



# FACT SHEET

## Production of *Celosia* as Cut Flowers

Fact Sheet 684



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## Introduction

*Celosia* is one of the most versatile herbaceous plant genera for cut-flower production. Flower heads may be harvested for fresh sales or dried for sale as everlasting flowers or use in potpourri. Inflorescence shapes range from enlarged spikes to fasciated, crested, and convoluted combs. *Celosias* are separated into three major groups: plume type, *Celosia plumosa*; crested type, *C. cristata*; and wheat type, *C. spicata*, which resembles a wheat head. *Celosia* flowers come in many shades of red, purple, gold, orange, and yellow, including multicolored flower heads.

Issued in furtherance of Cooperative Extension work, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, University of Maryland at College Park, and local governments. Thomas A. Fretz, Director of Cooperative Extension Service, University of Maryland at College Park.

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# Outstanding Cultivars

## Crested type, *Celosia cristata*



- 'Toreador' 18–20 inches tall; bright-red comb to 12 inches across
- 'Yellow Toreador' Yellow companion to 'Toreador'
- 'Chief Series' 40 inches tall; heads up to 5 inches across

## Plume type, *Celosia plumosa*



- 'Forest Fire Improved' 24 inches tall; fiery orange-scarlet plumes with bronze-red foliage
- 'Golden Triumph' 30 inches tall; golden-yellow plumes and green foliage
- 'Sparkler Mix' 40 inches tall; stiff plume-type variety with vibrant yellow, orange, and red colors

## Wheat type, *Celosia spicata*



- 'Flamingo Feather' 36–48 inches tall; white plume with pink top
- 'Flamingo Purple' 36–48 inches tall; purple plume/good color retention when dried
- 'Tassles Deep Rose' 36–48 inches tall; pink-purple color

The name *Celosia* is derived from the Greek word 'kelos,' meaning burn, which describes the flamelike colors and inflorescence of some cultivars. *Celosia* thrives in hot, droughty conditions and generally performs poorly in cool, wet summers.

## Propagation

*Celosia* is propagated from seed (43,000 seeds/ounce). Many cut-flower growers collect seed for future production. Some crested- and wheat-type varieties will reliably give back the characteristics of the parent plants when grown from seed, but many plume types will produce unpredictable shapes and colors.

*Celosia* seed is extremely small, and seedlings are vulnerable to damping-off. *Celosia* grows best when started in market packs or in trays in a greenhouse. However, *Celosia* seedling roots are

sensitive to transplanting. If you start seeds indoors, plant them in individual cells or pots, not in flats. Sow *Celosia* 4 weeks before the last frost date. Seed does not require light to germinate but must be lighted shortly after germinating to prevent plant stretching.

Care is needed to keep *Celosia* seed from drying out. Lightly cover seed, and place it under mist for 10 to 14 days until it germinates. Germinate *Celosia* seed at 65 to 70 °F at night and at 80 to 85 °F during the day. Exposure to temperatures below 60 °F will stunt plants and cause premature flowering.

Some growers plant *Celosia* directly into prepared field beds. Sow or transplant *Celosia* in the field after the danger of frost has passed. In general, field-planted *Celosia* seed and weed seed germinate at the same time and create an undesirable, competitive environment. A plant started in the greenhouse and transplanted to the field has a head start in competing with weeds.

