



# Cauliflower

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Cauliflower is the most exacting member of the cabbage family in the climatic requirements for production of high quality heads. It grows well only at comparatively cool temperatures with plenty of moisture and with heavy applications of fertilizer containing liberal amounts of nitrogen. Because it is not adaptable to warm growing conditions, it is planted early in the spring or in the early summer for fall harvest.

Good commercial production is limited to relatively few areas of the United States which border on large bodies of water where cool conditions prevail, or at high altitudes with warm days and cool nights. These areas include the Pacific Coast, Long Island, New York, areas near the Great Lakes, and the high mountain valleys of Colorado and Utah. Arid regions with intense sunlight and dry winds are generally not favorable to cauliflower production. Excellent commercial production has occurred in Utah near the Great Salt Lake and in the cool, high, mountain valleys.

## **Nutrition**

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Cauliflower is nutritious and yet low in calories. Cauliflower raw or cooked is a good source of vitamin C. One cup of raw cauliflower contains more than the daily recommended adult allowance of vitamin C. If the cauliflower is boiled, it will lose approximately 18% of the vitamin C. It is also a good source of vitamin A, thiamin, riboflavin, niacin, calcium, phosphorous, potassium, and magnesium. There are only 22 calories in a 3½ ounce serving of cauliflower.

Researchers at the New York Agricultural Experiment Station at Geneva have developed a bright orange cauliflower which tastes just like the white variety but is one hundred times higher in carotene, or pro-vitamin A. It is now in the developmental stage but may become available through commercial seedsmen.

## **Varieties**

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There are two variety types which are adapted to production in Utah. One is the early snowball type which includes the varieties: Snow Crown Hybrid, Early Snowball, and Starbrite Y Hybrid. These early snowball types are early in production, develop rather short, compact growth, and will require tying of the wrapper leaves around the curd to blanch the curd upon maturity. The second type is self-blanching and includes White Sails Hybrid, Ravella Hybrid, and Avalanche Hybrid. These types are improvements of the variety Self Blanche. The original type of self-blanching cauliflower was usually late in maturity, and though it produced in-arching

leaves, the self-blanching characteristic was not sufficiently developed to entirely blanch the head to produce a perfectly white curd, especially when grown in the spring season for maturity in the early days of summer. The Avalanche Hybrid is a relatively new development which is particularly effective in shading the curd as it approaches maturity so that relatively little tying would be required, especially if it is produced for fall harvest. The usual practice then, is to grow the early snowball types as early as possible in the spring with the intent to tie the wrapper leaves for blanching. The self-blanching types are primarily suited for planting in the early summer for fall harvest.

## ***Climate***

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Cauliflower is even more sensitive than broccoli to extremes of climate. It produces best in cool, moist conditions in the range of 60–70° F. If either high or low temperatures prevail, yields and quality are considerably reduced and the production may be lost entirely. It can be damaged by a sudden freeze or exposure to cold temperatures which causes premature heading. It is also damaged by a sudden heat wave which may cause over maturity of the developing curds within a day or two. Transplants set out in the spring must be protected from freezing temperatures by covering them with hotcaps, newspapers, plastic gallon jugs with bottoms cut out and tops removed, or row covers to prevent transplants from freezing. Plants maturing in the fall may be damaged even by a light frost.

## ***Growing Transplants***

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Cauliflower for early spring production must be grown as transplants. The plants grow rapidly, and with adequate growing conditions, will be ready for transplanting in five weeks. The seed is sown in a soilless mix and held at 70° F during germination. It is then grown in direct sun and kept at 60–70° F. It is not possible to “harden,” or gradually expose the plants to the cool temperatures of the outdoors for the unfavorable conditions of transplanting, because they must be kept in a vegetative state to prevent premature heading, or “buttoning.” Buttoning is a result of the, early development of the curd at the expense of leaf and stem growth. This condition occurs with low soil moisture, low temperatures, lack of adequate nitrogen fertilization, or a shock when transplanted to the garden. Caution should be taken to insure uninterrupted growth of the transplants from the time they are seeded to the time they are transplanted into the garden. Plants should be about 4" tall, have a good root system, and be fertilized with a soluble starter fertilizer at the time of transplanting to minimize shock.

