



Acknowledgement: This crop profile has been developed as a collaborative effort between the University of Kentucky Center for Crop Diversification and the University of Tennessee Center for Profitable Agriculture as part of a project titled Developing and Utilizing Crop Profiles for Tennessee Specialty Crop Growers. The project was made possible in part by the US Department of Agriculture's (USDA) Agricultural Marketing Service through grant USDA-AMS-TM-SCBGP-G-18-0003. UT Extension provides equal opportunities in programs and employment.



Cut Flower Production in Tennessee

Matt Ernst¹, Rachel Painter², and Celeste Scott³

Introduction

This publication provides considerations for producers establishing a cut flower enterprise in Tennessee. Cut flower production in Tennessee has increased with the growing popularity of direct market channels, like farmers markets and Community Supported Agriculture (CSA), and event-based agritourism, like on-farm weddings. Cut flowers are also popular with new farmers because of potentially substantial returns from relatively small land areas.

This fact sheet focuses on a typical startup cut flower enterprise in Tennessee and surrounding states: a smaller-scale enterprise serving a local market niche or diversifying existing farm production. Flower enterprises can vary greatly from farm to farm depending on the market served.

Producers seeking profitability from cut flower production can find many marketing and farm business planning resources at the [Center for Profitable Agriculture website](#).

Market Description and Common Marketing Channels

The dominance of high-quality global production in wholesale flower markets leads many U.S. producers to focus on product differentiation. Cut flower supply chains are well established, so focused effort will be needed in selection and marketing to establish opportunities for local



Photo by Austin Graf, Buzzed Blooms, Manchester, TN

Cut flowers can be packaged to sell directly to consumers in eye-catching color palettes.

cut flowers. Many cut flowers sold in the U.S. are imported by air from Central and South America, and from flower wholesale markets in the Netherlands.

Demand for cut flowers can be impacted by broader economic trends. Economic downturns and changes in tourism and event planning can have adverse impacts upon the floral industry. However, flowers are also viewed by many consumers as an affordable luxury. Smaller producers that sell directly to the consumer could, in some cases, be able to avoid risks of larger-scale supply chain disruptions and impacts upon demand.

Cut flowers may be sold through local direct markets like farmers markets, on-



¹Matt Ernst is an independent contractor with the Center for Crop Diversification.

²Rachel Painter is an Extension Specialist with the Center for Profitable Agriculture.

³Celeste Scott is a Horticulture Extension Agent in Madison County, Tennessee.



Photos by Kara Jamison, Blooming Joy Flower Company, Christiana, TN

Left: Ranunculus grown in the open field in late April. Frost cloth with hoops are used to protect blooms from frost. **Right:** *Helleborus* blooming in early March, even after a winter storm of snow and ice.

farm stands or U-picks, and CSA shares. Other forms of direct marketing for cut flowers include selling flowers or arrangements directly to event planners and other end users. Some producers will provide arrangements for events, like weddings, while other flower growers will provide flowers to local designers and planners servicing these events.

Local florists are also potential customers for cut flowers and cut stems. Specialty cut flowers – especially those that are difficult to ship from afar – can become a wholesale niche for local cut flower producers. Producers in the U.S. have seen some success with developing niche markets for lilies, snapdragons, gerbera, tulips and gladiolas (see [University of Kentucky CCD-CP-70](#))². Cut flower producers may also discover local demand for floral material that is unique or not readily available in wholesale channels; for instance, some floral designers may want cut stems from herbaceous perennials and woody shrubs.

Cut flowers can be a profitable standalone enterprise; they can also complement other product sales and add value within existing farm market channels. For example, containers of sunflowers or other cut

flower arrangements can add beauty and distinction to a farmers market stand. For growers selling from the farm, cut flower plantings can add beauty and attract interest in a farm’s production. In these cases, cut flowers add economic value by complementing an existing marketing plan.

