

Echinacea

Introduction

Coneflowers (*Echinacea* spp.) are herbaceous perennials with large daisy-like flowers. There are nine species of coneflower and all are native to central or eastern North America. Purple coneflower (*E. purpurea*), a well-known garden flower, is extensively cultivated in nurseries. This hardy ornamental is commonly planted in both home and commercial landscapes. Coneflowers are also effective, long lasting cut flowers.

Some species (*E. angustifolia*, *E. purpurea*, and *E. pallida*) are also prized commercially for their reported medicinal properties. Echinacea has been used as an immune system stimulant, an anti-inflammatory, and as an aid in healing wounds. While dried roots are most desirable in commercial medicinal preparations, the flowers, leaves, and seeds have also been harvested.

Marketing

Echinacea for ornamental use may be produced for several different markets. Retail sales of plants include garden centers, landscape nurseries, farmers markets, and other retail outlets. Echinacea plants produced for wholesale markets are sold to other nurserymen, landscapers, or retailers. Cut flowers for floral arrangements could be marketed to wholesale florists, retail florists, and farmers markets.

Roots and plant material produced for medicinal/dietary uses are generally marketed to herbalists, manufacturers, distributors, and pharmaceutical companies.



Echinacea is sold in various forms, including teas, ointments, pills, tinctures, creams, and powders. Most dealers will not enter into a contract with an inexperienced grower without seeing a sample of what the grower can produce. Buyers may also require laboratory tests for purity. Growers in other states have indicated that it can take up to 10 seasons to secure a contract.

Market Outlook

Purple coneflower is a popular plant in formal and informal perennial landscape plantings. Producers could discover this market through plant sales to retail garden centers, wholesaling to nurserymen, landscapers and retailers, and possibly landscape nurseries. Plants may also be sold at farmers markets or through other direct market channels. Sales of perennial plants maintained some strength amidst a difficult plant retail environment during the later 2000s, and perennial varieties offer promise for growers willing to identify viable markets, especially for novel varieties, in the 2010s.

There may be some market potential for newer coneflower

**Crop Diversification
& Biofuel Research
& Education Center**

varieties. The flowers of many *E. purpurea* cultivars range in color from pink to purple. Hybrids with yellow, orange, red, white, and green flowers, as well as novel flower forms, have been released in recent years. However, there has been some indication that some hybrids do not have the vigor or hardiness of the wild species, so growers should investigate any cultivars they select before making the decision to produce them. In addition, University of Kentucky research has shown two additional species (*E. tennesseensis* and *E. paradoxa*) have potential for mass production. They have unique horticultural characteristics not found in the commonly cultivated *E. purpurea*. *E. paradoxa* has yellow flowers and *E. tennesseensis* appears to be more resilient in the landscape than *E. purpurea*. Along with the release of novelty hybrids of *E. purpurea*, these two additional species could fill a unique niche market for nurseries interested in new plants native to North America.

A rapid increase in the demand for medicinal herbs occurred in the mid- to late-1990s as interest in natural health care and health products soared. While demand for medicinals has lost some of the momentum of the 1990s boom, it continues to remain strong. Echinacea is reportedly the most widely used medicinal herb in the U.S. The commercial echinacea market is concentrated among relatively few firms and larger scale producers. Producer prices received for echinacea dropped dramatically in the 2000s from prices reported during the 1990s. The market for Kentucky-grown cultivated medicinal herbs is highly uncertain at this time, making echinacea production for this market a dubious enterprise. Producers should always be sure to have a viable market before investing in any enterprise for new crops.

Production Considerations

Site selection and planting

Echinacea plants can be field-grown for herbal or ornamental use, or container-grown for ornamental use. Growing medicinal herbs generally necessitates the use of organic methods

of production. Organic growers must meet all USDA National Organic Program (NOP) requirements and be certified by a USDA-approved certifying agency, such as the Kentucky Department of Agriculture. NOP regulations state that the growing site must remain free of prohibited substances (e.g. artificial fertilizers and synthetic pesticides) for a minimum of 3 years prior to the time of harvest. Growers unable to secure organically produced seed may be permitted to use conventionally produced, untreated seed. However, seedlings for transplants must be raised in approved organic potting soils.