## ***To Seed Outdoors for a Fall Crop***

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Sow the seeds in a well prepared row 85–100 days before the first light frost in the fall. This timing is calculated by allowing five weeks to grow the cauliflower to the transplant stage and then allowing 50–75 days for final maturation. The difference in maturity time depends on the variety selected.

Several seeds can be sown 18" apart and when the seedlings are 2" tall, they may be thinned to one strong plant at each spacing. If expensive hybrid seed is used, it might be well to grow the transplants in a relatively small row with seeds spaced several inches apart and then transplanted to the desired locations when the plants are approximately 4" tall so that all plants are utilized.

## ***Soils***

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Best yields and quality are obtained on heavily fertilized, well-drained soils of moderate texture. Cauliflower may be grown well on a variety of soil types, but unusually heavy clay or very light sandy soils should be avoided. Cauliflower suffers more from hot and dry conditions when grown on the lighter textured soils than it does on heavier soils. This results from a lack of irrigation water when conditions of high temperatures and drought prevail. Cauliflower plants thrive with liberal amounts of fertilizer with plenty of nitrogen, and relatively large amounts of irrigation water. Due to the relatively small size of most home gardens, it is fairly easy to maintain a high level of soil fertility.

Three pounds, or 6 cups, of a 10-20-0 fertilizer should be applied for each 100 square feet of soil. The fertilizer should be broadcast and worked in before planting so that it will remain in moist soil throughout the growing season. Instead of broadcasting, one may choose to apply fertilizer directly to the rows. For transplants, 2 tablespoons of the mixed fertilizer can be placed 4" to the side and 4-6" deep by each plant. For direct-seeded cauliflower for fall harvest, the fertilizer may be banded 3-4" deep, and 3" to the side of the row at the rate of one cup per 10 feet of row. Well-rotted manure or compost made from lawn clippings, leaves, and other organic materials is of value in supplying nutrients and in improving the texture of the soil. If one or two bushels of manure are to be applied to each 100 sq ft, two pounds of treble super phosphate should be added in place of the 10-20-0 fertilizer application.

Since the size of the curd is dependent on the lush growth of the plants, it is well to side dress with nitrogen fertilizer several times during the growing season. One cup of ammonium nitrate, or equivalent, should be used for each 10 feet of row. Place the nitrogen in irrigation furrows, or 6 inches to the side of the plants. This will stimulate continuous growth and result in the largest possible curd. It is not possible to increase the size of the curd as the harvest period is approaching because the quality is lost upon over maturity, at which time the curd develops riciness, or a grainy texture. The curd must be harvested when it has reached the condition of best quality.

## ***Irrigation***

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Cauliflower grows best if given 1-1½" of water each week. Furrow irrigation is best because it does not wash off insecticides used to control worms. In addition, fewer heavy waterings are better than frequent light waterings.

## ***Insect Control***

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Insects are the nemesis of most cauliflower growers. It is usually unsettling to observe green cabbage worms, cabbage loopers, or aphids embedded in the heads of cauliflower. However, it is not difficult to control the insects that infest cauliflower. The control measures are safe, and if just a few guidelines are followed, there is no hazard from ingesting insecticides used to control insects in cauliflower. The common insects that infest cauliflower are the imported cabbage worm, which is a green worm that lays flat on the cauliflower leaves; the cabbage looper, which is an inchworm that forms a loop as it walks on the leaves of the cauliflower; and the green cabbage aphid which is a small, round, green insect with sucking mouth parts. These first two insects can be controlled by periodic applications of *Bacillus thuringiensis* (BT), which is a bacterial spore. This spore is sold under the trade names Dipel® and Thuricide®. Dipel® is applied at the rate of 1 tsp/gallon of spray; or Thuricide®, which is a liquid, may be applied at the rate of 1 Tbsp/gallon of spray to cover approximately 15 large plants. One teaspoon of 50%

wettable powder Diazinon® can be added to the Bacillus spray to control the green cabbage aphids.

