UNIVERSITY OF KENTUCKY College of Agriculture, Food and Environment

COOPERATIVE EXTENSION SERVICE
UNIVERSITY OF KENTUCKY COLLEGE OF AGRICULTURE, FOOD AND ENVIRONMENT
Center for Crop Diversification Crop Profile

Celery and Celeriac

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Introduction

Celery (*Apium graveolens*) is an herb and vegetable member of the parsley family. It is a cool-season crop that is a biennial, but is often grown as an annual for fresh market consumption. It does best when temperatures are relatively cool, particularly at night. Celery is a versatile ingredient for cooking, and during 2012, U.S. consumers used an average 6 pounds of fresh celery per person per year. The stalk is often served raw or cooked in vegetable dishes. Celery leaves are used much like an herb, similar to parsley, in flavoring soups, stews, salads and other dishes. Celeriac (*Apium rapaceum*) is also known as celery root, and is grown for its smooth celery flavor and long storage capacity. Like many root vegetables, it will keep for six to eight months if stored at 32 F with 95 percent relative humidity. Celeriac has a fine-grained white flesh and tastes much like a stalk of celery. Celery seed is derived from celeriac plants. Celeriac is often cooked and added to mixed vegetable dishes. It is easier to grow than celery if conditions are cool and moist.

Marketing and Market Outlook

Much of the U.S. commercial fresh market celery production is concentrated in California and Michigan. A small portion of celery is harvested for processing use in prepared foods such as soups and juices. The 2012 Census of Agriculture reported 488 U.S. farms harvested 32,577 acres of celery, with 30,385 acres harvested for fresh market sales.[1] The Census counted only four Kentucky farms harvesting celery in the 2012 growing season.[2] Celeriac is not reported in the 2012 Census of Agriculture information.

Celery and celeriac may be interesting crops for direct marketing in Kentucky, such as farmers markets sales and sales to restaurants. Cool-season crops can increase product variety and help growers extend harvest

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seasons. Niche crops can also be effectively marketed to highly interested consumers, like Community Supported Agriculture members. Sharing information about benefits, how to use celeriac, and how it tastes will be important to sales. For marketing to health-conscious groups, fresh celery contains vitamins A, C and folic acid, and nutritional minerals, yet has practically no calories. It is also an excellent source of dietary fiber.

Production considerations

Cultivar selection

Celery is a relatively quick crop to produce, while celeriac requires a longer growing season than most vegetables. Both also require a consistent amount of water throughout the entire growing season and prefer cool temperatures. When drought stressed, celery becomes tough, stringy and stronger in flavor.

Conga, Merengo, Samba and Tango are varieties that should do well in Kentucky. Samba and Merengo are resistant to Fusarium and Tango is tolerant to this disease, which is soilborne. Tango is considered to be sweeter and more tender than the other varieties listed here and is thus an excellent prospect for direct sales. Mars and Brilliant are two very good celeriac varieties.

Site selection and planting

Celery and celeriac both require fertile, well-drained soils with a pH range of 6.0 to 7.0. Irrigation is very important throughout the growing season. Sow seeds indoors in March, about 10 - 12 weeks before transplanting outdoors. Keep soil temperature warm and germination should occur within three weeks. Transplant outdoors in late May to mid-June after last frost has passed. Set plants 6 to 8 inches apart in rows 24 to 36 inches apart. Celery and celeriac bolt or go to seed easily. Exposure to night temperatures below 40 F and day temperatures below 50 F for 10 days can cause premature bolting. Plants will survive light frosts. Celeriac is more tolerant of frosts than celery. Celery has a high fertilizer requirement and should be sidedressed with 50 pounds of nitrogen per acre four to six weeks after transplanting and three to four weeks prior to harvest.

