

Garden Mum Production for Fall Sales

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Garden chrysanthemums grown for fall sales have been a successful crop for some Kentucky growers and a difficult crop for others. A strong market exists for garden mums because garden centers desire an inexpensive flowering pot plant to accentuate fall landscape plant sales. Additionally the commercial landscape market has expanded and needs flowering plants for use in the fall. Garden mums can be a simple crop to grow. If labor costs can be controlled, garden mums can be a "money-making" summer crop.



Garden mums are generally grown in containers but there is some field production in the state. Approximately 35% of the container-grown garden mums are grown in greenhouses with 50% grown outdoors by a greenhouse business. Only 10-15% of the garden mums in the state are field grown. Field production is relatively easy, but the mums are best only for direct sales to the consumer. Plants are dug at the time of sale and the consumer has 1-2 days to get them back into the ground and well watered or they will wilt and die. Container grown plants can be watered daily at the retail location so they have relatively good life at a retail market and for the consumer.

Observations from trials at UK and from commercial growers have led to the following recommendations. Each grower must consider all aspects of production carefully before beginning a garden mum production program.

MARKET

The most important recommendation for the production of a crop is a market analysis. This is especially true for garden mums because the market varies from year to year. Ten years ago, garden mums were relatively new to many Kentucky growers and the market was wide open, however, more than 600,000 are now produced in the state.

Most new growers consider their market casually and only begin to define the market after production has begun. This leads to unnecessary price-cutting and the new grower often cuts prices far below the high initial costs. Although it takes some time, a good market analysis will pay for itself later.

A market analysis can be relatively simple - you are looking for someone to buy your garden mums when they are in flower. Find and talk to all plant retailers in your area - garden centers, nurseries, supermarkets, farm stores, roadside stands, etc. Ask them:

- "Do you sell garden mums?"
- "How many do you sell?"
- "Where do you usually buy garden mums?"
- "What price do you expect to pay this year?"
- "What price do you expect to charge?"
- "How have sales been the last few years?"
- "Are they satisfied with their current supplier?"

- "Are there different types of mums or containers that they would like to get, but cannot get from their current supplier?"

Once you have organized the answers to these questions and others you add, you will have a market analysis. It may point to potential buyers, indicate products that are undersold in the market, or point out that there is little hope for selling garden mums in your area. If there were no local market, it would be better to know, before you make a large investment to grow garden mums.

Retailers expect flowering garden mums to be available in late August. Peak sales are in early September, but begin August 15 and continue to October 15 across the state. Natural season garden mums generally begin to flower September 15 and continue until October 15. Garden mums in flower in August and early September were shaded with a short day treatment and are usually grown in greenhouses. The shading treatment (described below) is more expensive than natural season treatment so early mums often get a premium price.

PRODUCTION RESOURCES AND SUPPLIES

Container Production Space - Garden mums can be produced outdoors or in greenhouses. Outdoor production is cheaper because fans and evaporative cooling aren't necessary. Additionally, plants are shorter and harder when grown outdoors. Indoor production usually requires growth retardant treatments for height control. Outdoor production can be on a 4-inch lime rock base, on a polypropylene ground cloth (fabric mulch) or possibly black polyethylene film. Some growers use the area where their cold frame greenhouses (without poly covers) are located. Plants should be spaced at 16-inch to 20-inch centers when fully grown. Thus 500 plants would require over 1000 square feet of production area.

Field Production Space - Garden mums require good field soils with no agricultural herbicide residue. Soils should be suitable for field digging the plants in the fall. Plants are generally spaced 24, 30 or 36 inches apart in the rows; rows are spaced 3 to 5 feet apart depending on the width of

cultivation equipment. Field-grown garden mums are generally larger than container-grown mums.



Containerized garden mums grown on a lime rock base with drip irrigation.

