



# Cole Crops

“Cole crops” is a general term used to describe several vegetables in the mustard family, including broccoli, Brussels sprouts, cabbage, cauliflower, collards, kale, and kohlrabi. All cole crops are cultivated varieties of the species *Brassica oleracea*. They are cool-season vegetables that prefer 60° to 70°F temperatures for optimal growth and can withstand light frosts without injury.

## Suggested Cultivars for Iowa

### Broccoli

*Days to harvest: 50–65*

**Arcadia**—late (fall production); small heads; domed

**Early Dividend**—early; reliable yields

**Green Comet**—early; large center heads and side shoots

**Green Valiant**—midseason; small firm heads

**Gypsy**—midseason; heat tolerant

**Mariner**—midseason; medium-sized compact heads

**Packman**—early to midseason; uniform; large heads

**Premium Crop**—midseason; large center heads; few side shoots

### Brussels sprouts

*Days to harvest: 85–110*

**Jade Cross**—large dark green sprouts

**Prince Marvel**—mild tasting; small to medium sprouts

### Cabbage (green)

*Early-season cultivars mature approximately 50 to 60 days after transplanting. Late season cultivars may require 100 or more days to mature.*

**Arrowhead**—early; cone-shaped head

**Blue Pak**—midseason; medium to large dark blue heads

**Bravo**—midseason; uniform round blue-green heads

**Dynamo**—early; small heads; less likely to split

**Gourmet**—midseason; medium to large heads

**Head Start**—early; medium to large heads

**Heads Up**—early; fusarium yellows resistant

**Rio Verde**—late; large blue-green heads

**Savoy Express**—savoy type; early

**Savoy King**—savoy type; midseason; high yields

**Stonehead**—very early; small heads

### Cabbage (red)

**Red Acre**—midseason; small round heads

**Regal Red**—early; medium heads

**Ruby Perfection**—late; small to medium dark red heads

### Cauliflower

*Early-season cultivars mature approximately 50 to 55 days after transplanting. Late-season cultivars mature in 75 to 80 days. Novelty cultivars produce purple and orange heads that change color when cooked.*

**Candid Charm**—midseason

**Early Snowball**—early

**Fremont**—early

**Snow Crown**—early; reliable for spring and fall

**Snowball Y**—midseason; solid smooth heads

**White Sails**—midseason

### Collards

*Days to harvest: 70–80*

**Flash**—non-heading type; slow to bolt; blue-green leaves

**Georgia**—non-heading type; wavy blue-green leaves

**Morris**—heading type; open pollinated

**Top Bunch**—deep green, slightly wavy, broad leaves

**Vates**—non-heading type; compact plants; smooth, dark green, thick-textured leaves; open pollinated

## Kale

*Days to harvest: 50–60*

**Blue Ridge**—dark blue-green, curled leaves

**Redbor**—finely curled, red-purple leaves

**Vates**—finely curled, blue-green leaves

**Winterbor**—blue-green, finely curled leaves

## Kohlrabi

*Days to harvest: 50–60*

**Early Purple Vienna**—early, reddish purple with white flesh

**Early White Vienna**—early, greenish white with white flesh

**Grand Duke**—pale green with mild white flesh

## Planting

Cole crops perform best in full sun and well-drained soils with a pH of 6 to 7. Crop rotation is important. To reduce disease problems, no cole crop member should be planted in the same garden space more than once every 4 years.

Both spring and fall crops of broccoli, cauliflower, cabbage, and kohlrabi can be planted. Brussels sprouts perform best as a fall crop.

Spring crops of broccoli, cauliflower, and cabbage are established by setting out transplants in early to mid-April in central Iowa. Young, stocky plants can be purchased at garden centers or seeds can be started indoors in early March. Before planting, harden the transplants outdoors by gradually exposing them to longer periods of sunlight over several days.

Fall crops of broccoli, cauliflower, and cabbage can be started indoors or direct seeded outdoors in early July.

Brussels sprouts should be started indoors in mid-July and transplanted outside in late August.

Collards and kale are usually seeded directly in the garden in late March or April for a summer crop and again in July for a fall crop.

Kohlrabi is usually direct seeded in late March to mid-April for a late spring crop or in July for a fall crop.

## Spacing

Broccoli, brussels sprouts, cauliflower, and cabbage transplants should be spaced 18 to 24 inches apart in rows that are 24 to 30 inches apart.

Collard seedlings should be spaced 12 inches apart after thinning. Rows should be spaced 2 to 3 feet apart.

Thin kale seedlings so plants are 8 to 12 inches apart. Rows should be spaced 2 to 2½ feet apart.

Kohlrabi seedlings should be thinned so the plants are 6 to 8 inches apart within the row. Rows should be spaced 18 to 24 inches apart.

