

Every Western Oregon Farmer and Gardener Ought to Grow Broccoli One of the Greatest Money Makers of all Crops

BROCCOLI GROWING IN GENERAL AND IN PARTICULAR BY PROF. A. G. B. BOUQUET

It Is Found Growing Best in Douglas County, the Coast Counties of Oregon, and Parts of the Willamette Valley—Two Strong Points in Favor of the Growing of Broccoli on the Farms of This Section—Good for People, and Good for Cows

(Following is the language in full of Circular 148, on "Broccoli Growing," by the Oregon Agricultural College Extension Service, the author being Prof. A. G. B. Bouquet, professor of vegetable gardening, one of the best authorities on this coast, and who has paid a great deal of attention to the broccoli industry.)

Broccoli, or winter cauliflower, is a hardy variety of cauliflower which has been developed for a number of years to withstand the cool temperature of the winter, and on the approach of spring, white heads are produced which are particularly acceptable to the trade during February, March and April.

Areas Adapted for Growing Broccoli. Due to the fact that this vegetable must remain in the ground during the winter it is necessary that the winter climatic conditions must be moderate otherwise the plant will succumb to frost. Successive low temperatures, such as 14 to 18 degrees above zero, will injure the plant and cause as a rule the collapse of the tissues of the stem which is the most susceptible portion of the plant.

Broccoli is, therefore, to be found growing best in Douglas county, the coast counties of the state, part of the Willamette valley, and the more protected part of the Columbia river. East of Portland and Troutdale, this vegetable is not successful due to cold winter temperatures and cold driving winds. In Southern Oregon some broccoli can be successfully produced, especially in the lower altitudes. The plant is one that is naturally adapted to mild winter conditions as well as to spring temperatures which are particularly warm.

The Roseburg district and vicinity is now producing fine broccoli which is well grown under the conditions there prevailing. The majority of the car lot shipments out of the state have been from this point.

Location of Land and Soil Types. Land for growing good broccoli must be naturally protected from cold winter winds which are injurious. Also the soil must be well drained inasmuch as the plants must remain in the ground during the winter time. The soil must likewise be of such a type as to hold moisture reasonably well during the summer, otherwise transplanting will be difficult and the plants will not survive the summer drought.

Manure is the most suitable fertilizer for broccoli and is always applied with profit. Some growers have been making a practice of putting manure between the plants during the fall in order that the ensuing crop may benefit from the application of the manure. Also this furnishes a coating over the ground which will minimize to some extent the tramping of the soil during harvesting. A spring application of manure is to be advised especially where no cover cropping has been practiced. If the ground is loose and rather light it should be covered in the early fall followed by plowing under the cover crop in the early spring and possibly a light application of manure. The use of cover crop is especially to be recommended for soils that seem to be rather loose and is used also with profit on soils that have a tendency to pack if they are rather heavy.

Some growers believe that broccoli can be profitably produced without resorting to the use of some commercial fertilizers. There are others, on the other hand, who grow extensive crops of broccoli who have never used commercial fertilizers. This subject is largely a matter of individual farm practice.

can be put into a fair state of till for growing broccoli.

Soils that naturally produce fine cauliflower cannot be used for broccoli because of their high water table in the winter. Such soils might be beaverdam lands, the peat soils or lands which are high in organic matter. If soils like these can be found that are well drained they will produce good broccoli but usually they have a high water table in the winter.

There is somewhat of a tendency at the present time to produce broccoli on some land that is not adapted to it. I recently saw for example a large field planted in this crop in red soil which had been farmed to grain for a number of years and which was evidently run out. The plants would not grow due, probably to the summer drought and the lack of organic matter in the soil and the soil was being cut would hardly pay expenses of growing. Broccoli soil must be fertile, well drained, of moisture holding capacity and carefully selected. Failures of crops are bound to occur if care is not exercised in choosing suitable land.

Preparation of Ground for Transplanting. If the land is continuously used for broccoli it must be of an exceptionally good type, inasmuch as the land has to be plowed rather late following the harvesting and is also tramped considerably during the process of marketing the crop. Some soils will continue to produce broccoli successfully year after year, without any rotation, but some rotation is advised. Free use should be made of cover crops sown between the plants in the fall in order that there may be some green manure to be turned under in the spring. Some cultivated crop like corn or potatoes might well be rotated with broccoli in order that the soil may be kept in a good mechanical condition.

