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HORTICULTURAL DEPARTMENT.

# OREGON AGRICULTURAL EXPERIMENT STATION,

CORVALLIS, OREGON.

## THE CULTIVATION OF VEGETABLES AND NOTES ON VARIETIES

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By GEORGE COOTE.

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## THE CULTIVATION OF VEGETABLES AND NOTES ON VARIETIES.

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### THE ONION.

FROM time immemorial the onion has been cultivated. It is supposed to be indigenous to India. From there it passed into Egypt, where it was cultivated 2000 years B. C. The onions of Egypt are probably the finest and most delicately flavored of any grown. This is due to the fertile soil and balmy climate of that country. From Egypt, it spread into Greece and Italy, and gradually from there all over Europe.

This bulletin will touch upon the so called "new onion culture," which, by the way, is so old, that like fashions and other things, it has been resurrected within the last few years. This method was introduced into England by Worlidge, early in the seventeenth century; nearly four hundred, years ago. He not only clearly demonstrated that he could, by this method, produce a large onion, but also one which would keep better.

By this method seed may be sown in the open as early as the middle of September or it can be sown later in boxes, say in January. These boxes should be kept in a gentle heat, and as soon as the young plants are large enough to handle, they should be pricked out or reset in other boxes or cool frame. This is necessary in order to give the young plants strength and more room to expand. When the plants are from 6 to 8 inches high, they are large enough to be planted out in the open field. Now, this field should be heavily manured in the fall, plowed as deeply as possible and left until ready to plant in the spring when it will easily work into good condition. The reason for leaving the ground rough after the plow, is that it will give better drainage, causing it to dry earlier in the spring and thus permit of an early planting. If these details have been carefully observed, planting may be done with the very first dry weather in April or early part of May, taking care not to work the ground while wet, but taking the first opportunity to harrow it as soon as it is dry on the surface.

After the ground has been properly worked, planting may be commenced, setting the plants from 5 to 6 inches apart in the row, and 15 to 18 inches between the rows. This distance will give a good opportunity for cultivating between the rows, which, by the way, should be done as often as weeds appear, during the season of growth.

From the results of experiments that have been made, the last three seasons have shown that the above method is much preferable for upland cultivation, as excellent results have been had. To those who have not the water at hand for irrigation purposes, this method is highly recommended. The soil should be prepared the same as for raising from seed.

#### **Cultivation of the Onion From Seed.**

The actual time for planting onion seed cannot be stated. This will greatly depend upon the season and the state of the weather and condition of the soil from the middle of February to the second week in April, although the latter would be considered getting late for sowing. However it is better to be a little late than to sow the seed when the soil is not in condition to be seeded. About the middle of March is the proper time for sowing the seed, therefore the first opportunity should be taken when the ground is in proper order, the ground having been previously well enriched and rendered pliable by early fall plowing.

After the plants have made a growth of from one to two inches high, cultivation should commence. This may be done with a hand cultivator or with the hoe. At this stage of growth care should be taken not to permit the weeds to overpower the young onion plants. Therefore careful watching and a thorough hand weeding must be done at this time; afterwards frequent cultivation should be resorted to and the oftener the better in dry weather, where irrigation is not practicable.

Supposing the location to be some old swamp or beaver-dam land and the water having been previously well drained off, and wishing to grow a crop of onions on such land, the first thing in the way of the preparation of such soil would be, to plow very deep early in the fall leaving the surface of the ground rough so that the frost may penetrate through the soil as much as possible. The frost will help to sweeten the soil, that is it will have the tendency

to take out the sourness that is left in the soil which has been caused by a constant overflow of water. Such land would always be benefited by the application of lime.

Onions should not be grown year after year on the same ground. A change of location is essential for many reasons. First, onions like many other growing crops become diseased. Secondly, insect pests deposit their eggs in the soil. These hatch and as soon as the next crop is ready they proceed to devour it, so that a change is good at all times both for the crop and land.

The growth of the onion will not deteriorate by the surface being rather compact, provided the soil can be kept moist by such irrigation. If not, the soil must be kept well stirred at intervals through the growing season. Upon this depends a great deal of the success in the growing of the onion crop.

Onions grown by a system of irrigation, though they yield well under its treatment, do not make the best for keeping long; these should be turned off to the markets at the earliest possible date, keeping those that have not been so heavily irrigated for the later market. Another good plan is to cease the irrigation some time before the crop matures. It is very essential that the crop be perfectly matured, if it is intended to keep it over any length of time. During our moist winters in the Willamette valley, if not well matured, it is impossible to keep them under any circumstances.

