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Garden Mum Production in Tennessee

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Garden mums (*Chrysanthemum* spp.) are favorite plantings in the fall landscape, and newer mum cultivars are promoted as spring planting options to add interest and color earlier in the growing season. Mums are usually container-grown and most commonly produced outdoors on ground-covered container pads or production fields. While mums can be produced under protection in greenhouses, heat accumulation can delay flowering (heat delay), therefore proper ventilation in greenhouses is required if outdoor field production is not an option. Some farms in Tennessee and the surrounding region have also had success selling field-grown mums dug and potted at the farm.



TRICOLOR MUMS

This fact sheet describes the major considerations for adding garden mums to a farm enterprise in Tennessee: marketing, production, harvest and economic considerations.

Marketing

Garden mums are an important part of landscaping and ornamental production operations. Large floriculture producers supply the majority of wholesale mums; however, broad consumer demand also supports smaller regional production. Markets for wholesale container plants are very competitive, and the types of retailers where garden mums may be purchased have increased over time. Wholesale customers for garden mums include lawn and garden centers, big box chain stores, food retailers, specialty retailers and florists. In some re-

gions, produce auctions are also significant wholesale channels for ornamentals. Growers should identify their markets and plan in accordance with their production window needs.

The U.S. Census of Horticulture reported more than 75 producers of garden mums in Tennessee in 2014, with a total marketing value of \$4.5 million. Wholesale mum production is most common in Tennessee; retail sales account for 10 to 20 percent of the market value of Tennessee-grown mums, according to the USDA. Direct market channels for garden mums

include community farmers markets, on-farm markets, roadside stands and subscriptions like community supported agriculture (CSA). Garden mums may also be sold directly to landscapers and other professionals.



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New and novel garden mum cultivars attract consumer interest and provide possible entry points into different market channels. Consumers continue to be interested in mums with unique colors and flower shapes, as well as mums blooming earlier than traditional garden mums.

Production Systems & Irrigation

The two types of outdoor production systems for mums in Tennessee are container-grown and field-grown. Container-grown mums are often grown on a gravel or crushed rock base, usually 4 inches deep, with landscape fabric underneath. Container-grown mums can be placed directly on plastic (polypropylene) mulch. Mums may also be grown in a high tunnel or cold frame greenhouse without the covering. In general, spacing for outdoor container-grown mums is on 16-inch to 20-inch centers; more than 1,000 square feet would be required to produce 500 containers. Before spacing, determine the maximum plant size for the specific cultivars grown to ensure adequate space is provided. Such information is available from breeding and horticultural suppliers and young plant producers.

Field-grown mums, which are often larger than those grown in containers, should be planted in healthy, well-drained soils with no herbicide residues. Spacing varies according to field layout and production equipment. Row spacings of 3 to 5 feet are common, with mums planted 2 to 3 feet apart in the row.

Mums may be container-grown in a variety of greenhouse systems. Summer temperatures in Tennessee require well-ventilated greenhouses for healthy mum production. If greenhouses lack proper ventilation, heat accumulation can delay flowering, referred to as heat delay among the floriculture industry. The utilities expense required to maintain optimum temperatures can result in higher production costs per unit, relative to outdoors production, for greenhouse-grown mums.

Irrigation is essential for container- and field-grown mums. Automated drip irrigation systems allow efficient watering and fertilizer delivery for both container- and field-grown systems. Overhead irrigation may be used for outdoor production; however, overhead systems use more water and labor for everyday watering. Overhead watering of mums can also promote some diseases.



FIELD-GROWN MUMS SHOULD BE PLANTED IN WELL-DRAINED SOILS WITH NO HERBICIDE RESIDUES.

Planting and Transplanting

Garden mums are planted from rooted cuttings purchased from horticultural young plant wholesalers and breeders. Some firms sell cuttings from patented cultivars; other firms sell non-patented and specialty cultivars. Certain types of cultivars may be better suited for different production systems and regions. Consult UT Extension and/or local garden experts for cultivars best suited to the local region.

Mum cuttings may be planted in Tennessee from May to July. Planting dates are determined largely based on the individual cultivar, flower response time, and desired sale dates. For example, wholesale producers may need to estimate the length of the growing season based on the earliest delivery date for customers. Producers growing for direct markets, including field-grown mums, will need to plant cultivars that are ready to harvest during peak demand times of the local season.