Those farmers who are growing the best crops of broccoli at the present time are putting a great deal of emphasis on the importance of thoroughly preparing the ground before the plants go in during the summer. The land is deeply plowed, thoroughly disked and harrowed and worked on a number of times in order that it may hold all the moisture possible.

Application of Fertilizers. Manure is the most suitable fertilizer for broccoli and is always applied with profit. Some growers have been making a practice of putting manure between the plants during the fall in order that the ensuing crop may benefit from the application of the manure. Also this furnishes a coating over the ground which will minimize to some extent the tramping of the soil during harvesting. A spring application of manure is to be advised especially where no cover cropping has been practiced. If the ground is loose and rather light it should be covered in the early fall followed by plowing under the cover crop in the early spring and possibly a light application of manure. The use of cover crop is especially to be recommended for soils that seem to be rather loose and is used also with profit on soils that have a tendency to pack if they are rather heavy.

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At the present time the Oregon Experiment Station is experimenting to endeavor to ascertain if broccoli commercial fertilizers may be profitably applied in growing broccoli. Most of the growers who have applied commercial fertilizer have not checked up on the net profit which they have obtained in applying the fertilizers. If cover crops are used there is a possibility that commercial fertilizers may be applied to advantage but the latter can never be used profitably as a substitute for manure. Commercial fertilizers will be most valuable for broccoli when the soil is in a fine mechanical state. From 600 to 1000 pounds of complete fertilizer is being used to advantage by some growers at the present time. The fertilizer is being put on in the early spring at the time the ground is being worked down with a spike-toothed harrow. Further suggestions regarding the use of fertilizers can be obtained from this department.

Varieties, Seed Strains and Seedling. The most widely known variety of cauliflower is St. Valentine. Imported seed was previously used but now good domestic seed is being obtained. It pays to get the best seed possible. Many crops have been grown unprofitably due to the seed not running true to type in the field. It pays to try to get the best seed rather than to try to economize with an inferior strain. If possible, some of the seeds should be tried a year ahead so as to know the character of the strain which is going to be used. Broccoli seed does not deteriorate in one year and so can be used after the strain has been tested. Several growers are producing their own seed but this is not a business that can be practiced by all. If particularly interested, write

for information concerning broccoli seed growing which will be furnished by this department.

Seeding is usually done in the field on a piece of finely prepared soil some time during the first or middle of May, the rows being spaced about 24 inches apart and the plants stand no closer than one inch apart in the rows. Well grown plants are big factors in getting a good planting in the field. If your plants are too close together in the row there is a tendency for them to become poorly developed and the roots will also be small. Good seed will usually germinate about 80 to 85 per cent so that the seeds should be sown about one-half inch apart or so, the covering of the seed to be about one-half inch. Most growers drill their seed in with a good hand drill. It is well to provide oneself with about three ounces of seed for about one acre of plants.

The plants should be well cared for in the seed bed up to the time they are put in the field. They should be grown without irrigation if possible, inasmuch as the plants which are non-irrigated have a tendency to grow sturdier and seem to respond more vigorously after they go into the field following transplanting. The rows should be constantly cultivated and the plants kept free from weeds. If the plants stand too thick in the row they should be thinned out as explained above. Some plant beds have a tendency to get infested with insects, in which case they should be sprayed with the proper solution. They may be sprayed with "Black-Leaf 40" or controlled by using the 3-in-1 dust. Details concerning the control of insects can be obtained from the department of Entomology or the department of Vegetable Gardening.

Transplanting to the Field. Transplanting should be done as far as possible when the weather conditions are entirely suitable, rainy or cloudy, inasmuch as this will make a great deal of difference in the readiness with which the plants stand up after they have been transplanted. The seed beds should be thoroughly soaked down before the plants are lifted. The plants should be about six inches high before they are put into the field. As much dirt should be left on the roots as possible in the transplanting. Distances of setting the plants vary from three to three and one-half feet between the rows and two to two and one-half feet between the plants, the variation being according to the character of the soil. The plants may be quickly set by using a spade or a tile shovel which will make a good deep hole for the plants so that they will go into the ground to the proper depth. Previous to setting, the field should be marked off at the distances desired.