Container Irrigation Systems - Trickle or drip irrigation is the most efficient and commonly used system for garden mum production. Design mains, submains and headers to distribute water to the trickle emitters in individual pots. Use the manufacturer's recommendations for system design. If you need further assistance, contact your county extension agent or floriculture extension specialist for more details. The initial cost for a trickle irrigation system (pipe, emitters, time clock, solenoid and fertilizer injector) will be about \$.70 per pot. This cost can be amortized over the 5-7 year life of the system; costs are outlined in the proposed budgets below. The addition of a time clock and solenoid to the trickle system allow automatic watering every day including weekends.

Overhead irrigation systems, such as sprinklers, require an investment similar to trickle systems for 500 pots or more. Overhead irrigation requires much higher water usage so the cost of more water, larger pumps and larger pipes must be considered. Also, overhead systems are more difficult to automate so someone must be available 1-2 hours a day to operate the overhead system.

Field Irrigation Systems - Trickle or drip irrigation systems are best for field production of garden mums. Systems with in-line emitters or drip holes spaced at the same distance as the plants offer efficient water and fertilizer applications. Many systems are available from farm, greenhouse, and

irrigation supply companies. Overhead irrigation can be used but has the same drawbacks mentioned above. It is common for small producers to use overhead sprinklers for field garden mum production but trickle systems are much more efficient.

Mum Cuttings - Garden mums are propagated by cuttings. Greenhouse plant supply companies or the 2-3 companies that grow garden mums distribute these cuttings. Cutting propagated mums are far superior to seed propagated mums for garden mum production, so it is not necessary to try garden mums from seed.

Sources of Garden Mum Cuttings

- Growers, Breeders -
 - GroLink Specialties, P.O. Box 5467, Oxnard CA 93031
 - Yoder Brothers Inc., P.O. Box 230, Barberton OH, 44203
- Brokers –
 - EHR, Inc. 350 Thomas More Pkwy, #109, Crestview Hills KY 41017
- Pre-finished Plants -
 - Red Barn Nursery, 1240 Baker Lane, Nicholasville KY 40356
- Specialty and Non-patented Cultivars –
 - Bristol Mums, Inc., 50 Pinehurst Rd., Bristol CT 06010
 - Donahue's Greenhouses, P.O. Box 366, Faribault MN 55021
 - New England Mum Co., Inc., P.O. Box 700, Sorrento FL 16749

Cultivar (variety) selection is quite important. Most cultivars perform satisfactorily in Kentucky, but certain types may be better for your production conditions. Some cultivars also perform better for early sales, so remember to constantly evaluate new cultivars for your production. Some cultivars will have flower buds visible shortly after they have been transplanted. Be sure to give these plants a hard pinch, removing 1-2 inches of the stem, as soon as they are established so new vegetative stems will be produced.

Throughout this publication, these plants have been called garden mums rather than hardy mums. Most mums are not reliably hardy or perennial in Kentucky; they generally last 1-3 years in the landscape. Even though hardiness trials have been completed in various states, the variations of winter seem to determine hardiness more than the specific cultivars.

Containers and Growing Media - Typical garden mum production occurs in 'mum pots', plastic or fiber pots that have an 8-inch diameter and 5 inch height. One gallon or three quart plastic nursery containers 6 or 6.5-inch pots are also used with equal success. One-quart nursery containers can be used successfully for late, un-pinched or once-pinched, crops planted in late June. Plastic containers absorb significant amounts of heat during the summer, enough to damage the root system and the plant. If possible, keep the plants pot-to-pot early in the season to keep the soil cool. As the mums grow, progressively space the plants so the foliage is nearly touching; this will keep the soil and root systems as cool as possible.

Any commercial growing medium used for greenhouse crops should be satisfactory for garden mum production in containers. Growing media is less than 20% of the direct costs for the crop, so be sure to use a good medium with which you have experience. Homemade soil mixes should have no more than 30% sterilized, herbicide-free soil included.

