

## Culture of Garden Chrysanthemums

### Types of Flowers

This publication is concerned with the chrysanthemums that bloom in the garden in late summer and autumn. Through hybridization the garden varieties have been greatly improved, particularly by the introduction of the Korean strain which gives increased hardiness.

Several types are grown in the garden. The **fully double type** has large flowers that usually measure at least 3 inches in diameter. The flower has many rows of ray florets ("petals"), and no center of disc florets or eye is visible. The **single** chrysanthemum has one to five rows of ray florets and a prominent central disc or eye. The **duplex** is intermediate between the single and the double. It has more than five rows of ray florets and a definite eye of disc florets. The **anemone type** has one to five rows of ray florets and a cushion of slightly enlarged and expanded disc florets, often with the same coloration as the ray florets. The **pompon** has small, well-rounded, fully double flowers that may vary in size from the miniature button type to the larger ball types, and are borne on well-branched sprays. Other variations less commonly seen in gardens include such novelties as the **thread, spoon and quilled** types. The so-called **cushion mum** is a dwarf dense plant of mound-shaped habit of growth, which rarely exceeds 1 foot in height. When in flower, the blossoms practically obscure the foliage. They are useful as edging plants and for general use in the foreground of a border.

There are many hundreds of named varieties in the trade. Development of new varieties is so rapid and turnover so great that one year's varieties are soon superseded by newer ones. Hence there is little practical advantage in listing selected named clones currently available. Catalogues of chrysanthemum specialists should be consulted for lists of plants in the various color ranges and heights, as well as for early, mid-season, and late-flowering varieties, disease resistance, and the like.

### Site for Planting

Chrysanthemums thrive in well-drained garden loam which is slightly acid (pH 6.5) in reaction and supplied abundantly with organic matter in the form of peat, leaf mold, well-rotted manure, or compost. Peat is an advantage in neutral or alkaline soil. The plants thrive in full sun but satisfactory results may be obtained in semi-shaded situations where the plants receive full sunlight for at least six, continuous hours a day.

### Soil Preparation and Fertilizing

In preparing a bed for chrysanthemums it is recommended that you have the soil pH and/or soil nutrients tested first so that soil pH, nutrients and organic matter levels can be adjusted accordingly. You can visit the [Cornell Cooperative Extension – Suffolk County web site](http://www.ccesuffolk.org) for information on having the soil tested or contact our office directly. If manure was not used as source of nutrients add a 3-4 inch layer (1 to 1½ cubic yards per 100 sq. ft.) of organic matter such as peat, compost, leaf mold, etc. to increase the organic matter content of the soil. A soil with adequate organic matter may not need additional fertilizer. Do not let the soil dry out during the growing season. Periodic deep watering may be needed depending on rainfall amounts. Using mulch on top of the soil will help retain soil moisture during the growing season.

### Planting and Propagation

Chrysanthemum plants purchased from the commercial producer arrive during May or early June. These are either rooted cuttings or cuttings grown for some time in soil to give increased development. As soon as possible plant the plants 10 inches apart in the garden. To obtain the best effect, group three or more plants together in the border.

Chrysanthemums are widely available in late summer-autumn for planting as well.

In early spring you may dig up and divide clumps that bloomed the previous autumn and over-wintered in your garden. You may also separate vigorous plants into single stems with enough roots to warrant transplanting. Less vigorous plants should be divided so that three growing points or stems remain in each of the new divisions.

You may leave over-wintering clumps in position and thin out the shoots to 8 to 10 inches apart. It is usually better practice, however, to dig out the old clumps and reset new divisions.

If the old plants have had foliage diseases or leaf nematodes, it is best to propagate by rooting terminal or tip cuttings from parent plants that have been moved to a greenhouse or tight coldframe or hotbed. The parent plants should be watered very carefully to avoid any splashing of the new shoot growth. When the new shoots are about 10 to 12 inches tall the top 3 inches may be broken out and inserted to root in a box of sand or vermiculite, or a mixture of sand and vermiculite or sand and peat. New roots will develop at the base of the cuttings of most varieties in about 3 weeks. These new plants should be free from leaf spot and leaf nematode if the leaves of the developing shoots and cuttings have been kept dry. Divisions, in contrast, will almost inevitably carry over any disease shown by the parent plant.

### **Pinching**

An important practice in growing chrysanthemums is to pinch out the terminal growing point or shoot when the plant is 5 or 6 inches tall. This causes the plant to send out lateral branches. When these laterals are 5 or 6 inches long, pinch out their tips. Pinching in this way makes a shorter spreading bushy plant with an abundance of bloom. After July 15 no further pinching is desirable. If you want fewer and larger blooms, with longer stems, do less pinching. Disbud to one bud a stem, and pinch out all side shoots, if you plan to exhibit flowers.

