



# Organic Asparagus

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## Introduction

Organic asparagus (*Asparagus officinalis*) is produced using pest management and fertilization methods that do not include synthetic compounds. Because organic crop production standards are regulated by the National Organic Program (NOP), growers producing and selling asparagus labeled “organic” must be certified by a USDA-approved state or private agency.

## Marketing

Asparagus is grown primarily in Kentucky for fresh market, especially near large population centers. Potential markets for organic asparagus include roadside stands, farmers markets, community supported agriculture (CSA) and similar subscription-based memberships, produce auctions, and local wholesalers. Restaurants, health food stores, and locally owned grocers may also be interested in Kentucky-grown organic products. Kentucky’s market window for asparagus, which varies depending on region, can start as early as April and run through the month of June.

## Market Outlook

Organic asparagus has excellent potential for increased production in Kentucky. According to UK and Census of Agriculture estimates, Kentucky asparagus harvested acreage falls between 35 and 65 acres, depending on the year. This indicates Kentucky’s population is underserved for fresh asparagus. Asparagus use has increased nationally since the 1990s, with imports providing the increased quantity supplied. At the same time, consumers show renewed interest in products grown locally and regionally, and increasing demand for organic products has made organic crop production one of



the fastest growing segments in U.S. agriculture. With solid marketing, organic asparagus production could add additional value to a potentially higher-value vegetable crop.

## Production Considerations

### *Site selection and preparation*

Only land that has been free of prohibited substances (e.g. synthetic pesticides and artificial fertilizers) for three years can be certified for organic production. A well-maintained asparagus planting can continue to produce for 10 to 15 years. Because of this crop’s longevity, it is especially important to be selective in choosing an appropriate planting site for organic production. Select a relatively level, rock-free site with light to medium-textured loam soil where asparagus has never been grown. Asparagus is susceptible to Fusarium, so do not plant in sites where Fusarium has been known to be present. Soils should be deep and without a hardpan. Good drainage is essential; asparagus will survive short periods of flooding, but not prolonged waterlogged soils. Because asparagus is a poor competitor with weeds, it is also critical to avoid fields where aggressive perennial



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weeds have a history of being difficult to manage.

Two full seasons prior to planting should be devoted to site preparation. This will include soil build-up, adjusting fertility, and weed management. Soil fertility can be enhanced through cover crops, nitrogen fixing legumes, green manure, animal manure, and approved natural fertilizers. Compost and composted manure must meet specific NOP processing requirements. Green manure crops should be fully decomposed before setting crowns.

#### *Cultivar selection*

Asparagus produces separate male and female plants. Older cultivars (e.g. 'Martha Washington' and 'Mary Washington') are a mix of both male and female plants. While female plants typically yield larger spears than male plants, female plants also produce berries that can result in volunteer seedlings throughout the landscape. However, new all-male hybrids have been developed for improved productivity, uniform spear size, and disease resistance to rust and Fusarium crown rot. Disease resistance is the most important selection criterion for the organic grower. The University of California has released some resistant cultivars, and Rutgers has an active breeding program focusing on disease resistance. Select vigorous marketable cultivars with the disease resistant qualities best suited for your location.

#### *Establishing a new planting*

An asparagus bed is generally established from 1-year-old, certified disease-free crowns. These crowns are the root systems from a 1-year-old plant grown from seed. Crowns can be purchased from a reputable plant producer or growers can produce their own in plant beds on the farm. Beds may also be established from greenhouse-grown 10- to 12-week transplants (plugs).

Organic asparagus production requires the use of certified organic planting stock that has not been treated with synthetic materials. Because it is difficult to find certified crowns or seed, organic growers need to plan ahead at least two years prior to the desired planting date when purchasing planting material. The organic certification program, soil testing, and site preparation should be completed before any planting material is ordered. Seven thousand to 9,000 plants are needed per acre with 1-foot plant spacing and 5 to 6 feet between rows.

Crowns should be planted in March or early April, while seeding or transplanting should be done in late April or early May. Asparagus crowns are planted in furrows at a depth of 6 inches below soil level. A W-shaped planting furrow is recommended for plugs. Compost or composted manure should be added to the furrow prior to planting and must meet NOP standards.

#### *Managing the planting*

Irrigation is especially important during establishment, i.e., the first two years after planting crowns or transplants. In mature beds, watering during fern production is also desirable. Withhold water in the fall to help asparagus enter its dormant period.

Conventional growers generally allow the ferns (tops) to remain standing through the winter whenever possible. Early fern removal can weaken crowns because it results in inadequate food supplies reaching the roots. Additionally, fern growth in the winter catches snowfall, thus protecting crowns from deep freezing and sudden soil temperature changes. Organic growers should mow and remove top growth soon after ferns have died back to the ground, generally about the time of the first hard frost. This provides better management of insect and/or disease problems by removing overwintering material. Using a controlled burn will accomplish the same task as mowing. Dry asparagus ferns burn very hot and quickly, so plan carefully if you do this. Maintain fertility by adding compost to the planting every fall. Supplemental organic nutrient sources include bloodmeal, fishmeal, cottonseed meal, and soybean meal.

#### *Pest management*

Pest management in organic fields emphasizes prevention through good production and cultural practices. Monitoring pests through frequent crop inspections and accurate identification are essential to keeping ahead of potential problems. The goal is not the complete elimination of a pest but rather management of pests and diseases so that crop damage is kept within acceptable economic levels.

Fusarium root and crown rot is the major cause of asparagus decline. This disease was responsible for an almost 90 percent decrease in acreage in New Jersey in the 1960s and 1970s. Foliar diseases, such as asparagus rust and Cercospora leaf spot, can also result

in reduced yields. Careful production site selection, growing resistant or tolerant cultivars, sanitation, and following good cultural practices will enhance the crop's ability to deal with disease problems. Organic control options are almost non-existent once a disease problem occurs.