## Transplanting

Transplant *Celosia* to the field when night (field) temperatures are consistently above

65 to 70 °F and

plants are in

the 2-to-4-leaf

stage, approxi-

mately 4 weeks

after sowing. Do

not hold plants in

market packs or

other growing con-

tainers. Once seedlings

are pot bound, they have been

stunted and will never develop into full-

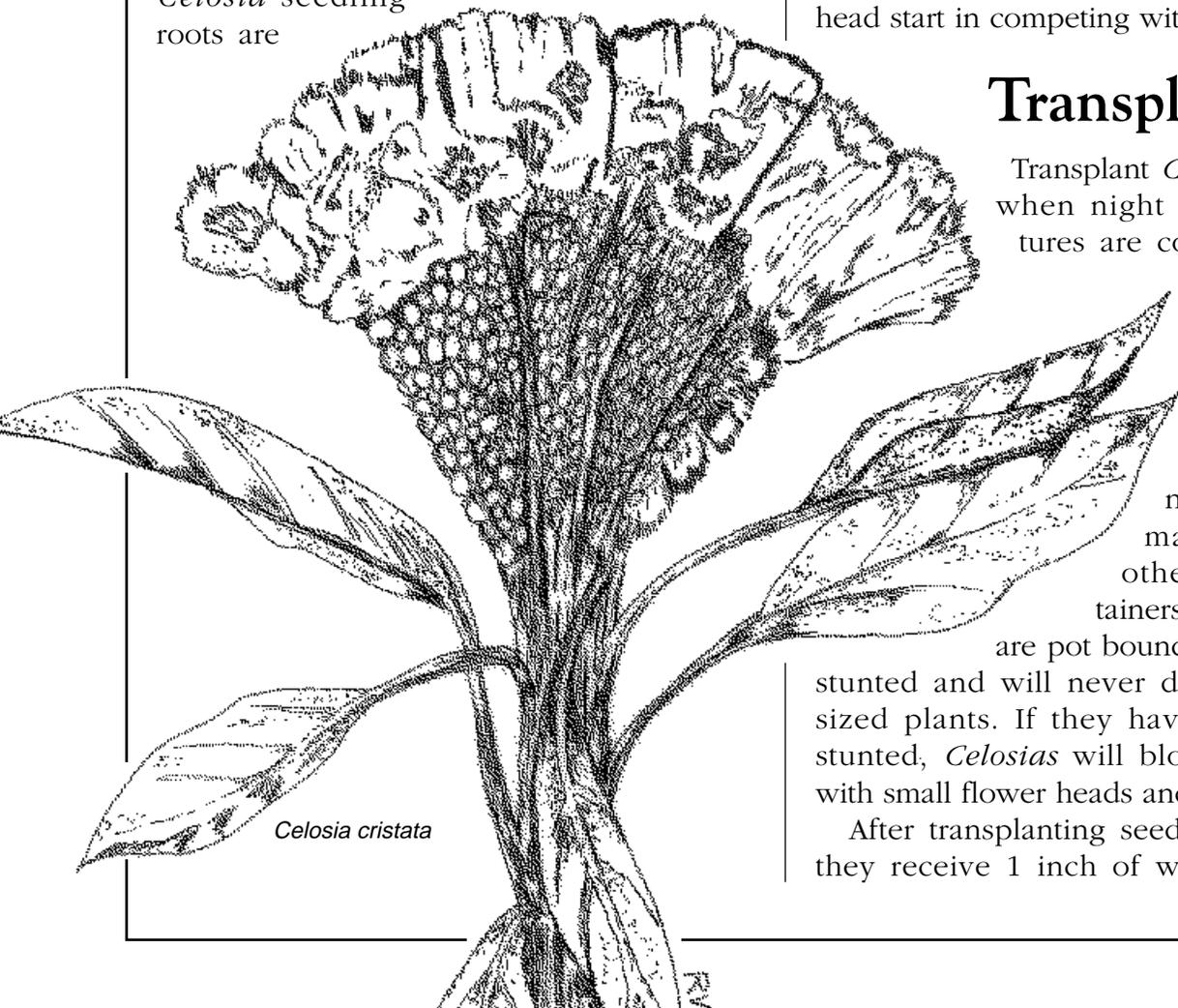
sized plants. If they have been severely

stunted, *Celosias* will bloom prematurely

with small flower heads and short stems.

