Winter 2014

MIAMI GREEN BYTES

A Newsletter for local gardeners, arborists, and landscapers from the UF-IFAS/Miami-Dade County Extension Office.

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Following near record rainfall June through August (Miami 39'', normal 25"), rainy season ended with below normal rainfall for September (-2.6") and October (-3.24"). Halloween ushered in the first significant cold front of the upcoming dry season with record low temperatures. November saw both rainfall and temperature slightly below normal. Despite warming ocean temperatures in the E. Pacific compatible with an El Niño event, it is yet to develop (chances at 65% from now into early next year). Current long range predictions for Florida are for cooler and wetter than normal conditions December through March. If correct this could result in an increased incidence of plant disease, a concern for local vegetable gardens as well as landscapes featuring annual bedding plants such as impatiens.

But first, as always at this time of year, it pays to be ready for not only any frosts and freezes, but cold damage in general.

In this issue you'll find:

Cold damage – what you need to know to protect landscape plants

Landscape recovery after the freeze - the do's and don't's..

Cool Season and irrigation – time to adjust irrigation schedules

I'd like to tell all about – *Hibiscus radiatus* On this occasion Lize Luna reveals how she fell for a stunning rose mallow.

Vegetable gardens and disease – a cool wet winter could increase the risk of disease

Plant of the month– an end of year pot-pourri

Plus the regular 'Pest Update' & 'At this time of year…'

Cold Damage – what you need to know to protect landscape plants

Significant damage to sub-tropical plants can occur well before temperatures approach freezing. Early cold fronts (before Thanksgiving) can be more injurious to tropical landscape trees and shrubs than those occurring later in January, even if in both instances temperatures only fall into the

40's. The sudden drop in temperature that occurred at the beginning of November this year (high of 78°F Nov. 1 to 48°F early morning Nov. 2) was sufficient to cause some leaf necrosis (e.g., *Hamelia cuprae* West Indian firebush, shown above left). This is due to the rapid change from a temperature that supports active growth of tropical shrubs and trees, to low temperatures well below 65°F (the minimum for active growth). A dramatic illustration of this occurred with the sudden early freeze that occurred before Christmas, 2009 which caused widespread damage with loss of landscape plants.

Will it freeze? Subtract 20 from the air temperature (°F) at sundown to obtain an *estimate* of the over- night low temperature.

Actively growing plants are more susceptible to cold damage than those where growth has slowed. For instance if during early January overnight temperatures dropped to the mid 30's, damage would be more severe if the previous December had been unusually warm compared to one where temperatures had gradually fallen to the low-mid 40's. By January sub-tropical trees, shrubs and palms that have experienced progressively decreasing temperatures for the previous 4-5 weeks should be exhibiting little or no active growth and be more able to withstand near freezing conditions. However this doesn't apply to truly tropical plants which can commence exhibiting signs of damage at 50-60°F, well above freezing.

Factors that may help mitigate damage from exposure to cold temperatures are most likely to be of relevance to a radiational type freeze compared to an advective freeze (see below). It is important to realize the amount of damage depends on both location and the length of exposure.

FREEZES CAN DIFFER

AN ADVECTIVE FREEZE is due to a large mass of frigid air and is associated wind speeds ≥ 5 mph; there may or may not be cloud cover Heat loss is due to the constant stream of cold air passing over plant surfaces

Protection from this type of freeze is more difficult.

A RADIATIONAL FREEZE occurs on cold windless nights when there is a lack of cloud cover, allowing heat to radiate from surfaces including those of plants. Such freezes often follow 1-2 nights of cold, breezy (but not freezing) weather, and can also be expected when early afternoon temperatures are <60°F. White (hoar) frost may form depending on moisture content of air. Protecting against damage from a radiational freeze is easier compared to an advective freeze.

▼ The most important factor in mitigating cold damage from a radiational freeze is relative location; within Miami-Dade temperatures can fall 10 - 15^{0}F lower in Miami-Dade's far western suburbs compared to Miami Beach during a cold weather event. For this reason consider growing rare, cold-sensitive, palms and shrubs in movable containers rather than in-ground, especially for locations more than 10 miles from the ocean.

▼ Property located adjacent to a body of water such as a man-made lake – heat stored in the water during daylight is released during conditions favoring a radiational freeze and can raise air temperatures and limit damage.

▼ Plants located near the side of a building, especially south, may derive some benefit of any heat radiated from nearby surfaces and will probably receive some protection from cold NW winds during an advective freeze.

▼ Plants located under a tree will benefit with any heat released from the soil being trapped under the tree's canopy.

Preventative Measures

▼ Pulling back mulch around trees to allow the ground to absorb and store sun's radiant heat for release during a radiational freeze. In south Miami-Dade of limited value due to porosity of rocky soils which lowers their capacity to store heat.

▼ Soaking the ground in order to increase the heat storage capacity of the soil. To be of any use this must be done for several days prior to the expected freeze, first raking back any mulch to the drip line; watering only the day of the freeze is not effective especially if it is already cold or windy. In saturating soil with water the risk of root disease increases. Soaking offers little protection in south Miami-Dade due to a thin layer of soil and porosity of underlying limestone.

▼ Plant covers – can be useful, especially on recently planted small trees and shrubs. Do not use clear plastic which traps moisture and allows heat to escape; fabric (e.g., a heavy bed sheet or burlap) or more effective are synthetic, woven or spun bonded, frost blankets. The latter can increase the plants ambient temperature by 2-4°F. It is essential that the whole of the plant is covered and the covering is secured to the ground with weights and covering only used the day the freeze is expected. Protection from an advective freeze may well be limited.

▼ Sprinklers can be used to protect small trees and shrubs from a freeze by forming a coating of ice. They must be turned on as the temperature approaches the freezing point and remain on until all of the ice has thawed. Again, extensive wetting of soil risks root damage and possible disease.

