

## Ornamental Ginger as Flowering Potted Plants

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Ornamental ginger encompasses a diverse and versatile group of plants that are gaining increased recognition in the flowering pot plant, landscape and cut flower markets. Ginger is the common name given to members of the Zingiberaceae family, a group of tropical, rhizomatous, herbaceous perennials that have showy and attractive foliage and flowers, which makes them interesting ornamentals. The various sizes, flower colors and postproduction longevity (up to 4 weeks or longer) are adding needed diversity to the greenhouse industry.

Ornamental ginger is most commonly propagated by rhizomes. The rhizome is an underground storage organ that serves as a major source of water and carbohydrates. Each rhizome has many lateral buds which grow out to produce a pseudostem above ground. In general, the outdoor growing period in zones 8 or greater is 7 to 8 months, and flowering takes place for 2 to 3 months. Flowering initiates new rhizome formation.

A majority of these ginger species are native (indigenous) to South East Asia with production occurring predominantly in Thailand and China. In their native habitat, the growth of most ginger species occurs during the rainy season, and dormancy occurs during the dry season. If rhizomes are kept dry, they will remain dormant. In contrast to their native habitat, in temperate climates rhizomes enter dormancy in winter in response to short days and/or low temperatures. Rhizomes in commercial production are harvested when dormant for storage and distribution. Postharvest handling of the rhizomes can have a significant effect on time to emergence and uniformity of emergence. Optimum storage time and temperatures will be discussed by species.

Ginger can also be purchased in plug trays from tissue culture companies. However the *Kaempferia* spp. are the only ginger recommended for growing from a tissue cultured plug if a finished plant is desired in a 60 day time period. Those ginger species grown for flowering pot plants (see Table 1) will flower more quickly and uniformly if grown from rhizomes. If tissue-cultured plants are purchased, a fuller plant can be grown in the first season, then allowing plants to go dormant in the fall by withholding water as the days grow shorter and temperatures become cooler. Many growers then remove the dead foliage and force the ginger rhizomes after February in the same container the next spring.

For plants grown from imported rhizomes, once ginger rhizomes are received they should be unpacked and inspected for damage or disease as one would any other bulbous crop. In general, rhizomes should be planted immediately after shipment, but some delay in planting is tolerated at proper storage temperatures. A substrate composed of peat/pine bark/perlite or a peat/perlite mixture is recommended. The soil of the native habitat of some of these ginger species (*Kaempferia* and *Curcuma*) has a neutral to basic pH so a substrate pH of 6 to 7 is recommended.

A "standard" container or deeper pot will provide for the best drainage and also provide space for placing the tuberous roots attached to the rhizome toward the bottom of the pot while covering the top of the rhizome with approximately 1 inch of substrate.

Breaking the tuberous roots from the rhizome may decrease flower number and will delay time to emergence. Thus, care should be taken to keep the entire tuberous root intact.



**Figure 1. Boron toxicity of *Curcuma*.**

emergence, greenhouse temperatures should be lowered to less than 85 °F. Some ginger are boron accumulators, which may lead to marginal foliar necrosis (Fig. 1). Therefore plants should be fertilized with a water soluble fertilizer low in boron or without boron, such as Scott's Tropical Foliage Fertilizer (24 N-8 P<sub>2</sub>O<sub>5</sub>-16 K<sub>2</sub>O).



**Figure 2. *Curcuma* rhizome.**

season's leaves and inflorescence; and the second is a swollen, egg-shaped root designated as a tuberous root (t-root). The rhizome should have at least 4 t-roots associated with it to ensure hastened emergence and flowering. Prior to planting, rhizomes of *C. alismatifolia* should be stored in dry peat moss for 3 weeks at 50 °F followed by 3 weeks at 86 or 95 °F. Under this treatment, shoot emergence will occur

Three or more rhizomes per 6-inch pot will produce a marketable finished container. Some companies do grade the rhizomes, by the number of tuberous roots per rhizome. The greater the number of tuberous roots the shorter the time to finish. After the initial irrigation plants should be given a preventive fungicide treatment.

Greenhouse temperatures should be kept at 85 to 90 °F until emergence of shoots to provide more uniform emergence. Emergence should occur within 20 to 30 days after planting for most *Curcuma*, *Globba*, and *Kaempferia*. *Curcuma*

*cordata* and *roscoeana*, however, will emerge approximately 70 days after planting. After

There are 90 genera of ginger in the *Zingiberaceae* family. This family contains at least 1,400 species and perhaps as many as 2,000 species. The genera of flowering gingers include *Alpinia*, *Curcuma*, *Etingera*, *Globba*, *Hedychium*, *Kaempferia*, and *Zingiber*. One of the most popular is *Curcuma alismatifolia*, which originates from Northern Thailand and Cambodia.