Production Systems

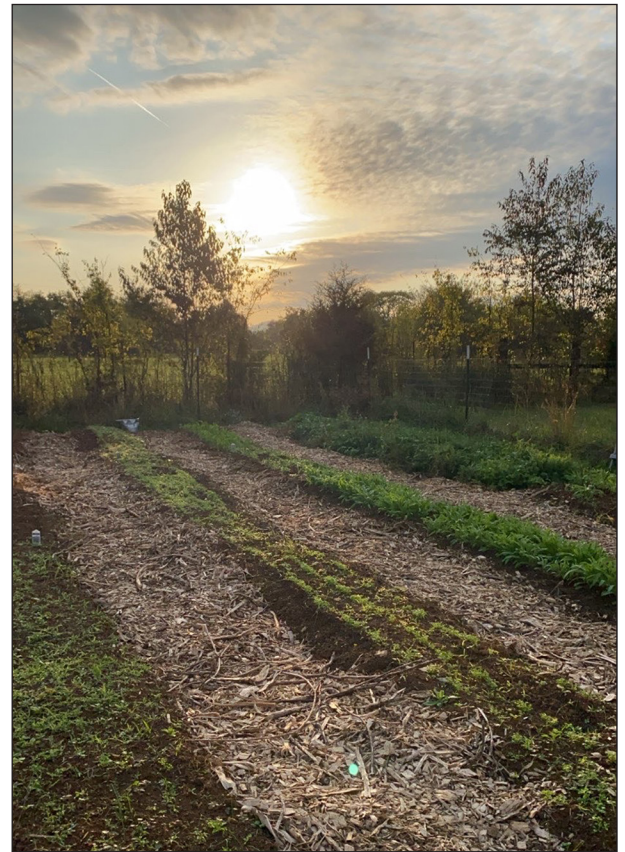
Cut flower growers in the South typically combine both covered and field production systems. Covered production systems range in complexity and expense and can include small and large greenhouses, high tunnels, low tunnels and row covers. Growing flowers from seed to harvest in an automated greenhouse may be the most complex, while very simple covered systems would include starting a few flats of seeds indoors for transplanting or using fabric for frost protection to extend the harvest season.

Growing cut flowers in raised beds is a common entry point for producers. Developing efficient production systems appropriate to the farm size and managing weeds, diseases and insects are important success factors for field-grown cut flowers.

²University of Kentucky Center for Crop Diversification, “Field-grown Specialty Cut Flowers,” CCD-CP-70



Photos by Austin Graf, Buzzed Blooms, Manchester, TN (above) and Kara Jamison, Blooming Joy Flower Company, Christiana, TN (right)



Above: Plastic mulch helps prevent competition from weeds in the field.
Right: Sowing spring flower seeds during the fall allows establishment and ideal growing conditions to produce beautiful spring blooms. Wood chips in pathways inhibit weed growth.

Plant Selection, Planting and Transplanting

Select flower varieties/cultivars that are suitable for production in Tennessee (see table on pages 7-12). Remember also that selections must be potentially profitable, based on market demand and production costs. Cut flower growers often build a customer base by selling established and familiar varieties/cultivars while also introducing new or novel flower types.

Consider both the desired customer base and the length of the marketing season when selecting which flowers to grow. Customers in some marketing channels, like farmers markets and on-farm markets, may be more open to different kinds of flowers throughout the marketing season. Other customers, like event venues and floral designers, may have more established product specifications and buying patterns. Defining and understanding the customer will greatly aid the cultivar/variety selection process.

Cut flowers grown outdoors are commonly grown in raised beds or in long rows; some flower types may be better-suited for bare ground production than others. Select sunny, well-drained sites with high organic matter and other good soil health characteristics. Sites

should have access to a water source for irrigation. Electricity and other utilities are necessary for greenhouses and other protected systems.

Cut flower crops can be adapted to crop systems of all sizes. Flower variety is the main factor in deciding whether to transplant or direct seed. Germination requirements vary between varieties, each with specifications on planting depth, stratification, scarification, and even light exposure. Beginning producers may find it cost-effective to purchase transplants from another grower or greenhouse.

Mulch helps prevent weed competition in field production. Several options are available to growers including organic mulch (bark mulch), biodegradable mulch films, woven fabric mulch, and plastic mulch. Keep in mind that when using impermeable products like plastic, you must first incorporate some type of drip irrigation to provide adequate moisture to the root zone. When using mulches that come on rolls, specialized tools for laying mulch, laying irrigation, transplanting, and seeding can improve efficiency and save costs on labor. In addition to reducing weed competition, mulch influences both soil temperature and moisture and plays a vital role in cut flower production.