▼ Enriching soil with organic matter increases heat storage capacity; however too much can make the soil heavy increasing the risk of it becoming compacted and/or waterlogged in the future.

▼Avoid turning/cultivating soil if a freeze is expected – this increases heat loss.

After a freeze inspect trees and shrubs for signs of damage, but do not remove affected stems as this could stimulate new growth susceptible to injury from any subsequent cold weather event. Wait until there is a reduced risk of a freeze (by the end of February in Miami-Dade). If foliage turns completely brown and remains on a tree or shrub this indicates more serious damage (e.g. dead limbs) compared to leaf drop or yellowing. Where substantial leaf loss has occurred, a light application of fertilizer is in order once there are signs of regrowth. Damage to palms (trunk/ bud) may not be immediately apparent and symptoms may not appear for several months (e.g. bud rot). For plants such as some gingers and heliconias, orchids, hoyas, mussaendas, portlandias, and many foliage plants including some palms, expect damage as temperatures fall below 50°F, particularly if they are in an open, windy situation.

COOL SEASON IS ALSO TIME TO ADJUST IRRIGATION SCHEDULES.

Scant rainfall means more reliance on supplemental water whether you use a hose with a hand held spray nozzle for a small plot of grass, a single lawn sprinkler or an automated system with several zones. But be careful not to over water – this is both dry season and cool season; with lower temperatures plants need less water and that includes turf. It's important not to reduce the amount of water applied per application, but the frequency of irrigation. During winter, depending on soil conditions (water holding capacity) it is possible that in a period of very cool weather no supplemental water would be needed for up to 10 days in Miami-Dade. If much warmer than normal it might be necessary to irrigate every 3 days though, be aware that we are under 2 day a week watering restrictions. Let the grass blades tell you when it is time to water – once they roll up about the

mid vein it's time to water. A smart irrigation controller or soil moisture sensor is the most reliable and efficient way to ensure that grass is watered only as necessary.

Relying solely on basic timers to operate sprinklers can lead to excessive moisture which promotes disease, especially if set to function during the evening. Brown patch, a cool season disease of turf rots the base of the grass blades (shown at right), and is more likely where grass blades remain wet (e.g., irrigating late in the day). The best time to irrigate turf grass is between 4:00 – 6:00 a.m. A cool, wet winter will increase the probability of brown patch, a disease that can be especially troubling on zoysia grass.

The University of Florida and University of Georgia researchers have developed a Smartirrigation Turf app for iOs and Android devices. The schedule generated takes into account such variables as soil types, location within the state, and weather conditions, and can be used to program multiple sites or irrigation zones within a site. If you are interested in learning more about the Smartirrigation Turf app and how it works take a look at the Smart irrigation for everyone! video produced by the Urban Conservation Unit or contact Jesus Lomeli.

A COOL WET WINTER COULD INCREASE THE RISK OF PLANT DISEASES FOR LOCAL VEGETABLE GARDENS

If the current long range climate predictions for Florida are accurate, winter into early spring will be cooler and wetter than normal. For backyard vegetable gardens this could mean an increased risk of diseases that thrive under such conditions, and these are described below for each crop. Know when to expect certain diseases based on forecasted weather conditions (temperature/rainfall) and where possible apply an appropriate fungicide to provide some degree of protection. Any treatment must commence as soon as symptoms are seen – most fungicides act as protectants and have limited curative effect. Look for spray products containing chlorothalonil, dithane or copper compounds; latter approved for organic use as are sulfur and horticultural oils. If you aren't sure contact the Miami-Dade Extension Office.

Use weather forecasts to plan when to irrigate your garden; both cooler than normal temperatures and more frequent rainfall would mean less need for supplemental water. More frequent or heavier rainfall means soil with too much organic matter (e.g., bagged black top soil) could become too wet increasing the likelihood of root and basal stem rots. Incorporate some type of aggregate such as coarse sand or vermiculite to improve drainage. When irrigating a vegetable garden keep water off the foliage.

Where available choose disease resistant varieties of vegetables; if you're using heirloom vegetables be aware that there will be an increased risk of disease.

TOMATO – **Bacterial speck**, caused by *Pseudomonas syringae* pv. *tomato* and favored by cool (63 - 75°F), wet, windy weather – requires 12 hours of leaf wetness to become established. Leaf spots are small (1/8 in) and dark brown, fruits spots are 1/16 in. in size or less, sunken, with a dark green halo, stems can develop elongated dark brown to black lesions. Difficult to control – if treated early, sprays containing fixed copper plus dithane will give some control. **Bacterial spot** is also facilitated by wet conditions but is of more concern during relatively hot weather (80 - 89°F). See also section on peppers below.

Late blight is caused by an oomycete (water mold) *Phytophthora infestans*. This is a soil inhabiting organism that is spread by rain/ wind-blown spores. Optimum conditions for disease are cool temperatures, 50 - 70°F, and relative humidity >80%, that permit plant surfaces to remain wet, and is frequently associated in Florida with the passage of a rain bearing cold front. The disease can affect leaves (see opposite) with grey to brown blotches; under humid conditions white to greyish powdery sporangia (spore bearing structures) appear on the underside of the leaf. Both stems and fruit can become infected,

Early blight *Alternaria solani* is occasionally seen mid to late winter, but as well as wet conditions it requires warmer temperatures (>75°F). Mature leafspots develop a characteristic 'bullseye' pattern of concentric rings.

Verticillium wilt is caused by a soil fungus that affect a wide variety of plants including potatoes, tomatoes, peppers and eggplant; there are two principal species and different strains each with its own range of host plants. Disease is most likely on neutral to alkaline soils (latter common in Miami-Dade) and during cool to moderate temperatures (68 - 75°F), and becomes more likely where plants are stressed. Once an infected plant sets fruit symptoms become more evident. At first the leaf margins (especially at the tip) of lower leaves and a few, terminal, upper leaves develop chlorotic (yellow) wedge shaped areas that turn

brown. Wilting occurs during the day with plants recovering overnight, but overall symptoms become progressively worse. The tomato plant may not die but the size and number of tomatoes will be seriously reduced.