Choose a site that has well-drained and moderately rich loam or sandy-loam soil for field production. It is advantageous to grow plants in a soil type that easily washes from the roots when plants will be harvested for herbal extracts. Fields with heavy perennial weed pressure should not be planted to echinacea.

Since container production of echinacea entails growing plants above-ground using a medium, well-drained mix, the type of native soil at the site is not as important. In general, container-production requires a firm surface with good surface drainage. To aid drainage, a 2- to 4-inch layer of course gravel can be spread on the site. This gravel bed is then covered with landscape fabric to suppress weeds. The ideal site will have a slightly sloping topography for proper air and surface water drainage. It will also offer water drainage to a pond or retention basin for recycling back to the crop. Container-grown plants need to be frequently irrigated, often several times per day, throughout the growing season. A source of clean water is probably the most important consideration in selecting a suitable site. Water quality should be tested for pH and mineral content on a regular basis, especially if the source is a well or pond. Drip or trickle irrigation is the most desirable irrigation method as it allows efficient use of water and does not wet the leaves; wet foliage favors foliar disease development.

Echinacea plantings are started from seed or transplants; however, transplanting greenhouse-grown plugs will achieve a more consistent and uniform planting than direct-seeding to the field or containers. Echinacea seed generally requires 1 to 4 months of stratification to break dormancy, and germination rates can be as low as 20% to 30%. Plugs may be purchased through some wholesale suppliers. A tobacco setter or water wheel planter can be used for transplanting echinacea to the field. Some growers prefer setting plants in the fall; however, plants can also be successfully set in May in Kentucky. Harvesting roots is easier when plants are grown in raised beds in the field.

Pest management

Weeds are the greatest threat to field production. Echinacea is a poor competitor with other plants, thus weed control is critical, especially during the first year. Most herbicides are not an option for organic growers, so hand hoeing and mulching tend to be the main techniques for weed control in organic fields. Diseases with the potential to cause serious crop losses include aster yellows and Sclerotinia crown and stem rot. Other diseases include southern blight and powdery mildew. Insects that may threaten echinacea include aphids, Japanese beetles, and leafhoppers.

Harvest and storage

Nursery plantings of echinacea for landscape use are generally marketable the growing season following planting. Field-grown plants may be harvested as either bareroot plants or moved to containers. The length of time a plant can be grown in a container is limited. Once unsold plants outgrow their container, they will have to be repotted to a larger container, divided into smaller units, or discarded.

Echinacea cut flowers are hand-harvested with a sharp knife, clippers, or pruners during the coolest part of the day. Once harvested, stems are placed in a bucket of water containing floral preservative. Harvested flowers should then be placed in a cooled area or cooler until

sold. Depending on the market, cut flowers are commonly sold individually, in bunches of five or 10 stems, or in mixed arrangements. Packaging containers may vary from 5-gallon plastic buckets to clear cellophane sleeves. Floral preservative and refrigeration are essential to keeping flowers fresh and extending their shelf and vase life.

Plants harvested for their roots are typically grown for 2 to 3 years. Roots can be harvested in the fall with a modified potato digger and then chopped into sections before washing. Dried roots will bring a higher price. Drying is accomplished by leaving roots in the field to dry naturally or by using an industrial batch drier typically used for tobacco. An acre of echinacea averages 2,500 to 3,000 pounds of dried root after 3 years of growth.

Labor requirements

The level of management for container-grown nursery plants is significantly higher than in field production. A common rule of thumb is to employ one nursery worker per actual acre of container production or one employee per 7 to 8 acres of field production.

