Cultural Methods for Some Common Vegetables

ASPARAGUS, CABBAGE, CELERY, ONIONS, TOMATOES

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Asparagus Culture

ONE of the best and easiest grown of our garden perennials is the asparagus plant. It can be started either from seed or from plants. If one wishes to raise plants to sell, it is better, of course, to plant the seed, but if asparagus is wanted for home or market use, in the shortest time possible, it is better to set out yearling seedlings.

It is important, in laying out the asparagus plantation, to select a place where it can remain permanently, for, if taken proper care of, the plantation will last for twenty years. The old idea was the asparagus "bed," the new is to plant in rows the same as corn, etc., so that for the market garden the cultivation can be done by horse. The land selected should be a deep, rich, fertile, moist, and cool soil, having a warm exposure, a gradual southern slope being preferred. If the land is originally hard and coarse, it should be worked a year or two in advance by the raising of some thoroughly tilled crop, using as much manure as possible in the process. Late, deep fall plowing is preferable, turning under a thick covering of well rotted manure. In the spring when the frost is out of the ground, plow furrows from six to ten inches deep and four feet apart. If the soil is not of the best quality, two or three inches of well rotted manure should be placed in the bottom of each trench and on this add a couple of inches of loose soil. Then, place the plants in the trench three feet apart. Cover with three inches of earth, it not being well to cover deeper, as it takes too long for the young shoots to push their way through. As
the shoots grow the rest of the earth can be filled in around them by after cultivation. When filled in, the crowns of the plants should be about six inches below the surface of the ground, for, if planted much less, the roots will push up to the surface and interfere with cultivation.

If asparagus seed is to be planted, it should not be more than one year old, as the germinating per cent. of older seed is low. Soaking the seed several hours in warm water enables germination to take place sooner, as ordinarily it takes about six weeks for the plants to come up. The seed is planted by the garden seed drill, in rows about eighteen inches apart. When the plants are up, thin out to about four inches in the row. It is well to sow radish seed with asparagus, as the radish will come up much quicker than the asparagus and enable one to detect the rows for weeding. The radishes can be pulled without interfering with the asparagus, as they can be matured before the asparagus reaches any height. The seedlings are set out the next year.

As the asparagus is a gross feeder, it is well to mulch in the fall with more or less well rotted manure, although straw and leaves will do. Before mulching, the old stalks should be cut and carried away, and, if affected with rust, should be burned. In early spring the straw and undecayed leaves should be removed, and about the last of June cover with a good coating of well rotted manure and cultivate in. Very little cutting should be done until two years after setting out, and then
the cutting should not be carried on later than July first, as the plants need to grow in order to store up a food supply for the next year's growth. In cutting the asparagus for use, a sharp, square-pointed knife should be used, and a straight, downward cut made just underneath the surface of the ground, care being taken not to injure the unseen shoots.

Where plants are affected with rust, spray with soap Bordeaux mixture, which is made up of four pounds of copper sulphate, four pounds of fresh stone lime to forty gallons of water, adding four pounds of dissolved laundry soap. As a prevention, destroy all stray plants affected with rust in the vicinity. Asparagus can be forced in winter in cellars, or hotbeds by using the roots of old plants; but these generally die after this kind of treatment. It is advisable only to use plants from an old field which is to be plowed up.

Some of the best varieties are: Early Argenteuil, Conover's Colossal, Palmetto, and Columbian Mammoth White.

R. S. HERRICK,

Cabbage Growing

Cabbage, like the onion and celery crops, is best adapted to a cool, moist, loamy soil. The cabbage is also a gross feeder, so heavy manuring of the soil is essential. This plant adapts itself to a great range of climates. However, the very best product, we believe, is produced in the mountain valleys, where the nights are always cool and the days not very warm.
The preparation of land for cabbage growing does not differ materially from that of other garden crops. It should, of course, be put in good tilth, and an abundant supply of well rotted stable manure should be used.

Cabbage seed must be sown six or seven weeks before it is desired to set the plants in the field. The time for planting varies somewhat with the season. Seed for early cabbage is sown about the first of March in flats in a forcing house or in hotbeds. If sown in hotbeds the seedlings are not usually transplanted until they are set in the field. The growing of plants in the greenhouse or in hotbeds is a trade in itself, the details of which must be carefully looked after. Seed for late varieties is usually sown in the open ground. Several sowings should be made, the first being planted about the tenth of April.