Fusarium wilt is a more aggressive disease causing more rapid wilting of the infected plant (initially on one side) which eventually dies. It is not as common locally, preferring slightly acid, sandy soil, rather than Miami-Dade's calcareous, high pH soils, and is favored by warmer temperatures (>80°F).

Fusarium root and crown rot in contrast to Fusarium wilt (which is caused by a different sub-species of Fusarium) is primarily a disease of the root system with only the stem immediately above the soil line involved. It is a disease of cool weather (50 - 68°F), with symptoms promoted by excessively acid, wet, heavy soil. Again local soil pH limits disease incidence though in raised beds or containers it could potentially occur if infected transplants are used.

Powdery mildew – a common pest of tomatoes in vegetable gardens; (shown left; see description in squash)

PEPPERS – Bacterial spot is the most frequently encountered disease in Florida bell peppers and occurs mainly during periods of windy rainy weather when overnight temperatures are >65°F, though it can occur at lower temperatures. Symptoms at first consist of water-soaked spots which become tan to reddish brown to almost black (shown at left) and may merge to produce larger blighted areas. Often the leaf becomes distorted and the margins maybe scorched. While leaves may yellow, there's an absence of yellowing around individual spots. The disease can also affect stems causing dark brown streaks and on fruits where dark brown scabby areas develop especially around the stem end.

Phytophthora blight – is caused by a water mold *Phyytophthora capsici* and is first noticed as an overall wilting of the pepper plant which results from rotting of infected stems. Disease is most likely on poorly draining, wet, compacted soil and requires temperatures >46°F. The infection at first produces water-soaked spots which turn dark brown and wilting occurs in sections of stem distal to the point of infection. The water mold that causes late blight (see tomato above) can also occur in bell peppers.

White mold – *Sclerotina* spp. cause disease in a wide range of vegetable crops, and is most likely where soils are overly moist, plant surfaces are wet and at temperatures from 60-70°F (see also the section on beans).

SQUASH AND OTHER CURCUBITS - Downy mildew is especially important on squash and cucumbers and is due to a water mold, not a true fungus (in this respect it differs from powdery mildew). On squash and cucumber leaves, symptoms first appear as pale green or yellowish angular areas on the upper surface which eventually become necrotic (brown). On the leaf underside, grayish to purplish spore masses form as a downy growth corresponding to lesions on the upper surface; this is a more conspicuous feature when the plant is wet. Severely infected leaves become brown and die. On cucumber necrotic areas can resemble those of either anthracnose or target spot. Once downy mildew appears it is difficult to control; any treatment has to be preventative, beginning when conditions are conducive to the disease becoming established. Severity is greatest during mild, wet conditions, optimally with nighttime temperatures of 55 to 75°F and relative humidity greater than 90 percent.

Powdery mildew- is a perennial disease of locally grown cucurbits but compared to downy mildew it is seen when there is an absence of rain and temperatures are warmer (75-85°F). A film of moisture (e.g., from heavy dew or overnight fog) promotes disease establishment as does shade. Scattered areas of the leaf surface may exhibit slight discoloration but usually the first signs of infection are white spots of powdery fungal growth on the upper leaf surface (occasionally they may also be found on the leaf underside). These symptoms are far more conspicuous than the greyish-white powdery growth seen with downy mildew, which is only present on the leaf underside. As the number and size of the spots expands some yellowing may occur, and if the infection is severe leaves will turn brown and shrivel. Elemental sulfur can be used to provide some control. Avoiding shade, especially early morning, and providing sufficient separation between plants to permit air to freely circulate will help limit disease from spreading.

BEANS – White mold (sclerotia rot) can be a significant problem for locally cultivated snap beans. Symptoms first appear as water soaked areas on leaves, stems or pods which rapidly turn brown and rot. Eventually a white, cottony, fungal growth appears on the surface of areas that have rotted within which develop hard, round, black, seed like sclerotia (fungal mass that that permits survival during conditions unfavorable to growth)– see photo at right. Sclerotia present in soil can infect plant roots or germinate to produce a spore producing structure (apothecia); spores are then transported on air currents to plant surfaces where in the presence of high humidity germination and infection can occur.

In snap beans infection often starts with spores that land on senescing flowers, and then spreads to stems and pods. Optimum conditions for disease are cool temperatures (60-70^{0}F) and high humidity; locally the period from late December through January is when the risk of disease is highest. For control avoid crowding of plants, use fresh soil (essential if disease was previously a problem), seed free of sclerotia, and avoid wetting plant surfaces when irrigating. In a small garden, removal of senescing flower petals can help reduce the risk of infection as can prompt removal of infected plants and their parts. Fungicides are available but are intended for use by commercial growers.

Bean rust – is not as important for commercial growers, where fungicides used for other diseases also suppresses rust. Initial symptoms are small, white to yellowish, raised, spots which form a pustule that erupts to release reddish brown spores (shown at right). Locally, principal period for disease is January through April, at temperatures between 63-73^{0}F and requires leaf wetness for 6-8 h. Avoiding high fertilizer nitrogen and applying potassium can reduce disease incidence. Foliar application of fungicides containing elemental sulfur can help prevent disease from spreading.

Common bacterial blight is more likely locally during winters that are unusually wet (when it can be spread through wind driven rain) and is first seen as small water soaked areas on the leaf underside. Symptoms (shown at left) become more conspicuous as dry, brown spots with distinct, rather narrow, yellow halos; these can merge into larger blighted areas with an associated increased yellowing of the leaf blade. Use of uninfected seed is the most important preventative measure. Other control measures include avoiding tending to plants when they are wet (and disease can be readily spread) and use of a copper based fungicide to help limit infection as soon as symptoms are seen. Rogue out any leguminous weeds (these could act as reservoirs for the bacterium responsible for bacterial blight).

