16 oz.—17 plts.	(Colored) Pinto, Red Kidney					} Seed in hotbed or flat—Feb. 22 to March 10 Six to eight weeks before time to set in garden Set plants in garden—April 10 to May 1, as soon as danger of frost is passed in spring
	Peppers (Hot)	1/4	1/16 oz.—25 plts.	Black Beauty, New York Improved	3 ft.	18 in.	1/4 in.	15 lbs.	
	Peppers (Sweet)	1/2	1/8 oz.—50 plts.	Tabasco, Long Red Cayenne	3 ft.	12 in.	1/4 in.	5 lbs.	
	Tomatoes	3	1/4 oz.—150 plts.	Calwonder, King of the North	3 ft.	12 in.	1/4 in.	10 lbs.	
Note: Varieties in bold type are wilt resistant.				(Early) Penn State, Danmark	5 ft.	2 ft.	1/4 in.	450 lbs.	} May 10 to June 10
				(Midseason) Pritchard, Stokesdale					
				(Late) Marglobe, Rutgers, Pearson					} March 15 to April 15 Suggest successive plantings
				(Small) Porter, Yellow Pear					
V	Sweet Potatoes	4	300 plts.	Impr. Porto Rico, Nancy Hall	3 ft.	10-14 in.	6 in.	10 bu.	} May 10 to June 10
	Peanuts	1	1/2 Lb. (Unshelled)	Impr. Spanish, Tennessee Red	3 ft.	18 in.	2 in.	10 lbs.	
VI	Sweet Corn	4	1 Lb.	(Early) Spancross, Sencross (Midseason) Golden Cross Bantam	3 ft.	12 in.	1 in.	400 lbs.	} Plant seed in cold frame in fall, Oct. 1 to 5—Set plants in garden next spring. Feb. 22 to March 10
VII	Onions (Mild)	1/2	1/4 oz.—150 plts.	Bermuda, Valencia	3 ft.	3-5 in.	Plts. 3 in.	40 lbs.	
	Onions (Pungent)	1/2	1 Pt. Sets	Yellow Globe, Ebenezer	3 ft.	3-5 in.	Sets 1 in.	50 lbs.	} Feb. 22 to March 10
	Cabbage	2	1/2 oz.—150 plts.	Golden Acre, Wakefield	3 ft.	18-20 in.	1/2 in.	300 lbs.	
	Kohl-rabi	1	1/4 oz.—35 plts.	White or Purple Vienna	3 ft.	18 in.	1/2 in.	80 lbs.	
	Beets	1	2 oz.	Early Wonder, Detroit Red	3 ft.	3-4 in.	1 in.	100 lbs.	
	Irish Potatoes	5	25 Lbs.	(Red) Triumph, Red Warba	3 ft.	12 in.	4 in.	8 bu.	
	Follow with Black-eyed or Cream Crowder Cowpeas			(White) Irish Cobbler, Warba					} Feb. 22 to March 10 Note:—Plant seed of head lettuce in flat early in January. Set plants in garden early in March.
	Turnips	1	1/4 oz.	Purple Top Globe	3 ft.	2-3 in.	1/2 in.	100 lbs.	
	Peas	2	2 Lbs.	World's Record, Thomas Laxton	3 ft.	1-2 in.	2-3 in.	100 lbs.	
	Mustard	1	1/4 oz.	Giant Southern, curled	3 ft.	1-2 in.	1/4 in.	40 lbs.	
	Spinach	1	1 oz.	Long Standing, Bloomsdale	3 ft.	1-2 in.	1/2 in.	40 lbs.	
	Lettuce (Leaf)	1	1/4 oz.	Grand Rapids, Simpson	3 ft.	1-2 in.	1/4 in.	40 lbs.	
	Lettuce (Head)	1/2	1/4 oz.—200 plts.	Big Boston, Imperial 44	3 ft.	3-4 in.	1/4 in.	20 lbs.	
	Radishes	1/4	1/2 oz.	Scarlet Globe, White Icicle	3 ft.	1-2 in.	1/2 in.	10 lbs.	

PLAN

It would be impossible to carry out the plan as suggested in the "Table of Arrangement of Vegetables in a Garden for a Family of Five" without a carefully prepared plan in advance. Too frequently a gardener starts planting with the first package of seed he comes to and continues to plant until all of that kind is gone. He picks up the next most convenient package and repeats the operation and so on, and as a result, there is no arrangement or proper proportion of the different kinds of vegetables.

Measure the length and breadth of the garden, then get a piece of white wrapping paper, yard stick and pencil, and lay off the garden plot to a scale. It is suggested that a scale of one-eighth inch to a foot be used.

The selection of kinds of vegetables to be planted in the garden, drawing of the garden to a scale, and the arranging of vegetables should interest the entire family on some cold night by the warm fireside.

