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BROCCOLI GROWING AND MARKETING

by

A. G. B. Bouquet

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Federal Cooperative Extension Service  
Oregon State College  
Corvallis

Cooperative Extension Work in Agriculture and Home Economics  
Wm. A. Schoenfeld, Director  
Oregon State College and United States Department of Agriculture, Cooperating  
Printed and distributed in furtherance of the Acts of Congress of May 8 and June 30, 1914

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## BROCCOLI GROWING AND MARKETING

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A. G. B. Bouquet

Broccoli, sometimes called "sprouting broccoli," is a cultivated variety of wild cabbage originating in Western Europe. The name "broccoli" is derived from the Latin name "brocco," meaning a shoot, and it was originally applied to the tender shoots which were thrown out by cabbage and related members preparing to flower. These green shoots have been used as important vegetables by Europeans for a long time.

In England the word "broccoli" is used to designate the winter and spring types of cauliflower. This was likewise true in the earlier days of Oregon's industry of growing and shipping spring cauliflower. In some places it is still called "cauliflower-broccoli" in that the heads are similar to cauliflower but the time of maturity extends from November to April. In Europe, varieties of cauliflower and cauliflower-broccoli very closely interjoin. This is also true in areas of the United States producing these crops. In order to differentiate between the broccoli referred to in this circular and the cauliflower-broccoli, the green or purple broccoli shoots are commonly known as "sprouting broccoli," for in this country at the present time the name "broccoli" is almost exclusively applied to the green or purple shoots and small heads, or in other words, the sprouting broccoli of Europe.

Extent of Production. Figures concerning the acreage of broccoli grown in Oregon for the open market and for processing are not available. The increase in production of broccoli in the Northwest for freezing preservation is shown by the fact that in 1937 only 519,102 pounds of broccoli were grown in Oregon-Washington for freezing, this figure being almost tripled in 1941, in which year 1,496,059 pounds of broccoli were grown for freezing preservation in Oregon and Washington combined. In 1942 this figure was considerably less, amounting to 702,597 pounds. The total frozen pack of broccoli in the U.S. was 2,679,759 pounds in 1941.

California grew 8550 acres of broccoli in 1942, with a yield of 155 40-pound crates to the acre, having a unit value of \$1.80 or a total value of \$2,385,000.

Climatic Conditions. Like other members of the cabbage family, broccoli prefers a moderately cool condition for its growth and period of development towards maturity. The edible flowering buds break up readily when temperatures are high, and this crop makes the best quality of buds during the cool weather of the fall and early winter. In California, sprouting broccoli is used as a fall, winter and early spring crop. In the Northwest, it is grown mostly as a fall and early winter crop.

Characteristics of the Plant. The sprouting broccoli plant is somewhat similar to the cauliflower plant except that it is more open in development and produces numerous lateral shoots which develop at the axils of the leaves. The true sprouting broccoli forms a single solid head in the center of the plant, after the cutting of which the laterals grow to a size about the diameter of a carnation flower.

Sprouting broccoli is medium hardy and will safely stand light frosts.

Varieties. English seed houses list white, purple and green sprouting varieties. For many years the purple sprouting has been an old standby for truck and home gardeners throughout Britain but in the United States the most widely grown variety of sprouting broccoli is the green type called "Green or Italian Calabrese."

Culture. Broccoli is grown in a similar manner to a crop of late cabbage, cauliflower, kale or Brussels sprouts. The plants are grown in an open seedbed in which the seed is sown at the rate of about 24 to 30 seeds to the foot, with a view of having plants about every half inch or so in the row. The time of seeding may extend from early in May to the middle of June and transplanting of the plants takes place some 7 weeks or so later when the plants are 6 to 8 inches high.

The plants are transplanted to the field, preferably during cloudy weather and set out at distances of about 24 inches between the plants and the row, and 36 inches between the rows.

