University of Kentucky
College of Agriculture,
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Cooperative Extension Service

Center for Crop Diversification Crop Profile
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Garlic and Elephant Garlic

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Introduction

Garlic (*Allium sativum*) is commonly used as a flavoring for food, as a condiment, and for medicinal purposes. The milder-flavored elephant garlic (*Allium ampeloprasum*) is actually a leek that produces large cloves.

Marketing

Direct marketing (farmers markets, roadside and on-farm stands, community supported agriculture) is the most-used option for Kentucky-grown garlic. Wholesaling garlic to local supermarkets and specialty food stores is also an option. In addition to whole bulbs, garlic can be sold in a number of other forms. Immature plants may be marketed as 'scallions,' also referred to as 'green garlic.' Flower stalks (scapes) harvested from hardneck types, sought as an ingredient in spreads and pestos, can be sold as a specialty item. Tops may be sold as greens.

Value-added techniques include braiding tops and pickling. There is no market for commercially processed garlic due to the lack of local garlic dehydration facilities. Garlic spreads are not an option for small-scale production since Kentucky state regulations (HB 391) prohibit the use of garlic-in-oil mixtures in home-based processing and microprocessing. The processing requirements for these and other low-acid products are stringent due to the potential danger of botulism poisoning developing from improper processing.

Market Outlook

Increased use of garlic was attributed to a rise in the popularity of international foods and a greater awareness of garlic's

reported health benefits. Garlic supply volume soared in the U.S. during the 1990s, exceeding 3 pounds per person in 1999 and remaining between 2 and 3 pounds from 2000 to 2017. Imported garlic became a much larger part of the U.S. supply around 2005. Record garlic imports in 2016/17 resulted in the highest ever availability in 2017. Domestic production increased to offset lower garlic imports in 2018.

Kentucky consumers have been receptive to organically and conventionally grown garlic. Locally grown garlic has been successfully marketed at farmers markets statewide and to specialty retailers in Lexington, Louisville and northern Kentucky. Kentucky restaurants have ranked garlic as one of the top produce crops that they are interested in sourcing from local growers. Garlic presents a variety of creative marketing possibilities for producers, from unique varieties to braids and other edible decorative options.

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Production Considerations

Cultivar selection

Garlic cultivars are grouped into two

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main categories: hardneck (produce a scape) or softneck (do not produce a scape); both types can be grown in Kentucky. Other traits that can differ between cultivars include clove arrangement, number of cloves, size of cloves, color, skin tightness, and flavor. Some of these characteristics can change depending on the production location and environmental conditions, thereby complicating varietal selection. Even hardneck and softneck designations can break down in different climates. Growers should select only adapted varieties that have the qualities in demand for the intended market.

There is only one cultivar for elephant garlic. Even the hardneck and softneck types, which may be sold under different names, have been identified as the same cultivar.

Site selection and planting

Garlic does best in well-drained soil high in organic matter. Heavy soils, which hamper bulb enlargement and stain the garlic, should be avoided. Garlic is planted by hand in the fall and harvested the following summer. Planting in raised beds promotes good soil drainage, reduces soil compaction, and increases the ease of harvest. Drip or trickle irrigation is recommended during the growing season, especially during bulb formation. Irrigation should be discontinued approximately two weeks prior to harvest. Mulching immediately after planting is beneficial.

Pest management

Disease problems include downy mildew, bulb and neck rots, purple blotch, and Botrytis leaf blight. Purchasing disease-free bulbs, rotating crops, and following good cultural practices can help prevent many of these diseases; however, fungicide sprays may be needed in some years. The most common insect pests of garlic include onion thrips and onion maggot. Scouting to monitor populations can help determine when and how often insecticides should be applied. Weed control is essential since garlic is a poor competitor. Mechanical cultivation, hand hoeing, mulch, crop rotations, and herbicide applications are typical weed management strategies.

Harvest and storage

Garlic is ready for harvest when the leaf tops begin to dry and bend toward the ground. The presence of three to five wrapper leaves is the best indication of maturity. Before harvesting, random bulbs should be pulled to be sure they have reached the desirable size. Mature elephant garlic bulbs are about twice the size of regular garlic. Rain during harvest causes serious problems because wet soil stains the bulbs and can increase the possibility of decay.

Garlic and elephant garlic bulbs are hand-harvested. Soil is loosened prior to pulling using a garden fork, bed lifter or potato digger. Properly cured or dried garlic can be stored for up to three months in a standard warehouse or up to six months in cold storage.

Labor requirements

Garlic production is labor intensive because the crop is planted and harvested by hand. Labor needs per acre are approximately 24 hours for production, 32 to 40 hours for harvesting and 16 hours for curing bulbs and packaging.

Economic Considerations

The cost of seed cloves plus the hand labor for planting and harvest makes the initial investment for garlic production high in comparison to some other vegetable crops. Additional costs include land preparation

and irrigation.

Garlic returns vary depending on how the crop is marketed. Garlic sold from $2 to $2.50 per pound could generate estimated returns to land and management of $250 to $2,200 per acre, based on a 4,000-pound yield on plasticulture in 2019. An acre of well-managed conventional or organic garlic that is directly marketed at or above $4 per pound could return more than $5,000 per acre. Management, price per pound, and marketing will determine the profitability of garlic for the producer. Garlic is also a potentially profitable small-scale crop, with yields of 35 pounds per 100-foot row estimated to produce positive returns to land, labor and management in 2019 when sold at a direct market price of $5.75 per pound.

Selected Resources

- Selected Internet Resources for Herb Marketing, CCD-MP-24 (University of Kentucky, 2018) http://www.uky.edu/ccd/sites/www.uky.edu.ccd/files/herbmarketing.pdf
- Garlic Production (Penn State Extension, 2017) https://extension.psu.edu/garlic-production
- Production and Management of Garlic, Elephant Garlic and Leek, Circular 852 (University of Georgia, 2017) https://extension.uga.edu/publications/detail.html?number=C852&title=Production and Management of Garlic, Elephant Garlic and Leek
- Organic Garlic Production (ATTRA, 2008) https://attra.ncat.org/product/garlic-organic-production/
- Garlic (Cornell Cooperative Extension, 2019) https://cvp.cce.cornell.edu/crop.php?id=14&list=yes
- Vegetables and Pulses Yearbook Tables (USDA/ERS, 2019) https://www.ers.usda.gov/data-products/vegetables-and-pulses-data/vegetables-and-pulses-yearbook-tables/

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