CALLA - LILY ... a potential nursery crop for South Florida.

Prepared by Joe Garofalo*

Calla-lilies, also called arum-lilies, are available in six species (spp), several subspecies (sspp), and quite a choice of cultivars (cvs) in a wide array of colors. Callas have become very popular during recent years, both as flowering pot-plants and as cut-flowers. They are chiefly grown for the showy, solitary spathes, which are beautifully colored and suggest a large corolla. The foliage of some species is used in arranging for a bold effect and dark green color. Others come with beautifully spotted foliage, the spots being translucent and mostly white. In some years some cvs ('Mango', 'Red Embers') have pale pink spots.

ORIGIN & ADAPTATION.
The general gardening public, and many nurserymen, have the mistaken idea that callas are difficult to grow in Florida, but that simply is not so. These fine geophytes ("bulb" plants), native to tropical & subtropical South (S) & East (E) Africa (Afr), require no chilling. They survive at least to climate zone 8a (+10° F), & some species are grown as garden perennials in N & C FL. In the coolest parts of N FL a Winter mulch is a good idea.

CLASSIFICATION.
Calla-lilies are in the genus Zantedeschia (for Giovanni Zantedeschi, 1773-1846, Italian botanist & physician), formerly Calla, and Richardia. The related genus, Calla, with the common name "wild calla," native to NE USA, is quite distinct from the calla-lilies discussed here, and much less showy.

Zantedeschia is in the arum family, Araceae, so callas are not "lilies" at all, but aroids. They are closely related to other aroids, including Aglaonema, Anthurium, Caladium, Dieffenbachia, Philodendron, Monstera, and Spathiphyllum. All six calla spp are rhizomatous herbaceous perennials. The rhizomes resemble the tubers of Caladium, so are commonly called tubers.

SPECIES AND CULTIVARS.
From a production standpoint, there are two distinct groups—the evergreen, wetland sp, Z. aethiopica; and the 5 deciduous (decid) spp, which are adapted to wet-dry conditions. Many growers select by color and size, dwarf for flowering pots, intermediate and tall for cut-flowers, rather than by sp. There is a large number of cvs available, and the color range is outstanding and rich within the white-yellow-orange-pink-red-maroon range, with many blends. Some of the following are difficult to find—try the Internet and wholesale bulb catalogs.

Z. aethiopica (4+ ft), the florist calla. Lvs arrow-head shaped, dark green, evergreen, but deciduous in N FL, spathe to 6+ inch (in), brilliant white, the largest. S Africa. Sold as sp, or a few cvs: 'Crowborough', the hardiest; 'Green Goddess', spathe mostly green; 'Little Gem', a free-flowering dwarf (1 ft); 'White Sail', spathe opens very wide.

Z. albomaculate (3+ ft), spotted calla-lily. Similar to above, but smaller, lvs decid, usually spotted, spathe to 4+ in, ivory or cream, purple blotched within at base, not opening wide. S to tropical E Afr. sspp albomaculata & macrocarpa lvs mostly spotted; ssp valida, lvs never spotted, spathe to 5+ in and more open.

Z. elliottiana (3+ ft), golden calla-lily. Lvs oval-heart-shaped, decid, white spotted, spathe to 4+ in. Afr, probably tropical Transvaal.

Z. jucunda (2 ft), lvs triangular, decid, with many elongated white spots, spathe 4+ in, golden-yellow with purple blotch. S. Afr.

Z. pentlandii (2 ft), lvs lanceolate, yellow-green, unspotted, decid, spathe to 4+ in, lemon-yellow, purple blotched, narrow-tube-shaped. S Afr.

Z. rehmannii (to 3 ft), red calla-lily. Lvs lanceolate, decid, spotted/unspotted, spathe to 4 in, narrow-tubular, slightly spreading tip, mostly reds, pinks, purples; Z. r. ssp superba white, fading to pink. In fruit, spathe arches to ground. Natal.

GROWTH CYCLE.
In N and C FL the evergreen Z. aethiopica makes a good garden perennial for a shady spot that stays too wet for other perennials. Plant them next to a ditch or pond, or in the water (up to 4 in deep). It grows continuously from late Fall through Spring, unless cut back by frost or lack of water. In N FL frost prevents growth until Spring. Growth slows in late Spring and the plants are dormant during the Summer, growing & flowering very little, but remaining green. The clumps increase in size and produce more flowers each year. All the decid spp must have a dry Summer rest period or they will rot.

SOUTH FLORIDA EXPERIENCE.
Seven seasons of trials in S FL have shown that the decid callas are not garden perennials here. They grow and flower well, then go dormant, never to be seen again. A few may resprout, but produce small, spindly plants that don't bloom & soon die. (Only Z. aethiopica can be grown as a perennial here.)

All calla spp can be forced in S FL. Basically, you plant, water and fertilize, make sure growth is never checked, then enforce a dry rest period by withholding water as they begin to die back.