Photos by Kara Jamison, Blooming Joy Flower Company, Christiana, TN
Above and right: Hortonova trellis netting is used to support cut flower stems.

Pest Management

Cut flower production must be managed for pests: weeds, insects and diseases. Planning for pests that are most likely to impact specific types of flowers can help growers design a production system that minimizes potential losses due to pests.

Weed pressure is significant for many flowers. Weeds compete for plant nutrients and may host insect pests and diseases. Mulching is often used as a first line of defense for weeds. Equipment such as mulch layers and straw spreaders can greatly reduce labor times needed for mulching. Mechanical and hand cultivation are also used frequently as a weed control measure in field production. Herbicide use, while limited in scope, is another tool in the production tool box. However, in order to prevent unwanted damage, labels must be read and followed to the full extent. Cover crops are also used, most often between rows, to discourage weed growth. Weeds should also be managed in the landscape and fields surrounding the flower planting in an effort to reduce safe haven for insect and disease pests and to reduce the likelihood of weed seed dissemination in or near the planting area.

Numerous insect pests can impact flower production in Tennessee. Common pests include aphids, leafhoppers, mites and thrips. Other insect pests include, but are not limited to, flea beetles, plant bugs, Japanese beetles and caterpillars. Integrated pest management

(IPM) is used to recognize insect pests and develop an appropriate system to manage pest damage. The IPM strategy can be used to manage insects in both open field and covered flower production systems. Producers starting plants from seed for transplanting should remember to include an IPM strategy in the greenhouse or wherever the transplants are grown.

Plant disease management is very important in cut flower production because diseases can substantially



Photo by Kara Jamison, Blooming Joy Flower Company, Christiana, TN
Sunflowers, ProCut® White Nite and Plum, in a solution with a CVBN conditioner tablet.

impact flower appearances and consumer acceptance. Selecting disease-resistant cultivars and practicing good site management and cultural practices can help manage diseases. Common diseases impacting cut flower production in Tennessee include powdery and downy mildews, foliar bacterial and fungal leaf spots, and root rots like black root rot.

Harvest and Storage

There are many differences in harvest and storage among flower varieties including the ideal time of day for harvest, the appropriate growth and/or flowering stage at which to harvest, the best postharvest floral preservative treatment, and the ideal temperature for storing cut stems. The following are a few best practices for harvesting and handling cut flowers:

- Cut flowers during a cool part of the day
- Regularly clean knives, shears and other cutting tools used for harvesting flowers
- Place the cut stems into clean buckets of water with a floral preservative directly after cutting; buckets may then be moved to a packing shed or other processing area
- Recut at least one inch of the stem under water before storing in a refrigerator or cooler
- For optimum vase life, store most cut stems at 32-35 degrees F and 90 percent humidity

Some flowers, such as *Dianthus* spp., *Delphinium* spp. and *Scabiosa* spp., are very sensitive to ethylene. They will be damaged if stored in a refrigerator or cooler with ethylene-producing fruits and vegetables. Producers should check a list of ethylene-sensitive flower species to determine if extra caution is needed, especially if flowers will be stored alongside produce.

The importance of postharvest handling for cut flowers cannot be overstated. The way each different flower variety is handled will determine its storage and vase life. Growers should consult research-based recommendations for handling and preserving each type of flower. Finally, always understand the buyer's preference and expectations for flower quality and expected vase life after purchase. Wholesale buyers, in particular, will have very high expectations for flower quality.

Labor and Economics

Harvest and postharvest processing are the largest labor commitments for cut flowers. Production labor needs include pre-plant soil preparation, weed and



Photo by Austin Graf, Buzzed Blooms, Manchester, TN
Options for selling cut flowers include farmers markets, on-farm stands or U-picks, and CSA shares.

pest management and crop maintenance and management, including scouting for disease and pest pressure. Marketing labor, such as delivering flowers to customers or staffing a farmers market booth, can also be significant for cut flower growers.

Producers considering a cut flower enterprise should prepare a detailed budget prior to purchasing any crop inputs – or even deciding to pursue the enterprise. This section describes important parts of a cut flower enterprise budget and points to useful resources for determining prices for cut flowers.