Commercial mum producers apply a starter fertilizer at planting and additional nitrogen throughout the growing season. Nutrients often are injected into irrigation systems to deliver a desired nitrogen rate. Mums are sensitive to magnesium and calcium deficiency, and supplemental calcium and magnesium are usually delivered through fertigation or soil amendments. For container-grown mums, the supplemental nutrients can be provided by a calcium nitrate-based fertilizer and Epsom salt drench.

Pest Management

Common insect pests on garden mums include aphids, caterpillars, leafhoppers, grasshoppers and spider mites. Insect damage can be managed and limited through an integrated pest management program that incorporates a broad range of cultural practices, pest control products and scouting.

Major disease challenges for mums in Tennessee include bacterial leaf spot (caused by *Pseudomonas cichorii*), fusarium wilt, pythium root rot and rhizoctonia web blight. Other challenges include rhizoctonia stem rot, various fungal leaf spots and blights, and bacterial blight.

Preventative management practices are similar for many garden mum diseases. Growing mums in containers or under protection reduces the risks of introducing soilborne diseases; avoiding ground contact with pots is commonly recommended. Sanitation practices, such as cleaning and sanitizing production equipment, also prevents the introduction of disease organisms into the production environment. Avoiding using overhead irrigation is another strategy because overhead irrigation can help create an environment more favorable to disease.

Many producers use preventative fungicide applications to reduce the risk of crop loss in both container and field-grown mums. Crop rotation for field-grown mums is important to reduce risks from disease carried by soilborne pathogens.

Harvest and Handling

Container-grown mums are sold in their containers. During production, containers may need to be anchored or positioned behind a windbreak to keep the mum pots from falling over during windy conditions. When planning for production, field-grown garden mum producers should account for labor time needed to pot or package field-grown mums for sale. Some producers have used “dig-your-own” marketing to sell field-grown mums at the farm.

Economic Considerations

Garden mum production costs are best evaluated on a per-plant or per-container basis. Costs per mum may vary greatly and depend upon the production system used. There may also be a wide range of costs within similar production systems. Greenhouse costs of pro-



SPACING FOR OUTDOOR CONTAINER-GROWN MUMS IS ON 16-INCH TO 20-INCH CENTERS.

duction, for example, can vary greatly depending on the size and type of greenhouse, age of the facility, and required systems costs such as ventilation.

Variable costs are costs that vary according to the number of plants produced in a specified area. The major variable cost categories for growing garden mums are the costs of soil preparation or soil media (for container mums), containers, mum cuttings, fertilizer and fertigation, costs to operate the irrigation system, pest control products, labor for planting and harvest, and mum marketing costs.

Fixed costs are costs that do not change according to the number of plants that are grown in a certain area. Fixed costs for mum production include depreciation on equipment and assets used for multiple years: tractors and soil preparation equipment, irrigation pumps and pipelines, landscape fabric and gravel used to establish gravel beds, and land rent or taxes.

One of the possible benefits for adding garden mum sales to an existing operation is that producers may be able to use existing equipment and assets toward mum production. Producers already growing field vegetables on raised beds with drip irrigation, for example, may be able to add a modest-sized mum enterprise that uses existing soil preparation and drip irrigation equipment. Similarly, mum production in an uncovered greenhouse or high tunnel, or on a gravel bed, may also be able to draw on existing irrigation equipment.

The following table provides a comparison of cost categories for small-scale mum production in two