PRODUCTION SCHEDULE

Potting and Field Transplanting - Traditional garden mum production schedules recommend that cuttings should be planted May 20-June 10 for natural season flowering. These remain as the recommended times for planting but other factors should be considered as well.

- Garden mums planted from May 25 to June 10 may require pinching three times. Overall plant size is increased by this practice. Field grown mums benefit from this early planting more than container grown mums.

- Garden mums show only small increases in size during June and July, but increase in size rapidly during late August and September. New cultivars are free branching and produce many branches at flowering. Later planting and a single pinch or no pinch may produce large plants if optimum irrigation and fertilization practices are used. New schedules recommend planting one or two cuttings per pot in early July; these plants may be grown without a pinch depending on your experience.
- In University of Kentucky trials, mums planted July 7 and June 20 were comparable in size and somewhat smaller than mums planted June 5. Early July is the latest date to plant garden mum cuttings to produce large plants in 1 gallon or mum pots.
- Smaller garden mums grown in 1 qt. containers were planted July 7 and July 20 in our trials. These "4-inch" garden mums were very successful and quite large. They were more difficult to water and would require a special market.
- Garden mums "left-over" from spring bedding plant sales can be used for summer production for fall sales. Be sure to remove all flowers and flower buds with a hard pinch to stimulate new growth.
- Garden mums that will be shaded for early flowering must be planted earlier than the standard dates. Consult schedules prepared by cutting producers to determine the best dates for planting.

Pinching - Traditional garden mum production schedules suggest two pinches - the first within two weeks of planting in the field or in a container and the second, three weeks later in late June or early July. Traditionally, most growers have used two pinches but newer varieties may require no pinch or only one pinch. Some growers use an application of Florel as a second pinch. This growth regulator will increase branching and reduce stem elongation. Florel also causes flower abortion, so be sure the application is at least 6 weeks before plants should be in flower for your sales date.

Vegetative stems of garden mums are usually given a "soft" pinch. This practice involves the removal of the growing point, a few young leaves and about 1/2 inch of stem from the stem tip. A soft pinch is used for the first pinch, only one stem, and the second pinch, 2-8 stems. Occasionally a "hard" pinch, removal of 1-4 inches of stem, is necessary. A hard pinch is used to remove flowers, flower buds or crown buds to stimulate vegetative growth of the plant.

Irrigation - Garden mums in containers need consistent and regular irrigation once or twice EVERY day. Newly planted mums can be watered every few days. Through June and early July, watering once per day is sufficient. Late July, August and September weather conditions often require watering twice per day.

In trials at UK, garden mums grew best when irrigated in a sub-irrigation system (capillary mat) that kept the growing medium moist 24 hours a day. Although sub-irrigation systems are not feasible for mum production outdoors, these results demonstrated how important consistent, thorough irrigation is to garden mum production.



Garden mums grown on a "tobacco float bed" using capillary mat, upon a layer of 2" styrafoam to "float" the plants, to wick water up to the plants.

Hand watering simply cannot apply the consistent, thorough irrigation necessary. This is especially true when plants are grown in commercial media that is difficult to re-moisten after it is thoroughly dry. Trickle irrigation systems, especially when automated with a time

clock, offer the best technique to irrigate mums economically outdoors.

Field grown garden mums do not need irrigation every day, but require irrigation during typical Kentucky summers. Field mums will require 1 to 1.5 inches of water each week through normal rainfall or irrigation.

Fertilization - Chrysanthemums are heavy feeders, they need regular fertilization throughout the crop. A single application of controlled release fertilizer in containers or a single application of fertilizer in field grown mums will not be sufficient for quality garden mums.

Field soils for garden mums should be tested prior to planting. Soil pH should be 6.0 to 6.8 with phosphorus and potassium at high levels. A starter fertilizer solution should be applied at transplanting. Mums should be side-dressed with ammonium nitrate (33-0-0) at a rate of 30-40 pounds of N per acre shortly after the first pinch. This should be repeated after the second pinch.