Generally, there are two kinds of costs in a crop enterprise budget: variable costs (costs that change based on the quantity produced on a certain space) and fixed costs (costs that do not change with the quantity produced).

Typical variable costs in cut flower production are compost and other soil amendments, mulch, machinery and equipment costs like fuel, oil and rent, seeds or transplants, pest control, marketing containers, harvest labor, and flower sleeves and other marketing supplies.

Typical fixed costs for cut flower growers include the purchase of irrigation equipment, reusable plant supports and trellising, farm equipment purchase costs and the initial investment for a high tunnel or greenhouse structure.

A sample cost worksheet applicable to many cut flower varieties is included on Page 6.

Example Cost Worksheet: Sunflowers for Cut Flowers

Variable Costs	Quantity	Unit	Price per Unit	Total
Soil Amendments (Lime, compost, etc.)				
Fertilizer				
Seeds or Plugs				
Mulch				
Irrigation Supplies				
Weed Control				
Disease Control				
Machinery/Equipment				
Harvest Labor				
Flower Sleeves, etc.				
Marketing Costs				
Total Variable Costs				

Fixed Costs	Quantity	Unit	Price per Unit	Total
Depreciation of Machinery, Equipment				
Depreciation on Irrigation System				
Insurance				
Land Rent or Taxes				
Total Fixed Costs				

Once the total production costs and yields are estimated, producers can determine what prices will be needed for profitability. Knowing the cost of production is always important; it is especially applicable to flower growers targeting florists and others accustomed to paying wholesale prices. Setting prices for direct retail markets can also be challenging. Discussing prices with potential customers, before beginning production, is one of the best ways for specialty crop growers to project realistic prices per stem. Comparing probable prices with the estimated costs of production can then inform a producer's ultimate decision to grow cut flowers.

Additional guidance for growing and marketing cut flowers can be found in these helpful publications:

A General Guide to Pricing for Direct Farm Marketers and Value-Added Agricultural Entrepreneurs https://trace.tennessee.edu/cgi/viewcontent.cgi?article=1029&context=utk_agexmkt

Choosing Direct Marketing Channels for Agricultural Products <https://extension.tennessee.edu/publications/Documents/PB1796.pdf>

“Cut Flower Production” (Penn State University, 2012)
<https://extension.psu.edu/cut-flower-production>

“Cut Flowers” (University of Kentucky Center for Crop Diversification)
<https://www.uky.edu/ccd/production/crop-resources/nursery-ornamental/cut-flowers>

“Getting Started in the Production of Field-Grown, Specialty Cut Flowers” (Virginia Cooperative Extension, 2019) <https://www.pubs.ext.vt.edu/426/426-618/426-618.html>

“Greenhouse-grown Specialty Cut Flowers” (CCD-CP-58, University of Kentucky Center for Crop Diversification, 2021)
<https://www.uky.edu/ccd/sites/www.uky.edu/ccd/files/ghcutflowers.pdf>

In print
Specialty Cut Flowers, 2nd edition. Allan M. Armitage and Judy M. Laushman. 2008. Portland, OR: Timber Press. 636 pp.

