Field-Grown *Celosia plumosa* for Cut Flowers

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Tall varieties of *Celosia plumosa* produce useful cut flowers. Since they require warm temperatures and bright light, their season is limited to late summer and early fall production, but the colors and texture are very desirable at that time. They are most useful as filler between heavier flowers, such as gladiolus, or as prominent flowers in smaller arrangements.

Currently, there are not many tall varieties (over 30 inches) offered by seed companies. Good cut flower plants may be obtained by carefully selecting seed from existing available mixtures. If desired colors are not available in the mixtures, shorter varieties may be grown alongside to introduce the wanted colors in future generations. This may also improve the form of the plumes.

Plants should be started in a warm greenhouse six to seven weeks before transplanting into the field by sowing 500 to 1,000 seeds per 11" x 22" flat with soil about 1 1/2" deep. When the first true leaves develop, drenching with 1 teaspoon of Terrachlor and 1 teaspoon Captan per gallon of water may be necessary to prevent damping off. When plants are about 2" tall, they should be hardened in a coldframe or cool plastic house and held outside in full sunlight until transplanted directly into the field.

Plant outside after warm weather arrives, spaced about 12" apart in rows 40" apart. If weed control and cultivation is not a problem, *Celosia* can be planted in beds at 12" x 20" spacing. If soil is hot and dry, the rows should be watered thoroughly before planting to keep the seedlings from excessive wilting. Seedlings should be thoroughly watered as soon as possible and, except in the case of severe drought, should

Weed Management In and Around Greenhouses

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Weed management is of concern to growers both inside and outside their greenhouses. Some common problem weeds include Creeping Oxalis or wood sorrel (*Oxalis corniculata*), hairy bittercress (*Cardamine hirsuta*) and prostrate spurge (*Euphorbia humistrata*). Other weeds that I have seen include common chickweed (*Stellaria media*), galinsoga (*Galinsoga parviflora*), ragweed (*Ambrosia artemisiifolia*) and dandelion (*Taraxacum officinale*). Annual and perennial grasses can also be a concern.

Weeds harbor insects such as whiteflies, aphids, thrips and fungus gnats larvae. Weed management is an important part of a grower's total insect management program.

Wind-blown seed, such as oxalis, can be blown into pots in the greenhouse causing a nuisance weed problem. Weeds also detract from the appearance of your establishment.

Management Options

Outside the Greenhouse

Ideally, growers should maintain a ten- to twenty-foot weed-free barrier outside the greenhouse. It is especially important to eliminate weeds near the vents. Growers may consider screening the vents to limit the introduction of wind-blown seed. Mowing may drive insects, such as thrips, inside through the vents.

Inside the Greenhouse

A grower's first line of defense is sanitation. Introducing only clean plant material and using sterile media will help prevent the accidental introduction of weed seeds into the cropping area. Using porous concrete walkways and geotextile fiber mats under the benches help to prevent the estab-
not need irrigation again for the entire season. After plants are established, a light application of 6-24-24 dry fertilizer is recommended. Too much nitrogen can cause plants to grow too soft, and they will not hold up as well when cut.

When plants are about 12" tall, they can be pinched relatively hard leaving 6 to 12 leaves on each plant. The resulting branches produce more stems of uniform size than the center stems would if not pinched.

Harvesting starts after about 10 weeks of warm weather (usually mid-August in southern Michigan,) and lasts until frost. They are cut, stripped and bunched in the field in handful sized bunches. Ten or twelve bunches usually fills a four-gallon bucket, and they are marketed through normal wholesale channels.

Throughout the harvesting season, desirable plants are selected for seed. They are marked and observed over a period of time to determine if they possess desirable traits for cut flowers. Plants that produce flowers on the central stem should be avoided. Their offspring may produce open straggly plumes or so many seeds that the appearance is less desirable. The flowers are the tiny white and cream or lavender blooms that form on stems at the base of the plumes or are scattered throughout the plumes. Plants with too many flowers have to be harvested when they are young because, when the seeds mature, they darken, giving a less attractive appearance to the plume. Plants with few or no seeds can be left in the field for a longer time and can, therefore, be held until needed.

Plants that have toppled in the wind or exhibit Botrytis-like stem rot should be avoided. These traits may show up in future generations. Exceptions may have to be made if the color is wanted and no better specimens are available. Avoid plants that produce combs in the plumes unless some rather weird strains are wanted. Choose plants that branch well. Some vigorous branching plants can produce more than a bunch of flowers on each plant.

Seeds can usually be harvested after frost, but some may have to be collected earlier if seed starts falling. The entire plume can be picked and dried in paper bags for a few weeks before seed is removed. Crushing the seed pods by hand and shaking them through a window screen, then blow-
ing off all the light material or rolling them out of the debris cleans the seed sufficiently. Each variety is sealed in a glass vial or jar and stored in a 45°F refrigerator until used.

Seed germination is usually good for four or five years, but the best germination rate seems to occur the second year. Some varieties have had some seeds germinate after eight years.

Most selections will produce a mixture of colors and habits of growth, but some varieties could be "trued up" if grown isolated at least 200 feet from other celosia and all nonconforming plants are harvested or destroyed before flowers form.

Stay Tuned!

The 1994
New England Greenhouse Conference
October 17, 18 and 19, 1994
Sturbridge, Massachusetts

The program is now complete. You will be receiving notification shortly.

water or psi. Multiply psi by 2.31 to obtain feet of water. For example, 40 psi is equal to 92 feet of water or a column of water 92 feet high.

Valves are needed in a water system to control the flow of water. Ball valves should be used for shut-off purposes where possible because they have less friction loss and allow a greater flow than gate or globe valves.

All municipal and domestic water sources must be protected against contamination caused by backflow. The most commonly used backflow preventer is the vacuum breaker. If you are connected to a municipal system, check with the water company to see what is required.

Make the system automatic.

Automatic control is desirable where several zones are used. It requires a controller and solenoid valves to turn each zone on or off. Controllers are available that will meet almost unlimited combinations of watering duration per zone, watering frequency per zone per day, override if more water is needed or skip if there are no plants in that zone. With recent advances in solid state technology and the increased use of computer control, more precise watering should be possible with lower fertilizer usage and less potential pollution.

No water system is any better than its installation.

• If the system is to be used during the winter, supply pipes should be buried below the frost line. In areas of heavy traffic, pipes should be protected by placing in a culvert or drain pipe. To avoid stress on connections, allow for expansion of the pipe.

• Provide adequate power to the pump. A common cause of failure on electric pumps is a low voltage condition caused by too small a wire size.

• Design the system to keep the number of fittings and valves to a minimum to reduce the friction loss.

A good installation is one where the pump and other components are easily accessible, making inspection and maintenance easy. Also make provisions for expansion by installing extra tees at critical locations.