VEGETABLE CULTURAL DIRECTIONS

LETTUCE

Lettuce is a plant which should be grown during the late fall and early spring in every home garden. It can be grown during the winter without much trouble in an ordinary hotbed. Lettuce grows very quickly during cool moist weather, but stops growth and becomes bitter soon after the hot weather starts. Plant thickly in rows three feet apart during the last of February or the first of March. Cover about one-fourth inch deep. After the plants are up, thin to six inches apart. In order to have a continuous supply, plantings should be made every week or 10 days till May 1. For fall lettuce, plant during the latter part of August and first of September. Plant seed October 5 to 10 in a cold frame and winter over as cabbage plants. Set the plants in the open ground the last of February or early part of March for raising of good head lettuce.

Lettuce is one of our most popular garden crops and is easily grown early and late. When planted too early in late summer, the seed will frequently remain dormant until the weather conditions become cool. Thus it is seen by planting in a cool, moist location, such as the north of a building, germination of the seed can be secured earlier. Successive plantings can be made from the last of July to the first part of September. Where winter lettuce is desired, plant the seed in August and transplant to the cold frame in early September.

Late plantings on the south side of a building will furnish a supply for the table during late fall and early winter.

VARIETIES: Big Boston and New York No. 12 (Iceberg) are good head varieties. Grand Rapids and Black Seeded Simpson are good leaf varieties.

CANTALOUPE AND MUSKMELONS

Muskmelons generally do better on the light sandy soils and particularly on the bottom lands. In the western part of Oklahoma, however, they succeed well on the upland and do moderately well in quite heavy upland. Muskmelons are difficult to transplant. For this reason, it is not practical to start large quantities of them in a hotbed or cold frame. A few extra early ones may be started in tin cans or paper pots as suggested for cucumbers, or a series of plantings may be made. The first planting should be made about April 5 and the second April 20. The first planting may be killed by frost, but the second practically always escapes. After danger of frost and insect injury is over, the plants are thinned to two or three of the oldest and strongest plants. The hills for muskmelons should be made six to eight feet apart. Make a slight mound at each hill about a foot across. Scatter about a dozen seed over this hill and cover about three-quarters of an inch deep.

VARIETIES: The Rocky Ford and other varieties of the gem class are the most popular. Pollock 10-25; Hales Best No. 36; Mildew Resistant No. 45; and Hearts of Gold are also popular in Oklahoma. The Honey Dew and Cassaba are comparatively new varieties but are highly spoken of for home use.

MUSTARD

For use in early summer plant thickly in rows three feet apart and cover three-fourths of an inch deep. Plant the seed the last of February or early March. Gradually thin the plants as they are used until they stand 10 inches apart. Mustard will grow until the weather is quite cold, and so fall plantings may be made as late as September 1 to 15.

Mustard is one of our standard vegetables for greens, and because it is easy to grow, if it is liked, should be in every fall garden.

Plant the seed in rows from the last of July to the first of September for fall use.

VARIETIES: Southern Giant Curled and Ostrich Plume are good varieties.

OKRA OR GUMBO

Because of the ability of okra to make a steady growth during the hot and dry summer weather this vegetable deserves a place in every Oklahoma garden. Plant about six inches apart in rows three feet apart the first to the latter part of April. Thin to 20 inches apart when the plants are well started. The seeds should be covered about an inch deep. If the pods are gathered before they ripen the plants will fruit heavily until frost. To be palatable, the pods must be gathered when quite small, only two or three days old. The fruiting wood or branches can be increased by pinching out the terminal (top) bud of the main stem.

VARIETIES: Early Dwarf Prolific, Clemson Spineless and White Velvet are good varieties.

ONIONS

Onions are found in practically every home garden during the average garden season. A rich sandy loam soil, containing a good supply of organic matter and which is well drained, is best suited to the growth of onions. Bottom ground, where overflows do not occur during the growing season, if of a sandy nature, is good onion soil. Onions do not develop to best advantage and are stronger flavored when grown on heavy soils.

The raising of onions from sets and seed in Oklahoma is not so common as formerly in the home garden. Seed or sets are usually planted in early spring. Onion seedlings (small onion plants) secured from the south or raised in a hotbed or cold frame, are very common. The Bermuda onions are most commonly raised in this way. At present the Denia onions (Valencia) are grown from seed, but likely in the course of a few years, the use of seedlings will become more general. Onion seedlings are set in early spring, usually thick in the row, and thinned to three to four inches apart. The thinnings are used as green onions. In case of large plantings the seedlings are usually set four to six inches apart. Cultivation should be frequent and shallow.

TYPES AND VARIETIES: There are two general types of onions grown in Oklahoma, namely American and foreign or European.

As a rule the American onions produce bulbs smaller in size, of denser texture, stronger flavor, and better keeping quality than the European onion. There are three recognized colors in the American onions, yellow, white, and red. The Yellow Globe is one of the leading varieties. The Southport White Globe is one of the leading white varieties, and the Southport Red Globe is a leading red variety.

The Bermuda onions are the most popular foreign onions and include the Crystal White Wax, White Bermuda, Yellow Bermuda, and Red Bermuda.

Sweet Spanish or Valencia (white and yellow) are popular in Oklahoma. These varieties keep better than the Bermudas. The Prizetaker is another foreign variety and resembles the Valencia, but is somewhat stronger in flavor.