Cut Flower Options for Tennessee

Scientific Name	Common Name	Type	Propagation	Initial Harvest	Harvest Period	Pest/Disease	Comments
<i>Achillea millefolium</i>	Yarrow	P	Seed Transplant Division	Spring	June - September	<ul style="list-style-type: none"> • Powdery mildew • Rhizoctonia • Many leaf spots • Botrytis • Pythium • Root-knot nematode 	<ul style="list-style-type: none"> • Harvest when pollen is visible
<i>Ageratum houstonianum</i>	Floss Flower	A	Transplant	Spring	8 weeks	<ul style="list-style-type: none"> • Leaf rust • Whitefly • Aphid 	<ul style="list-style-type: none"> • Blooms are most productive at temps between 60-70F • Harvest when center is fully open
<i>Amaranthus caudatus</i>	Love-lies-bleeding	A	Direct Seed	Summer	To frost w/ succession planting	<ul style="list-style-type: none"> • None of importance 	<ul style="list-style-type: none"> • Support netting is recommended • Harvest when ¾ of inflorescence are open
<i>Ammi majus</i>	False Queen Anne's Lace	A	Direct Seed	Summer	6 weeks	<ul style="list-style-type: none"> • None of importance 	<ul style="list-style-type: none"> • Direct seed in fall or very early spring • Sap can cause dermatitis • If starting indoors for succession planting chill for 2 weeks before germination • Harvest when 80% of inflorescence is open
<i>Antirrhinum majus</i>	Snapdragon	A	Seed Transplant	Early Spring	Depends on Group (I-IV) and cultivar	<ul style="list-style-type: none"> • Rust • Botrytis • Powdery mildew • Downy mildew • Many leaf spots • Root and crown rot nematodes • Aphid • Whitefly • Leaf miners • Mite • Foliage-feeding caterpillars 	<ul style="list-style-type: none"> • Cool season • Harvest when 1/3 of spike is open • Store upright to prevent stem bending • Warm temperatures result in early flower but weak stems
<i>Bupleurum rotundifolium</i>	Bupleurum aka Thoroughwax	A	Seed	Spring			<ul style="list-style-type: none"> • Harvest when flower begins to show color

Scientific Name	Common Name	Type	Propagation	Initial Harvest	Harvest Period	Pest/Disease	Comments
<i>Capsicum annuum</i>	Ornamental Pepper	A	Seed Transplant	Summer	To frost	• Aphid	• Valued for showy fruit display • Harvest once desired color has formed
<i>Celosia</i>	Wheat (spicata) Celosia Crested (cristata) Cockscomb Plumed (plumosa) Cockscomb	A	Direct Seed Seed Transplant	Summer	July – September Up to 10 weeks	• Botrytis • Alternaria • Cercospora • Phyllosticta leaf spots • Powdery mildew • Aphid • Thrip	• Harvest when plumes are fully colored • Will freely reseed if not harvested • Succession planting is recommended every 3-4 weeks for high quality stems
<i>Consolida ajacis</i>	Larkspur	A	Direct Seed	May	6 weeks	• Basal rot • Crown rot • Powdery mildew • Stem canker • Aphid • Leaf miner • Cyclamen mite	• Requires cold treatment of seed and vernalization of plant tissue • Direct sow in Mid-October through November for spring production • Harvest when 2-5 of bottom florets are open • Cuts are very sensitive to ethylene in storage
<i>Cosmos bipinnatus</i> <i>Cosmos sulphureus</i>	Cosmos Sulfur Cosmos	A	Direct Seed Seed Transplant	Late Spring	To frost with succession planting	• Powdery mildew • Bacterial wilt • Root rot • Aphid • Japanese beetle • Leafhopper	• Heat loving • Direct seed only after soil temps average 60F • Harvest when petals of the first ray flower begin to open or when bud colors • Cold storage will lengthen vase life
<i>Dahlia hybrids</i>	Dahlia	P	Bare Root Transplant	Summer	June - frost	• Powdery mildew • Dahlia mosaic virus • Corn earworm • Cutworm • European corn borer • Slug • Spider mite	• Lift tubers after the first frost • Harvest when bud is 75% open

