

A WORD OR TWO ABOUT GARDENING

Ornamental Corms, Tubers and Rhizomes for Miami-Dade: From gladioli to cannae.

Two previous articles in this series have reviewed the opportunities flowering bulbs provide for enriching local landscapes, concentrating on several members of the Amaryllidaceae. Most other true bulbs including amaryllids such as *Agapanthus* and *Clivia* plus members of the lily family (e.g., *Lilium*, *Allium*, *Hyacinthus* and *Fritillaria*) are unsuited to local conditions. There are other geophytic plants apart from those with true bulbs that can be used in local landscapes as either temporary or permanent bedding plants. The present article reviews some of these including corms such as gladioli, caladiums (tubers), cannae (rhizome) and ornamental sweet potatoes and day lilies, both tuberous roots.

Corms differ from bulbs in being solid, formed from a thickened underground portion of the stem and covered with a papery tunic of dried leaf bases. Corms are devoid of the fleshy scales/enlarged leaf bases found on true bulbs. Roots grow from the base of the corm, while on the upper surface one or more buds give rise to new shoots and flowers. Lateral buds often develop in two rows down opposite sides of the corm (corresponding to areas in between stem nodes) and these too can give rise to new shoots. Corm forming members of the lily family (e.g., *Colchicum*, meadow saffron) produce new corms in a manner superficially analogous to offsets produced by true bulbs. In the iris family (Iridaceae), which contains most cormiferous plants, a new corm forms each year directly on top of the dried remnants of that from the previous year. In addition while in flower, cormels (small corms) can form between the old and new corm.

This is the case with **gladioli** popular both in formal flower beds and as long lasting cut flowers, with the added attraction of being available in a wide range of colors. Many thousands of cultivars have been developed, most derived from a limited number of species from southern Africa. Individual flowers are tubular to funnel shaped, arranged alternatively as a tall spike, with all the flowers on one side of the spike facing the same direction. Colors range from white to yellow through shades of pink, red, violet – most colors except a true blue. There are multi-colored flowers, those with speckling and some with a smoky hue. Flowers at the bottom of a spike open first, with a whole spike flowering over a period of about a week.

Gladiolus corms can be planted any time of the year in a mild winter climate, and will flower about 80 days later. However in South Florida it is best to avoid exposure to the wettest months of the year (June –September). Corms should be lifted after flowering just before foliage completely dies down, dried then stored in a cool dry place after separating new corms from the parent corm. When planting, choose corms that have a definite crown (not flattened), with a ring of root buds visible around the base. Set out 4-6" apart at a depth of about 3", slightly deeper in a sandy soil, choosing an area that receives full sun. For landscaping purposes gladioli are best grown in clumps rather than formal rows, and can be set out with other annual bedding plants, inserting several stakes in the ground for support. Soil should be organically enriched but light, and once growth commences kept evenly moist. Corms

can be dusted with a fungicide (e.g., Captan) before planting. In order to lessen the risk from soil borne diseases/pests avoid growing gladioli in the same part of the yard for more than 2-3 years.

Like corms, **true tubers** also consist of stem tissue; in this instance the tips of rhizomes (stems growing just beneath or on the soil surface) that become, swollen, solid and starch filled. Scattered on the surface of each tuber are eyes, growing points that give rise to new shoots and roots. With care it is possible to propagate plants from sections of tuber providing each piece contains at least two eyes. Apart from the common potato, tuber-forming plants are found in members of the Lamiaceae such as *Solenostemon rotundifolius* (Hausa potato) and *Plectranthus esculentus* (Livingstone potato) both food crops in W. Africa, certain aroids (colocasias and caladiums) and the gloriosa lily. **Caladiums (*Caladium bicolor*)** are native to tropical S. America and widely grown for their strikingly colorful foliage, cultivars having leaves patterned in shades of green and /or pink, red or white. Two groups of cultivars can be distinguished according to leaf shape: fancy-leaved (heart shaped leaves similar in form to Alocasia but much smaller) and lance-leaved (narrower, smaller leaves on a more compact plant). The fancy-leaved cultivars are more often used as landscape plants in South Florida, whereas the lance-leaved caladiums are more popular in hanging baskets or containers.

Most caladiums grow best in reduced light; in the landscape this means dappled shade, or at least some shade during the hottest part of the day. In full sun, color is less intense and wilting more likely with concomitant loss of foliage unless plants are frequently watered. There are some varieties that perform well in full sun including 'Seagull' and 'Garden White' (white), 'Rosebud' (pink) and 'Red Frill' (red). Caladiums require at least 6-8" of moisture retentive, light, organically enriched soil – a soil mix that is too heavy is liable to remain wet thereby promoting tuber and/or root rot. Tubers are spaced about 1' apart at a depth of 1-2", and can be planted during spring, taking care to prevent soil from drying-out. In some cases, most often for container plants, tubers need to be de-eyed (removal of the apical eye) to promote increased more even production of shoots. A slow release 10/10/10 can be incorporated into the soil at the time of planting. Once air temperatures fall below 65°F foliage color will deteriorate; usually caladiums continue to grow in Miami-Dade through the winter. If abnormally cool and/or wet, tubers should be lifted and re-planted in spring.