Of recent years young cabbage plants have suffered greatly from the attacks of the flea beetle. In many instances growers have lost their entire plantings by the ravages of this pest. The only practical way to combat this insect on the young cabbage is to grow the plants in frames where they may be covered with thin muslin. The most critical time is when the plantlets are pricking through the ground. The shading afforded by the thin muslin at this time does no harm.

A bed 12 feet long by 6 feet wide will grow enough plants to set one-half acre of land. It is usually estimated that one pound of seed will produce plants enough for four or five acres of land.

Plants for the late crop are transferred
to the field sometime during the month of June. After the land has been put in a good state of tilth ditches are made in the direction which will make irrigation most easy. The distance between the ditches will vary from 24 to 36 inches according to the variety grown. Rows 28 inches apart are perhaps most common. After the ditches are made one man drops the plants 15 to 18 inches apart and another follows to do the planting. The plants are set on the side of the ditch, and as soon as possible water is turned in to follow up the planter.

From four to eight days after the plants have been set water is run through the rows and sometimes this irrigation is repeated two or three times before the ditches are filled. When the plants have become well established the ground is leveled either by hand or with a cultivator. While the cabbage is an easy crop to grow yet it is quickly injured by improper irrigation. It will not stand a water-logged soil.

There are a few insect pests and diseases, and of this number the flea beetle is the most injurious. It can be controlled as mentioned above. Cabbage lice and cabbage worms are not usually abundant enough under field conditions to seriously affect the crop. The black rot of cabbage occurs some seasons. Its presence is known by a portion or all of the cabbage head becoming soft, dark colored and foul smelling. There is no remedy for this trouble, except possibly in the rotation of crops. However, it does not appear every year upon the same land, as is common in the East.
The cost of growing cabbages is estimated at about $33 an acre, and the average price for the past ten years has been 45 cents a hundred pounds.

W. Paddock, Horticulturist and Botanist, Agricultural Experiment Station.

Celery Growing

It would seem at first glance that Colorado conditions would be against the best development of the celery crop. However, we find that where the best type of celery soil is selected and well managed that our celery attains a quality that is rarely equaled. Celery is a native of swamp lands of the seashore, and for this reason, it probably requires more skill to grow the crop to perfection under semi-arid conditions. Celery soil should be naturally moist, and this condition is found usually upon river bottom land. Such land contains a certain amount of sand and vegetable matter so that it does not easily bake.

In preparing land for celery it should first of all receive a liberal amount of well rotted stable manure. Then it should be cultivated and harrowed until the finest possible seed bed has been secured.

There are but two varieties grown to any extent in Colorado, the Golden Salf-Blanching for early, and Giant Pascal for late.

But little home grown seed is used, but those growers who have made a practice of growing their own seed from the best selected plants, have found it to be far superior to the best that was obtainable upon the market. The
vitality of celery seed varies very greatly so that many growers do not count on securing more than 2,500 plants from an ounce of seed, although sometimes as high as 25,000 stalky plants are secured from the same amount. Celery seed is very slow in germinating, consequently the young plants are difficult to grow.

Seed for the early crop of Golden Self-Blanching is usually sown between the first and fifteenth of March in mild hotbeds from which crops of lettuce or radish have been removed. Pascal celery seed for the late crop is mostly sown between the first and fifteenth of April in coldframes or in the open ground. There are advantages in favor of planting in frames where protection may be given by cloth, as the shade prevents the ground from rapidly drying and baking.

Plants are set in furrows sometimes in the edge of a small stream of water, and if this is not done the water should follow very closely after the planter. Where Golden Self-Blanching is grown, rather wide furrows are made and the plants set on each side of the furrow, thus making two rows about 12 inches apart. The distance between the double rows is about four feet. Giant Pascal is grown in single rows and the plants are set from 6 to 8 inches apart in the row with the rows four feet apart.

Very thorough cultivation, of course, must be given to the celery plants, and the weeds must be kept down. No directions can be given in regard to irrigation, for the reason that land varies so much in regard to its requirements for water. An effort should be made
to keep an even degree of moisture.