Cultivation. Cultivation of the young plants should begin almost immediately after transplanting has taken place and should thereafter be conducted regularly every eight or ten days so that as much moisture can be held in the soil as possible. It is not desirable to cultivate too deeply especially close to the plant but a mulch of from two and one-half to three inches is ample to hold the necessary moisture during the summer.

Pamphlets will be issued in due order concerning other features of growing and marketing the winter vegetable such as cauliflower, Brussels sprouts and the like. Pamphlets will be issued in due order concerning other features of growing and marketing the winter vegetable such as cauliflower, Brussels sprouts and the like.

Broccoli, a Great Vegetable. Professor Bouquet is also editor of the farm department of the Pacific Homestead, the farm paper published from The Statesman building, and in every issue of the magazine that a much moisture can be held in the soil as possible. It is not desirable to cultivate too deeply especially close to the plant but a mulch of from two and one-half to three inches is ample to hold the necessary moisture during the summer.

As most folks who live in the western country know, there are few places in the United States where broccoli can really be grown to its perfection. This is because of the peculiar conditions of the winter months and the nature of the spring for harvesting and marketing the crop. Western Oregon and Washington are at least two parts of the country where the vegetable thrives to very good advantage and in Western Oregon car lot shipping has been developed more than in any other section. I do not think that the average farmer who might be interested for instance, in dairying, appreciates what a valuable crop of green feed the broccoli plant is. When the kale plants just about going back or is about through then the broccoli is coming on just at its best with the result that the broccoli plant begins to go to seed long after the kale plant is just about going back or is I have weighed many broccoli plants in the growing districts and have found that there were up to 12 pounds of green feed after the head and the jacket had been cut off. I am not saying that this is the case with all plants but there is considerable feed in any event, even with the head of cauliflower cut. Consequently one gets both the value of the broccoli head and the feeding value of the plant. If I were dairying, I would plant both kale and

LIGHT CLAY SOIL IS BEST FOR BROCCOLI IN OLD LINN

Geo. Baertleins Finds That, With the Use of Barnyard Manure, He Can Produce Good Quality on This Kind of Land—Santiam Sandy and Black Bottom Land Not Suitable

Editor Statesman: In reply to your letter of March 17th, will say what little I know about broccoli growing I have learned by my own experience.

I have been experimenting for five years and have learned that I can grow it with good success. Ten or twelve farmers started to grow broccoli a few years ago here near Lebanon, located on the Santiam bottom lands. They have tried it for two or three years, but made a failure of it, for two reasons.

In the first place, they got poor seed, and, secondly, broccoli will grow too rank in that sandy land and will be too tender and will not stand the cold weather. My land is located on Oak creek.

On the banks near the creek is where I grow large, nice heads of broccoli. I prefer the light colored clay soil, too poor to grow wheat, and I put a coat of stable manure on it and it will grow good broccoli. The black soil near the creek is not good for broccoli. I think any high or hill land will grow broccoli, when enriched, in the Willamette valley. The St. Valentine is the best for this climate. The French white variety will also do pretty well. I set out the plants in the month of July and it will ripen the next spring in March and April.

FIVE YEARS EXPERIENCE IN GROWING IN YOUNG ORCHARD

R. A. Busenbark of Roseburg Has Found Broccoli a Profitable Crop to Cultivate Between the Rows of His Fruit Trees

Editor Statesman: Your request for an article on broccoli at hand and will answer as best I can. We became interested in broccoli about five years ago when looking for a profitable crop to grow in a young orchard. The first year we planted four acres, with excellent results. Since then we have grown from five to nine acres each year. Our net returns have averaged around \$109 an acre each year until this year it will fall far below that on account of the freeze in December. The seed is sown in May and transplanting is done in July. The ground must be kept thoroughly cultivated, both before and after setting plants, in order to keep down weeds and retain moisture.