A third type of tuber involves that portion of the seedling stem (the hypocotyl) between the cotyledons (juvenile leaves) and roots which becomes swollen as the plant develops. Occasionally referred to as **stem tubers**, they differ from corms and rhizomatous tubers (which last for only one season and disintegrate as food stores are exhausted) in enlarging with each growing season. This is the case with tuberous begonias (*Begonia x tuberhybrida*), which boast some of the most spectacular blooms of any geophyte. Unlike the more familiar wax or fibrous rooted begonias, widely used locally as bedding plants, tuberous begonias are far more difficult to grow and unsuited to south Florida conditions. Cyclamens and sinningias also develop swollen hypocotyls. The former are in the primrose family (Primulaceae), blooming from fall into spring; garden or hardy cyclamens are popular as outdoors plants in northern

landscapes and florists cyclamens are grown as indoor container plants. When in active growth neither type of cyclamen should be exposed to temperatures exceeding 70°F, making them difficult to maintain in south Florida. *Sinningia speciosa* (commonly and misleadingly referred to as “*gloxinia*” or “*florist’s gloxinia*”) is a popular house plant and requires high humidity and a temperature range from 65 - 75°F. The genus *Gloxinia* is related to *Sinningia* (both in the family Gesneriaceae) but does not produce stem tubers.

Although most rhizomatous plants do not develop tubers, rhizomes are themselves important both as storage organs and as a means of vegetative plant dispersal. Like aerial stems, **rhizomes** produce apical and adventitious buds from which new shoots/roots develop. Where adverse conditions cause above ground plant parts to die down (e.g., drought) the rhizome becomes more or less dormant. However once conditions improve, quiescent rhizome buds sprout and rapidly produce new leafy shoots. Many locally grown ornamental plants are rhizomatous, some such as gingers, costas (spiral gingers), heliconias, ornamental bananas and perennial peanut (groundcover) having been previously discussed in this column.

Most of the commonly grown irises are **rhizomatous plants** (bearded and beardless irises) – Dutch, Spanish, English and Reticulata irises are propagated using bulbs. The majority of irises are not suited to Miami-Dade; the Florida native iris *Iris hexagona* (**Dixie iris**) grows as far south as Collier County but requires moist to wet, rich, organic soil. **Louisiana hybrid irises** (rhizomatous iris crosses involving several species including *I. hexagona*) also require organically rich, moist, acid soils; drought tolerance is low and in hot dry weather foliage will yellow unless plants are mulched and watered. If you try to grow them in Miami-Dade, you will need to prepare an 8-10" deep bed of organically enriched soil (build a raised bed on limestone), and ensure adequate supplemental water with frequent applications of fertilizer. Avoid high nitrogen fertilizer as this will delay/reduce flowering - use a complete fertilizer such as a slow release 8/2/12 palm special, with supplemental applications of iron and other trace elements to correct any trace element deficiencies. Louisiana irises are best planted in late fall; for bare root plants, the rhizomes should be only just covered with soil followed by a 3" layer of mulch. After flowering in spring, growth will slow during summer.

Easier to grow locally than Louisiana hybrid irises, *Dietes bicolor*, **yellow morea** or **wild iris** is found from east Africa into South Africa and has fans of narrow, 2' sword-shaped, leathery leaves and 3' branched stems carrying pale yellow flowers each with a dark brown to maroon blotch. As clumps expand, *D. bicolor* can serve as a coarse-textured, flowering groundcover for areas in full sun (best flowering) to part shade. More attractive where soil remains moist, especially in full sun, it will survive with only occasional watering once established. One gallon container plants can be spaced 18-24" apart (rhizomes are not available). Established clumps can be divided after flowering and succeed best if started in containers before planting out. Two other species are sometimes available, *D. iridioides* (African iris, white tepals blotched blue) and *D. grandiflora* (fortnight lily, flowers similar to *D. iridioides* but larger). Both of these require more shade than *D. bicolor* and do not adapt as readily to Miami-Dade conditions.

Another rhizomatous member of the iris family **narrow-leaf blue-eyed grass**, ***Sisyrinchium angustifolium***, is found widely in pineland areas of Florida. It is somewhat drought tolerant though best if soil remains moist, succeeds on local limestone soils and requires little fertilizer. Far less showy than the above irises, *S. angustifolium* is a diminutive plant with grass-like foliage, small, blue, six-petalled flowers. It is best used with other native wildflowers in areas of moist pineland or possibly to edge a flower bed in a more formal garden. Like the Louisiana irises it should be planted in fall and will become more or less dormant in summer.