The most common winter onion is the one on which clusters of small onions (bulblets) are produced on top of the onion stalk, probably correctly spoken of as perennial tree onions. The perennial tree onion is grown for green onions and is more commonly found in Oklahoma gardens than the multipliers and may be set in the late summer, fall, or spring. The small bulbs of the Yellow Multipliers and White Multipliers (potato onion) grow into large ones which break up into smaller onions and thus are propagated. The small bulbs (bulblets) are usually used for pickling. These onions are very hardy and can be left in the ground during the winter, but it is better to take them up when mature and separate and reset three to four inches apart in the spring. These onions are sometimes erroneously spoken of as "shallots."

Shallots are closely related to onions. They are perennial, seldom producing seed. The small bulbs are compound and grow and break up into smaller ones. These small bulbs are set out in the spring and harvested when mature and stored in a dry cool place. Shallots are used principally for flavoring.

PARSLEY

Parsley is a comparatively easily grown vegetable. It is generally used for garnishing and for soups. Plant the seed the last of February or in early March. Thin out the seedlings until they stand three or four inches apart in the row. Only a portion of a row or a very short one will be sufficient for an average family.

The roots may be dug up in the fall and planted in an enclosure on the south side of a building, or they may be transplanted into a box or pot and grown in the house in the winter as an ornamental plant and used as a source of garnishing material, soup, etc.

VARIETY: Triple Curled is a good variety.

PARSNIP

The parsnip is one of the most successful root vegetables in Oklahoma and withstands the drouth remarkably well. The seeds are slow to germinate and should be planted quite early.

Plant the seed the last of February or early March. Plant them thickly, one-half inch deep in rows three feet apart. When the plants are well started, thin to about four inches apart. Do not harvest until late, as freezing seems to improve them.

The cultural directions for carrots are applicable to parsnips, except that parsnips require a longer time in which to mature. Plant parsnips not later than July.

VARIETIES: Hollow Crown and Guernsey are good varieties of parsnips.

PEAS

Only the early varieties of peas are successful in the greater part of this state. They do not grow well except in cool, moist weather. Make the first planting as soon as the ground can be worked in the spring, the last of February to the first part of March. Two or three more plantings should be made at intervals of 10 days. Frequently early, medium, and later varieties are planted at the same time to avoid successive plantings. Plant one inch apart in three-foot rows and cover two inches deep.

VARIETIES: The following varieties are recommended: Early—World's Record and Glacier; Midseason—Thomas Laxton, Laxton's Progress; Late—Multifold (Hundredfold); Commercial Canning—Alaska (small), Thomas Laxton (large).

PEPPERS

Peppers are tender and have much the same plant requirements as egg plant and tomatoes. They should be started inside in a flat or hot bed, the seed being planted about the last of February and transplanted to a cold frame in three or four weeks and finally to the open ground when danger of frost is past. Handle in flats the same as for tomatoes. In the garden they should be set 18 inches apart in three-foot rows.

VARIETIES: Of the hot-fruited varieties the Long Red Cayenne, Tabasco, and Red Chili are popular. Of the sweet peppers the King of the North, Calwonder, and Ruby King are good varieties.

IRISH POTATOES

One of the most important vegetables that can be grown on the farm is the Irish potato. Where proper care is given and enough ground is available, every farmer should raise his own supply. It is important to have your Irish potato crop mature early in order to avoid the dry hot summer. Select well-drained sandy or sandy loam soil containing an abundant

amount of organic matter. Make your plantings of an early variety as early as it can be done safely. Use first certified seed if possible, for as a rule they make a little earlier than average seed and produce a larger yield of a superior grade of potatoes. Cut the potatoes so that each seed piece will contain at least two good eyes. Plant potatoes from the last part of February to the first part of March, depending upon the season and section of the state. Open up furrows, distribute the seed pieces 10 to 12 inches apart, and cover with two furrows. This method of covering results in quicker germination. Later, as the potatoes are about to come up, harrow the ridges off level; and in this way you will establish a soil mulch and destroy any growth of grass or weeds that may be appearing at this time.

The early cultivation can be comparatively deep. After the root system extends out and near the surface of the soil, the cultivation should be more shallow from time to time. After the potatoes have reached a few inches in height, decrease the depth of cultivation, but gradually mound the soil about the base of the plant, and thus afford room in which the potatoes can form without resistance.

Mulching is becoming common, especially in some portions of the state. Where a mulch of old waste straw or hay is applied immediately after planting, the potatoes will be slow to come up. This, during seasons of late frost, may be a means of the plants escaping the damage from the freeze. It is generally preferable to apply the mulch after the potatoes have been cultivated once or twice.

VARIETIES: The Triumph, Irish Cobbler, and Early Ohio are the three most popular early varieties in Oklahoma. The Triumph matures the earliest of the three; however, the yield is not equal to that of the Irish Cobbler which usually exceeds that of the Early Ohio. The Irish Cobbler holds up better than either of the two, but the Early Ohio holds up better than the Triumph. Two new, very promising varieties are the Red and White Warba, both of which are early, productive, and gaining in popularity.