Broccoli is a heavy feeder, and applications of manure and fertilizer are beneficial, and necessary if the same field is planted to broccoli year after year. We use a horse-drawn transplanter with which a man with two good steady boys and a team of horses can set 2000 plants an hour. It requires from 3500 to 5000 plants to set an acre, and from three to four barrels of water. When sowing seed it usually requires two

ounces of seed for each acre of broccoli to be set out. We usually stop cultivation in September, when there is no more to be done until harvesting time, which begins about the first of March, though cold weather during February and March may retard the harvesting three or four weeks. The Umpqua Valley Fruit union handle the bulk of the crop grown at Roseburg. The broccoli is graded according to size and quality of heads. No. 1 broccoli includes all the large, firm white heads; No. 2 the small firm white heads. These are shipped to the eastern markets. No. 3 broccoli contains heads that have become too ripe for long shipment, or good heads that have been slightly damaged by careless handling. This grade reaches the western markets or goes to the canneries. As to growing broccoli around Salem or central Willamette valley, only experiments can tell, as all sections of the Umpqua valley do not grow broccoli successfully. Broccoli is also grown at Oswego and other places about Portland. Much of the seed used in the Roseburg district is grown at Oswego.

LEADING OSWEGO BROCCOLI GROWER ENCOURAGES BEGINNERS

An Ever Increasing Demand, Which Can Be Supplied Only From Our Section—Sufficient Reward to Induce Much Trial and Experimenting

(In sending the communication below, Mr. Kruse says in his private note to the editor: "I had but an hour's time and did not get far enough to cover harvesting, marketing and profits." He says his article is "intended, as your letter suggests, to assist those who are wondering whether they can grow it or not.")

Editor Statesman: In speaking of broccoli, there seems to be two things which ought to be clearly set forth. The first is to save the enthusiast who knows little about its culture and requirements from wasting his money, which can be easily done as there are many hazards in the game before the money is returned. Next is to help if possible, those who are fairly familiar with its culture, marketing, etc.

If I can render any assistance either to the prospective grower or the old timer, I should feel well paid for my effort. cannot go into very close detail without expanding too much, for

current publication, and also making the subject monotonous to the average reader, therefore I hope the seasoned growers will bear with me in mentioning things entirely for the benefit of those who have no experience with broccoli. It is a very slow heading plant of the cauliflower family, of which there are many strains, the earliest of which are the Snowball varieties; then comes the Autumn Giant, Late Algiers and a few other fall or winter heading strains. But the broccoli is the only strain which can successfully stand dormant through the long lifeless winter months and emerge in the spring with sufficient vigor to make good heads. So at best you cannot expect a very tough plant of such close relation to your garden cauliflower, which is regarded as the easiest plant to offend by improper soil handling. It is therefore apparent that no

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DR. BAILEY, ONE OF THE PIONEERS, ON BROCCOLI

The Necessity of a Crop Between the Trees of the Young Orchards Led to the Development of the Broccoli Industry in Douglas County, and Pointed the Way to Great Things

(Dr. C. H. Bailey, who furnishes the Salem slogan pages of The Statesman the following article, is an old newspaper man, who worked on some of the big papers of the country. He is surely contributing a great deal to the future greatness and prosperity of Oregon.)

The Broccoli Industry in Oregon. (Winter Cauliflower). In 1913, when the writer was serving as fruit inspector for Douglas county, hundreds of acres had been set to orchards, but the owners were having a hard time to make both ends meet. These orchards were only 2 or 3 years old, and the space between the trees was an economic waste due to the fact that Roseburg could not consume the vegetables that could be grown and there was no cannery to handle such products. It was this condition that led to the development of the broccoli industry; some one-year crop that could be shipped to the eastern consumer being needed in order that the embryo horticulturists could have an immediate income.

The matter was first broached in the Douglas County Pomona Grange, and that organization immediately saw the feasibility of the movement, and, together with the Roseburg Commercial Club, donated enough funds to finance two farmers' institutes with which to arouse interest in the industry. Professor Bouquet, of the Oregon Agricultural College, has been of great help in developing the infant industry to its greatest proportions and has always taken a great deal of interest in the growing of the crop. Broccoli is not hard to grow; in fact, any one who can grow winter cabbage or kale can grow broccoli. The plant requires rich soil, but barnyard manure or commercial fertilizer rich in potash will give the plant plenty of food. We are growing good broccoli on our farm on land that, until the past few years, had been in grain for a generation.