Previous to transplanting, land for broccoli should be fertilized either with manure and a complete commercial fertilizer or a cover crop will have been turned down in the early spring and supplemented by the application of a complete commercial fertilizer having possibly an analysis of 5 percent of nitrogen, 10 percent of phosphoric acid, and 10 percent of potash. If sulfate of ammonia, 18 percent superphosphate and 50 percent muriate of potash are used, there would be 250 pounds of sulfate of ammonia, 550 pounds of superphosphate and 200 pounds of muriate of potash contained in 1000 pounds of the 5-10-10 fertilizer. Added to this, also, should be 20 pounds or so of commercial borax to supply the minor element boron which is instrumental in preventing the stalks of the broccoli from being scarred or galled. Tests conducted by experiment stations, as well as by commercial growers, have indicated the desirability of including borax in the fertilizer for broccoli. Part of the complete fertilizer may be broadcasted and plowed under and the remainder used as side dressing material, or if a smaller amount of fertilizer is used per acre it might be applied solely as a side application preceding the irrigation of the broccoli plants.

Supplementary applications of water assist in keeping the plants growing steadily and producing a good quality of buds.

Insect Pests. The main insect attacking broccoli is the aphid, which can do a lot of damage to the flower buds if it is uncontrolled. Early dusting or spraying of the plants with nicotine sulfate will prevent the attacks of aphids from becoming serious. Usually three to five applications of control material are necessary. Even then it is difficult to get 100 percent control.

Harvesting. The edible parts of sprouting broccoli are the stems, flower buds and leaves. The flower buds range in size from two inches or so in diameter up to the size of the large central flower head which is from 4 to 8 inches or so in diameter. The largest flower of the plant is borne on the main stem in the center and then in the axils of the leaves lateral shoots or sprouts develop which constitute the source of edible stalks and flower buds which are bunched together for market.

The vegetable is considered ready for harvest and preparation for market when the flower buds are well developed but yet are still compact and before the white or yellow petals of the flowers appear.

In California those who harvest the crop carry a basket on the back into which the broccoli is placed after it is cut. The broccoli stems are later bunched and trimmed in specially made bunchers with "Twistems" holding the stalks together.

The harvesting season of frozen-pack broccoli begins usually about September 15, with a peak delivery about October 25 and a closing around November 20.

Broccoli is packed in flat crates, usually holding 28  $1\frac{1}{2}$ -pound bunches per crate. In 1942 the average yield per acre of broccoli for shipment from California was 155 crates of 40 pounds. Two tons per acre is considered a normal yield of broccoli for processing.

#### Cauliflower-Broccoli

This is the type of "broccoli" that produces a central white head and no lateral shoots such as the sprouting broccoli. The season of maturity is from early winter to the following spring. Oregon's crop of cauliflower-broccoli begins usually about the first of March, extending to late April. In California varieties of cauliflower-broccoli, called in that state "broccoli-cauliflower," are planted to give a continuous supply of heads from November to May. This is accomplished by growing such varieties as "November," "Christmas," "February," "March Early," "March Late," and "April."

St. Valentine is the variety most widely grown in Oregon.

Due to the fact that cauliflower-broccoli (or broccoli-cauliflower) produces its crop following the winter season, it is necessary that the area where it is growing is comparatively free from frosts. Successive low temperatures around 15° F. will injure the plants, particularly the stem, which is the most susceptible portion of the plant to frost injury. During some mild winters in the Willamette Valley crops of this vegetable are successfully grown.

Land for cauliflower-broccoli should be well drained, moderately to quite fertile, and protected from cold winds. Some of the best land for this crop is on second bottom that is not subject to overflow. Land that is impoverished or too light to hold moisture well during the dry season is not suitable for the heading types of broccoli.

Most good types of cauliflower-broccoli are self-protecting in that the head leaves cover the white head quite well. Nevertheless, growers usually tie the outside leaves over the heads to keep the white "curd" from becoming discolored.

The culture of cauliflower-broccoli is virtually the same as for cauliflower, concerning which crop a circular is obtainable from the local county agent or from the College Exchange, Corvallis, Oregon.

Problems regarding the growing of sprouting broccoli or cauliflower-broccoli concerning which information is desired should be addressed to the writer of this circular, Vegetable Crops Department, Corvallis, Oregon.