Powdery mildew is most commonly seen on beans during early spring during warm, rainless days with heavy overnight fog or dew. Both foliage and pods are affected but on latter, powdery symptoms are rarely present - see squash for general description.

***Pythium* spp.** are water molds found in soil that cause both seed and root/stem rots (damping-off of seeds both pre and post emergence). Most severe symptoms are associated with excessive moisture, deep planting and recent incorporation of incompletely composted plant material into the soil. For these reasons it is most often linked with early fall planting, though any time

conditions favor wet soil (including winter) *Pythium* disease becomes a potential problem. In young plants, *Pythium* produces a root rot with wilting and death or stunted growth; rotting may begin at the soil line spreading downward throughout the root system, and may spread up into the base of the stem causing colorless to dark brown soft rot.

COLE CROPS (Leafy Brassicas) – Black Rot, caused by a bacterium (*Xanthomonas campestris* pv. *campestris*) is the most damaging disease of cabbage in Florida and while it can occur at any time of the year (temperatures between 40°F to 97°F) optimum conditions require excessive moisture and temperatures between 68°F and 82F°. In addition to cabbage, black rot attacks other cole crops, including broccoli, cauliflower, kale, kohlrabi, Brussels sprouts, rutabaga, turnip, collards, radish, mustard, and water cress. Initial symptoms consist of small, water soaked spots which turn brown with a yellow halo. On some crops characteristic yellow, wedge-shaped areas may be produced at the leaf margin (as shown for cabbage in the photo at right). These turn brown and the veins within appear black. As the bacteria move down the leaf veins and into the plant's vascular system, the disease becomes systemic and spreads to other leaves which wilt and die. Prevention is the only option and steps such as using a raised bed and a free draining soil among others can help. Most importantly exposing brassica seed to a hot water treatment can eliminate any seed borne infection.

White rust is not a 'true' rust fungus but more closely related to downy mildew (which can also affect brassicas) and is found on leafy brassicas such as arugula, bok choy, broccoli, collards, mustard and turnip greens. A different species of the pathogen is a serious pest of spinach (infected leaves of latter shown at right). Initial signs of infection are small white to cream colored blisters seen on leaves and stems which (these could be mistaken for whitefly or mealybugs). The blisters enlarge eventually erupting through the lower epidermis of the leaf, releasing powdery spores (technically sporangia) which are dispersed by wind and rain to infect other plants. There is also a resting stage that can survive in soil. Optimum conditions for white rust are high humidity and temperatures from 60°F to 77°F. There

are fungicides available that can help control white rust, including copper based products, but the disease is rarely severe enough to warrant their use. Measures such as avoiding wetting leaves when irrigating and removing any cruciferous weeds will reduce the risk of infection, plus replacing soil (i.e. in a raised bed) if a previous crop exhibited symptoms of white rust.

I'd like to tell all about … … …

This is an opportunity for staff of the Miami-Dade Extension Office to provide a personal view of a plant they love (or hate!), from ornamentals to fruits and vegetables, South Florida natives to exotics.

On this occasion Office Support Specialist *Lize Luna* directs our attention to a stunning flowering rose mallow.

I adore flowering plants and would like to take this opportunity to draw your attention to a plant acquired from my mother, who in turn obtained the seeds from an uncle. Once it began to flower I absolutely loved the profusion of large, magenta flowers with their deep purple almost black throat. The leaves are also distinctive and I was concerned in case someone thought I was growing an illegal plant! I wasn't sure of the name (thought it was a hibiscus) and found out from a co-worker it was a rose mallow, ***Hibiscus radiatus***.

Commonly known as **October rose** or **monarch rose mallow**, the plant is native to India and Myanmar. In South Florida growth is rapid producing a short lived, sprawling to procumbent, herbaceous perennial which develops into a large untidy mound of stems. For this reason October rose usually needs to be tied to a support as shown in the photo below, though you can encourage more shrubby growth with frequent tip pruning during spring and summer.

Individual flowers only last for a day, but they are produced continuously fall into early winter. Leaves are variable being palmatisect with 3-7 lance-shaped lobes; the petioles are stiffly hairy with occasional prickles. Plants can be grown from seed (soak in water for several hours before planting) or cuttings; seeds sown late February/early March will produce fully grown, blooming plants by October/November. If attempting to save seeds be sure to wear gloves as the fruit (a capsule) is covered with small prickles.

October rose can be grown in full sun to light shade and adapts to most soil types but prefers a free draining,

organically enriched, sandy soil. Once established it is moderately tolerant of drought (water once per week in hot dry weather). October rose is an obligate short day plant (it flowers in response to shortening days of late summer and fall), so pruning should cease no later than the end of August.

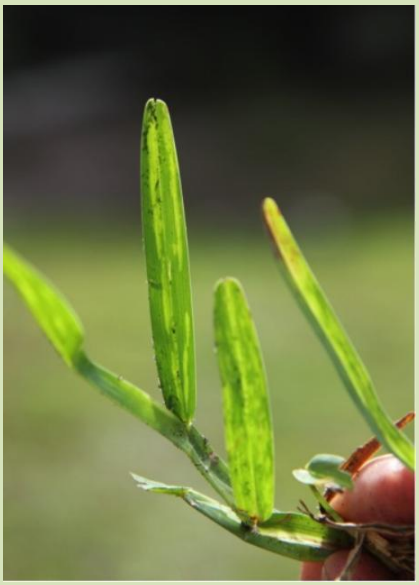
An unusual feature of October rose is it's genome; whereas most plants carry 2 sets of chromosomes (diploid) a few have evolved with multiple sets (e.g., tetraploids have 4 sets), with the chromosome in each set more or less identical. *Hibiscus radiatus* is unusual in that it is an allotetraploid, evolving as a natural hybrid with 4 sets of chromosomes, 2 sets coming from each species involved in the original cross, in this instance *H. cannabinus* (Indian hemp) and *H. suratensis* (comfortroot). October rose shares some traits with *H. cannabinus* (e.g.herbaceous perennial) and others with *H. surattensis* (e.g., procumbent to sprawling growth). However flower color is quite different as both parent species have pale yellow petal lobes (with a dark red throat) not the magenta flowers of *H. radiatus*.