Labor needs include approximately 42 hours per acre for planting echinacea to the field. Producers growing their own transplants will have additional labor needs. Hoeing will necessitate well over 160 hours per acre over a three-year growing period. Cut flower production is labor and management intensive, and requires trained labor for harvesting stems. Echinacea harvested for herbal extracts will necessitate an additional 35 hours per acre for washing and drying roots.

Economic Considerations

Start-up costs for echinacea production include the purchase or production of plugs, the labor required for establishment, and installation of an irrigation system.

Production of ornamental echinacea plants, especially novelty species or cultivars, can be a profitable addition to an existing nursery

operation. The cost of producing echinacea for the ornamental market is comparable to other herbaceous perennial plants. Nursery production costs will vary considerably depending on operation type and size. The large overhead investment required to establish a field container nursery typically requires a size larger than 15 acres to generate economic returns. Growers with superior management and production skills who cultivate niche markets for new or specialized varieties may be able to generate positive returns from smaller nurseries.

Echinacea herb production is a long-term investment in time, energy, and finances. It takes a minimum of 2 to 3 years for roots to develop to a marketable size. Risks include plant establishment failure, an uncertain market, fluctuating prices, and the difficulties associated with organic production practices. Equipment needs include a planter, potato digger, washing equipment, and drying equipment. The total capital investment could easily reach \$10,000 per acre before a harvest is realized. Breakeven prices for production costs calculated in 2010 for a hypothetical acre of production in Kentucky ranged between \$6 and \$7 per pound. A higher price per pound (\$15 to \$20) would be needed to recoup the grower's capital investment within 5 to 10 years. As of 2010, it would be unlikely to locate a regional wholesale market guaranteeing such wholesale prices for farm-raised echinacea.

Selected Resources

- Evaluation of Coneflower (Echinacea) Species for Nursery Production under Field Conditions (University of Kentucky)
<http://www.uky.edu/Ag/NewCrops/echinacea.html>

- Selected Internet Resources for Herb Marketing (University of Kentucky, 2010)
<http://www.uky.edu/Ag/NewCrops/herbmarketing.pdf>
- Commercial Echinacea Production, Agdex 188/20-1 (Alberta Agriculture and Food, Canada, 2000) *Available for purchase*
[http://www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/agdex10531](http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/agdex10531)
- Echinacea (British Columbia Ministry of Agriculture, Food, and Fisheries, 2003)
http://www.agf.gov.bc.ca/speccrop/publications/documents/echinacea_factsheet.pdf
- Echinacea (Virginia Tech, 2001)
<http://www.sfp.forprod.vt.edu/factsheets/echinacea.pdf>
- Echinacea as a Tobacco Crop Alternative (University of Wisconsin-Madison Center for Integrated Agricultural Systems, 2000)
http://www.cias.wisc.edu/archives/2000/01/02/echinacea_as_a_tobacco_crop_alternative/index.php
- Economic Issues with Echinacea, MF-2532 (Kansas State University, 2002)
<http://www.agmanager.info/agribus/econissues/mf2532.pdf>
- Herb Production in Organic Systems (ATTRA, 2005)
<https://attra.ncat.org/attra-pub/summaries/summary.php?pub=42>
- Production Practices for *Echinacea augustifolia* (Agriculture and Agri-Food Canada, 2007)
<http://www4.agr.gc.ca/AAFC-AAC/display-afficher.do?id=1193337467277&lang=e>
- Warm Climate Production Guidelines for Echinacea (University of Florida, 2004)
http://hort.ufl.edu/floriculture/pdfs/crop_production/Echinacea_ENHFL04-008.pdf

August 2010

Reviewed by Bob Anderson, Extension Specialist (Issued 2003, Revised 2006)

Reviewed by Shawn Wright, Rebecca Schnelle, and Sharon Bale, Extension Specialists (Revised 2010)

For additional information, contact your local [County Extension](#) agent