HARVESTING

There is a great loss from rot by harvesting potatoes improperly. Potatoes should be harvested when the plants are matured, as shown by the plants beginning to turn yellow. Do not wait until the vines are dead and dried up or the potatoes will be injured by heat in the ground, and will rot when harvested and stored.

In harvesting Irish potatoes do not leave them exposed to the sun. Handle them carefully in order to prevent bruising,

and, if the sun is shining while digging, pick them up immediately. Remove all cut or broken potatoes before storing.

A variety of harvesting tools may be used, such as a spading fork, a lister, or a potato-digger.

STORING

Irish potatoes should be stored in a cool, dry place where the sun cannot shine on them. A dry cellar or cave is ideal, but many do not have such space. Until cold weather, Irish potatoes may be stored under the house, if the soil is well drained, and the house does not have a solid foundation. A storeroom or barn may be used as a storage place. On the approach of cold weather sufficient protection should be given to prevent the potatoes from freezing.

SECOND CROP

Sandy loam creek and river bottom soil is preferable for growing a fall crop of Irish potatoes. As a general rule the average attempt to grow a second crop of Irish potatoes is a failure due to (1) lack of moisture; (2) high soil temperatures; (3) slow sprouting of seed. Irish potatoes, for best sprouting, growth, and development require cool moist conditions which frequently do not prevail during late July and early August, the usual time of planting a second crop.

Factors affecting moisture, temperature, and sprouting are as follows.

Irrigation: Irrigation is very helpful in growing a fall crop of potatoes. If the soil is dry and hot at planting time, start irrigation immediately following planting and repeat if needed to supply moisture and reduce soil temperature.

Straw Mulch: A mulch of bright straw three to four inches deep applied immediately after planting will conserve moisture and reduce soil temperature.

Fallowed Ground: Spring and summer fallowed ground is preferable to ground which grew an early spring crop, or one on which grass and weeds have been permitted to grow. As soon as the soil is plowed a mulch two or three inches deep should be established and maintained throughout the summer just as though a crop were growing. By keeping up such cultivation until planting time the soil will be moist and cooler than otherwise. After planting maintain the mulch by frequent cultivations until after the plants are up and growing.

Timely Planting: Plant fall potatoes the latter part of July or early August, preferably just following a shower of

rain. In some of the commercial potato areas of the state small number two potatoes are thrown back into the furrow at harvest time, covered, and kept cultivated, and with favorable weather conditions a fair stand and yield of fall potatoes is secured.

Slow Sprouting: Late maturing varieties of Irish potatoes do not sprout as readily as early maturing varieties. For the fall crop use Bliss Triumph, Red Warba, or White Warba in preference to Irish Cobbler or Early Ohio.

Size of Seed and Cutting: Seed pieces $1\frac{1}{2}$ to $1\frac{7}{8}$ inches in diameter are to be preferred to the smaller sizes. Contrary to general opinion seed of the above size cut in half will sprout more readily than uncut seed.

Pre-sprouting: Pre-sprouting may be accomplished by placing seed on loose, moist soil in a dense shade under a tree or shed and keeping covered with three to four inches of straw which is kept moist for 10 days to two weeks, at the end of which time the potatoes will have begun to sprout. Remove the seed, cut, and plant.

Chemical Treatment: The sprouting of spring grown seed may be hastened by treating with a drug called ethylene chlorohydrin. Place the potatoes to be treated in a container that can be tightly closed, such as a five gallon can, which holds a little over one-half bushel of seed. Set a saucer on top of the potatoes. Crumple a piece of cloth and lay it in the saucer; pour on the cloth a tablespoon of ethylene chlorohydrin and close the container. Place the container in a cellar or cave where the temperature is as near 70° Fahrenheit as possible and leave for 24 hours. Remove the potatoes from the can and air in a basket or burlap bag for some four or five days before planting. When ready to plant, cut the seed the same as for planting without treatment. When using the ethylene chlorohydrin it is necessary to keep the potatoes from getting too warm since high temperatures will injure the seed.

Seed Sources: Seed for fall planting may be secured from four sources, namely: (1) Northern seed from the previous year's crop which has been kept in cold storage from late spring until planting time; (2) seed from the previous fall crop which has been kept in cold storage from late spring until planting time; (3) seed from the early spring crop grown in the south, either southern Texas, Louisiana, or Florida, which has been kept in cold storage until planting time (it should be borne in mind that a spring crop of potatoes grown in the states mentioned above matures earlier than the early spring

crop grown in Oklahoma); (4) Oklahoma's spring crop with special treatment such as (a) placed in cold storage for about three weeks, (b) treated with ethylene chlorohydrin, or (c) pre-sprouting before planting.

Planting: Plant the seed of the fall crop deeper than for the spring crop and plant about twice as much seed for a given area. Cover with a moderate ridge.