After transplanting seedlings, make sure

they receive 1 inch of water every week



*Celosia cristata*

from either rain or irrigation. Although *Celosia* is heat and drought tolerant, lack of steady moisture can stunt plants and promote premature flowering.

Spacing in the field depends on the type selected and whether single-stem or pinched-production is the management choice. Crested types need at least 18 inches between plant centers. Plume types should have at least 24 inches between plants. Wheat types should be planted 24 to 36 inches apart. Spacing can also affect the final flower size. Spacing on 6-inch centers is necessary to produce plants with small heads, which may be desirable in some markets.

## Culture

### Field Production

*Celosia* thrives in well-drained soil with a pH of 6.0 to 6.4. For cut-flower field production, pick a location with a rich, deep, loamy soil and at least 8 hours of full sunlight. Plants with too little sun will be leggy and will not produce marketable flowers. *Celosia* normally requires 4 to 12 weeks of

vegetative growth prior to flower initiation for optimum shoot development.

To obtain the maximum number of multiple flower heads for crested- and plume-type *Celosias*, pinch plants 2 weeks after transplanting. This will promote branching and multiple, small flower heads. If you have a market for large, crested *Celosia* flower heads, do not pinch the first bloom. Some of the crested types may require staking to keep flower heads from falling over. Wheat- and many plume-type *Celosias* are free branching and do not require pinching.

*Celosia* plants need relatively high amounts of nutrients; nitrogen is the key element. Select fertilizers with a 3-1-2 ratio of nutrients. Run a soil test and bring fertility levels up before planting *Celosia*. After planting, maintain high fertility levels to promote growth.

### Greenhouse Production

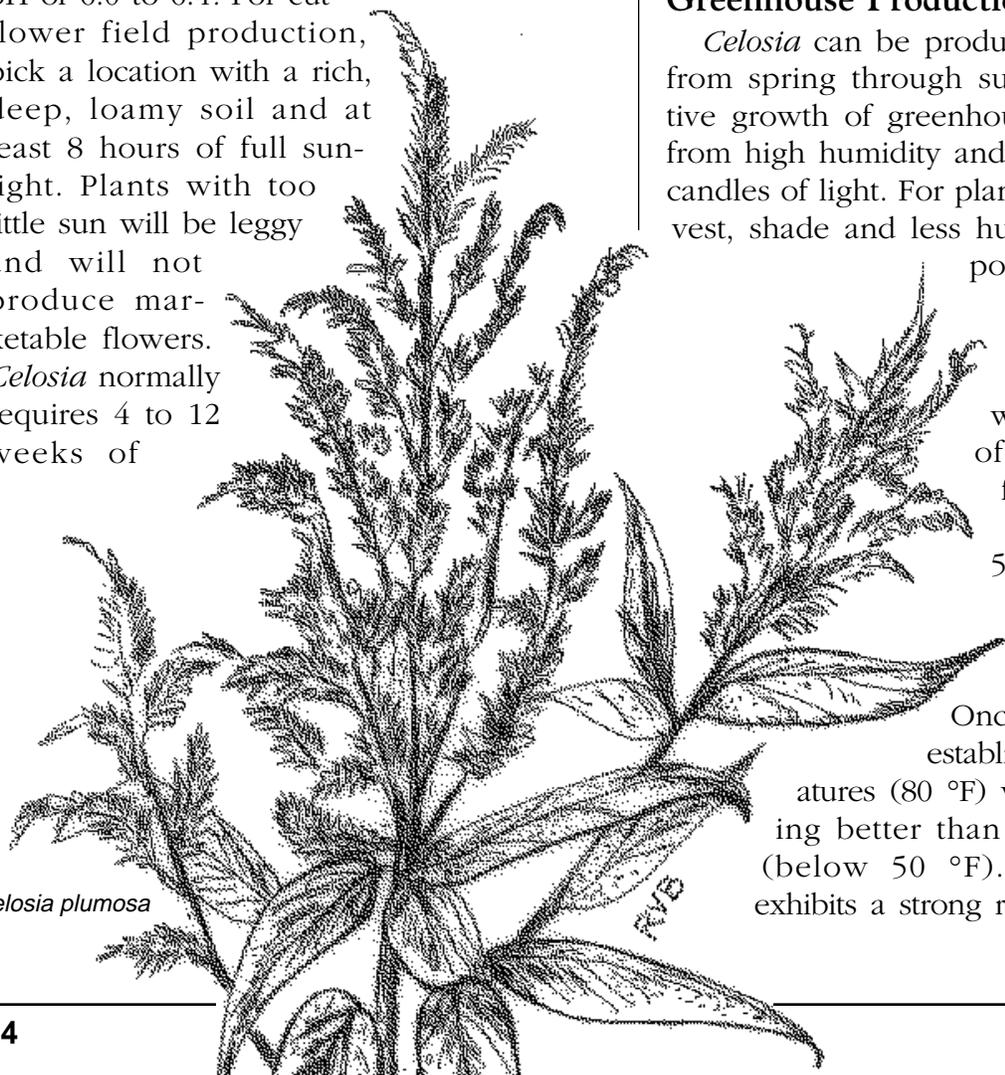
*Celosia* can be produced in greenhouses from spring through summer. The vegetative growth of greenhouse *Celosia* benefits from high humidity and 3,500 to 5,000 foot candles of light. For plants approaching harvest, shade and less humidity improve the postharvest quality.