#### **Cultivation for Formation of Onion Sets.**

The manner of producing onions for sets is the following: The soil should be of an inferior quality, such as has been run out by constant cropping but should be of such texture as to permit of good cultivation that is it should be easy to work—a poor sandy loam would be preferable. The important thing is to keep the sets from becoming too large, and in order to overcome this, it is advisable to sow fifty five to sixty pounds of seed to the acre.

The seed may be sown as late as the last week in May or the first week in June. By sowing the seed so thick causes the seedlings to be so crowded that it prevents their making a very large growth. In sowing the seed rather a wide drill should be made so that the seed may be spread out sufficiently. If the sets should grow too large these should be picked out and sold for pickling purposes. To prevent the sets from becoming too large, they may be pulled up and

harvested when large enough. As a rule harvesting may be done the early part of August, thus giving ample time for drying off well before fall rains set in, taking care to house them when perfectly dry. The sets may be run through a sieve or screen with about  $\frac{3}{4}$  inch mesh. Use only such as will pass through this screen for sets.

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## PEAS.

In this bulletin only such as have been tested will be discussed. Peas belong to a family of Leguminosæ known scientifically as *pismun sativum* and are thought to be a native of Asia, where they were grown several hundred years B. C. The garden varieties are divided into two classes; the shelling or most common, and the sugar or edible podded, which may be again divided into dwarf or climbing, with seed of each either smoothed or wrinkled. In the United States the shelling varieties are used mostly in the green state. But in Europe they are also used to a great extent in their dry state. The edible podded varieties have a soft, thin pod which may be cooked in a manner similar to the string bean.

Three varieties of peas were grown from seed donated to the station by Atlee Burpee & Co., namely, Hurst's Reliance, Gregory's Surprise and New English Forcing.

Hurst's Reliance proved to be a hardy and strong growing variety, vines when full grown measured from 2 feet to 2 feet 6 inches. It is very productive, pods being well filled with from 6 to 8 peas which are very sweet. This can be highly recommended for a main crop.

Gregory's Surprise is a hardy variety and of a dark green color, growing about 12 inches high and being a little more productive than the Hurst's Reliance. The quality is about the same. The pods are not quite so large, producing from 5 to 7 peas in each. It is an excellent variety owing to its requiring no staking and can be grown closer together between the rows.

New English Forcing.—This is a very dwarf growing pea, the vine being only 8 inches high, producing a good quality of large, well filled pods with from 8 to 9 peas in each pod, of better quality than either Hurst's Reliance or Gregory's Surprise. Below is given in tabulated form the results of the notes taken on the three varieties above mentioned:

Name of Variety.	Date of Sowing ..	Date of Germinat- ing .....	Date of Blooming	Date of Edible Maturity .....	Date of Market Maturity .....	Date of Maturing
Hurst's Reliance.....	April 17	May 1	June 22	July 4	July 10	July 30
Gregory's Surprise.....	April 18	May 1	June 4	June 20	June 26	June 30
New English Forcing.....	April 17	May 1	June 6	June 24	June 29	June 30

## BEANS.

Union Bean No. 4966.—Seed received from the Department at Washington. The variety has been tested for two years in succession and proves to be an excellent one on account of its productiveness and good quality and length of season. It stands the dry season well, and does not become stringy and tough as some others do.

Burpee's Stringless.—This, as the above, gave good satisfaction; is productive and of good quality, pods being quite fleshy and very tender and of an excellent green color, which make it a very desirable market variety.

Burpee's Extra Early Refugee.—A very prolific bean of good quality, well worth its cultivation; ranks very favorably with the best; plants dwarf and close growing.

### Burpee's New Willow Leaf Bush Lima.

The great trouble with the Lima bean in this locality and perhaps throughout the Willamette valley, is that it is a very uncertain crop. The last two seasons have matured them very well, but for several seasons before it has been impossible to mature them in time to harvest the crop. This variety is very dwarf growing, being only from about five to six inches high with pods about three inches in length by one inch in width, containing from three to four beans in each pod.

In 1900 seed of the above variety matured on the experimental ground. The seed saved was sown in the spring of 1901 at the same time and in the same row with seed of the same variety sent out by Burpee & Co. of the above year.

This was done in order to test the productiveness and the dates of maturity of these same varieties grown in different climates.