SWEET POTATOES

Sweet potatoes can be grown in most of the sections of the state; however, they do best in light, sandy soil. It is preferable to plow the ground in the fall, that is, where it does not blow, and then make the ridges in the spring. These ridges may be re-formed a few weeks before setting time to destroy any vegetable matter that may be growing at that time. Just before setting time, drag the ridges down until they are practically level. In case of heavier soil, it is desirable to leave higher ridges than for lighter soil.

It is very important to have good seed for the production of plants or slips. The potatoes are bedded in a hotbed the latter part of March. The plants are never set in the field until the danger of frost is past. Too frequently careless methods are used in the setting of plants in the open. Any method used in setting plants that will injure the plants should be avoided. A good method is to use the spade. Press the spade into the ground and push the handle forward so that an opening is left behind the blade of the spade. Place the plant in properly; withdraw the spade, and firm the soil about the root of the plant with the foot. Three- to four-foot rows are good and the distance apart in the planting in the row will influence very much the size of the potatoes. Too far spacing of plants in the row followed by a moist summer will frequently result in the production of a large percent of large potatoes commonly termed "jumbos." Twelve inches is a good average distance to space plants in the row. Vine cuttings may be used for a late setting, but the yield could not be expected to be as great as from the early slips. Potatoes raised from the vine cuttings afford a means of reducing diseases in seed for subsequent seed purposes.

The majority of sweet potatoes are set out in May and early in June; however, the plants may be set as late as the first part of July, and with a fair season make a pretty good crop. On account of lack of moisture it is not advisable to make high ridges on which to set the plants; especially is this true late in the season.

For "slips" or "draws" for late planting, vine cuttings may be substituted. In fact, potatoes produced from the vine cuttings are less apt to be diseased than potatoes from "slips" or "draws."

Vine cuttings are made by cutting pieces 8 to 12 inches from the runners of growing plants. When the season is moist the runners need not be so long. In case of long cuttings, the base of the stem is coiled around the hand and the coil is placed in the ground; leaving three to four inches of the top projecting above the ground.

VARIETIES: The Porto Rico, Porto Rico Improved, and Nancy Hall are the most popular varieties of sweet potatoes grown in the state. The Porto Rico is planted more extensively, however, the Porto Rico Improved frequently brings a premium on the local market because of its quality and is gaining in popularity.

PUMPKIN

Pumpkins grow quite well in Oklahoma. Their culture is much the same as for melons and cucumbers. The hills should be made 10 to 12 feet apart, and due to their very rank growth, they are usually excluded from the garden. A very good method is to plant them in missing hills in the corn field. In this way they are cultivated along with the corn.

VARIETIES: Among the popular varieties of field pumpkins are Connecticut Field, Kentucky Field and Cushaw. Among the sweet varieties of pumpkins are Japanese Pie, Large Cheese, and Small Sugar and Boston Pie.

RADISH

Radishes may be grown successfully during both spring and fall but become too strong during the hot weather to be palatable. Plant thickly about one-half inch deep in rows, the last of February or early March. Plantings may be made at intervals of two weeks until about the middle of May. For fall radishes plant rather deep from the middle of August to the middle of September.

There are three classes of varieties of radishes, the early small-sized, the later long-shaped, and the winter radishes. The length of time required for maturity is in the order of classes as named. The winter varieties require the longest time to mature.

The small, round, or oblong varieties will require only three to four weeks to mature from seed.

Plant the seed from the last of July to the middle of September for fall use.

VARIETIES: Early Scarlet Globe, and French Breakfast are early varieties. White Icicle, Chartist, and Long Scarlet are larger, longer, and later varieties.

China Rose and Chinese White Winner are winter varieties.

RHUBARB

Rhubarb is nearly always grown from roots or crowns. These crowns are usually secured from a seed house, nursery, or neighbor. In the drier sections of the state, low ground is especially desirable as a site for rhubarb, as rhubarb needs a great deal of moisture and is a gross feeder. Any deep rich soil that has been well manured will, however, prove quite satisfactory. It is preferable to set the roots or crowns at least in a semi-shaded place in most sections of Oklahoma. A number of instances have been observed where rhubarb has been grown in a limited way on the northeast side of buildings.

In the garden, it is preferable to set rhubarb on the shaded side where there is a board fence to protect the plants from the sun. The crowns should be set two or three inches deep and three feet apart in rows four or five feet apart. They should be set early in the spring. Cultivate thoroughly during the entire season. The second year the stalks may be pulled for four or five weeks.

VARIETIES: Victoria, Linnaens, and McDonald are good varieties.

RUTABAGA

The rutabaga is more of a fall than a spring vegetable in Oklahoma. They are slower to mature than the turnip and where planted in the spring, the hot weather frequently comes on before they are large enough to eat and as a result they become tough, stringy, and bitter. They are best grown in the fall. Seed planted in late summer in rows, harvested in late fall, and banked in soil banks for winter use is a good practice.

The culture of rutabagas is the same as for turnips, except that rutabagas require a little longer time to mature. Plant the seed the last of July to the middle of August.

VARIETY: American Purple Top is a good variety.