Cannas are a group of colorful herbaceous rhizomatous plants. Often misleadingly called lilies, they are in the Cannaceae, a small family in the order Zingiberales that also contains the banana, ginger and heliconia families. Ornamental cannas are a complex group of hybrids (***Canna x generalis***) with showy flowers in shades of yellow, orange, pink, scarlet/red to purple, some of which are biccolored. In addition foliage can vary with leaves that are gray-green to bright green through shades of brown to purple, some being variegated. Cannas vary in size from dwarfs, such as the Pfitzer series (to 2.5') to the giant King Humbert series (to 6'). Most of these cultivated cannas are derived in part from *Canna indica*, sometimes referred to as the wild canna or Indian shot. The latter name is due the appearance of the seed, which resembles lead shot. None of the cannas are native to India. All are originally from the New World tropics and sub-tropics, though they have now naturalized in many areas of the world. One species, *Canna flaccida* (golden canna), is native to S.E. United States, and grows to 3-6' in south Florida. The yellow flowers although attractive, are short lived and the plant spreads rapidly given sufficiently moist soil. It cannot be recommended for garden cultivation.

Cannas are relatively easy to grow, requiring for best results at least 6-8" of moist but free-draining organically enriched soil, in a site receiving full sun to slight shade. On Miami limestone consider constructing a raised bed, or for just 3 or 4 plants, cannas can be grown in 4-5 gallon containers using fresh potting soil. New plants are usually started in late winter to early spring in South Florida by setting out lengths of rhizome, 2-3" deep and 1-2' apart. For expensive cultivars it is worthwhile starting rhizomes in containers then transplanting to the landscape once they develop top growth. Ensure that the soil remains moist and apply a slow release fertilizer (e.g., 8/2/12 slow release palm special) every 2-3 months. Remove spent flowers to ensure renewed flowering, and thin out old weak stems.

Cannas can be left in the ground year round in south Florida, however it is beneficial every other year to cut them back as winter approaches and dig out the rhizomes. The planting bed can then be cultivated (weeds removed and additional organic matter worked into the bed), diseased/exhausted rhizomes removed and healthy rhizomes cleaned of adhering soil, rinsed in Consan (fungicide) after which they can be stored or planted.

The most troublesome pests of cannas are caterpillars, particularly leaf rollers, and snails. Apart from occasional problems with bacterial leaf spot, diseases aren't usually significant where plants are grown in full sun and soil that isn't too heavy. Rust can sometimes affect foliage during periods of dry, cool (below 80°F) weather.

Root tubers (swollen sections of root), although they may superficially resemble true tubers, produce the majority of new shoots at the proximal end, the portion that joins onto the base of the stem (the root crown). This is in contrast to a true tuber where buds are more evenly scattered over the surface (though they tend to be more concentrated near the tip (distal end). When using root tubers for propagation (e.g., dahlias) it is important to remove the entire tuber with a small portion of stem tissue attached to ensure removal of a bud.

Most dahlias grown in Miami-Dade landscapes are dwarf bedding types, such as seed-raised Unwin dwarf hybrids. Seed can be sown in flats spaced 1-1½" apart in the middle of September and should germinate within 3 weeks. Once the seedlings have two sets of true leaves, transplant to 3" peat pots containing a soilless potting mix, and by the beginning of December they should be ready to set out in the landscape. If you desire convenience, transplants are usually available in local garden centers for planting out during December/January. The large flowering, decorative dahlias are grown from root tubers (available from mail order sources, or sometimes local garden shops), but require more effort and need to be planted early. You should use a free draining, organically enriched soil, planting tubers (bud eye facing up) about 6" deep. Some growers cover with only 2" of soil initially, adding more as the shoot appears. Withhold water until a shoot appears above ground; at this time irrigate as needed to ensure that soil remains moist (never wet) and apply a 2" covering of mulch. Be prepared to contend with several pests and diseases especially powdery mildew and spider mites. Dahlias are endemic to cooler mountainous areas of Mexico/Central America and cannot endure local summer heat and humidity.

