Chrysanthemums for the Home Garden

Chrysanthemums or "mums" are one of the most popular fall perennials for the garden. Numerous varieties are available today and can be selected to bloom from late summer through the entire fall. The genus *Chrysanthemum* belongs to the aster or daisy family and consist of over 200 species including annuals, perennials and small shrubs. Native to the Far East, chrysanthemums became a part of America's floriculture in the late 1700s when they were first introduced. By the early 1900s, hardier varieties were being grown and with the introduction of the Korean hybrids, mums became quite popular as a garden plant. These Korean hybrids became the breeding stock for most all hardy chrysanthemums present today.

Garden mums are vigorous clump-type plants with strong, upright or sprawling stems which can often become woody; the leaves are slightly aromatic. Many new varieties of chrysanthemums are being developed each year which differ greatly from their common ancestors in color, size and form. Most are quite easy to grow in the garden, however, some are hardy only in mild climates and freeze out when planted beyond their zone of winter tolerance.

In general, chrysanthemums are short-day plants meaning that the flowering response is triggered by the shortening days of late summer. The requirement for short days to induce flowering can either occur naturally outdoors in late summer or can be controlled in a greenhouse by excluding light for 9 to 13 hours each day and for an extended period of 8 to 12 or more weeks depending upon the variety or mum type. This technique allows growers to produce flowering mums and make them available any time of year.

Mums in the Garden

There are many places where hardy chrysanthemums can be enjoyed in the garden. Because of their shallow rooting habit, plants can be dug with a spading fork and easily moved to new locations. This has a particular advantage because mums can be grown for most of the season in a sunny location. Then, after they have developed flower buds, moved to partially shaded border areas where they will come into full bloom. In cooler locations the flowers are more apt to last for a longer period compared to full sun areas.

In the fall, garden centers are selling potted mums which can be transplanted to the garden to fill in bare spots in the flower bed. Mums also lend themselves well to containers and hanging baskets. This is one of the most popular ways to enjoy mums since these containers and basket can be moved to any sunny location around the landscape.

Although slightly more intensive in care, cascade mums present the opportunity to create a spectacular floral display. Cascades make up a group of mums which have a weeping or trailing habit. These plants can be trained to grow over wire supports, up or down fences or walls and generate a tremendous number of blooms from a single plant.

Planting Location

Chrysanthemums require well-drained soil and full sunlight to grow and successfully bloom. This means generally 6 hours of sunlight or more each day during the summer period. Plants grown with less light will become weak, spindly and produce few flowers. Avoid locations which are exposed to street or porch lights as this will interfere with the flowering light response to shortened days. The best location is a southern or southeastern exposure preferably against a foundation or wall where additional protection is given from frost. Improve the drainage before planting by elevating the bed with a good mix of garden loam and compost.

Soil Preparation and Planting

Any garden soil which is good for growing vegetables will be satisfactory for growing mums. If particularly high in clay, additions of organic matter including peat, composted leaves, rotted manure or straw will improve the drainage and aeration. While working the planting bed, collect enough soil for a soil test and follow the recommendation for amounts of fertilizer to be added. Containerized plants should be planted at the same depth at which they were grown. Do not bury the root ball. This will promote a lack of root aeration and root rot caused by fungal pathogens. Chrysanthemums are shallow rooted and do best if planted high. This means that frequent watering may be necessary during times of high heat and little rainfall. Space plants generally about 18 inches apart. Spreading varieties may require larger spacing.

Pinching

To generate a plant full of flowers and control growth, chrysanthemums require some pinching of the tips. This encourages branching and more compact growth. It also will stimulate more flowers to be produced. Pinching is done by removal of about an inch of the tip of each branch or shoot. This is snapped out with the thumb and index finger. The first pinch should be done when the plant is 6 to 8 inches tall and repeated when new branches become 6 inches tall. A third pinch may be necessary on fast-growing varieties. If plant are not properly pinched, they will become tall, leggy, easily blown over by winds and have few flowers.

The most important thing to keep in mind when pinching the growth back is the timing of the last pinch. For early flowering varieties which bloom in mid-September, the last pinch should be around the middle of June. Varieties which flower in the early part of October should be given a last pinch on July 1. Later flowering varieties should be pinched for the last time no later than July 15. Overall, about 3 months is required between the last pinch and bloom. This is a general rule which can guide you in controlling the growth and stimulating more bloom production.