Scientific Name	Common Name	Type	Propagation	Initial Harvest	Harvest Period	Pest/Disease	Comments
<i>Echinacea purpurea</i>	Purple Coneflower	P	Seed Transplant Division	Summer	6-8 weeks	<ul style="list-style-type: none"> • Cercospora leaf spot • Septoria leaf spot 	<ul style="list-style-type: none"> • Replant in 3-5 years to maintain vigor • Harvest just as petals are expanding • Many Echinacea species are suitable for cut flowers
<i>Foeniculum vulgare</i>	Bronze Fennel	P	Seed Transplant	Summer	To frost	<ul style="list-style-type: none"> • None of importance 	<ul style="list-style-type: none"> • Harvest foliage for filler • Harvest bloom when umbel is 80% open • Host plant for swallowtail caterpillars
<i>Gladiolus hybrids</i>	Gladiolus	A	Corm	Summer	To frost with succession planting	<ul style="list-style-type: none"> • Corm rot • Dry rot • Leaf and flower spot • Tobacco mosaic virus • Thrip • Spider mite • Aphids • Wire worms 	<ul style="list-style-type: none"> • Perennial treated as an annual • Use large corms • Successive plant every 2 weeks after last spring frost • Harvest when 2-3 flowers at the base of spike are showing color • Must remain upright during storage and transport
<i>Gomphrena globosa</i>	Globe Amaranth	A	Direct Seed Transplant	Summer	To frost	<ul style="list-style-type: none"> • Leaf spots • Tomato spotted wilt virus TSWV-1 • Damping off 	<ul style="list-style-type: none"> • Heat and humidity tolerant • Aggressive grower • Succession planting not required for continual harvest • Look for cultivars with stem lengths that average 15" • Harvest when bloom colors but before fully opened • Great option for drying
<i>Helianthus annuus</i>	Sunflower	A	Direct Seed	Summer	August - October	<ul style="list-style-type: none"> • Aphid • Many caterpillar • Grasshopper • Downy mildew • Powdery mildew • Stem rot • Rust 	<ul style="list-style-type: none"> • Sequential planting weekly for extended harvest • Harvest when centers are still tight and petals have not begun to curl back
<i>Helleborus hybrids</i>	Lenten Rose	P	Transplant Division	Late Winter	February - May	<ul style="list-style-type: none"> • Leaf spot • Crown rot 	<ul style="list-style-type: none"> • Unique addition to winter bouquets • Papery blooms have a long vase life

Scientific Name	Common Name	Type	Propagation	Initial Harvest	Harvest Period	Pest/Disease	Comments
<i>Leucanthemum hybrids</i>	Shasta Daisy	P	Transplant Division	Summer	10 weeks	<ul style="list-style-type: none"> • Botrytis • Downy mildew • Powdery mildew • Aphid • Thrip 	<ul style="list-style-type: none"> • Require division every 3 years to remain productive • Harvest when daisy is beginning to open
<i>Lilium hybrids</i>	Asiatic Lily & Oriental Lily	P	Bulb	Summer	Depends on type	<ul style="list-style-type: none"> • Botrytis • Lily mosaic virus • Bulb rots • Southern blight • Aphid • Grasshopper • Nematode 	<ul style="list-style-type: none"> • Asiatic are earlier to bloom, shorter, with upright facing blooms • Orientals are later to bloom, taller, and larger outward facing blooms • Plant pre-chilled bulbs in early spring • May be treated as annuals or perennials in Zones 7 and above • Harvest when first flower is colored but not yet open
<i>Lunaria annua</i>	Money Plant Dollar Plant	A	Direct Seed	Summer	Through frost		<ul style="list-style-type: none"> • Actually a biennial • Sow seed in late summer before desired harvest • Blooms are insignificant - grown for showy seed pods • Excellent for drying
<i>Narcissus</i>	Daffodil	P	Bulb	Early Spring	6 weeks	<ul style="list-style-type: none"> • Botrytis • Narcissus basal rot • Viruses • Aphid • Large Narcissus bulb fly • Bulb scale mite • Narcissus nematode • Slug 	<ul style="list-style-type: none"> • Plant in fall • Combination of early and late-blooming cultivars can result in 8-10 weeks of bloom • Cut wound excretes a substance detrimental to many other cut stems so place in clean water for 24 hours and then rinse stems before arranging
<i>Ocimum basilicum</i>	Basil	A	Seed Transplant	Summer	To frost	<ul style="list-style-type: none"> • Downy Mildew 	<ul style="list-style-type: none"> • Select resistant cultivars • Harvest when bloom spikes begin to open