One potential caveat – some question as to potential degree of invasiveness. Indian hemp can be invasive (has escaped in some parts of Florida) so probably wise not to grow October rose near native plant communities.

Pest Updates

Timely information regarding pests affecting Miami-Dade Gardens and landscapes

The sugar cane mosaic virus can affect a variety of different species of grass apart from sugar cane, including St Augustine. Symptoms on St. Augustine grass were regarded as mild (grass blades with yellow streaks often barely noticeable). However outbreaks during 2013 in Pinellas and Palm Beach Counties saw far more severe symptoms with grass turning brown and dying. To date severe symptoms appear to develop early fall and into the following spring at which time some recovery may be noticeable, though in other instances entire lawns have been destroyed.



Initial symptoms of mosaic virus

Severe symptoms of mosaic virus

A comparison of turf grasses indicates that the 'Floratam' cultivar of St. Augustine grass to be more susceptible to the virus than 'Bitter Blue or 'Palmetto. Disease due to sugar cane mosaic has not been reported in Miami-Dade but local homeowners and landscape maintenance professionals need to be on guard, particularly as the virus can be spread on landscape maintenance tools and equipment.

Predictions of a cooler and wetter than normal winter mean that downy mildew could be a problem not only for vegetable crops but also ornamentals used in local landscapes, in particular impatiens. Control of downy mildew on impatiens is difficult and preventative applications of fungicides are required as once disease symptoms are noticed the disease rapidly spreads.

A potential solution may be at hand with the Bounce© and Big Bounce© series of inter-specific impatiens hybrids which are being promoted as highly resistant to downy mildew. Resistance is due to the fact that the 'Bounce' series contain no genetic material from *Impatiens walleriana*, which is highly susceptible to downy mildew and the species traditionally grown as 'impatiens'. Although other cultivars such as the 'SunPatiens' series have been suggested as substitutes they have an upright growth habit that resembles New Guinea impatiens. The 'Bounce' series produce fuller, spreading plants like *I. walleriana* ideal for use in mass flower beds. It remains to be seen how they will perform under South Florida conditions but national release for retail sales is during spring of 2015.

Fusarium wilt of queen palms is a fatal disease that is of concern since in part it could be prevented through persons engaged in landscape maintenance sanitizing pruning equipment between jobs and between plants. Short lived air-borne spores also spread disease; soil borne spores survive for many years making it inadvisable to re-plant with another queen palm. Initially fronds become pale green followed by yellowing then finally turn brown. Although termed a wilt, fronds do not droop but remain upright (see photo at left). Disease symptoms are also seen on Washingtonias, but are not known to occur on other locally grown palms. The Fusarium wilt of Canary Island date palms is due to a different sub-species.

The weedy vine *Coccinea grandis* (ivy gourd) is, like the more familiar bitter melon (*Momordica charantia*), another member of the Convolvulaceae that can become a weedy nuisance, especially on a chain-link fence. Both produce colorful fruits (see photo at right) and have stimulated interest as they contain compounds that lower blood sugar and have therefore been promoted by some as having a role in controlling

diabetes. Best advice is to consult a physician before indulging in self-medication, especially if you are already taking a prescribed medication. Remember cool season is a good time to rogue-out invasive plants, especially nuisance vines.

Mulberry trees (*Morus rubra*) are a popular item in local landscapes but the fact that they are native does not mean they are free of pests. One serious pests encountered locally is white peach scale which if left uncontrolled can eventually kill an infested tree particularly on sandy soils. As shown at right the scale is found on the bark of the trunk and branches. It is an armored scale so there is no black sooty mold associated with an infestation as found for instance with soft scales and mealybugs.

There are several beneficial insects that can provide some control of white peach scale including ladybird beetles, but a heavy infestation will need the use of pesticides (call the Miami-Dade Extension Office).

In addition to white peach scale mulberry trees are highly susceptible to root knot nematodes as seen in the photo below which shows galled and swollen roots. The risk is much higher on sandy soils, e.g., NE corner of Miami-Dade, and lower on the rocky limestone soils of the Miami rock ridge. Incorporating additional organic matter into the soil and use of mulch may help reduce root damage. Before planting a tree, suspect soils can be assayed for pathogenic soil nematodes by sending samples to the UF Nematology Laboratory.

The gumbo-limbo at right is exhibiting symptoms of wood decay due to the fungus *Kretzschamaria duesta*. This causes a basal trunk canker and root rot and produces a fungal stromata (a sheet of fungal tissue and spore-bearing structures) which is at first greyish white to pale brown, turning black and brittle. There is no cure and since the fungus rots the inside of the trunk, the tree is at increased risk of suddenly falling; for this reason early removal is advisable. Planting trees at the correct depth, away from sprinkler heads, avoiding damage from line trimmers and mowers and limiting stress can help prevent the disease from becoming established. Kretschamaria seems to be of more frequent occurrence on gumbo-limbo.

When considering what to use as hedge material orange jasmine **(*Murraya paniculata*)** continues to be in demand**.** Once widely used in local hedges, it is now impossible to find due to stringent restrictions on growing orange jasmine since it is a host for the insect vector (a psyllid) of the bacterium that causes citrus greening disease (which is devastating Florida's citrus industry). It has also been implicated as an important reservoir host for the citrus greening bacterium, though published surveys of urban plantings of orange jasmine in Central Florida have cast doubt on this. However even if orange jasmine's importance as a reservoir host for the bacterium is discounted, it remains an important host for the Asian citrus psyllid, essential for the spread of citrus greening For this reason it is unlikely that restrictions on growing orange jasmine will be changed; there are however plenty of alternative shrubs that can be used for hedges in Miami-Dade.

