

Brussels Sprouts

Miranda Hileman Combs¹ and Matt Ernst²

Introduction

The Brussels sprout (*Brassica oleracea* var. *gemmifera*) is a cool-season cole crop that is related to broccoli, cabbage and cauliflower. The sprouts are buds or small heads that are produced in the leaf axils (the space between the base of the leaf and the stem above it). Sprouts mature starting at the base of the stem and working upward. In Kentucky, Brussels sprouts do best as a fall crop since sprouts maturing in hot weather are more prone to be bitter.

Marketing and Market Outlook

Currently there is little production of Brussels sprouts in Kentucky. Much of the commercial production for Brussels sprouts produced in the United States is concentrated in California, with some East Coast production on Long Island, New York. The Census of Agriculture reported that two Kentucky farms harvested Brussels sprouts in the 2012 growing season.¹ Across the entire U.S., 658 farms reported harvesting 7,569 acres of Brussels sprouts in 2012, with 5,462 acres being harvested for fresh market sales.²

In Kentucky, fall crops appear to have the most potential for fresh market sales. Direct marketers should work to create niche markets, like restaurant or farmers market sales, for freshly harvested Brussels sprouts. Brussels sprouts can provide more variety to produce offered at roadside stands, community supported



agriculture shares and farmers market booths. Offering recipes and other tips for use can help introduce Brussels sprouts to new consumers.

Production Considerations

Cultivar selection

Brussels sprouts are a slow-growing cool-weather vegetable, growing best when daytime temperatures are between 65 and 80 degrees F; they even do well in lightly frosty weather. For an early spring crop, start the seed about six weeks before the plants are to be transplanted, or about mid-February for transplanting around

April 1 in most areas of Kentucky, allowing for harvest in mid-June. For a fall crop, plant seed between mid-May and early June and set transplants in the field between



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Table 1. Common Brussels sprouts varieties for Kentucky

Variety	Maturity	Hybrid	Date to Maturity	Comments
Jade Cross E	Early	Yes	85 days	Medium sprouts
Nautic	Late	Yes	105 days	Medium sprouts

mid-June and August 1. Fall planting harvest might extend through Thanksgiving. Growers should be careful in selecting varieties as some may not produce firm harvestable sprouts under our growing conditions. A few varieties good for Kentucky are listed in Table 1 (see Page 2).

Site selection and planting

In Kentucky, Brussels sprouts do best as a fall crop in a cool, moist climate. All cole crops grow well in reasonably fertile, well-drained, moist soils with plenty of added organic matter. A mulch will help keep the ground cool and moist. The pH should be between 6.0 and 7.0 for optimum growth. A pH within this range will discourage club root disease and maximize nutrient availability. Cole crops are heavy users of sulfur; soils prone to deficiencies can be amended by using one of the many sulfur-containing fertilizers to supply 10 to 20 pounds actual sulfur per acre. Boron will need to be supplied in areas of the state that are low in boron. Brussels sprouts should be spaced 24 inches apart in the row, with rows 24 - 36 inches apart. A starter fertilizer applied around the root system during transplanting is recommended. Throughout the growing season, it is important to keep soil moist and the plants growing; irrigation is important.

Pest Management

Weeds and insect pests can be problematic because Brussels sprouts are a long-season crop. For weed control, careful frequent cultivation, as well as preemergent herbicides can be helpful. Damage to plants can result from cutworms, cabbage loopers, imported cabbage worms, diamondback moth larvae, cabbage maggot, thrips and cabbage aphids. Early detection is critical for controlling these pests. Scouting to monitor populations can

help growers determine when and how often pesticides should be applied. Cabbage aphids are the most serious problem as they begin infesting the sprouts once the temperature drops below freezing and are not readily removed. Several plant diseases can result in yield losses. Black leg, black rot, club root, powdery mildew and wirestem can affect Brussels sprout plants. Select tolerant varieties, use disease-free seed or transplants and rotate cole crops with other (non-cole) crops annually. Fungicide and bactericide sprays may also be necessary.