Curcumas comprise at least 65 species with different colors, forms, and sizes. The inflorescence is a compressed spike with colorful bracts that can develop from the shoot, or directly develop from the rhizome (Fig. 2). The curcumas have a succulent adventitious root system. Some of the species, like *C. alismatifolia*, develop swollen roots to store water and reserve food for plant growth. Thus, the underground

part of the plant bears two types of storage organs.

The first is a rhizome with buds that will produce next

uniformly in 13 days, which is a decrease of about 40 days for rhizomes that receive no storage treatment.

Rhizomes of *C. cordata* should be stored for 2 weeks at 50 °F followed by 3 weeks at 95 °F for emergence in 48 days. With no storage, emergence will occur after 82 days. The most rapid emergence for *C. roscoeana* occurs when rhizomes are stored for 12 to 16 weeks at 77 °F (56 days to emergence) and the slowest, when rhizomes are not stored (86 days to emergence). For information on other *Curcuma* species and hybrids refer to Table 1.



Figure 3. *Curcuma cordata*.



Figure 4. *Curcuma alismatifolia*.

For production of brightly colored bracts and deep green leaves, *Curcuma alismatifolia*, *Curcuma thorellii*, *Curcuma* hybrids, and *Curcuma* species should be grown in full sun. If these species are grown under shaded conditions the flower stems and petioles tend to elongate and topple. The bracts of the inflorescence tend to fade and postproduction longevity is shortened.



Figure 5. *Curcuma thorellii*.

*Curcuma* *cordata* (Fig. 3) *Curcuma gracillima*, and *C. roscoeana* grow and flower best under 30 to 50 percent shade. *Curcuma alismatifolia* (Figure 4) and *C. thorellii* (Figure 5) will produce an inflorescence approximately 60 days after emergence and every 30 days thereafter during the summer months.

*Globba* have a pseudostem which is 20 to 30 centimeters tall, terminating with a pendent inflorescence of lavender, pink, white, or yellow bracts accented by a slender, curved, yellow corolla (Table 1). Various rhizome storage treatments can decrease emergence to a minimum of 14 days after planting. Those treatments include storage for 12 or 16 weeks at 77 °F and storage for 3 weeks at 59 °F followed by 3 weeks at 86 °F. If rhizomes are not stored or stored for as few as 2 weeks at 77 °F, shoots emergence can take approximately 56 days. Most all *Globba* species grow best and flower under 30 to 50 percent shade. *Globba winittii*, commonly

called “Mauve Dancing Ladies” will produce the first inflorescence approximately 60 days after emergence and will continue to bloom the remainder of the growing season (Fig. 6).

The 50 species of the genus *Kaempferia* and the one species of *Cornukaempferia* are nearly stemless herbs with thick, aromatic rhizomes (Table 1). They are grown primarily for their beautiful foliage. Most *Kaempferia* have a silver to purple feather pattern in the middle of the upper side of the leaf radiating outwards with various shades of green (Figure 7). Others, such as *Kaempferia gilbertii* ‘3 D’ have a white margin on a deep green leaf (Figure 8). *Cornukaempferia aurantiflora* has a silver feather pattern on the outer edge of the leaf with a deep maroon underside (Figure 8). Most of the *Kaempferia* spp. produce small white, pink or orange flowers. On a flowering spike arising from the base of the



Figure 6. *Globba winittii*.

plant a solitary flower is borne each day to be replaced by another the following day. These gingers grow best under 30 to 50 percent shade. *Kaempferia rotunda* has proven to be one of the best *Kaempferia* for landscape planting (Figure 9). The plant has rounded leaves that grow close to the ground, producing a dense mound. The most rapid emergence of *Kaempferia* occurs when rhizomes are stored for 16 weeks at 77 °F (8 days to emergence) and the slowest, when



Figure 7. *Kaempferia* spp. 'Grande'.



Figure 8. *Kaempferia gilbertii* '3-D'.

rhizomes are stored for 2 weeks at 77 °F (58 days to emergence). Because the foliage of *Kaempferia* is the primary attribute of this plant, transplants from tissue culture will produce a very



Figure 9. *Kaempferia rotunda*.

nice pot plant.

Temperature is the primary factor affecting sprouting and growth and is commonly used to hasten or delay development. For a species to be used as a potted plant, it must be possible for growers to provide flowering plants within a specific time interval. Because gingers go dormant in the winter, they are suitable for growing as summer flowering potted plants and/or landscape plants anywhere in the United States. Most rhizomes are harvested from November to January in Thailand and shipped to the United States in February through April for forcing. Gingers can be held dormant in dry peat moss at about 50 °F until space becomes available for forcing, fitting into the pattern of activity of many grower operations. Because gingers prefer warm growing conditions, they are good candidates for summer greenhouse or nursery production fitting the lull between summer and fall production.