Fertilization

Most mums will require fertilization several time during the spring and summer to stimulate good growth, produce thick stems and maintain a healthy green color. Chrysanthemums are not heavy feeders like vegetables so, it is best to use a dilute fertilizer applied several times prior to bud set. Nitrogen has the greatest effect on flower production and general growth. If too much is applied, vegetative growth will be hard to control, fewer flowers will be produced and overall, flowering will occur later in the season. Before planting a bed in the spring, about 4 pounds of 5-10-5 per 100 square feet can be worked into the soil to a depth of 6 inches. This gives about one-quarter pound of nitrogen per 100 square feet and should be enough fertilizer for the season if abundant organic matter is present. A second application around August 1 may be beneficial especially on poorer soils. Apply about 2 tablespoons of 10-6-4 or 4 tablespoons of 5-10-5 fertilizer over a 2 foot circle at the base of individual plants. Alternatively, broadcast about 2 pounds of 5-10-5 per 100 square feet. Apply no more than about a tenth of a pound of nitrogen at this time.

General Care and Maintenance

During the early part of the summer, a layer of mulch material should be applied to the soil after it has warmed up as this has definite advantages to conserving and regulating moisture to these shallow-rooted plants. Besides the benefits of water control, mulch protects the bed from erosion, compaction and retards weed seed germination. Use a 2 to 3-inch layer of coarse peat, leaf mold, compost, nut hulls or lawn clippings mixed with leaves. Mulches composed of chipped wood, sawdust and straw may consume nitrogen fertilizer and rob the root system. If you use these materials as mulch, double the fertilizer applied to the bed.

If you cannot control the growth of the plants to the point that they have become tall and begin to drop over, then some support may be necessary in the form of wire frames or upright stakes. Wire peony or tomato frames work well and should be put in place before they are needed, otherwise these will be more difficult to position without damaging the plant.

After the plants have flowered, the stems should be cut off close to the ground. Leaf, flower and stem debris should be collected and composted provided they are not disease or insect infested. If that is the case, the materials should be composted separately and not used for mulching or soil improvement around the plants. Disease or insect infested materials can be buried and left out of the garden.

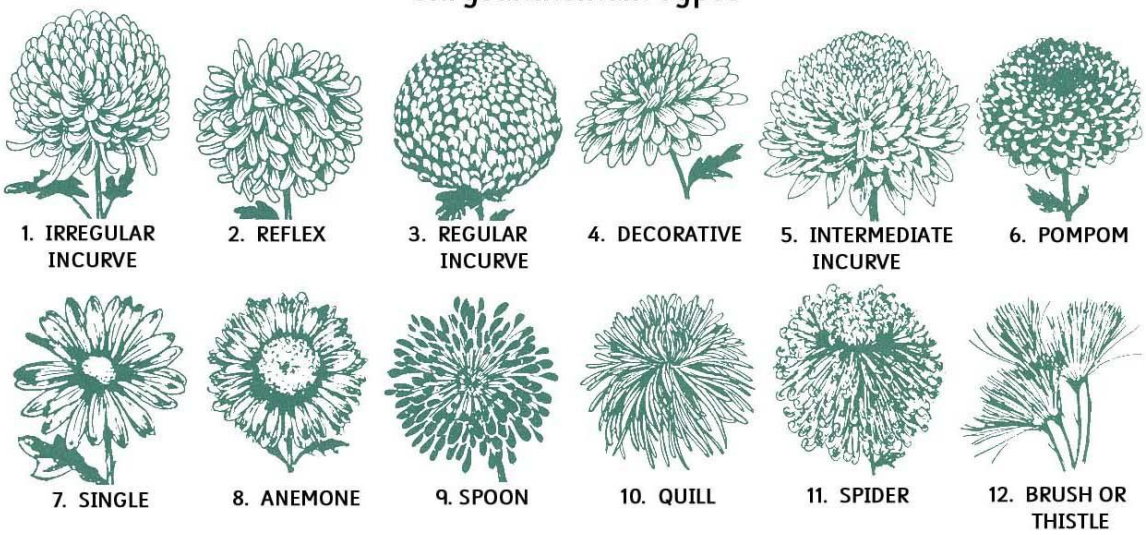
Often chrysanthemums listed in catalogs are noted as being winter hardy meaning that the plants will overwinter and grow the following season. The term “hardy” has been used sometimes inappropriately and gardeners should be cautious about believing that all mums are winter hardy when stated so. The fact is that many mums are not reliably hardy depending upon the climate conditions presented and even the most hardy varieties may not make it through a severe winter of subzero temperatures.