Harvest and Storage

Cut off the top of plants when sprouts begin forming, usually in mid-September. It takes about 30 days for sprouts to develop after topping. Progressive leaf removal beginning at the plant base also forces sprouts to develop and firm up. Harvest begins after the first frost in mid-October before stalks are heavily colonized by cabbage aphids. Fall harvest in Kentucky is the most practical and rewarding and plants will tolerate temperatures down to 20 °F. Once this low temperature is reached, sprouts turn a dull purplish green and are not marketable. Harvest the sprouts when they are about ¾-inch in diameter, compact and bright green to obtain the most tender and best flavored sprouts. Commercially, sprouts are harvested when they are 1½ inches in diameter. The plant’s lower leaves should be broken away and the sprouts snapped or cut off close to the stem with a sharp knife. Make successive harvests from the base upward as the sprouts develop. Sprouts should be cleaned, trimmed of loose leaves, and sorted to remove those that are soft or damaged. Avoid yellowing sprouts with signs of wilt rot or insect damage. Refrigerate soon after harvesting until selling. Brussels sprouts can be sold in pint or quart baskets or bags. Some producers

cut the plant at its base with loppers and sell the entire stalk with Brussels sprouts attached after removing the leaves. North Carolina State University Extension has found that one Brussels sprout plant is capable of producing about 2.5 to 3 pounds of sprouts; however, a Kentucky grower averages 1.5 to 2 pounds per plant. There is a small market for Brussels sprout leaves that are cooked like collard greens. The best looking leaves are selectively cut about a week before stalks are harvested and tied in bunches of 10 for marketing.

Labor Requirements

Brussels sprouts are labor intensive; University of Wisconsin production budgets estimate 470 hours required per acre, including 426 hours per acre for harvest and 40 hours for marketing. Plasticulture will add 8 to 10 hours more per acre, mostly for plastic removal. Labor requirements per 100-foot row of Brussels sprouts are estimated at three to five hours, including marketing time.

Economic Considerations

Initial investments include land preparation, purchase of seed or transplants, and installation of an irrigation system. Cooling, irrigation, and handling equipment for proper Brussels sprouts production are similar to those needed for broccoli and cauliflower. Brussels sprouts production in Kentucky is probably best suited for direct, niche, and well-developed local markets.

Returns will vary greatly depending on yield, markets and price. Wisconsin production budget estimates modified for Kentucky suggest estimated variable costs of \$5,100 per acre, and fixed costs of \$300 per acre. Assuming 8,000 pounds of production per acre sold at a price of \$1.25 per pound, returns to land and operator could approach \$5,000 per acre. Returns to land

and management per 100-foot row of direct market Brussels sprouts sold at \$1.50 per pound are estimated at \$30 to \$35.

¹USDA, NASS. Kentucky, Table 38. Vegetables, Potatoes, and Melons Harvested for Sale: 2012 and 2007 http://www.agcensus.usda.gov/Publications/2012/Full_Report/Volume_1,_Chapter_1_State_Level/Kentucky/st21_1_038_038.pdf

²United States, Table 38. Vegetables, Potatoes, and Melons Harvested for Sale: 2012 and 2007 http://www.agcensus.usda.gov/Publications/2012/Full_Report/Volume_1,_Chapter_1_US/st99_1_038_038.pdf

Selected Resources

- Vegetable Production Guide for Commercial Growers, ID-36 (University of Kentucky, 2014-15) <http://www.ca.uky.edu/agc/pubs/id/id36/id36.htm>
- Home Vegetable Gardening in Kentucky, ID-128 (University of Kentucky) <http://www2.ca.uky.edu/agc/pubs/id/id128/id128.pdf>
- Vegetable Directory: Brussels sprouts (University of Illinois Urban Extension) <http://urbanext.illinois.edu/veggies/brusselsprouts.cfm>
- 2014 Wisconsin Fresh Market Vegetable Budgets <http://www.uwex.edu/ces/farmteam/budgets/fresh-market-vegetable.cfm>
- Horticulture Information Leaflets: Brussels sprouts (North Carolina State University, 2001) <http://www.ces.ncsu.edu/hil/hil-6.html>
- Midwest Vegetable Production Guide for Commercial Growers (2014) <http://learningstore.uwex.edu/assets/pdfs/A3684.PDF>
- Fruit and Vegetable Connection: Brussels sprouts, (Purdue University) https://ag.purdue.edu/hla/fruitveg/Pages/brussels_sprouts.aspx

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Photos courtesy of John Strang

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