Lantana is subject to two dipteran (true flies) leaf miners In a previous edition of this newsletter (Winter 2013) damage from one of these leaf-miners *Ophoimyia camarae* was described and is illustrated in the photo at right (inset). Note the herring bone pattern as the mines follow lateral leaf veins. The other species *Calycomyza lantanae* (shown at right) causes a blotch mine and has been recorded as causing extensive damage. Both species of leaf miner are

native to Florida and have a preference for *Lantana camara* which, with sterile non-invasive cultivars now available, is becoming more common in local landscapes.

While the dry warm days and foggy nights of late winter/early spring are when powdery mildew is more widespread, favorable conditions can also occur during late October into early December with the end of rainy season. This is shown at right on a leaf from a Texas olive tree (*Cordia boissiera).* The fact that this particular tree was subject to considerable shade undoubtedly contributed to most of the foliage being infected with powdery mildew. Texas olive should always be situated in full sun.

Plant of the Month

An end of year plant pot-pourri

A Colorful, and Sometimes Fragrant Assortment

There is no particular theme on this occasion, just an opportunity to review some of the various landscape plants encountered during the past year; some new, others worth a second look, but the emphasis on color, and in some instances fragrance.

The spring issue of this newsletter featured members of the Acanthacesae, a family notable for the range of attractive landscape plants that are 'made for the shade'. From this same plant family can be added three more members. Firstly, ***Justicia brasiliana***, a small (to 3') shrub from the moist forests of E. Brazil. Known as **lady in pink**, flowers are borne at each node (in leaf axils) with blooming occurring for most of the year. Leaves are smooth with slightly crenate margins and prominent lateral veins. The rather lax stems produce a sprawling growth habit that makes lady in pink an ideal shrub/groundcover beneath a tree. Limit sun exposure to early morning, thereafter semi-shade; soil should be enriched with some organic matter, moist but free-draining. Cut back plants that

Justicia brasiliana **(syn. Dianthera nodosa 'Brazil')**

become too leggy and provide a complete fertilizer spring and early fall.

The second member of the Acanthaceae, ***Whitfieldia elongata*** **(white candles)** is from W. Africa. Usually seen as a small (3-4') evergreen shrub it can grow up to 6'. The leaves are ovate, dark green, smooth and leathery with downwardly curled margins and prominent veins. The flowers are pure white, tubular with prominent, lanceolate lobes, and arranged in attractive, nodding, terminal racemes. Situate out of direct sun but in an area receiving bright light, and provide a loose, free draining, organically enriched soil.

Whitfieldia elongata

The final of these three shrubs, commonly known as **Eldorado**, (***Pseuderanthemum carruthersii*** **var.** ***carruthersii)***, is found in moist forests of Pacific Islands (Polynesia and Melanesia). In its native habitat it grows as an open, untidy shrub to about 6', but with frequent tip pruning cultivated specimens are more compact and usually do not exceed 3'. Leaves are ovate with depressed lateral veins; some are yellow with a reticulate pattern of fine green veins. Individual flowers are salve-shaped with white petals and purplish red speckles around the throat, arranged in racemose spikes. Plants should be situated in bright light with at most early morning direct sun; soil should be enriched and moist. With some salt tolerance, this is a suitable choice for coastal sites protected from on shore wind.

Pseuderanthemum carruthersii var. *carruthersii*

Another white flowering shrub made for the shade, though not in the Acanthaceae, is **Alibertia 'Belize'**. *Alibertia* is a genus in the Rubiaceae (Gardenia family) of small trees /shrubs found from southern Mexico through Central America and into South America to Brazil. They often occur in the transition zone between grassland and forest and so can accept some direct sun. *Alibertia* 'Belize' is of unknown provenance; it can grow to about 8' and should be situated in bright light to part full sun. Like gardenias it requires an organically enriched, acidic soil, and on local calcareous soils is prone to develop trace element deficiency symptoms (evident in photo). This can be corrected with the appropriate chelated nutritional sprays and soil drenches.

There is some confusion between *Alibertia* 'Belize' and the closely related *Augusta rivalis* a more diminutive plant growing to about 3' which also features 'needle' like flowers (a long thin corolla tube) with flaring lobes. One obvious distinguishing feature are the remnant, scaly, brown, stipules which are typically found near the stem apex of albertias (see photo inset).

***Augusta rivalis* (needle flower)** is found in Central America growing at the edge streams (*rivalis* means 'of a sream') and is an attractive landscape item in its own right (cultivation is similar to Alibertia 'Belize'). It forms a low growing (2-3') shrub with numerous thin branches bearing narrow, lanceolate leaves. With their thin 5' tubular corolla and spreading white lobes the flowers are the plant's most conspicuous feature, and as an added bonus they exude a mild night-time fragrance. A good choice planted along the edge of a shady decorative pool.

***Alibertia* 'Belize'**

Attention now focusses on another plant for the shade but one with mildly fragrant, very showy blue flowers, the **apostle plant *Neomarica caerulea***. Native to Brazil's Atlantic coast rain forest, it is a member of the iris family (Iridaceae) and found growing in fast draining, highly depleted, acid soils often overlain with plant debris. Unlike the more familiar garden irises (*Iris* spp.) which grow from bulbs and become dormant during winter, *Neomarica* spp. are evergreen, herbaceous, clump forming plants that grow from a slow spreading rhizome, with growth slowing in the winter. Each flower comprises 3 large pale blue sepals and 3 smaller dark blue petals, the bases of both striped yellow and brown. Flowers are short-lived but produced continuously during warmer months of the year. Use a crumbly,

Neomarica caerulea

organically enriched soil containing coarse sand. Water as required to maintain soil moisture, especially when plants are flowering, allowing soil to dry out slightly during winter. Little other care is necessary; an occasional application of a low nitrogen fertilizer in spring and late summer and on local limestone based soils iron deficiency may develop (pale leaves). Plantlets may form on spent flowers, but not a frequent event on this species – any that form can be removed and potted up in a free draining potting soil. Once established they can be transplanted in the landscape - a bed of apostle flowers makes a memorable display.