Scientific Name	Common Name	Type	Propagation	Initial Harvest	Harvest Period	Pest/Disease	Comments
<i>Paeonia hybrids</i>	Peony	P	Divided Crowns	May	3-4 weeks	<ul style="list-style-type: none"> • Botrytis • Root Rot • Stem Rot • Viral ringspots 	<ul style="list-style-type: none"> • Crown should have at least 5 eyes • Transplant crowns in fall • 3-5 years until production • Harvest when color appears on top of a tight bud
<i>Pennisetum</i>	Fountain grasses	A	Transplant	Summer	To frost		<ul style="list-style-type: none"> • Harvest foliage and seed heads
<i>Ranunculus asiaticus</i>	Ranunculus	P	Tuber	Spring	4-6 weeks	<ul style="list-style-type: none"> • Root rot • Crown rot • Southern Blight • Powdery mildew • Aphid 	<ul style="list-style-type: none"> • Treated like an annual in Zones 7 and lower • Cool-season bloomers • Soak tubers and then plant indoors to observe shoot and root development and then plant those that are viable • Cold treatment may improve flowering • Harvest when buds show color
<i>Rudbeckia hirta</i>	Black-eyed Susan	P	Seed Transplant	Summer	June - August	<ul style="list-style-type: none"> • Downy mildew • Powdery mildew 	<ul style="list-style-type: none"> • Harvest when terminal bloom is fully open
<i>Scabiosa atropurpurea</i>	Pincushion Flower	A	Direct Seed	Spring	Spring - frost	<ul style="list-style-type: none"> • None of importance 	<ul style="list-style-type: none"> • Successive planting every 2-4 weeks • Harvest when center begins to unfurl
<i>Scabiosa caucasica</i>	Scabiosa	P	Seed Transplant Division	Spring	4-6 weeks	<ul style="list-style-type: none"> • Powdery Mildew • Root Rot • Curly top virus 	<ul style="list-style-type: none"> • Requires cool temperature to initiate bloom • Performs best in areas with cooler summer temps • Harvest when color appears
<i>Solidago hybrids</i> & <i>Solidago rugosa</i>	Goldenrod	P	Seed Transplant	Late Summer	To frost	<ul style="list-style-type: none"> • Rust • Powdery mildew • Downy mildew • Spider mite • Whitefly • Leaf miner 	<ul style="list-style-type: none"> • Replant every 2-3 years to maintain vigor • Harvest when inflorescence is ¼ - ½ open
<i>Tagetes erecta</i>	African Marigold	A	Direct Seed Seed Transplant	Summer	To frost	<ul style="list-style-type: none"> • None of importance 	<ul style="list-style-type: none"> • Successive plantings every 3 weeks • Harvest when bloom is nearly mature

Scientific Name	Common Name	Type	Propagation	Initial Harvest	Harvest Period	Pest/Disease	Comments
<i>Tithonia rotundifolia</i>	Mexican Sunflower	A	Direct Seed Seed Transplant	Summer	To frost		<ul style="list-style-type: none"> • Stem has a delicate neck • Harvest when petals have unfurled from center
<i>Tulipa</i>	Tulip	A	Bulb	Spring	6 weeks	<ul style="list-style-type: none"> • Botrytis • Bulb/basal rot • Bacterial soft rot • Blue mold 	<ul style="list-style-type: none"> • Hybrids are treated as annuals • Plant in the fall • Using a mix of early, mid- and late-season cultivars will extend harvest period • Harvest when 50% of flower is colored
<i>Zinnia elegans</i>	Zinnia	A	Direct Seed Seed Transplant	Summer	To frost	<ul style="list-style-type: none"> • Alternaria leaf spot • Powdery mildew • Aphids • Cutworm • Japanese beetle • Grasshoppers 	<ul style="list-style-type: none"> • Successive plantings every 2-3 weeks through mid-summer • Harvest when pollen is visible and nearly fully mature

Suggested Citation:

Ernst, M., R. Painter, and C. Scott. (2021). *Cut Flower Production in Tennessee*. CCD-CPA-CP-3. Lexington, KY: Center for Crop Diversification, University of Kentucky College of Agriculture, Food and Environment. Available: <https://cpa.tennessee.edu/wp-content/uploads/sites/106/2021/1/TNcutflowers.pdf>

*Reviewed by Natalie R. Bumgarner, Associate Professor and Residential and Consumer Horticulture Extension Specialist, University of Tennessee
Photos courtesy of Kara Jamison, Blooming Joy Flower Company, Christiana, Tennessee, and Austin Graf, Buzzed Blooms, Manchester, Tennessee*

June 2021

Educational programs of Kentucky Cooperative Extension serve all people regardless of economic or social status and will not discriminate on the basis of race, color, ethnic origin, national origin, creed, religion, political belief, sex, sexual orientation, gender identity, gender expression, pregnancy, marital status, genetic information, age, veteran status, or physical or mental disability.

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