Callas in S FL start growth in Fall, grow through Winter, & slow down as the heat of late Spring settles in. After flowering slows down, cut back on irrigation, & let them go dormant. At this point callas must be dried & rested before the next bloom cycle. Dig the rhizomes, air-dry, & store under dark, well-ventilated conditions. In Fall these can be re-planted, & will grow just as well as newly-purchased rhizomes, & will increase in size & form offsets each year. (Z. aethiopica also goes dormant if not watered—it stops growth, retaining about half the foliage—but it may also be grown continuously.)

PRODUCTION PRACTICES.
Several methods are used in commercial production, using raised beds or pots for cut-flowers, and several sizes of containers for flowering pot-plants. Light shade is usually provided because flower quality is reduced in full sun. The essentials are: high nutrition, bright light with shade, & plenty of water.

Rhizomes of Z. aethiopica are produced in Israel, The Netherlands, and California. These have escaped in tropical and subtropical regions of the world, where they naturalize in moist places. The decid spp are produced in France, The Netherlands, and New Zealand. They are sold by size, based on diameter. Commonly available sizes are small (< 2 in), and large (>2 in). If purchased as named cvs, smalls sell for about $105-$130/100. The large sizes sell for $185-$270/100. Purchased as a mixture, the prices drop to $100/100 (small) and $250/100 (large). Some bulb companies offer a "collection by color," which includes five separated colors with no cv names for $129/100 (small). These prices are less than the cost of amaryllis bulbs.

FORCING IN POTS.
The dwarf callas are well-suited for pot production. Forcing them is easy, and the turnover for flowering pots can be better than for begonias or mums. The dwarf cvs are commonly produced in 6-inch azalea pots. The medium-height cvs do well in gallons, and the largest types can be produced in 3-gallon pots. Z. aethiopica, the largest, opens only one or two flowers at a time, making it less suitable as a flowering pot than as a cut-flower. Bulb dealers supply height information on the cvs they sell.

As the "flowers" age, they do not wither or dry out as most flowers do, but remain erect and seemingly fresh as the seeds develop within the spathe. Their color

darkens, taking on tones of red or green. This characteristic of the calla growth cycle can be used to the grower's advantage since the pots remain in "bloom" for an extended period, well over a month. Eventually these old flowers (now fruit) bend over, especially Z. rehmannii, depositing the seeds on the soil surface. A grower should never see this, because the pots are sold well before the bending stage. Some cvs appear to bend sooner than others.

POTTING.

For forcing, either soil-based or soilless media can be used, but must be well-drained & free of pathogens. The peat-and-perlite mixes work well. Fill the pots nearly to the top & lightly firm the medium. Use one small rhizome per 6-in azalea or gallon pot, 2 for 2-gallon pots, and up to 3 for 3-gallon pots. Press them into the medium firmly, and add medium to cover. Completely cover the rhizome; the roots emerge at the top, just below the buds. Leave a half-in head space.

Pot them, water well, place in shade, and wait for some roots to develop before watering again, in 1-2 wks. Water if you need to, but do not keep the pots constantly wet. Once the pots fill with roots and top growth is well started, you can begin a fertilization schedule. It can be noted, however, that good finished pots can be produced with little or no added fertilizer. They should be in bloom in 4-8 weeks.

When potted callas are taken indoors the low light level causes the flower and leaf stalks to stretch. This happens with most plant species, and takes a week or more to become evident. This is of much less concern with callas than with other bulbous crops. The retailer should be advised to give them as much light as possible.

FORCING AS CUT-FLOWERS.

Callas are also easy as cut-flowers. Z. aethiopica & Z. albomaculata are always in demand, but the large-flowered cvs available in several strong colors should be considered, along with the medium-sized cvs. The smaller cvs also make excellent cut-flowers, but there is very little demand for them.

For cut-flower production, buy the largest rhizomes available since they will produce more flowers, larger flowers, and bolder foliage. Cut the flowers when the spathe is partially or fully open, but before the pollen sheds. They can be stored dry at 40° F for up to 3 days, or wet for a week. A regular fertilization program will be required to maintain production over the longest potential period.

DISEASES & PESTS.

Flowering pots are in and out of the nursery in less than 3 months. If good sanitation is practiced, disease and pest problems will be minimal. Problems reported in Florida include aPhyllosticta leaf spot, cucumber mosaic & tomato spotted wilt viruses, bacterial soft rot, and Phytophthora root rot. When bulbs arrive, inspect them for signs of disease, insect damage, and physical injury. If damage is found, contact your county extension agent or the Plant Disease Diagnostic Clinic for management recommendations. Most problems can be controlled by roguing—just remove and destroy affected rhizomes.

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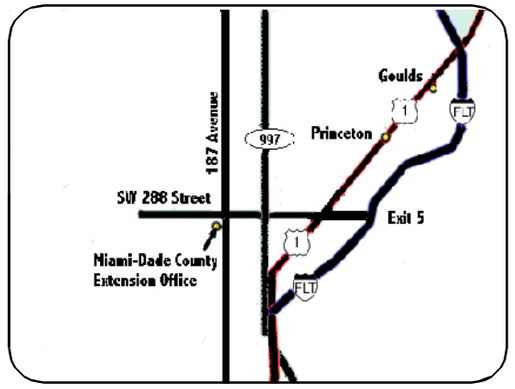

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