In the Willamette valley it would probably be necessary to give more attention to air drainage than we do in this section, as the winters are slightly colder in the big valley. Surface water will kill the plants, so that well-drained land must be chosen for this crop. Several years ago a large acreage was planted in the southern end of Douglas county and around Eugene, all of which planting proved a failure due to poor seed. The problem of a pure strain of seed, especially since the war, has been a serious one and one that we have had to work out for ourselves. When we first started the industry foreign seed was depended upon and proved true to name, but since then, probably due to the fact that the seed growers had been pressed into military service, leaving the growing of seed to inexperienced hands, imported broccoli seed has been a failure. The past few years a few broccoli growers have devoted their attention to producing a domestic strain of seed that is now superior to or at least equal to the best that we have ever received from abroad. The broccoli plant is closely allied to the cabbage plant and unless a pure strain of cauliflower seed is planted the grower, instead of having a firm, compact head of cauliflower or broccoli, will have a little button about the size of a silver dollar or else a head that is fuzzy and unsalable.

With the enormous development of canneries in Oregon, the future of the broccoli industry is assured. J. O. Holt, packing manager of the Oregon Growers' Co-operative Association, has informed me that he has sold for delivery next year 125,000 pounds of canned broccoli, the price per season he would not accept any more orders was because of the fact that he was certain he could not obtain the broccoli to pack. Broccoli is especially edible as mustard pickles, being firmer than the summer or fall varieties of cauliflower. Broccoli should be planted between the 20th of May and the first of June in a well prepared seed bed. It is the custom on our farm to place the rows three feet apart in our seed bed, cultivating the plants with the ordinary one-horse cultivator or the two-horse corn plow. The latter with the dirt shields in place, is ideal when the plants are young. We place the plants three feet apart so that when we transplant the plants we can leave a plant about every three feet, thereby making the seed bed a permanent bed. We use a garden drill in planting, endeavoring to place the seed about four to the inch. The seed bed should be plowed as deeply as possible, as broccoli plants have a long tap root that should have no obstacle placed in its downward path. Thorough cultivation, such as given any garden crop, is all that is needed until the time comes for transplanting the plants.

Some time between the 20th of June and July 1st, when the weather is favorable, transplanting should take place upon land that has been thoroughly plowed and worked until there is a loose bed at least six inches in depth. The land should be marked just as it is for corn, three feet each way being sufficient. The plants are better able to stand transplanting if water is used in resetting, and one of the hand planters now on the market is a handy implement for

this work. With these hand planters it is claimed that an acre a day may be transplanted, but I have never been able to plant more than three-fourths of that amount of land per day. Most of us, however, use the horse planter that is used extensively in the tobacco regions for transplanting tobacco. One of these machines with three people can easily transplant four or five acres per day. After taking the plants from the seed bed, the tops of the plants should be dipped in a solution of "Black Leaf 40" in order that aphids or aphid eggs that may be on the plants may be destroyed. This should be done after about half the tops of the plants are either cut or twisted off. Be careful not to let the "Black Leaf 40" get upon the roots of the plants. Care should be taken to keep the tap roots of the plants intact in pulling the plants from the seed bed. If the soil is at all packed, first loosen the dirt around the plants with a spade. It is good practice to cultivate the land as soon as possible after transplanting, as this seems to stimulate the growth and settles the dirt more firmly around the roots. The field should then be cultivated about every ten days or after each rain until the fall rains commence. After the first fall rain it is the custom on our farm to broadcast vetch and oats in the rows between the plants and then give the field one final cultivation.

Nothing more is necessary except that it may be wise to go through the gardens and break off suckers that may have appeared upon the stalks, as these suckers will not make heads and absorb more or less the life that should go into the head or "flower". The plants head in March, and coming as it generally does, between the time when the California cauliflower crop is about off the market and the Florida green vegetables are not yet available, generally brings the grower a good price. In fact, it is generally recognized

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BROCCOLI SEED FOR SALE

After a series of experiments extending over a period of eight years, we have developed a strain of Broccoli seed that has withstood a temperature of 8 degrees above zero the past winter with a loss of less than 20 per cent. We have a limited amount of this seed for sale at \$2 per ounce. Two ounces will plant an acre.

BROCCOLI PLANTS

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