It is generally necessary to apply magnesium and calcium supplements throughout the crop for best growth. Apply Epsom salts (magnesium sulfate - MgSO₄) at the rate of 1 lb. per 100 gallons of water every 3-4 weeks through the crop until September or at the rate of 1 oz. per 100 gallons of water with every watering. Apply calcium nitrate (CaNO₃) at a rate of 1.5 lb per 100 gallons of water every 3-4 weeks through the crop. Calcium nitrate must be used separately, do not mix with any other fertilizer for application. Some mum cultivars are quite sensitive to calcium deficiency so be sure to use calcium from the beginning of the crop.



Some cultivars are quite sensitive to calcium deficiency.

Container-grown mums require fertilization every week or with every watering. It is important to monitor your fertilization practices with 3-5 soil tests throughout the crop. Additionally, it is important to have an analysis of your irrigation water before production begins, in order to establish the best nutrition program.

Fertilization with every watering is preferred, but generally requires the use of a proportioner or injector in the irrigation system. A standard fertilization program for garden mums involves the use of liquid fertilizer and controlled release fertilizer. At transplanting begin the fertilizer program of 100 ppm N from 15-16-17, 20-10-20 or similar water soluble fertilizer for soilless growing media. Just after the first pinch, top-dress 1/2 teaspoon of 14-14-14 Osmocote to each container. Continue the 100 ppm fertilizer until the time of the second pinch. At that time, increase the fertilizer to 150-200 ppm; 1-2 weeks later, apply another 1/2 teaspoon of Osmocote. Decrease the fertilizer rate to 100 ppm in mid August and stop fertilization in early September.

Rates of 400-500 ppm of nitrogen from soluble fertilizer should be used if fertilizing the plants only once per week. Other materials may be used satisfactorily as fertilizer, contact your county extension agent or floriculture extension specialist for more information.



This red coloration is typical of nitrogen and phosphorus deficiencies.

Pest Control - Insect pests - aphids, leafhoppers, grasshoppers, caterpillars - and spider mites are relatively common on garden mums. Gray mold

and bacterial leaf spot are common disease problems. Many grass and broad leaf weeds will be a problem in garden mum fields. Because pesticide labels change frequently, no specific chemical controls will be listed here. Contact your county extension agent or floriculture extension specialist for more information.



Garden mums with insect damage and general chlorosis from insufficient fertilizer applications.

Day-length Control of Flowering –

Chrysanthemum flowers are initiated in late July when day-lengths are shorter. In plant catalogs, garden mums are rated as 6, 7, 8, etc. week cultivars. This relates to the amount of time it takes from initiation of flowers to opening of the flowers. Because natural flower initiation occurs around July 25, no cultivars could flower before September 10 and others 1-3 weeks later. Choose mum cultivars according to their time to flowering so you will have early, mid-season and late flowering cultivars.

Flower initiation occurs with few complications in late July. Temperatures and day-length, however, affect flower development, in

late summer. It is common for all mums to suffer ‘heat delay’ in summer; the high night temperatures delay flower development. For this reason, some garden mum cultivars will not flower on time in mid September, but will be delayed into late September and October.

Most growers make no effort to prevent heat delay. Heat delay can be reduced by artificial day-length control through the application of a black (opaque) cover to change the day-length. The plants are covered with the black cloth from 8 p.m. each evening; the cloth is removed at 8 a.m. each morning. This treatment could begin July 25 and continue until plants show color (6-8 weeks). This treatment is essentially impossible to do outdoors, but is possible in a greenhouse. This black cloth or short day treatment can also be used in a greenhouse earlier in the summer to produce flowering garden mums for August 15 or September 1 when the market demand is very high.



The 'Ruby Mound' garden mums on the left were shaded (black-cloth) or grown natural season (right).

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