Pest Management

Common insects that damage celery are thrips, flea beetles, aphids, tarnished plant bugs, leafhoppers, cutworms, armyworms and cabbage loopers. Diseases that have been identified in KY in the past 15 years include early blight (caused by *Cercospora apii*, which can also infect celeriac) and late blight (*Septoria apiicola*), both fungal diseases that typically initiate as leaf spots in foliage. These pathogens have been shown to originate on celery seed and/or infected celery debris from the previous cropping season, so purchasing certified disease-free seed and using regular crop rotation will decrease the risk of developing these diseases in new celery crops. An array of chemical options are labeled for early and late blight management in celery, including strobilurins, sterol-demethylation inhibitors, chlorothalonil, and coppers (always check product labels to ensure compatibility with the crop). Black heart is a physiological disorder associated with a calcium deficiency where the young central leaves break down, turn black and decay. This may spread to the celery heart. It occurs when plants are low in calcium, over-watered, drought stressed, over-fertilized or over-mature.

Harvest and Storage

Celery is generally ready to harvest 85 to 120 days after transplanting. It is cut when the stalks measure at least 6 inches from the soil line to the first leaf. Quality deteriorates over time as the stalks yellow and become pithy. After harvest, remove field heat by using refrigerated forced air cooling, then pack in an upright position and keep them at a constant temperature; 32 F with 98 percent relative humidity is best. Celery will store, if kept properly, for one to two months. Celeriac can be harvested late summer through fall at a 3- to 5-inch diameter. Some growers wait to harvest until after the first frost of the season, as it is said to “sweeten” the root. During

harvest, remove as much dirt as possible, cut off the rootlets and remove all but 1 inch of foliage. After harvest, treat just like celery. If stored properly, celeriac will remain in good condition for six to eight months.

Labor requirements

Labor requirements for celery will vary depending on available equipment and the production system used. Small-scale production (100-foot rows or a similar layout) will require the most labor for growing transplants and planting, weed control and harvest. Total labor requirements will be similar to cole crops (broccoli, cauliflower and cabbage). Sometimes contact with celery foliage can create a severe rash. When working with this crop even on hot, sunny days, wearing long sleeves, long pants and gloves is recommended, as is washing any exposed skin as soon as possible after contact.

Economic considerations

Celery and celeriac may be incorporated into existing market gardens and diversified vegetable production systems. Seed, transplant production, weed control and harvest labor time are the most significant costs for celery and celeriac production. Variable costs are likely in the $75 to $100 range per 100-foot row. Fixed costs – including an irrigation system, land and equipment - will vary with the size and scale of production.

Positive celery returns are projected for 2015 in an average small-scale production system in Kentucky, assuming 150 heads are sold for a price of at least $1.50 per head. Celery returns to operator labor and management, for sales at farmers market and other direct markets, project as similar to returns from crops like broccoli and eggplant.

[1] United 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

[2] USDA, 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

Selected Resources

On the Internet

- Agricultural Marketing Resource Center, Celery Profile http://www.agmrc.org/commodities__products/vegetables/celery-profile/
- Kitchen Gardener Magazine, How to Grow Celeriac http://www.vegetablegardener.com/item/5582/how-to-grow-celeriac
- Food availability (Per Capita) Data System, Celery http://www.ers.usda.gov/data-products/food-availability-%28per-capita%29-data-system.aspx#.U_OZ-WOwS3E
- Koike, S. T., Davis, R. M., Turini, T. M. UC IPM Pest Management Guidelines: Celery. UC ANR Publication 3439 (University of California, 2008) http://www.ipm.ucdavis.edu/PMG/r104100111.html
- Celery (Horticulture Information Leaflet, North Carolina State University, 2001) http://www.ces.ncsu.edu/hil/hil-27.html
- Celery (Oregon State Vegetable Production Guide, 2010) http://horticulture.oregonstate.edu/content/celery-2
- Cost of Fresh Market Celery Production in Southwestern Michigan (Michigan State University, 2002) https://www.msu.edu/user/blackj/Staff_Paper_2002-36.pdf

In print

- Koike, S. T., Gladders, P., Paulus, A. O. 2009. Early blight and Late blight of celery and celeriac. Vegetable Diseases: A Color Handbook. Academic Press, pp. 83 – 91.

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