Insect pests include asparagus beetles, Japanese beetles, aphids, and cutworms. Organic insect management strategies include sanitation, controlling nearby vegetation, natural predators/parasites, insecticidal soap, and organic insecticides.

Another significant challenge for organic asparagus growers is weed control. Pre-planting strategies include selecting sites with low weed pressure, tillage, and the use of smother crops. While intensive weed control is especially important during establishment when weeds can easily out-compete the young crop, following good weed management practices throughout the life of the planting is also important. Cultivation and mowing are methods of reducing weed problems after planting; care must be taken to not damage crowns with equipment. A living mulch between rows provides an alternative method for weed management. Composted wood chips, weed-free straw, or pine straw can be used as mulch to aid in weed suppression within rows. Once mulch is applied, weeds will have to be removed by hand because machine cultivation will not be possible within rows. A small nursery hoe is more useful for getting between ferns than a standard row crop hoe. Organic mulches will delay spear emergence in the spring.

#### *Harvest and storage*

Harvest equipment, storage areas, and packing materials must comply with NOP standards. Asparagus is harvested by hand when spears are 8 to 10 inches long. Ferns should not be allowed to develop until the harvest period is over.

Asparagus to be shipped and sold wholesale is usually hydro-cooled after harvest to retain high quality. Asparagus can then be stored for up to three weeks. Spears are cut to uniform length, tied in 2- to 2½-pound bunches, and packed in pyramid crates for wholesale market sales.

#### *Labor requirements*

Organic systems are more labor intensive than conven-



tional systems, largely as the result of increased labor times required for monitoring and managing weeds, diseases, and insect pests. Labor needs for organic asparagus the year of establishment are estimated at 200 hours per acre. For the following years, asparagus requires approximately 85 hours per acre for production and 80 to 150 hours per acre (3½ hours per 100 pounds) for harvest and packing. Organic production also requires management time for the mandatory recordkeeping.

### **Economic Considerations**

Initial investments include land preparation (including cover crop seeding and organic fertilizer), purchase of asparagus seed, transplants, or crowns, and installation of an irrigation system.

Costs of establishing a new organic asparagus field before the first harvest can reach \$4,000 per acre. Establishment and planting costs can be recouped by the fourth or fifth year of production. The major establishment costs are labor, crowns, and fertilizer. Per acre production costs for the first harvest year (500 pounds of asparagus) are estimated at \$1,100 with a \$50 return to operator labor, land, and management; this includes the cost of hiring 50 hours of harvest labor at \$12.50 per hour. Costs for a full harvest of 1,500 pounds of asparagus per acre are estimated at \$1,890. This includes a harvest and marketing cost (hired labor and handling) estimated at \$0.80 per pound in the full harvest years. This resulted in a per acre return of \$1,860 to operator labor, land and management (2019), assuming producers sell asparagus at an average of \$2.50 per pound.

Since returns vary depending on actual yields and market prices, the following per acre returns to land and management for the fourth year are based on three different yield scenarios at \$2.50 per pound. Conservative estimates represent an average return to land, labor, and management using Kentucky production assumptions for 2019.

Pessimistic (1000 lbs)	Conservative (1500 lbs)	Optimistic (2000 lbs)
\$1,010	\$1,860	\$2,710

Organic asparagus may also be produced in smaller beds, especially for farmers markets and other direct market sales. A 100-foot by 4-foot bed producing 40 pounds of asparagus sold at \$2.50 per pound could produce returns of \$60 over variable costs and \$15 to \$30 over total costs, including all labor costs.

### Selected Resources

- Commercial Asparagus Production, HO-66 (University of Kentucky, 2008) <http://www.ca.uky.edu/agc/pubs/ho/ho66/ho66.pdf>
- Kentucky Department of Agriculture Division of Value-added Plant Production: Organic Program (KDA) <https://www.kyagr.com/marketing/organic-marketing.html>
- Sample Asparagus Production Budget for Kentucky (University of Kentucky, 2016) [https://www.uky.edu/ccd/sites/www.uky.edu.ccd/files/asparagus\\_budget\\_2016.pdf](https://www.uky.edu/ccd/sites/www.uky.edu.ccd/files/asparagus_budget_2016.pdf)

- Vegetable Production Guide for Commercial Growers, ID-36; includes Organic Manures and Fertilizers: Appendix G (University of Kentucky) <http://www2.ca.uky.edu/agcomm/pubs/id/id36/id36.pdf>
- Asparagus Breeding Program (Rutgers) <https://breeding.rutgers.edu/asparagus/>
- Organic Weed Management (eOrganic, 2013) <https://eorganic.org/node/2551>
- National Organic Program (NOP) <http://www.ams.usda.gov/nop>
- Organic Asparagus Production (NCAT-ATTRA, 2001) <https://attra.ncat.org/attra-pub/summaries/summary.php?pub=377>
- Organic Weed Control Toolbox (eOrganic, 2019) <https://eorganic.org/node/2782>
- Resource Guide to Organic and Sustainable Vegetable Production (NCAT-ATTRA, 2012) <https://attra.ncat.org/attra-pub/summaries/summary.php?pub=19>

### Suggested Citation:

Kaiser, C. and M. Ernst. (2020). *Organic Asparagus*. CCD-CP-108. Lexington, KY: Center for Crop Diversification, University of Kentucky College of Agriculture, Food and Environment. Available: <http://www.uky.edu/ccd/sites/www.uky.edu.ccd/files/Asparagus-Organic.pdf>

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**June 2020**

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