#### **Nutrition.**

Greenhouse *Celosia* needs weekly applications of a dilute complete fertilizer (for example, 20-10-20 or 15-5-15) at 100 to 150 ppm based on nitrogen.

#### **Temperature.**

Once *Celosia* plants are established, warm temperatures (80 °F) will promote flowering better than cool temperatures (below 50 °F). Because *Celosia* exhibits a strong response to tempera-



*Celosia plumosa*

ture, sequential plantings can extend the period of harvest.

**Photoperiod.** *Celosia* is a quantitative short-day plant. Although it will flower at any photoperiod, one of 14 hours or less is best. For the fastest flowering, 4 to 5 weeks of short days are needed. After 4 weeks, there is no delay in the rate of flowering or reduction in flower quality if *Celosia* receives a long-day photoperiod. Long days promote increased fasciation in crested types.

## Pests of *Celosia*

### Aphids

*Celosia* is unaffected by most insect pests, however green peach aphid, *Myzus persicae*, and melon aphid, *Aphis gossypii*, occasionally do some damage. Heavy aphid populations can cause stunting and deformed flower heads. Look for these pests clustered on the growing tips of plants.

### Biological Control of Aphids

Aphid populations can be controlled by naturally occurring parasites and predators. Many of these beneficial insects are attracted by flowers. Growers can help preserve beneficial insects by avoiding cover sprays of residual insecticides. If aphid populations reach plant-damaging levels in spite of beneficial insects, spot treat with a short residual chemical such as those listed in the Chemicals section of this fact sheet. The University of Maryland publication "Biological Control of Insect and Mite Pests of Woody Plants" (\$22) will help you identify beneficial insects that are commonly found in your cut-flower production

