

Brussels Sprouts, Cabbage, Cauliflower, Chinese Cabbage, and Kale

Prepared by ANDREW A. DUNCAN
Extension Vegetable Production Specialist, Oregon State University, Corvallis

BRUSSELS SPROUTS

Brussels sprouts are well adapted for seed production in western Oregon. When grown for seed, this crop is handled the same as described below for cabbage. Plants can be spaced closer than cabbage because they do not branch as much as cabbage. Yields as high as 1,800 pounds per acre are possible if the crop is planted in 24-inch rows.

CABBAGE

When growing open-pollinated cabbage seed, a practice sometimes followed is for the seed contractor to raise plants for his producers in one large plant bed. The transplants are then distributed to the growers in early fall. The plants overwinter in the field, bolt in February and early March, and are harvested during the following July and August.

When the seed-to-seed method is used, the transplanting operation is eliminated and seed is planted directly in the field where the crop will be grown to maturity.

The production of hybrid cabbage seed requires planting of male and female lines—generally two rows of female to one row of male plants. Hybrid cabbage seed may be produced from transplants or on a seed-to-seed basis. Transplanting delays maturity of the crop about two weeks and this should be kept in mind when estimating harvest dates.

Time of seeding and transplanting

Planting and transplanting schedules should be arranged so that each variety will reach a size sufficient to insure its bolting the following spring. Most varieties should reach a loose head stage by December 1. The common experience has been that plants not sufficiently advanced at the onset of cold weather remain vegetative in the spring or do not bolt properly. If the plants are too mature by December, they tend to die in severe winters or succumb to soft rot if the winter is mild.

Experiences in the Willamette Valley have shown that seed of late varieties of cabbage, such as the Ball-head strains, Late Flat Dutch, and Mammoth Red Rock, should be planted July 1-15; Glory of Enkhuizen, Ferry's Round Dutch, and Marion Market should be planted July 15-31; and early varieties such as Jersey Wakefield, Charleston, Copenhagen Market, and Golden Acre should be planted July 20 to August 5 in plant beds.

Transplanting begins about the first of September. The varieties are transplanted in the order of their maturity range (earliest first), with completion about the middle of September.

Spacing and staking

The usual spacing for cabbage in western Oregon is 2 to 3 feet between rows and 1 foot between plants in the row. The closer spacings, both between and within rows, give the highest seed yields per acre.

Fertilization

Before planting, broadcast $1\frac{1}{2}$ to 2 pounds of boron. Band 300 to 400 pounds of a complete fertilizer containing N-P-K at time of seeding or transplanting. Use a fertilizer grade containing adequate sulfur.

Fall applications of nitrogen do not increase the yield over spring applications. It is usually more profitable to save the additional nitrogen for very early spring applications.

Where adequate irrigation is available, up to a total of 150 pounds of nitrogen per acre may be used to advantage. Where irrigation is not available, nitrogen should not exceed 75 to 100 pounds per acre. Applications of nitrogen in February and early March stimulate bolting and give higher seed yields than applications made in April and May. Broadcast applications of nitrogen are satisfactory. Spring rains leach the nitrogen into the root zone.

Split applications of nitrogen, the last one in May during the early bloom stage, do not increase the yield of seed over earlier single applications.



This is one of a series of *Fact Sheets* reporting Cooperative Extension work in agriculture and home economics, Gene M. Lear, associate director. Printed and distributed in furtherance of Acts of Congress of May 8 and June 30, 1914. Oregon State University, Oregon counties, and U. S. Department of Agriculture cooperating.

Harvesting and threshing

Cabbage harvest usually begins in mid-July and extends into August. The stage to cut cabbage depends somewhat on the variety; for the most part, harvesting should begin when the plants have taken on an overall orange to brownish cast, when the majority of the pods at the top of the plant have brown seeds in them, and before shattering has occurred. The plants are sometimes cut off by hand with corn knives, piled in shocks or windrows, and allowed to cure for a week or two before threshing. It is most common, however, to cut and windrow the plants with a swather. When thoroughly dry, the plants are either hauled to a stationary thresher in a canvas-lined conveyance or are pitched gently into a combine. Since cabbage threshes readily and the seed is easily cracked, the cylinder speed of the thresher should be slow (1,000 RPM or less) and some of the concaves should be removed. Usual yields are about 800 pounds per acre; good yields are about 2,000 pounds per acre.

Pest control

For best results, follow the recommendations in the current issues of the Oregon State University pest control handbooks.

CAULIFLOWER

Only a few attempts have been made to grow cauliflower for seed in western Oregon. Yields are often quite low, with 200 to 300 pounds per acre being the average yield obtained for the Snowball summer varieties.

Cauliflower is similar to cabbage in some respects but appears to be more exacting in its soil and climatic requirements. Plants are more difficult to overwinter than cabbage and usually will not survive the more severe winters in the Willamette Valley without some special protection.

The usual method of producing this crop is to seed thinly in out-of-doors plant beds about September 1 or to seed directly in cold frames or in a nonheated greenhouse about October 1. When the plants grown out-of-doors are of sufficient size to transplant (toward the last part of October), they are placed in pots or veneer bands and transferred to protective cold frames or greenhouses. Plants that are started in the greenhouse or cold frames can be transplanted any time between November and February. They remain there until they are set out in the field in late March or early April.

The care of the crop during the second year is similar to that described for cabbage. Spacing between plants is usually closer, however, with early varieties being spaced in $3\frac{1}{2}$ -foot rows and about 2 feet apart in the row. Cultural and fertilizer procedures should be aimed at getting the plants to head as early and uniformly as possible without retarding the growth. After

the plants have bolted and matured seed, they are cut off above the old head area, shocked, and allowed to dry. The regular combine thresher and any standard cleaning mill can be used satisfactorily in the threshing and seed cleaning.

Considering the large amount of hand labor necessary to produce cauliflower seed and the relatively low yields obtained, it is doubtful if Oregon producers can ever compete effectively with the California and European growers of this seed crop.

CHINESE CABBAGE

Chinese cabbage is grown as an annual, being very similar to mustard and Shogoin turnip in growth habits. Chilili and Wong Bok are the principal varieties.

Fertile soils are essential for high yields. Irrigation is not usually required, although in certain dry years it would probably make the difference between a profitable and an unprofitable seed crop.

Chinese cabbage is usually seeded in early March in rows 22 inches to 24 inches apart. Later spring plantings may fail to bolt. Fertility and other cultural requirements are similar to those described in the sections on mustard and spring-sown turnip. Growers of Chinese cabbage should be prepared to control troublesome insects such as the pod-borer, aphid, and flea beetle.

The crop can either be harvested from the swath or can be taken standing directly from the field. Seed yields have been fairly consistent and have ranged from 500 to 2,000 pounds per acre under Willamette Valley conditions.

KALE

Curly Kale is the most popular type grown in western Oregon as a seed crop. When grown for seed, it is an early maturing biennial, well adapted for seed production in the Willamette Valley. Seed production is usually by the seed-to-seed method but may be by the transplant method.

Cultural practices

General cultural procedures, such as row spacing, fertilization, and irrigation are similar to those of fall-sown turnip. Kale must be planted early in order to obtain high yields. Dwarf kale varieties should be planted from August 1 to 15, whereas the Siberian variety yields highest if planted later—August 15 to September 10. Supplemental irrigation is often needed to get the plants started but is usually not required the following season.

Kale is harvested with a combine, either from the swath or taken directly from the row. Seed yields of 1,000 to 2,000 pounds per acre are not uncommon for the Siberian variety. The dwarf varieties are lower in yielding ability, 500 to 800 pounds per acre being an average yield.