Many mum selections will survive the winter if the plants gradually become frozen and remain that way until spring. Deep snow cover will assist this and protect the frozen soil if it remains intact throughout the winter. Unfortunately, that is not characteristic of the conditions in the St. Louis area and plants must be able to stand the freezing/thawing fluctuations which typify our climate.

The best defense against adverse weather conditions is to provide good drainage so that water does not accumulate around the plants and promote ice formation. After the first frost, mound a few shovels of soil forming an 8-inch layer around the base of each plant. Cut the branches back to 10 inches above the soil line and apply a 2 to 4-inch mulch layer as soon as the soil surface freezes. This means loosely layering evergreen branches, straw, or other lofty materials around the plants. Avoid using materials like leaves or peat moss which will pack down and retard emergence of leafy shoots in the spring. After the last danger of frost has past, this mulch and soil can be removed. If leafy growth has already started and the possibility of frost is still present, apply another layer of loose mulch to protect the growth.

As an alternative to overwintering plants in the bed, they can be dug and placed into cold frames to better ensure survival. This means a little more work, but for those varieties which are tenderer, it is often the only way to keep plants from one year to another.

Chrysanthemum Types



1. Irregular Incurve Largest of mum varieties. Rather loose, informal appearance, with lower petals drooping. Needs to be staked. Large blooms. Mid season - Oct.

2. Reflex Large durable flower. Needs to be staked. Large to medium-large blooms. Early season - Sept., Oct.

3. Regular Incurve Football mum, a compact flower with 3-5 flowers/plant. Needs to be staked. Large to medium-large blooms. Mid season - Oct.

4. Decorative A flattened full bloom. A good cut flower and garden mum. May need support. Large to medium-large blooms. Early and mid season - Sept., Oct.

5. Intermediate Incurve Incurving but loose flower form, may need support. Large to medium-large blooms. Early and mid season - Sept., Oct.

6. Pompon Mass of small blooms. Small miniature button to large ball shaped flower. Good for cut flowers. Medium-large to small blooms. Mid season - Oct.

7. Single Daisy-like spray, small flower or a few larger blooms. Mid season - Oct.

8. Anemone Single-like but more pronounced center. May need support. Large blooms or small flowers. Mid season - Oct.

9. Spoon A daisy-like flower with spoon-like ends to florets. Interesting form. Large blooms or small flowers. Mid season - Oct.

10. Quill Tubular florets like spoon but not flattened on the ends. Large blooms or small flowers. Mid season - Oct.

11. Spider Fuji mum - the most exotic, with thin thread-like florets, tubular ends are coiled. Large blooms. Mid season - Oct.

12. Brush or Thistle Unusual, broom-shaped flower. Does not open flat, excellent filler for arrangements. Medium-large blooms. Mid season - Oct .

13. Exotic Varieties that do not conform to any one form.

Propagation

There are several way to increase the number of plants that you are growing without buying new ones; division of whole plants, stem cuttings and planting seed.

Division

Typically, mums grown for two years can be divided by splitting the root system of an old plant into two or more separate plants. This is best done in the spring after the new growth is about 6 to 8 inches tall. Simply dig up the plant and examine the root system identifying the new underground shoots that come off the old plant. Remove each rosette consisting of the leafy growth and a root system. Plant these back into the garden taking care not to bury the division too far down into the soil.

Cuttings

Perhaps the best way to propagate new plants is by taking stem cuttings. These are preferred to divisions because they often will grow more vigorously and have less disease problems. In the spring, when plants have reached a height of 8 to 10 inches, make stem cuttings by removing leafy tips that are 3 to 4 inches long. Remove the basal leaves to give about 1 to 2 inches of clear stem and plant this into a soil mix of one part peat moss and one part sand, perlite or vermiculite. This can be done directly in the garden or in a suitable container with good drainage. The cutting should become rooted in about 2 to 3 weeks. The most critical factor is moisture control. While these cutting are forming roots, they need to be watered daily. It is often helpful to make a cover out of plastic to prevent complete wilting. Plants should not be placed in intense sunlight, however, should receive some sun each day, preferably in the early morning. If a plastic cover is used, care should be taken that the inside temperature does not reach more than 75 degrees.