Far better adapted to local conditions than Dahlias, the **sweet potato** (*Ipomea batatas*), long appreciated for its' edible tuberous roots, has found more recent use as a valuable landscape ornamental. Active breeding programs such as that at North Carolina State University are providing cultivars differing in both leaf color and shape as well as growth habit. Of the early cultivars '**Blackie**' has deep purple leaves, contrasting sharply with the chartreuse '**Margarita**'. Somewhat less vigorous, '**Tri-Color**' has grey to green/white/pink to red variegated leaves. Ornamental sweet potatoes are sold as rooted container plants and should be planted in an enriched but free-draining soil. Locally they can be set out at any time, but spring will permit more rapid establishment. Sweet potatoes are usually grown with full sun exposure, but when growing ornamental types in south Florida part shade from hot afternoon sun is recommended. This will not only help to enhance leaf color, but lessen the risk of wilting and the need for supplemental water. During spring/summer twice weekly watering should be sufficient where there is some shade. With all day exposure to hot sun ornamental sweet potatoes will require frequent watering to thrive and remain attractive.

Use a low nitrogen fertilizer (e.g., a 5/10/10) so as not to encourage over vigorous soft growth. Even so during summer be prepared to frequently cut back vines to control spread, especially the first three of the above cultivars. Stems root at the nodes where they contact moist soil and this, together with their rapid growth, makes all three cultivars good choices as attractive groundcovers. They will climb into shrubs and a chain link fence, so be careful where they are used. The '**Sweet**

Caroline' series are not as sprawling, somewhat more upright growing and especially effective when allowed to spill over the edge of a large raised planter. Leaves can be lobed or heart shaped and light green, purple, red or bronze; growers under the Proven Winners brand offer the larger '**Chillin™ 'Blackberry Star'**, '**Blackberry Heart'** and '**Limeade'** and Syngenta Flowers recently introduced two compact selections, '**Sidekick Lime'** and '**Sidekick Black Heart**'. Sweet potato root tubers like dahlias exhibit proximal dominance in that new shoots are produced at the stem end, however it is not as strong and a single tuber can produce several shoots (known as slips). It is much easier to start ornamental sweet potatoes by rooting stem cuttings, and this reduces the risk of introducing the sweet potato weevil, a serious pest that destroys tubers.

Probably the most widely used of all tuberous rooted ornamental plants are **day lilies**, formerly part of the lily family (Liliaceae) now a separate family (Hemerocallidaceae) of about 15 species from which more than 60,000 named cultivars have been developed. Clump forming, they produce two-ranked, thin, linear (strap-like) leaves grouped in 'fans' and a flower scape (the tip often branched) bearing racemes of funnel shaped flowers. Flowering occurs from spring through summer (depending on cultivar) with blooms in many colors from the palest yellow to deep burnt orange to almost red, but always with at least an underlying hint of yellow. In a few instances flowers are fragrant. Although individual flowers are short lived (less than 24 hr) they are continuously being replaced over the blooming period of the cultivar in question. In south Florida only evergreen and some semi-evergreen types can be grown. Although often expensive, day lilies are long-lived. Underutilized in Miami-Dade landscapes, they should be seriously considered with the recent availability of containerized cultivars suited to south Florida conditions. These include '**Miami Medallion'** (apricot/yellow, floriferous - extended bloom season); '**Yeehaw Yellow'** (golden yellow petal tips suffused burnt orange); '**Aztec Evergreen'** (golden yellow, extended bloom period) and **Kaskel Color Mixes** (from a local Miami grower).

Day lilies are not particular as to soil providing it doesn't become waterlogged – local sandy/rocky soils benefit from 10-15% added organic matter. Situate in full sun, though cultivars with very deep colored blooms are more attractive with some partial afternoon shade. Containerized daylilies can be planted at any time, spaced 12-18" apart. Bare root plants are best planted in late fall to late winter and regularly watered until established - when setting out, spread the roots over a dome of soil before adding backfill. Ensure that the crown (small area of white tissue between base of leaf fan and roots) is covered with no more than $\frac{1}{2}$ " of soil. Apply a complete slow release fertilizer in spring. Daylilies are quite drought tolerant, however they should be watered during extended periods of hot dry weather especially once scapes and flower buds develop. Where necessary provide 1" of water per week in no more than two early morning applications (flowers will wilt if watered during the heat of the day). Developing seedpods should be removed to maximize flowering and dead leaves to discourage disease. Flowering of locally grown daylilies often declines after 3-4 years at which time they should be lifted. This is best done in the fall, the clumps divided, the foliage cut back to 6" and the divisions then replanted.

Pests are few: in spring Eastern lubber grasshoppers may chew leaves, aphids can cause both leaf tips and flower buds to become brown and spider mite feeding results in foliage turning yellow/tan. Leaf streak is a fungal disease that results in an elongated area of the leaf, usually next to the mid-rib turning yellow then brown. This can be confused with yellow streak rust a more serious disease, which causes raised yellow to orange pustules and brown blotches as leaves become more heavily infected. This can be difficult to control on susceptible cultivars. Day lilies are a wonderful addition to ant landscape but if you are a pet owner be careful where you place them. As with true lilies and amaryllis, they are highly poisonous to cats.

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