Item	Container-Grown	Units	Field-Grown (1/4-acre)	Units
Preharvest Variable Costs				
Cuttings	1,000	cuttings	1,000	Cuttings
Potting media / Soil Preparation	10	5.5 cu. ft. bags	1/4-acre	Equipment for preparing raised beds
Mulch	2,000 to 2,500 sq. ft.	Landscape fabric	~2,500 row feet	Plastic mulch
Mum pots (8-inch)	1,000	Pots		
Labor to transplant/plant and fill pots (~150 cuttings per hour to plant, 100 pots per hour to fill)	18	Hours	8	Hours
Weed control	0	Hours	~2,500 row feet	Plastic mulch
Fertilizers & nutrients: Starter, slow-release, magnesium and calcium	Varies		Varies	
Growth retardants	1 tsp/80-85 mums		1 tsp/80-85 mums	
Insect controls	Varies		Varies	
Disease controls	Varies		Varies	
Machinery/Equipment				
Fertilize/Water/Care labor	12	Hours	10	Hours
Pinching labor	3 to 5	Hours	3 to 5	Hours
Apply pesticides	2	Hours	2	Hours
Containers (Field-grown may vary if customer-dug)			Up to 1,000	Pots
Potential Marketing Cost Categories				
Transport to market	Varies, according to market and farm location	Fuel, vehicle repairs and maintenance	Varies, according to market and farm location	Fuel, vehicle repairs and maintenance
Labor – transporting and selling	Varies	Include both hired labor and owner/operator labor	Varies	Include both hired labor and owner/operator labor
Marketing memberships and fees	Varies	Vendor fees, payment processing	Varies	Payment processing
Fixed Costs				
Depreciation of machinery, equipment		Potting equipment, vehicle		Machinery, vehicles
Depreciation (allocated annual cost) for gravel*	Varies		N/A	
Depreciation on irrigation system	Varies			
Insurance	Varies			
Land rent or taxes	Varies			

*The whole cost of gravel will need to be incurred at the beginning of the enterprise

Adapted from UK CCD mum economic estimate originally adapted from Brian Whipker, "Cost of Producing Garden Mums in Containers" (Purdue University, 1990)

scenarios: approximately ¼-acre of field-grown mum production (1,000 mums at 30-inch spacing in 4-foot rows) and 1,000 mums grown on a gravel bed over landscape fabric (2,000 to 2,500 square feet of production). This is provided as an example of potential costs for new growers planning to direct market mums on a comparatively small scale. Experienced nursery and greenhouse producers could approach 10,000 mums and more.

In addition to financial factors, available space, producer experience in horticulture and floriculture, and the target market will all impact the decision to produce a field-grown or a container-grown product. For on-farm marketers, field-grown flower production can also create a welcoming and attractive environment for customers.

It is worth noting several differences between container- and field-grown mums. Container-grown mums will require more labor during planting and transplanting, especially as the pots must be filled with growing media. Field-grown mums will likely require more labor at harvest, as they must be put into containers for sale. Producers marketing mums on the farm could use a combination of “customer-dug” and pre-potted mums to potentially save on labor times. There can be slight labor time advantages in fertilizing and pest control for container-grown mums; however, these lower times are often because of upfront investment in efficient delivery systems (irrigation).

There are also several similarities. Profitable mum production depends on regular watering, fertilizing and disease management – all by use of drip irrigation systems. Irrigation system costs will be incurred with both container-grown and field-grown production. Disease and insect control variable costs will also be similar between the two systems. The producer’s experience with spraying crops, and the presence of spray equipment used for a floriculture crop, may affect application costs for pest management products.

Conclusion

This fact sheet provides an overview of garden mum production in Tennessee, highlighting important marketing, production and economic factors. Producers considering mum production should identify the best potential production system to fit an individual farm and develop cost and return projections based on the specifics of the selected production system.

Resources

- A General Guide to Pricing for Direct Farm Marketers and Value-Added Agricultural Entrepreneurs (University of Tennessee, 2011) <https://pafarm.com/wp-content/uploads/2018/07/PB1803.pdf>
- Choosing Direct Marketing Channels for Agricultural Products (University of Tennessee, 2010) <https://extension.tennessee.edu/publications/Documents/PB1796.pdf>
- Garden Mums (Center for Crop Diversification Crop Profile - Kentucky, 2017) <https://www.uky.edu/ccd/sites/www.uky.edu.ccd/files/mums.pdf>
- Garden Mum Production for Fall Sales (University of Kentucky, 2002) <http://www.uky.edu/hort/sites/www.uky.edu.hort/files/documents/gardenmums.pdf>
- Growing Garden Mums for Fall Sales (University of Massachusetts Amherst, 2015) <https://ag.umass.edu/greenhouse-floriculture/fact-sheets/growing-garden-mums-for-fall-sales>
- Garden Mum Production: Diseases and Nutritional Disorders (University of Kentucky, 2015) <http://plantpathology.ca.uky.edu/files/ppfs-or-h-10.pdf>

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Photos courtesy of W. Garrett Owen

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