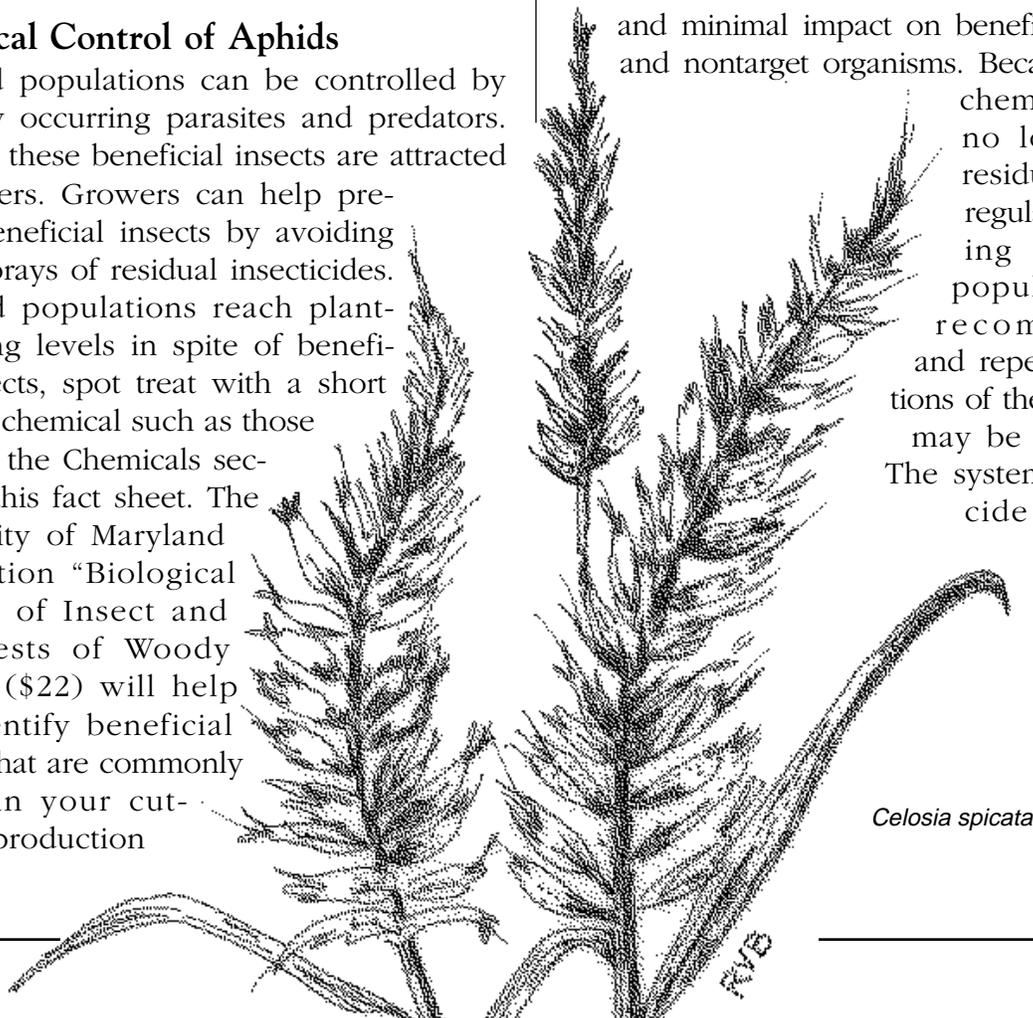
area. Contact the Publications Office, 0109 Symons Hall, College Park, Maryland 20742 to obtain a copy.

The lacewing (primarily genera *Chrysopa* and *Hemerobius*) is a common aphid predator and can be purchased from biological control companies. Check new growth for aphids. If they are discovered, release lacewings at the rate of 1 predator to 50 aphids. To be effective, lacewings must be released before aphid populations reach damaging levels.

The University of California publishes a list of biological control suppliers. Information on how to obtain this list is available through local Maryland Cooperative Extension Service offices.

### Chemical Control of Aphids

Horticultural oils, insecticidal soaps, and neem are three biorational chemicals that suppress aphid populations. Biorational chemicals are materials that have short residuals and minimal impact on beneficial insects and nontarget organisms. Because these chemicals have no long-term residual effects, regular monitoring of aphid populations is recommended and repeat applications of the chemicals may be necessary. The systemic insecticide acephate



*Celosia spicata*

(Orthene™)\* is labeled for use on herbaceous plants and effectively controls aphids. Once a systemic insecticide has dried and been absorbed by the plant, the effect on beneficial insects is minimal.

