



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, cooperatives, community supported agriculture (CSA) subscriptions, 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. A rule of thumb for market size of conventional asparagus production is 10,000 people for every acre produced. According to UK and Census of Agriculture estimates, Kentucky asparagus harvested acreage falls between 35 and 65 acres, depending on the year. This could indicate Kentucky’s population is underserved for fresh asparagus.



Increasing consumer demand for organic products has made organic crop production one of the fastest growing segments of agriculture. Typically, organic production brings higher returns for the producer. Organic asparagus production can add additional value to an already high-value vegetable crop.

Production considerations

Site selection and planting

Only land that has been free of prohibited substances (e.g. synthetic pesticides and artificial fertilizers) for 3 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. 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



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competitor with weeds, it is also important to avoid fields where aggressive perennial weeds have a history of being difficult to manage.

One to 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 and drop berries. Seed production and the resulting volunteer asparagus seedlings are undesirable in a commercial planting. 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 an extremely important selection criterion for the organic grower; it is even more important than uniformity of spears. 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 and insect resistance 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. Soil testing, the organic certification program, 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

Providing supplemental water can increase productivity and extend the life of the planting. Irrigation is especially important during establishment, i.e., the first 2 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, the dead ferns in the winter catches snowfall, thus protecting crowns from deep freezing and sudden soil temperature changes. However, organic growers may need to 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. In addition, removing the tops in the fall facilitates mechanical weed control in the spring, whereas leaving the debris could clog cultivators. Using a controlled burn will accomplish the same task as mowing and

it also eliminates the need to physically remove the top growth. 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 necessarily the complete elimination of a pest but rather to manage pests and diseases so that crop damage is kept within acceptable economic levels. Fortunately, few disease and insect problems plague asparagus; however, the few problems that do exist can be serious and difficult to control for organic and conventional growers.

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 beetle, aphids, and cutworms. Organic insect management strategies include sanitation, controlling nearby vegetation, natural predators/parasites, insecticidal soap, and organic insecticides.

Another significant challenge to organic asparagus growers is weed control. Pre-planting strategies include selecting sites with low weed pressure, tillage, and the use of smother crops. No-till and minimum tillage systems, which can be used for conventional asparagus, are not recommended in organic asparagus production. 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. Weeds can harbor insects and diseases that effect the crop. Asparagus has a wide root system so cultivation is difficult. Care must be taken to not damage the crowns. Mowing between the rows after planting can help. A living mulch between rows provides an alternative method for weed management. Composted wood chips, weed-free hay or straw, or sawdust 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 smaller hoe, such as those typically used in nursery stock production, is more useful for getting between ferns than a standard row crop hoe. Organic mulches may have a cooling effect on the soil, which can 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; otherwise, spear emergence will be delayed.

Asparagus to be shipped and sold wholesale is usually hydro-cooled after harvest in order to retain high quality. Asparagus can then be stored for up to two 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 conventional 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 at least 85 hours per acre for production and 80 to 150 hours per acre (3½ hours per 100 pounds) for harvest and packing. Organic production will also require additional management time for the mandatory record keeping.

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. Once established, asparagus is one of the least expensive vegetable crops to maintain but it is more difficult to establish and maintain a perennial vegetable crop than an annual crop as pest, disease and weed issues can build up over time. Per acre production costs for the first harvest year (500 pounds of asparagus) are estimated at \$1,000 with a \$250 return to operator labor, land, and management. Costs for a full harvest of 1,500 pounds of asparagus per acre are estimated at \$1,710 with return to operator labor, land and management of \$2,040. These returns assume producers sell asparagus at \$2.50 per pound. Harvest and marketing costs, including labor, are estimated at \$0.60 per pound in the full harvest years.

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 the University of Kentucky's statewide return estimates to land, labor, and management (2012).

PESSIMISTIC (1,000 LBS)	CONSERVATIVE (1,500 LBS)	OPTIMISTIC (2,000 LBS)
\$1,600	\$2,170	\$3,120

Organic asparagus may also be produced in smaller beds, especially for farmers markets and other

direct market sales. Based on Iowa State University cost and return data for a 100-foot by 4-foot bed producing 40 pounds of asparagus sold at \$2.50 per pound, producers might expect an \$80 annual return over variable costs and \$50 return 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) <http://www.kyagr.com/marketing/plantmktg/organic/index.htm>
- Sample Asparagus Production Budget for Kentucky (University of Kentucky, 2016) http://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://www.ca.uky.edu/agc/pubs/id/id36/id36.htm>
- Asparagus Breeding Program (Rutgers) <http://breeding.rutgers.edu/asparagus-varieties/>
- Bring Existing Weeds Under Control Before Planting Weed-Sensitive Crops (eXtension, 2014) <http://articles.extension.org/pages/18549/bring-existing-weeds-under-control-before-planting-weed-sensitive-crops>
- 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 (eXtension, 2015) <http://articles.extension.org/pages/18532/an-organic-weed-control-toolbox>
- Resource Guide to Organic and Sustainable Vegetable Production (NCAT-ATTRA, 2012) <https://attra.ncat.org/attra-pub/summaries/summary.php?pub=19>

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