The result was in favor of home-grown seed, plants were stronger, quite a considerable more productive, and matured earlier. In both instances the quality was good.

Burpee's Bush Lima strain of Quarter Century.—This variety made fairly good growth but did not mature much seed. It is not in any way suited to our location. But what seed did mature will be sown this year to see what the outcome will be next fall with home grown seed of this variety.

Buff Bean.—Pod yellow, a good strong growing plant; one of the early varieties. Very productive, ranks favorably with Union and Burpee's New Stringless. Only drawback to it is that the pod is yellow. Those who like the color of pod will find it very suitable owing to its productiveness.

Broad Bean—*Faba vulgaris*.—Several varieties of this bean have been received from the Department of Agriculture, and have given good results, being quite hardy, they can be grown in our climate to good advantage for stock feeding purposes, although the varieties treated upon are mostly used as a vegetable in their green state—never in the dry. That is not to the writer's knowledge though he has been acquainted with them for over half a century.

In order to appreciate them in the young state, a taste must be cultivated for them, as they have a peculiar flavor of their own. In Italy, Germany and England, they are very much grown for table use, also for horse feed, although the smaller variety is generally used for the latter purpose. When used as a vegetable they must never be permitted to become the least matured, although some prefer them even when in half matured condition. When cooked in this latter state the water should be strained off and other hot water be used to finish cooking them; this will take away the rather strong taste. They are mostly cooked with pork or bacon. Do not understand me to cook the pods as in the string beans, but shell the same as peas.

Culture.—This variety of bean should be sown early, say February, and not later than the middle of March, if good results are expected. Owing to the manner in which the roots penetrate the soil, very deep plowing is essential. This will give them an opportunity to throw their long tap root well into the soil, as otherwise they can not do when grown on shallow ground. Sometimes these are grown on soil that needs a change from heavy and continued crops. They should be sown from two to three feet between the rows. This

gives a chance for good cultivation of the soil during the greater part of the summer, serving both as a fallow crop and as a means of growing a good quantity and good quality of food either for hogs or horses. When used for the latter they should be very coarsely chopped, one-half pint per day will have a great effect on the animal, putting fresh life and vigor into him, enabling him to stand the strain of the daily work much better.

The following table gives the results as shown by notes taken:

Name of Variety.	Date of Planting.	Date of Germinating.....	Date of Bloom.....	Date of Edible Maturity.....	Date of Marketable Maturity.....	Date of Maturity
Union.....	May 4	May 14	July 11	July 17	July 22	August 28
Burpee's Stringless.....	Sept. 30	May 14	July 2	July 12	July 17	August 17
Burpee's Extra Early Refugee.....	April 26	May 10	July 21	July 28	July 30	August 28
Burpee's Bush Lima, strain of Quarter Cent.	April 30	May 14	July 20	July 30	August 5	Sept. 15
Burpee's New Willow, leaf Bush Lima.....	April 30	May 14	July 24	August 5	August 10	Sept. 5
Burpee's New Willow, leaf Bush Lima.....	April 30	May 14	July 8	July 17	July 23	Sept. 5
Buff Bean, Dept. Agri. No. 4984.....	May 4	May 15	July 11	July 17	July 22	August 28
Broad Bean, No. 4353, variety Scileans.....	April 13	April 30	July 25	July 10	July 15	August 12
Broad Bean, No. 4358, variety Neapolitan...	April 28	May 12	July 7	July 18	July 25	August 12
Broad Bean, No. 4352, variety Servilla long pod	April 28	May 12	July 12	July 25	July 30	August 28
Broad Bean, No. 4351, Aqudulce Improved...	April 28	May 7	July 18	August 2	August 8	August 28

Broad Bean—*Faba vulgaris*—Average yield per acre of the varieties of Broad beans; 75.41 bushels, grown 18 inches between the rows or planting 5 rows to rod or 3.3 feet apart the yield was 34.26 bushels.