SALSIFY OR OYSTER PLANT

The culture of salsify is much the same as for the parsnip. The seeds should be planted one inch deep in rows three feet apart, as soon as possible in the spring, about the last of February or early March. When the plants are well started thin three to five inches apart. The roots may be used in the fall, dug and stored for use during the winter, or they may be al-

lowed to remain in the ground until spring before digging during a mild winter.

VARIETY: Sandwich Island is the common variety.

SPINACH

Spinach is now a much more popular vegetable in Oklahoma than it was formerly. The growth of spinach has been urged because of its value in the diet.

Spinach will grow in a wide range of soils. Rich loam soil, fairly moist and well drained, is preferable for growing this vegetable. Since it is a leafy plant, plenty of nitrogen in the soil is very important; and where it is grown in such a soil, it is much more succulent and tender.

Spinach is a semi-hardy vegetable and thrives best during the cool, moist portions of the growing season, namely spring and fall. For spring, plant the seed in February and March and for fall and winter, plant when the fall rains and cool weather begin, which, as a rule is in September. Plant in rows for home use.

VARIETIES: Long Standing Bloomdale, Old Dominion, and Bloomdale Dark Green are good Savoy varieties. Giant Noble is a desirable smooth leaved variety.

NEW ZEALAND SPINACH

New Zealand spinach is not a true spinach and belongs to a different botanical family. The foliage resembles somewhat that of ordinary spinach and is used for the same purpose, that is, for greens. The foliage is smaller, thicker, and has more of an icy appearance. The plants are branching and spreading in nature, one plant frequently covering a space three to four feet square. The seed are large and angular, and have a very hard seed case. Soaking the seed or filing or cutting a hole in the seed case will hasten germination.

New Zealand spinach will stand the hot dry weather of Oklahoma and should be planted by every home gardener.

The tips of branches and foliage are used for food and are clean from sand and soil as a rule. Plant in early spring in rows four feet apart and thin plants to two feet apart in the row. For semi-commercial use in Oklahoma New Zealand spinach is often planted late in order to follow the common spinach which is usually out of season when the weather becomes hot and dry.

SQUASH

There are several types of squash, three of which are raised more or less in Oklahoma. These are the Hubbard, the Cu-

shaw, and the Summer squash. The Cushaw and the Summer Crookneck are particularly well adapted to the prairie section of Oklahoma. The insects must be watched closely, however, or the young plants will be destroyed. The Cushaw and Hubbard should be planted in hills eight to 12 feet apart, April 10 to May 1. The summer squash should be planted in hills three or four feet apart. Eight or 10 seeds are usually planted in a hill, and the plants later thinned to two or three.

VARIETIES: Among the summer yellow varieties of squash are Yellow Straightneck, Yellow Crookneck and Yellow Bush. The most popular summer white squash is the White Bush (Scallop) (Patty Pan). The Green Hubbard is the most popular winter large squash while the Table Queen (Acorn) is a popular small winter squash.

SWISS CHARD

Swiss chard is a vegetable that should be planted more extensively in the home garden. It is one of the vegetables that may be planted in early spring and will stand the hot dry weather of summer and continue to furnish a vegetable dish from spring until freezing in the fall or early winter. It is what might be called a dual purpose vegetable. It is used for greens in the spring and early summer, and later the stems and larger veins of the leaves may be stripped, creamed, and substituted for asparagus. Thus, Swiss Chard may be termed as greens and also summer asparagus.

Swiss chard is described as a foliage plant; therefore, it does best where planted in a rich soil. It will then produce a quick and tender growth. Plant the seed in early spring, the last of February or first of March in rows, and finally thin to eight to 10 inches apart in the row.

VARIETY: Lucullus and Fordhook Giant are good varieties.

TAMPALA

Tampala is a new and untried vegetable in this state. According to "Work" tampala is a new name for an old Chinese vegetable. In contrast to spinach it grows well in mid-summer and is of good table quality, mild flavored and not so coarse as Swiss chard. The leaves are prepared, cooked and served like spinach. It does well in hot weather. The young stem tips and leaves may be cooked together. The larger stems, up to the size of one's little finger, may be separated from the leaves and cooked as you would cook asparagus.

A small initial planting would be interesting. Plant similar to spinach but not as early. Bean planting time will be satisfactory for tampala.

TENDERGREEN

Tendergreen tastes similar to turnips while young, as it grows older the flavor is more like rape or collards. It does not have the pungent taste of mustard or the spinach flavor which some people do not like. The seed germinate and come up quickly. Plants are vigorous and more productive than mustard, spinach or Seven Top turnips.

Tendergreen plants are quite resistant to heat, drought, and cold. This vegetable deserves to be planted more extensively in Oklahoma.

Plant in early spring and thin in rows.

TOMATOES

The tomato is one of the most popular vegetables grown. However, in many portions of the state, especially during early hot dry summers, the plants frequently shed a large portion of their blossoms and do not set fruit. Other than this difficulty tomatoes are comparatively easily grown.

The falling of the blossoms without setting fruit is not so prevalent early or late in the season, but is worse during the hot and dry weather. Therefore, we should do everything practical to induce plants to set on a maximum amount of tomatoes before unfavorable weather sets in.