Diazinon® should be applied on a 10 to 14-day interval. The Dipel® and Thuricide® are safe to humans so cauliflower can be eaten the same day it is sprayed with BT. However, harvest should be delayed for at least five days after Diazinon® has been applied. The BT sprays are effective for at least one week if they are not washed off by a heavy dew, rainfall, or sprinkler irrigation. If a spreader/sticker is used, it will prevent the rapid washoff of the BT spores.

It is important to control flea beetles on direct-seeded cauliflower. These are small, black beetles which feed on the young seedlings just as they emerge. These beetles can be controlled by a spray made of 2 teaspoons of 50% wettable powder Sevin® insecticide per gallon of spray. It is important to control this insect just as soon as the plants emerge or serious damage can occur within a few hours.

One other insect which is usually not present but sometimes infests cauliflower is the cabbage maggot. This is the larval stage of a lazy, adult insect that looks something like a small house fly. The maggot is controlled by mixing Diazinon® insecticide around the roots of the cauliflower. This can be done by sprinkling two tablespoons of 5% Diazinon® granules into five feet of row where the seed or transplants will be grown, and then working it into the soil before transplanting. Or, ½ tsp 50% wettable powder Diazinon® can be mixed in one gallon of water and applied as a drench in transplanting water at the rate of ½ pint per plant. These insecticides may be applied at the same time the fertilizer is applied.

## **Harvesting**

When cauliflower heads are exposed to light when enlarging, the curd develops a greenish/yellow color and an undesirable strong flavor. While the developing curds are still small, they are protected from the sun by the in-arching leaves. As the heads enlarge, the leaves are forced apart and protection diminishes. In the early snowball types, it is essential to tie the relatively short outer leaves over the developing heads to maintain the white curds as they mature. The heads with short, spreading leaves are protected by pulling the longest leaves together over the head and securing them with strong rubber bands or tying them with soft twine. Because the plants do not develop heads at the same time, each plant should be observed every few days and each plant tied when the head is 2–3" in diameter. If different colors of elastic or twine are used, it will be easier to determine which heads may be ready for harvest without opening each tied head. In warm weather, cauliflower heads may develop to maturity three to five days after being tied. But in cool weather, it may take as much as two weeks from tying to harvest. When the cauliflower is in prime condition for harvest, the heads are fully developed, compact, white, and free from discoloration. The heads should be at least 6" in diameter, with curds that are dense and of a fine texture, and devoid of a granular appearance.

## **Storage**

Cauliflower has a moderately low respiration rate, comparable to carrots, crisp-head lettuce, radishes, and summer squash. It may be stored for 3–weeks at 32° F or 2 weeks at 37° F. Excess amounts of cauliflower may be frozen by cutting the curds to desired size, blanching in hot water or steam for three minutes, cooling in cold water for 3 minutes, and then placing in freezer bags for freezing.

## **Cooking/Serving**

Cauliflower is very convenient in that as the head is harvested, it requires almost no preparation for cooking or eating fresh. A whole head of cauliflower needs not more than 25 minutes of cooking time. Place the cut up pieces in 1" of boiling, salted water. Let it cook for five minutes without a lid and then cover it for another 10–15 minutes, depending on the size of the head. Cauliflower can pick up a yellowish cast if cooked in hard, or alkaline, water. If one teaspoon of fresh lemon juice is added to the cooking water, the color will remain white. Cauliflower, like all vegetables of the cabbage family, should not be overcooked because in doing so, strong, undesirable flavors and a soft texture result.

There are many ways of serving cauliflower. Here are a few ideas: cauliflower sprinkled with bread crumbs that have been lightly browned in butter, cauliflower with cheese, lemon, or tartar sauce over it, florets cooked in beef or chicken stock and garnished with chopped parsley; cooked cauliflower with lemon butter, or chopped almond butter. Cauliflower is good raw in a tossed green salad, with dip as an hors d'oeuvre, or tossed with green onion, lemon juice, salt and pepper.

Cauliflower is a mild tasting, nutritious vegetable of the cabbage family, which with the application of only a few special details in production, blanching, and harvest, produces one of the most delightful vegetables in the garden.

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