Lonchocarus violaceus

From a blue iris to a mauve colored flowering tree, *Lonchocarpus punctatus* (syn. *L. violaceus*) lancepod sometimes known as Florida lilac, is neither a Florida native (Trinidad & Venezuela) nor a lilac. Lancepod is a small tree, to 20 - 30', low branching with a spreading canopy composed of long arching branches with imparipinnate, compound leaves composed of 6-8 pairs of 2-3" leaflets. Blooming occurs even in young trees. Branches are covered in upright panicles of fragrant, mauve to lilac, pea like flowers. In Miami expect flowering late summer well into fall. The tree will survive limited periods of dry weather but prefers moist soils. Look for signs of nutritional deficiencies (iron and magnesium) when grown on Miami-Dade limestone.

Pink flowering peregrinas (*Jatropha integerrima*) such as 'Pink Princess' have so far failed to approach the popularity of the original red flowering species. 'Pink Princess' is not as vigorous as the species type, and slower to establish but it does eventually make a very attractive, low maintenance, shrub with delightful clusters of candy colored flowers. The plant can be grown as a small tree but is more usually seen as a 3-6' shrub. Provide a site with free draining soil, and for optimum flowering situate in full sun. Prune as necessary (flowers on new growth) and once established water only during hot dry weather.

Jatropha integerrima 'Pink Princess'

At this time of year…..

Some timely information for Miami-Dade landscapes

***Ruellia simplex*, known commonly as Mexican bluebell or Mexican petunia** continues to be a popular landscaping plant locally, easy to grow and with attractive blue flowers. It is on occasion troubled by pests, but its main drawback is the fact that it has become an exotic invasive, not only difficult to eradicate in landscapes but spreading in to native plant habitats. For that reason it is no longer recommended, a species native to Florida *Ruellia carolensis* is the preferable choice. However for those that prefer the more colorful Mexican bluebell, the University of Florida-IFAS have developed a sterile series of plants (the Mayan

Ruellia 'Mayan Purple'

series) available in white, purple, pink and blue flowering forms. These are now in commercial nursery production and should be available at area garden shops. The use of sterile versions of otherwise invasive exotic landscape plants is not new, Lantana being an earlier example. Colorful, drought tolerant and useful in butterfly gardens, non-native lanatanas are highly invasive and can cross with and contaminate the gene pool of native species (such as *Lantana depressa*).. Here too there are sterile cultivars derived from the exotic lantana (*Lantana camara*) that can be used in local landscapes – 'Gold Mound', 'New Gold', 'Alba' and 'Patriot' are all recommended.

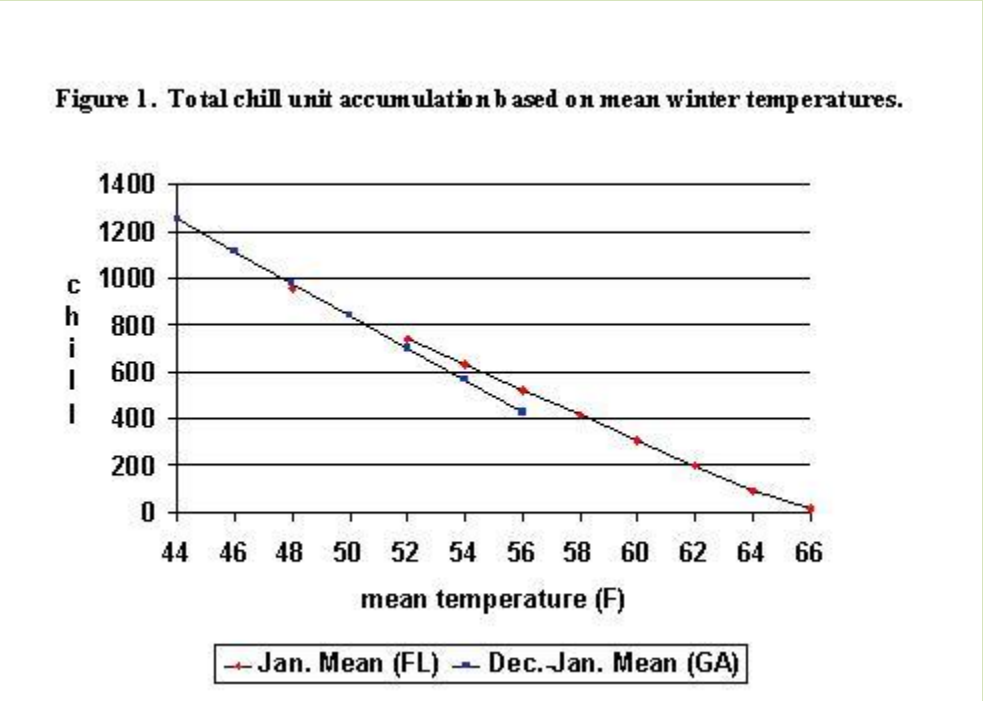
Plant edema can be mistaken for a disease but the cause is abiotic (a cause other than a transmissible pathogen), in this instance weather related events are the cause. At this time of year rainy weather followed by overcast skies and cool windless conditions can make plants more susceptible to edema**.** Under such conditions water loss due to transpiration is unable to equal that taken up by the root system. The excess water accumulates in enlarged cells of the leaf parenchyma causing the underside of the leaf to appear blistered. The blistered areas of the epidermis eventually rupture becoming brown and corky- this can be mistaken for insect/mite damage or due to a leaf spotting disease. Apart from leafy greens (such as the cabbage leaf shown above), other vegetables including tomatoes can be affected, plus ornamental plants from cacti and orchids to ixora and hibiscus. You can reduce the chances of edema developing by not over watering, and avoiding irrigating plants when it is overcast, and ensuring that they are not deficient in potassium..