## VEGETABLE MARROW.

This is a half hardy annual, requiring the same cultivation as the pumpkin or squash. Two years ago several varieties of the marrow were received from the Department of Agriculture, the seed having been received from Italy. The plants do not run to vine as do many of the English varieties, such as Moor's Vegetable Cream and the like, but make a compact growth, producing their fruit from the main stem. In most cases the fruit is of a dark green color, often mottled either with white or yellow. Some plants produce marrows from twelve to fifteen inches in length, others round fruit, some being green or white or of a yellowish color; as above, all being smooth instead of having a rough, warty growth like the

summer squash, namely, the crook neck. All varieties of the vegetable marrow are more strictly a summer vegetable, consequently are of no value for winter use as are the squash and pumpkin. The cultivation is in every way the same as for the latter. The vegetable marrow being a summer vegetable, it is desirable to plant seed early in pots or boxes in hotbeds prepared for that purpose, taking care to harden off before planting out in the open ground. This should not be done until all danger of frost is past; previous to setting out, the ground should be well covered with well rotted barnyard manure and plowed under as deeply as can be done. When manure is scarce I have found the following plan answers remarkably well: first dig out a hole twelve or fifteen inches deep and place several shovelfulls of manure into the same, covering the manure over with the soil that has been taken out to the depth of six or eight inches, then set the young plants in a triangular position over the spot where the manure has been deposited. Seed may be planted in the way described for plants. This plan works well on all varieties of the squash family. The following numbered varieties were received from the Department of Agriculture: Nos. 3136, 3134, 3148, 3133, 3132.

There was not enough difference in the growth and production to warrant a separate description. Each packet of seed produced marrows of all shapes and colors, some being quite round and dark green; while others were oval or oblong, some were spotted with white and yellow. The plants were of a compact growth.

## BROCCOLI AND CAULIFLOWER.

There is a great deal of misunderstanding regarding the Cauliflower and Broccoli. Both are the same in their general make up and growth, both producing heads in the same manner and to the casual observer are taken one for the other. The difference is that Cauliflower is a more tender variety and therefore will not stand a very low temperature. The seed is sown in early spring and will produce heads during the summer.

The Broccoli will stand a temperature as low as 25 without much injury to the plant. The seed is sown in the spring, the plants set out in June or early part of July and continue to grow until the spring following, some varieties producing heads at intervals during winter and up to as late as Máy. Attention needs to be directed during the winter to such plants as are about to produce heads. These should have the outer leaves turned over the head to protect it from frost to which it is very susceptible.

The seed may be sown and the plants treated in every way as for the cabbage. They thrive well in a deep, rich soil. Much better results would be had if more attention were given to the matter of deep cultivation, that is, in deep spading or plowing of the ground. Manure that has been well composted should be used plentifully.

and plowed in deep. By so doing the roots of the plants are encouraged to penetrate deep into the soil where they can find moisture as well as food. The shallow plowing in of manure has the tendency to keep the feeding roots of plants near the surface and will therefore soon dry out and turn blue, and when once the plants are stricken with the blues no further growth will be made and they might as well be discarded.

Experiments were made in growing the Broccoli for seed production during the years of 1900 and 1901, but the results have not been satisfactory owing to the temperature's falling so low that the tender heads become more or less damaged and as a result failed to produce seed to any considerable extent. I am inclined to think that if the experiment were made in the southern part of the state where the climate is more even that quite a success might be made in the production of seed. As it is, nearly all of our seed has to be imported.

The following varieties of cauliflower are best adapted for early use: Early Snow Ball, Extra Early Erfurt and Early Paris. There are many so-called varieties but the above have proved to be the most reliable on our testing ground. For second early are Burpee's Dry Weather, Lenormand's Short Stem. For fall and early winter Veitche's autumn Giant Broccoli, for succession, as follows: Snow's Winter White, Knight's Self-protecting, Purple Sprouting, Daniels' Mammoth, and the Old French—The Sulphur. The above will be found to mature in the order named.

Seed for extra early planting may be sown in cold frames the first week in October, and the young plants thinned out so that they do not stand too thick in the bed. The frame should be provided with glass lights so that the plants may be protected at will from heavy rains and frost, taking care to give plenty of air at all times. During the winter, plants grown in this manner will be ready to set out early, and are more hardy than those that have been hurried up in a hotbed in early spring.

Plants raised under glass in early spring should be well hardened off before attempting to set out into open ground. For the late varieties, seed may be sown in a bed prepared for that purpose in the open ground. In removing young plants from the seed beds, care should be taken to lift them with all the roots possible. Do not attempt to pull them up. By so doing the greater part of the roots are left in the ground and the plants will be much weakened by it. Broccoli may be treated in the same manner as late Cauliflower.

In concluding this bulletin, I wish to say that it was not written so much for the professional gardener, as for the amateur, the novice, who takes a keen interest in all the little details of the successful growing of his kitchen garden and who desires to grow the best varieties to the very highest state of perfection, without taking into consideration the extra work that such care and cultivation may cause.

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