Seeds

Seed is rarely used to propagate new mum plants. This is because few mum varieties will actually set seed and the seed that is produced generates plants inferior to named varieties otherwise propagated by cuttings or divisions. On the other hand, seed produced by hand-pollination is an important method of obtaining new varieties. Primarily, because is much easier to generate new plants from cuttings, seed propagation offers no real advantage to the average home gardener.

Selected Cultivars

There are hundreds of excellent chrysanthemum varieties and the process of selection can be challenging. Often you will hear the words “garden mum” or “florist mum”. These terms are used to talk about hardiness. Generally, garden mums are hardy in the areas sold. However, florist mums are not and are produced for use as a flowering indoor pot plant. Without extra protection, they will be difficult to overwinter outdoors. If you want to give a flowering mum and want to plant it outside when the flowers are past, then choose a garden mum.

Of the numerous cultivars available for home gardeners, a select group of garden mums can be recommended having withstood the test of time at the Missouri Botanical Garden.

Cultivar	**Color**	**Type**
Debonair	intense lavender	decorative
Stargazer	dark lavender	daisy
Tinkerbell	intense purple	pompom
Patriot	white	pompom
Minngopher	intense red	decorative
Allure	yellow	daisy
Ruby Mound	crimson red	pompom
Triumph	dark brown center, golden petals	decorative
Roll Call	orange bronze	decorative
White Stardom	pure white	daisy

Pancho	orange bronze	pompom
West Point	yellow	pompom
Johnny Appleseed	orange bronze	pompom
Flaming Sun	orange bronze	decorative

Diseases

A number of diseases plague chrysanthemums. Avoiding overcrowded and shaded conditions will help in reducing the incidence of disease because under such conditions, moisture is likely to remain on the leaves providing good conditions for diseases to get started.

Septoria Leaf Spot
This leaf spot disease is caused by a fungus which attacks leaves and produces brown to black spots. The disease will begin on the lower leaves and move its way upward until perhaps half of the leaves become brown and wilted. The fungus overwinters in debris on the soil surface. Spores produced from infested debris splash onto new foliage in the spring and initiate new infections. The best way to control the disease is to avoid the initial infections by cleaning up infested debris from around the base of the plant. If the disease shows up on the leaves, a fungicide can be used to avoid continued infections. Fungicides labelled for leaf spot control include benomyl (Benlate), chlorothalonil (Daconil), zineb, maneb or mancozeb. No cultivars are resistant to this disease.

Powdery Mildew
The same fungus which causes powdery mildew on roses, phlox and zinnias can become established on cluysanthemums. The best conditions for powdery mildew development are moderate to cool temperatures and high relative humidity, but not free moisture on leaves. Typically this disease is more prevalent during the early to late fall when air temperatures at night are relatively cool. The only way to control powdery mildew is to use a fungicide sprayed every 7 to 10 days. Sulfur, benomyl (Benlate), dinitro phenyl crotonate (Karathane), triademefon (Bayleton) or triflorine (Funginex) are labelled for control of powdery mildew of chrysanthemum.

Virus Diseases
Virus diseases like mosaic and stunt or virus-like diseases such as aster yellows are occasionally a problem on chrysanthemums. These diseases are typically transmitted by insects and vary in their occurrence each year according to the insect survival rate after winter. They may cause plants to be severely stunted with distorted leaves or have mottled and yellowed leaves with no apparent reduction in growth. Aster yellows is caused by an organism called a mycoplasma which resembles bacteria, but behaves much like a virus in symptom development. There is little you can do to prevent these diseases and other virus disease in the garden. The best approach to this is to rogue out infected plants as soon as they are discovered and control insects which transmit the viruses; particularly aphids and leafhoppers.

Insects

Aphids
Aphids are soft-bodied insects that range in color from green to black and about one-eighth inch long at the largest. Aphids feed by sucking out plant juices from cells. Most feeding activity will take place from the underside of the leaves and buds. Under severe infestations, aphid feeding will cause tissues to become yellowed. The only way to effectively control aphids is with insecticides. Suitable materials include malathion, diazinon and insecticidal soap which when use properly and sprayed to provide uniform coverage can be quite effective.

Caterpillars
A couple different types of caterpillars may chew holes in the leaves or feed on the buds. Generally, these

pests will cause little lasting damage and therefore should be tolerated unless the plant shows more than 50% loss of tissue. Caterpillars can otherwise be controlled by using an insecticide like those mentioned for aphid control. In addition, carbaryl (Sevin) should be added to the list as well as one biological insecticide called *Bacillus thuringinesis* (Dipel, Thuricide, Bactur). Insecticidal soaps are not effective against caterpillars.