The principal factors favoring the production of tomatoes are: (1) The rising or securing of large stocky cold frame plants to set out in the open ground when the danger of frost is past; (2) Setting the plants in a semi-protected place from the southwest winds; (3) Setting the plants deeply and properly spacing in a fertile soil; (4) Proper staking or trellising and pruning; (5) Cultivation.

Stocky Cold Frame Plants.—Plant your tomato seed in a hotbed about the fifteenth of February. Lay off the rows in the hotbed two or three inches apart and one-half inch deep. Drill the seed in, or broadcast them; then cover and water. Keep the hotbed properly watered and ventilated, leaving the seedlings in the hotbed about three or four weeks before transplanting to the cold frame. A "flat" may be used as a substitute for the hotbed.

Keep your tomatoes properly watered. That is, when the soil becomes dry, water thoroughly in the morning, and do not water again until the surface shows the soil becoming dry. Do not permit stale, warm, wet air around the plants as they are

more apt to rot off under such conditions. During the warm days or warm portion of the day ventilate the hotbed.

When the plants have reached a height of one and one-half to two inches, which should be in about three or four weeks, transplant them to a cold frame. Prepare the cold frame by forking up and pulverizing the soil. In case the soil is not fertile, work in some well pulverized, rotted manure. Set the plants a little deeper than they were in the hotbed or flat. Space the plants four inches apart each way which will give them plenty of room to develop into stocky cold frame plants by the time they can safely be planted out in the garden. Water the plants thoroughly immediately after transplanting to the cold frame. Protect from the hot sun and wind, shading during the hot part of the day for the first few days. Watering should be done in the mornings and frequency will depend upon the heat, wind, and vigor of growth of the plants. Simply watch the plants and when the soil becomes dry on top water them thoroughly.

Gradually harden off the plants toward the close of the cold frame period, by uncovering them a little earlier in the morning or admitting more air and by leaving uncovered later in the afternoon. Finally, on warm nights the cover may be left off entirely.

Set Plants in a Semi-protected Place. You have undoubtedly observed that semi-protected tomato plants set on more fruit than plants set out in an open exposed place. Where your plants can be set to the north or northeast of a building, a hill or forest, the hot summer winds will be broken. In setting plants in such a protected place avoid excessive shade by not placing the plants too close to the building or hill or trees.

A thick planting of corn to the south or southwest will serve as a late windbreak. The writer has observed some marked differences favoring the summer windbreaks for tomatoes.

Setting Plants.—Contrary to general supposition tomato plants will set more fruit in a rather rich soil than in only fairly rich soil or poor soil. In case the soil selected for your tomato planting is not rich, rotted manure may be applied around the plants in setting, providing it is well mixed with the soil. In case rotted manure is not available, supply fresh manure as a mulch after the plants are set out and gradually work the manure into the soil.

Where a plant lies on moist soil it will take root and where a plant is set deeply, say two or three inches deeper than it stood in the cold frame, it will develop a second root system

and therefore will be able to stand more dry weather on account of the deep root system.

Set your tomato plants in five-foot rows. If staked or trellised, the plants can be set as close as 24 to 30 inches apart in the row.

Tomato plants should not be set in the open until danger of frost is past. However, should the season be misjudged and if it becomes necessary to protect the plants, bend them over and cover with soil, merely leaving the tip of the leaf uncovered. Plants may be left covered two or three days.

Staking or Trellising and Pruning.—Staking consists of driving a stake down by each plant. Drive the stake deep enough to support the plant and leave it projecting about four feet above the ground. The stake should be in place by the time the plants are 15 inches high. Tie a soft string tightly around the stake and then loosely around the plant. As the plant increases in height, it will be necessary to tie the plant above twice more.

Where stakes are scarce, a trellis similar to a grape trellis may be used. Set permanent end posts and fairly permanent posts every 20 feet. Temporary light posts or supports may be set in between. The permanent end posts should be seven feet long. Set them two feet deep, and thus they will project five feet above the ground. Fairly heavy wire is preferable. However, the writer has used waste bailing wire, fastened together to give length. Fasten the wires on the windward side of the post. The bottom wire should be about two or two and one-half feet from the ground and the second wire at the top of the post.

Before you begin tying to the bottom wire decide how many stems you are going to leave on the tomato plant. About two stems is a good average, that is, the main stem and one branch. The branches except at the ground, arise at the base (axils) of the leaves. Select the branch to be left in addition to the main stem and pinch out all the other branches, while young, small, and tender. You may think this pruning difficult, but go out and examine a tomato plant that is 8 to 12 inches tall and you will find one main stem and branches coming out along the stem just where the leaves are attached. After the surplus small branches or suckers are pinched out, others will appear higher up as the plant grows. Keep these suckers pinched out from time to time. When the branch which was left in addition to the main stem reaches some size, secondary branches will appear on it the same as on the main stem; keep these pinched out. Where these branches are left too long, they

consume nourishment and after a certain size is reached, they cannot be pinched out and it will be necessary to cut them out.