## Fertilization

If a soil test has not been done, apply 1 to 2 pounds of an all-purpose garden fertilizer, such as 10-10-10, per 100 square feet and incorporate into the top 4 to 6 inches before planting.

About 3 to 4 weeks after planting, apply a small amount of an all-purpose garden fertilizer in a band along one side of each row to keep plants vigorous.

## Estimated yield

With good management practices, average yields per 10-foot row are as follows.

- **Brussels sprouts**—approximately 7 pounds
- **Broccoli and cauliflower**—approximately 10 pounds
- **Cabbage**—approximately 6 to 8 heads
- **Collards**—approximately 7 to 8 pounds
- **Kale**—approximately 7 to 8 pounds
- **Kohlrabi**—approximately 8 pounds

## Care during the growing season

Most cole crops have shallow root systems and require weekly irrigation if rainfall doesn't provide 1 inch of water per week. Weeds should be removed regularly to prevent competition for water, nutrients, and light. Shallow cultivation is recommended because root systems of cole crops can be easily damaged. A 2 to 3 inch layer of organic mulch, such as straw, helps control weeds and conserves soil moisture.

Cauliflower heads exposed to sunlight are cream-colored to light green. If white heads are desired, they may need to be blanched. Blanching eliminates light penetration to the developing flower buds, thus giving them a white color. When the heads are 2 inches across, loosely tie the inner leaves over the heads with large rubber bands, cloth strips, or twine. The heads develop rapidly after tying and are generally ready to harvest within 1 to 2 weeks.

## Potential problems

### Buttoning

Broccoli and cauliflower plants exposed to stressful growing conditions may form heads prematurely. This development is called buttoning. Stressful conditions that may lead to buttoning include exposure to prolonged periods of temperatures below 50°F, dry conditions, and infertile soils. Also, large (older) transplants that are rootbound are more likely to button than are young plants. Plants that button do not form usable heads.

### Cabbageworms

Cabbageworms are greenish caterpillars that eat large, irregular holes in the foliage of most cole crops. Treat when caterpillars are first noticed with products containing *Bacillus thuringiensis* (Bt). This bacterium causes a fatal disease in caterpillars. Synthetic and other organic pesticides also can be used.

## Harvest and storage

**Broccoli**—Cut heads when they are blue-green, about 6 inches across, and before the small, yellow flower buds start to open. Cut the central stem several inches below the head. Many cultivars produce side heads after the main head is removed. Broccoli stores well in perforated plastic bags in the refrigerator for up to 1 week.

**Brussels sprouts**—Flavor is improved by a light frost. Harvest individual sprouts or buds from the base of the plant as they become solid. Buds should be 1 to 1½ inches in diameter and still tender and green. Remove buds higher up on the plant as they become firm. Do not strip the lower leaves from the plant because they are necessary for further growth.

**Cabbage**—Cut heads when they feel solid and heavy. Remove the loose cover leaves and store in perforated plastic bags in the refrigerator for 2 to 4 weeks. Large heads are prone to splitting if not harvested promptly. Split heads are a sign of overmaturity or excessive water uptake. To reduce the incidence of splitting and delay or stagger harvest, pull the plant upward and gently twist to break some of the roots and thus reduce water uptake.

**Cauliflower**—Harvest when the heads are 6 to 8 inches across, but still compact and smooth. Overmature heads begin to open up and become grainy in texture and appearance. Cauliflower will store well for 2 weeks in perforated plastic bags in the refrigerator.

**Collards and kale**—Both can be harvested periodically over time by removing the fully mature leaves and allowing the young leaves to continue to grow. Store in perforated plastic bags in refrigerator for 10 to 14 days. If preferred, the entire plant head can be harvested about 60 days after germination.

**Kohlrabi**—Flavor is mildest when the thickened stems are 2 to 3 inches in diameter. Remove leaves and roots and store in perforated plastic bags in refrigerator for 3 weeks.

## For more information

Additional information about vegetable gardening and other horticultural topics is available from local extension offices and from these Web sites:

### ISU Extension Distribution Center—

[www.extension.iastate.edu/store](http://www.extension.iastate.edu/store)

### ISU Extension Food Preservation Resources—

[www.extension.iastate.edu/healthnutrition/food/preservation/resources.htm](http://www.extension.iastate.edu/healthnutrition/food/preservation/resources.htm)

### ISU Extension Horticulture—

[www.yardandgarden.extension.iastate.edu](http://www.yardandgarden.extension.iastate.edu)

Questions also may be directed to ISU Extension Hortline by calling 515-294-3108 during business hours (10 a.m.–12 noon, 1 p.m.–4:30 p.m. Monday–Friday).

If you want to learn more about horticulture through training and volunteer work, ask your ISU Extension office for information about the ISU Extension Master Gardener program.

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