### **Flowering**

Chrysanthemums normally flower after the days become shorter in August and later. To make them flower in advance of the normal season or to make late-flowering varieties flower before freezing weather, cover the plants with opaque black cloth at 6 PM and remove it at 7 AM each day, starting in late July and continuing until September

### **Pests and Diseases**

Several diseases and pests attack chrysanthemum plants. Leaf spot caused by the fungi *Septoria chrysanthemella* and *S. obesa*) cause spots which at first are small and yellowish, then dark brown to nearly black. Sometimes the spots coalesce into blotches; minute black fruiting bodies are faintly visible in these spots. Leaves may turn yellow and drop prematurely or dry and hang down along the stems. Spores are splashed from plant to plant in watering or rain, and are spread on cultivating tools. For this reason avoid cultivating plants when the foliage is wet.

Powdery mildew caused by the fungus *Erysiphe cichoracearum* causes a white fungus growth to form on primarily the upper surface of the leaves. Usually this disease is not considered serious since it forms late in the summer. To help manage this disease, plant in areas with good air drainage and thin overcrowded plantings. Avoid frequent overhead watering, especially at night. Remove all infected plant parts in autumn and destroy them.

Vascular wilt diseases caused by the fungi *Fusarium spp.* and *Verticillium albo-atrum* cause symptoms of water stress, partly because they attack the vascular system of the plant. This is partly because the vascular system is physically clogged and partly because the fungus may release harmful toxins. Plants may show stunted growth, yellowing or scorched leaves and, ultimately, may wilt and die. Affected plants should be removed and destroyed.

Rust diseases caused by *Puccinia chrysanthemi* and *P. horiana* attack chrysanthemum. *P. chrysanthemi* is usually found in greenhouses and *P. horiana* is common outdoors. Remove infected plants and/or plant parts and destroy them. Water early in the day and thin plantings to provide good air circulation.

Various virus diseases attack chrysanthemum. Rogue out and destroy any plants suspected of being infected with a virus disease. Also control insect vectors on the plants.

Chrysanthemum foliar nematode, *Aphelenchoides ritzema-boi*, is a widespread problem on chrysanthemum. Dark spots on areas on the undersides of the leaves characterize first symptoms. About 5 days after infection the veins

become discolored and stand out sharply on the upper leaf surface. The diseased leaves turn brown or black, starting in wedge-shaped areas between the veins. The leaves eventually dry, wither, and hang down along the stems. Keep foliage dry; avoid overhead watering if possible; use mulches to prevent splashing; avoid crown divisions and instead make tip cuttings, which are usually free from nematodes.

Insect problems which can attack chrysanthemum include: aphids, four-lined plant bug, tarnished plant bug, spittlebugs, thrips, spider mites, certain beetles and caterpillars, and stem borers. Four-lined plant bug adults are greenish-yellow in color with 4 black lines running down their backs. They are generally flat and slender and about 1/4 inch long. The insect, as a result of its feeding, causes brownish spots on the upper leaf surface to form. These could be easily mistaken for fungus leaf spots.

Tarnished plant bugs are oval and flattened, measuring approximately 1/4 inch in length. The adults are a mottled brown color with irregular yellow-brown, red-brown, or black markings. The eyes are very prominent on this insect. Distinctive markings along the side of the posterior third of the body are triangular and yellow and tipped with a small, dense black triangle. Injury is similar to that of the four-lined plant bug. Keep the garden and surrounding areas weed free.

Contact Cornell Cooperative Extension - Suffolk County for current pest management recommendations.

### **Hardiness**

Chrysanthemums in general are not regularly hardy, and greenhouse varieties rarely survive the first winter if planted out-of-doors. Many varieties can withstand quite low temperatures, but not fluctuation temperatures with alternate freezing and thawing. A mulch of the ordinarily used materials, such as leaves or straw, is not suitable because it excludes light which is essential to normal functioning of the basal leaves. Use hemlock or spruce branches to cover the plants and add a light covering of salt hay after the ground is frozen. Plants usually come through the winter as well with no mulch at all as with the materials usually used. Winter damage is less on well-drained soils than on those poorly drained. The single-flowered variety Clara Curtis, *Chrysanthemum rubellum*, is usually completely hardy.

Resource: *The Culture of Garden Chrysanthemums* Extension Bulletin #894, by R. E. Lee, former member of the faculty in the Department of Floriculture and Ornamental Horticulture, Cornell University; revised 6/71 by C.C. Fischer, Associate Professor, Cornell University.

Disease revisions obtained from: *Westcott's Plant Disease Handbook 4th Edition*.

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