## Diseases and Other Damaging Agents of *Celosia*

Few diseases affect *Celosia*. Most diseases that pose a threat can be prevented by good sanitation practices. In the field, this means destroying old plants; in the greenhouse, good sanitation includes disinfecting growing surfaces and using sterilized soil media and clean water sources.

### Fungi

*Celosia* seedlings are susceptible to damping-off caused by *Rhizoctonia*, *Pythium*, and *Phytophthora* fungi. Disinfecting growing surfaces and maintaining strict sanitation are the most important practices to prevent damping-off.

Leaf spot, caused by the fungi *Alternaria*, *Cercospora*, and *Phyllosticta*, is occasionally a problem for *Celosia*. Overhead watering promotes leaf spot, thus, trickle irrigation is recommended for field-grown *Celosia*. If overhead watering is the only method available, water early in the day so that foliage will dry completely before nightfall.

### Nematodes

The root-knot nematode, *Meloidogyne* spp., can attack and damage *Celosia*. The nematodes feed inside roots and produce visible swellings. *Celosia* infected by root-knot nematodes are stunted, off-color, wilt in hot weather, decline, and die. New field production areas should be tested for nematodes before planting. If plants begin to perform poorly, inspect their roots for swell-

ings. If swellings are visible, destroy the infected plants and treat the fields for use the following year. Chemical nematicides are toxic to plants and should be applied only to fallow ground. Thus, control of plant parasitic nematodes must be done prior to planting.

### Ozone

*Celosia* is sensitive to ozone, an air pollutant that can injure plants. Ozone can reach high levels in Maryland; the highest levels occur when it is sunny and hot. Ozone enters leaves and damages the internal leaf cells when stomates are open. The first symptom of injury from ozone is a fine stipple or flecking on the upper surface of leaves. Irrigation causes leaf stomates to open, therefore, growers should avoid irrigating during the hottest part of the day (10 a.m. to 2 p.m.) when high ozone conditions exist. Schedule watering from sunrise to midmorning.

## Season of Bloom

*Celosia* blooms from midsummer to fall and produces harvestable flowers for up to 8 weeks. Sequential planting (every 2 to 4 weeks) of crested or plume types will ensure a constant supply of large flower spikes.

## Harvesting

Harvest crested *Celosia* when the center of the head has expanded but before outer edges begin to discolor. Plume- and wheat-type *Celosias* should be harvested when 50 percent of their flowers are open. Late harvest of flower heads will allow the development of seed that will shatter in the consumer's environment. Cut *Celosia* so that two or three leaves remain on the stem. The leaves help pull water up the stem, which helps retain freshness. Secondary flowers can be used for potpourri or crafts.

# Drying *Celosia* for Everlasting Sales

Crested- and plume-type *Celosias* are well suited to drying and selling as everlasting cut flowers. Wheat-type *Celosia* has a tendency to shatter when dried, making it difficult to handle or ship without damaging the flower head. The wheat *Celosia* 'Flamingo Feather' dries to a snowy white. 'Flamingo Purple,' a new introduction, and 'Tassles Deep Rose' retain their color fairly well when dried.

For the best color retention, all *Celosias* should be dried rapidly. Some growers utilize a greenhouse covered with black plastic, place harvested stems on a bench, and use exhaust fans to carry out moisture. This is done for 7 to 14 days.

## Summary

- \* Select *Celosia* types and colors according to your market needs.
- \* When starting seedlings in containers, keep the plants growing vigorously. Do not allow the plants to become stressed because this may cause premature flowering.
- \* Grow plants in full sun.
- \* If you desire multiple flower heads, pinch plume and crested types when the first flower forms.
- \* Monitor for aphids and beneficial insects.
- \* Monitor for diseased plants and promptly remove those that are infected.

## References

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- Seals, Joseph. 1993. *Cut Flowers—Prolonging Freshness*. Batavia, IL: Ball Publishing.

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