Celery plants are blanched either with boards or earth, and some Giant Pascal is partially blanched by tying each hill with newspaper. Most of the celery is finished by placing it in trenches about 12 to 18 inches wide, and a little deeper than the plants are tall.

When danger from frost occurs, a light covering is put over the top of the trenches, and this must be varied to suit the conditions.

The cost of growing celery varies considerably according to the way it is handled. Perhaps $150 an acre will not be far from the average. Two hundred fifty dollars an acre is about as low as a crop has ever sold for, and growers have occasionally received as much as $1,000 an acre.

W. PADDOCK,
Horticulturist and Botanist, Agricultural Experiment Station.

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Onion Growing

The onion thrives best in a cool, moist soil which is easily kept in a mellow condition. Such soils are mostly confined to river bottoms and they contain more vegetable matter and sand than is commonly found in our soils. Large amounts of decayed vegetable matter seem to be essential to the best development of this crop.

Heavy soils are not suitable for onion growing, for the reason that it is difficult to make a good seed bed, and then the surface is liable to bake and crack, much to the in-
jury of the young plants. It is difficult to get a uniform growth of onions on such soils, consequently a large per cent. of scullions usually result.

The land for onions should be heavily fertilized with well rotted stable manure and plowed in the fall or very early in the spring; it is then put in the very best condition possible for planting.

The onion seed should be sown very early, much of it being planted in March, and all should be in the ground by the tenth of April. Early seeding is necessary, for the reason that the bulbs should make most of their growth before hot weather comes on. The seed is sown about one inch deep with hand drills, using from 3 1/2 to 4 pounds per acre. The distance between the rows depends upon the system of irrigation to be followed. If the field is to be flooded, the rows are usually made 12 to 14 inch apart, but if the furrow system is adopted, the ground is plowed out in ridges about 30 inches apart and then flattened to about 9 inches on top. Two rows 3 inches apart are then planted on each ridge, the furrows between the double rows being used for irrigation and cultivation. Most growers try to plant the seed so that the plants will be 1 1/2 inches apart, so as to avoid thinning.

Cultivation and weeding is begun by hand as soon as the plants appear above the ground. The hand wheel hoe is used, but the thinning and some of the weeding must, of course, be done by hand.

If good onion soil has been selected, but
little irrigation will be needed in the fore part of the season. In the heavier soils, where the water is run in furrows between double rows, the irrigation is begun earlier and every effort is exerted to keep the ground moist.

Harvesting is begun by the 15th of September, and the crop is usually all out of the field by the middle of October. The bulbs are pulled by hand and thrown into windrows. After they have become completely cured, the tops are removed and the onions are sorted and sacked. Topping is done by cutting off the tops about a half inch above the bulb, taking care to make a smooth cut so as not to injure the outer coverings.

The principal markets for Colorado onions are in Texas, though some onions are sent as far east as St. Louis.

A great many varieties have been tested and the so-called new onion culture has been attempted. The numbers have gradually narrowed down to one, the Yellow Globe Danvers. This variety seems well adapted to our conditions of soil and climate.

Good seed is a prerequisite to success. Good home grown seed from selected bulbs has given by far the best results. The cost of growing an onion crop may be estimated at about $60 an acre.

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Training Tomatoes in the Home Garden

For people who are growing vegetables in a limited space it is most desirable to grow the plants as compactly as possible. Few of the garden vegetables sprawl over the ground as do tomatoes. For economy of space, east of culture, neatness of appearance, and increased productivity garden tomatoes should be staked and pruned. The method is also conducive to earliness.

Set the plants as closely as 1½ feet in rows three feet apart (2x4 in the very rank growing varieties). Secure a sharpened stake five or six feet long for each plant, and when the plants are 15 to 18 inches high begin to train them. Remove all the laterals, except one or two, which, with the main stem, may be tied to the stake with strings of white cotton cloth (which will not break the stem). As these continue to grow keep them tied loosely to the stake, constantly pinching off the side shoots. The increased productiveness is not so much per plant as in the fact that so many more can be grown upon the same area. Trellises have been advocated, but require more labor.

The writer is acquainted with a government employe in Washington, D. C., who, for many years, has pursued this method in the very small area of the back yard of a city lot, and has not only grown enough fruit for the immediate use of his family and supplied his neighbors liberally, but whose wife has preserved enough, in various forms, to last an entire year.

Leslie F. Paull,