Plant growth retardants are recommended in order to use some of the more vigorous cut flower species such as *Curcuma cordata* and *Curcuma alismatifolia* 'Siam Tulip' as potted plants (Table 1). Since most of these gingers do not have a true stem, growth retardants should be applied as a drench when the shoot has emerged to about 5 inches above the substrate or when roots have grown to the sides of the container. Application of uniconazole at 10 mg a.i./container or 20 mg a.i. paclobutrazol is recommended.

All of the aforementioned gingers have been planted in the landscape at Burden Center, Baton Rouge, LA (USDA Hardiness Zone 8). Three years of data indicate that all of these gingers are hardy to Zone 8 in the landscape. Overwintering survival is also linked to good mulching and to a well-drained soil to prevent root rot. Thus, these plants can be marketed as a flowering potted plant for use in year-around interior landscapes, and as either perennials (USDA Zone 8 or greater) or summer annuals (similar to *Caladium*, *Colocasia* and *Alocasia*) in exterior landscapes depending upon the climate.

**Table 1. Description of ornamental gingers.**

Species	Average Height	Inflorescence/Foliage	
<i>Cornukaempferia aurantiiflora</i>	1 foot	Leaves w/ silver feathered margins to dark maroon color. Small orange flowers. 40 to 60% shade.	Formatted: Justified, Line spacing: single
<i>Curcuma alismatifolia</i>	2 feet	Tulip shaped flowers, ~ 3 - 4", pink or white. PGR required. Full sun.	Formatted: Justified, Line spacing: single
<i>Curcuma alismatifolia</i> Hybrids	1 foot	Tulip shaped flowers, ~ 3 - 4", shades of deep purple to white. PGR not required. Full sun.	Formatted: Justified, Line spacing: single
<i>Curcuma cordata</i>	2 - 3 feet	Cone shaped flowers, ~ 4 to 6", pink. PGR required. Full sun to 50% shade.	Formatted: Justified, Line spacing: single
<i>Curcuma roscoeana</i>	2 - 3 feet	Cone shaped flowers, ~ 4 - 5", bright orange. PGR required. Full sun to 60% shade.	Formatted: Justified, Line spacing: single
<i>Curcuma</i> sp. 'Precious Patuma'	1 foot	Tulip shaped flowers, ~ 1 - 2", pink, pink w/green tips. Full sun. No PGR.	Formatted: Justified, Line spacing: single
<i>Curcuma petiolata</i> 'Emperor'	2 to 3 feet	Grown for variegated foliage. Full sun to 50% shade. PGR.	Formatted: Justified, Line spacing: single, Tabs: 1.63", Left
<i>Curcuma thorellii</i> 'Chiang Mai Snow'	1 foot	Tulip shaped flowers, ~ 2 - 3", pure white. Grown for rhizome. No PGR required.	Formatted: Justified, Line spacing: single
<i>Globba</i> spp.	1 to 2 feet	Arching pendant inflorescences. 40 to 60% shade.	Formatted: Justified, Line spacing: single
<i>G. bulbifera</i>		Small yellow bracts with yellow flowers forming bulbils.	Formatted: Justified, Line spacing: single
<i>G. pendula</i>		'Silver Comet', 3 to 4 feet, silver variegation, yellow bracts.	Formatted: Justified, Line spacing: single
<i>G. winitii</i>		'Mauve Dancing Ladies', mauve bracts.	Formatted: Justified, Line spacing: single
<i>G. magnifica</i>		'White Dragon', white bracts, requires a PGR drench.	Formatted: Justified, Line spacing: single
<i>Kaempferia galanga</i>	lay flat	Foliage pale green with some variegation, small flowers. 40 to 60% shade	Formatted: Justified, Line spacing: single
<i>K. gilbertii</i> '3-D'	6 inches	Foliage with white margin, deep green stripes in center of leaves, small white flowers. 40 to 60% shade	Formatted: Justified, Line spacing: single
<i>K.</i> spp. 'Grande'	2-3 feet	Foliage rounded and large with pattern silver feather on upper and maroon back. 40 to 60% shade	Formatted: Justified, Line spacing: single
<i>K. pulchra</i>	1 foot	40 to 60% shade.	Formatted: Justified, Line spacing: single
'Bronze Peacock'		Leaves lanceolate, purple/silver variegation with bronze bracts.	
'Silver Spot'		Leaves lanceolate, silver variegation with small pink flowers	
'Raven'		Leaves lanceolate, striking silver feather and maroon back	
<i>K. rotunda</i>	3-3.5 feet	Variable purple/silver variegation with purple to green leaves with large white and purple flowers. 40 to 60% shade	Formatted: Justified, Line spacing: single