Leafhoppers
These small, wedge-shaped insects are always found on the underside of leaves where they feed by sucking plant juices out of cells. Typically, they are green in color and fly or run sideways when disturbed. Heavy feeding will cause leaves to become mottled, curled and withered. The same insecticides as those recommended for aphids plus carbaryl (Sevin) will control leathoppers.

Leafminers
Leafminers spend most of their pest life inside leaves burrowing between the upper and lower cell layers. Light-colored, serpentine mines can be easily distinguished. Heavily infested leaves may curl and wither. Insecticides sprayed over the surface are not likely to control the feeding of leafminers in the leaves, however, malathion and diazinon can be used to control egg-laying adults.

Plant Bugs
Plant bugs do not typically cause real problem on chrysanthemums, but can be found feeding on sap by puncturing tissues with their mouth parts. These insects are about one-quarter of an inch long, brown or green in color with some black marking on the back. If necessary, plant bugs can be controlled by use of malathion, diazinon or carbaryl.

Spider Mites
When conditions become hot and dry, spider mites can be a persistent problem on chrysanthemums. These are related, but not true insects which feed on the underside of leaves by rasping and rupturing cells with their mouth parts. The plant sap which leaks out is then lapped up. Heavy feeding will cause the leaves to become bronzed and dry looking. They are difficult to observe with the naked eye and therefore, often avoid detection until the damage is already done. Insecticidal soaps as well as those pesticides which control aphids can be effective against spider mites. Carbaryl (Sevin) will not control mites.

How to Grow a Cascade Mum

Cascade mums are a type of chrysanthemum which trails outward or lies over as it grows. These plants are typically grown with the use of some kind of support like wire or fence to keep the plants growing in a certain direction. To grow a cascade mum you must take some special care in order to maximize the bloom production; the results can be spectacular and very creative.

The first step in growing a cascade mum is to propagate stem cuttings taken from container stock plants which have been grown indoors under constant light through the fall and winter. The light need only be a 60 watt bulb, however, this will keep these stock plants from initiating flower buds. It is important to keep the plant in a vegetative state so that good stem cuttings can be collected.

Around the first part of February, snip off 3 to 4-inch long tips of the stems from the stock plants and insert 1 to 2 inches of the stem into a rooting soil mix of 50 percent sand and 50 percent peat. Keep the cutting continuously moist for about 2 to 3 weeks until the rooting has completed. A plastic cover over the rooting container may prevent the cutting from drying out. Transfer the rooted cuttings to 4-inch pots and hold under continuous light for 6 more weeks and fertilize on a regular schedule with a soluble household fertilizer. At this time the cuttings should be about 10 to 14 inches tall. Transplant 2 or 3 cuttings to a 10-inch finishing pot with a good houseplant mix of peat and perlite. Immediately give a soft pinch by

removing 2 inches of the terminal growth. Keep under light until about the 15th of April. This is the point in the season that the days are long enough to keep the plants from setting bud.

As one suggestion, construct a wire frame 5 feet long and position the mum containers close to the base. Begin to fasten the terminal growth to the wire by securing loosely with twist ties. As the plants grow and for every 4 inches of growth produced, pinch the terminal buds by removing about 2 inches of the stem. Repeat this at intervals where new growth has reached 4 inches and reestablish the terminal shoot by selecting and tying up laterals to the frame.

When the frame has become filled, begin to shear the plants by removing all terminal growth and leaving 2 to 3 leaf nodes on each terminal. Stop shearing around July 15th so that the plant will begin to set buds. It takes about 90 more days until the plants will begin to bloom. This means approximately mid-October depending upon the cultivar selection.

Bud set is controlled by day length. As the days become shorter in the later part of the summer, the flower buds will be initiated. Any light source like street lamps or porch lights will interfere with this flowering response so plants must be kept isolated from these and any other light source during the night.

Once the flowers have been produced, plants can be transplanted into the garden or cut back to be held as stock plants for the next year. Most cascade mums are hardy and can withstand average low temperature in our area.

Some of the best cascade mums to grow include:

'Bronze Charm' - bronze single type
'Yellow, White or Pink Daphne' - single type
'Firechief' - red single type
'Megumi' - bright yellow anemone type