Blossom end rot of is another abiotic disorder, in this instance it is related to a lack of sufficient calcium during development of fruits of several vegetables. Apart from forming the "cement" (as calcium pectate) that joins plant cells together, calcium plays an important role in plant cell division and as a cofactor for several enzymes. Plant parts undergoing rapid cell division (developing root tips, leaf/flower buds and fruit) are therefore especially susceptible to a calcium deficiency. There is abundant calcium in local native soils; it is however advisable to add a calcium source, such as dolomitic limestone, if you are making up a soil mix from scratch (e.g., for containers or a raised bed). Even where there is sufficient calcium in the soil, problems can arise due to external factors that can limit availability and result in a localized deficiency within the plant when there is a high demand for

calcium. This can occur locally especially in tomatoes, but also in other solanaceous crops (peppers, see photo above right, and eggplant) and occasionally in squash. A localized deficiency of calcium causes an early loss of integrity of the cell walls of the developing fruit, with a subsequent breakdown of the surrounding tissue which is then subject to secondary invasion by fungal pathogens.

Factors that can affect calcium availability include soil that is too dry or too wet which results in limited uptake (if too dry there will be insufficient soluble calcium, if too wet the root system will be starved of oxygen and cease to grow). Plant calcium levels are related directly to the rate of transpiration - the largely passive process by which water is taken up from the soil and lost to the atmosphere through the leaves. During periods of low humidity the rate of transpiration increases causing more of the calcium taken up to be transported to the foliage and less available for the developing fruit. Even though the above conditions may be of limited duration, if they coincide with a period of early fruit development, blossom end rot symptoms will eventually become visible. Since calcium exhibits such limited mobility within the plant, *applying foliar sprays containing calcium will not correct blossom end rot*.

If you long to grow temperate fruit in our local sub-tropical climate and are tempted to try one of the low chill varieties available you need to know the number of chilling hours that can expected in your location. One method is based on the number of hours between 32 - 45^{0}F, but an easier approach is to use the mean average temperature of the coldest month (January for Florida). From this the number of chilling hours can be estimated by using the graph shown above. For Miami this past season there were no chilling hours based on a January average temperature of 67.9 ^{0}F. Historically chilling hours for Miami-Dade usual range from 0 to 50 hours.



Original graph appears in "Chilling accumulation: Its importance and estimation"

Trace element deficiencies (such as iron) are common on our local, high pH, calcareous soils and result in new growth appearing pale to chlorotic. This is the case with the Japanese blueberry tree (*Eleaeocarpus decipiens*) shown in the photo at left. To correct such deficiencies foliar applications of chelated nutritional sprays containing trace elements can be used, in particular for zinc and manganese, For iron soil drenches are more effective and where soil has a pH above 7.2 (most of metro Miami-Dade), use iron chelated as Fe-EDDHA*. During cool season results will be at best limited as most trees and shrubs are not in active growth and lower soil temperatures will limit uptake. Better to wait and correct trace element deficiencies during the period from late March into September when tropical and sub-tropical trees and shrubs are actively growing.

*sodium ferric ethylene di(o-hydroxyphenyl-acetate)

If you're wondering how else Miami-Dade Extension helps county residents call or use the internet links to our office shown below – there's assistance with food preparation, nutrition, health and managing family finances, plus an active 4H youth development program. Boaters, anglers and those who care for our marine environment will find information and activities within the local Sea Grant program. Send any general comments concerning Miami Green Bytes to the editor and for a specific article contact the author using the e-mail links provided below.

Look for the spring issue of Miami Green Bytes during March 2015

The Miami-Dade County Extension Office, a division of Miami-Dade County Department of Regulatory and Economic Resources, is located at 18710 SW 288 Street, Homestead, FL 33030, and can be contacted at 305 248-3311 or by e-mail: dade@ifas.ufl.edu . Web site: http://miami-dade.ifas.ufl.edu/

Contact persons for the articles in this issue are : Laura Vasquez (Adjusting irrigation schedules) and John McLaughlin Ph.D. (remainder) with thanks to Lize Luna (contributed to 'Let me tell all about---').

Photo Credits: Brown patch turf (**Doug Caldwell UF-Collier County Extension**); Tomato bacterial speck (**Plant Management Network**); Late blight - tomato stem (**Wikimedia**); Late blight tomato – fruit (**Plant Doctor**); Verticillium wilt tomato (**Ohio State University Extension**); Bacterial leaf spot pepper **(Paul Bachi University of Kentucky**); Blossom end rot pepper (**Bob Hochmuth IFAS-UF**); Downy mildew cucumber (**Wikimedia)**; Bean rust (**Wikimedia**); Bacterial blight snap beans (**IFAS-UF**); White mold beans (**R. Mulroney University of Delaware**); Black rot crucifers (**Gerald Holmes Cal. Poly State U**.); white rust spinach (**Wikia)**; *Hibiscus radiatus* (**Lize Luna UF-Miami-Dade Extension**); sugar cane mosaic virus (**IFAS-UF**); *Impatiens* 'Big Bounce' (**IFAS-UF**); Fusarium wilt queen palm (**Adrian Hunsberger UF Miami-Dade Extension Ofice**); White peach scale (**Bugwood.org**); Mullberry, galled roots (**Cindy Dwyer**); Texas olive - powdery mildew, Japanese blueberry treee & *Jatropha integerrima* 'Pink Princess; (**Helen McLaughlin**); *Justicia brasiliana*, *Whitfieldia elongata*, *Neomarcia caerulea* & *Lonchocarpus punctatus* (**Teresa Olczyk**); *Ruellia* 'Mayan Purple' (**IFAS-UF**) **John McLaughlin** (remainder).

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