With this system of training much less tying will be necessary. When the plants have a tendency to drop over tie a soft string loosely around them, just beneath a leafstem, about the third leaf from the top of the plant. Carry the string up to the bottom wire and tie. This will support the plant and keep it in an erect position, until it is considerably above the wire. Finally tie a second string to this same stem, similarly as in the first case, and carry the string to the top wire and tie. The plant will finally reach the top wire and can be tied so it will not fall over as badly as it continues to grow taller. The secondary stem or branch is tied the same as the one just described.

After the two branches reach the top wire further pruning is usually abandoned.

Cultivation.—Frequent shallow cultivation is important. In addition to the usual advantages of cultivation there is the additional value of assisting in maintaining more uniform conditions and thus tending to lessen blossom end rot. Cultivation will conserve moisture, keep down grass and weeds, and permit air to enter the soil. A cultivation should be given after each rain or at least every two weeks. One of the principal advantages of staking or trellising and pruning is to permit cultivation throughout the entire season.

Mulching the tomatoes with straw or grass clippings, as substitute for cultivation, in small plantings, is becoming more common and results seem to be satisfactory. Where systematic, thorough cultivation is not practiced, mulching will give decidedly better results.

VARIETIES: The following varieties are suggested: Early—Danmark, Penn State, Summerset. Midseason—Stokesdale, Pritchard, Bounty. Late—Marglobe, Rutgers, Pearson. Wilt resistant—Pritchard, Marglobe. Small Fruited—Porter, Yellow Pear.

Two small fruited varieties which usually set fruit under adverse conditions, including heat and drouth, are Danmark and Porter.

TURNIP

The turnip is a cool weather plant, and it is difficult to get the seed to germinate during dry, hot weather. The turnips also get more or less woody and strong if grown during hot weather. Plant thickly in three-foot rows about the last of February or early March. Thin the plants later to five inches

apart. For the fall crop, sow in rows or broadcast sometime in August or September on well prepared land. Cover with a rake or brush harrow. The success of this crop in the western two-thirds of the state depends wholly on the amount of fall rain.

Turnips are usually regarded as the principal fall garden crop. On account of greens and turnips furnished in the fall and turnips during the winter where cared for rightly, turnips are entitled to a place in every fall garden.

Where turnips are planted too early and dry, hot weather follows, the quality is usually poor, the turnips being tough in texture, strong in flavor and difficult to cook.

There seems to be a difference of opinion as to which is the better method of planting turnip seed—in rows or broadcast. Under the average conditions, the row method is preferable. The chief advantages in the row method are: insures better stand, does not require so much seed, cultivation may be practiced, and under average care, the turnips will be larger.

Where seed are planted in rows, the seed may be pressed after being distributed in the drill previous to covering them with loose soil.

In case of soil foul with grass and weed seed, the row method is a distinct advantage. The grass and weeds may be kept in check by cultivation, which at the same time will conserve moisture and loosen the soil. Where the plants are thinned properly in the row the turnips will be larger and of a more uniform size.

The thinning of the turnips should begin just as early as the foliage is large enough for greens in order to give space for the other plants to grow. As the turnip is a semi-hardy vegetable, it will stand considerable freezing. The turnips which are left at the approach of very cold weather may be stored in a soil bank for winter use.

VARIETIES: The Purple Top White Globe is the most popular variety of turnip grown in Oklahoma. Another good variety is the Golden Ball. The Purple Top Milan is grown as an early, quick maturing turnip.

WATERMELONS

Watermelons prefer a sandy soil containing an abundant supply of organic matter which enables them to better withstand dry weather. A soil in which legumes have been grown which is of a light sandy nature is an especially desirable soil for growing watermelons.

Watermelons are comparatively gross feeders; therefore, where the soil is not naturally fertile, a liberal use of barnyard manure is desirable. Rotted manure is desirable for spring applications. Where manure is comparatively scarce, it would be well to distribute it in the furrow or in the hill and mix it well in the soil previous to planting the seed. Watermelons are sensitive to cold and, therefore, should not be planted until the danger of frost is past. Frequently an early chance planting is made, and in about 10 days a second planting is made in the same hill or row. Thus, if the first one is injured by cold, one has a certain stand in a comparatively short time.

It is preferable to plant watermelons in check rows varying from 10 feet each way to 15 feet apart each way in case of drier and thinner soils. Melons are responsive to good cultural treatment which check planting facilitates. It is not desirable to handle the vines after they have begun to set fruit.

By thinning the vines to one in a hill at the final thinning and reducing the number of melons per vine, the melons will be larger and more uniform in size. In thinning the melons, it will be necessary to go over the patch two or three times, at intervals of about 10 days. As soon as imperfect melons are noticed, they should be removed.

Watermelon wilt is becoming a crop limiting factor in some sections of the state. The most practical way of growing melons under wilt conditions is by planting wilt resistant varieties, the leading ones of which for commercial planting are: Stone Mountain No. 5, and Hawkesbury, Kleckley's No. 6 and Klondike R7.