

## IN THIS ISSUE

- **Soil pH... Page 1**
- **Pollinator Palaces... Page 3**
- **View From The Plant Clinic... Page 4**
- **Family Photo Album... Page 5**
- **Polinator Extravaganza... Page 6**
- **Demo Garden Update... Page 7**
- **No Bake Energy Bar... Page 8**
- **What Does It All Mean... Page 8**
- **Master Gardener Tips... Page 9**
- **Can You Name This... Page 10**
- **Public Events Calendar... Page 11**



# Backyard Gardener

VOLUSIA COUNTY EXTENSION

JULY 2014

## Soil pH and its Effect on Nutrient Availability, Soil Microbial Activity and Plant Health

Joe Sowards

UF/IFAS Extension, Volusia County  
Urban Horticulture Agent and Master  
Gardener Coordinator

*Note: this article is adapted from UF/IFAS  
EDIS publication HS1207.*

There are 18 elements necessary for plant growth. They are; Hydrogen (H), oxygen (O), carbon (C), nitrogen (N), phosphorus (P), potassium (K), calcium (Ca), magnesium (Mg), iron (Fe), manganese (Mn), sulfur (S), boron (B), copper (Cu), zinc (Zn), molybdenum (Mo), chlorine (Cl), nickel (Ni) and silicon (Si). The availability of these nutrients to plants is governed by soil chemistry, specifically, pH.

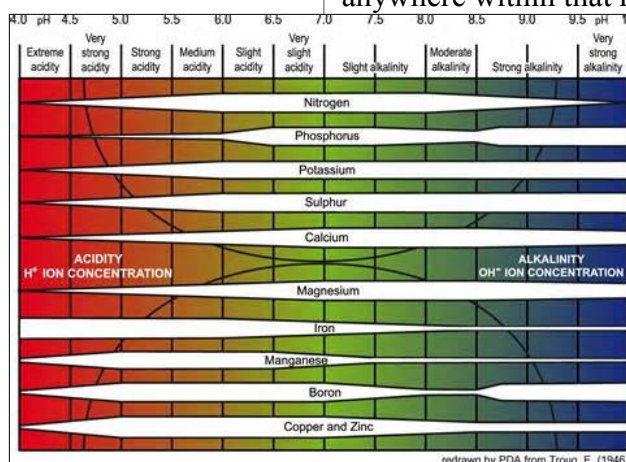
Soil pH is a measure of soil acidity or alkalinity. The pH range (remember high school chemistry) is from 0 to 14. P pH of 7.0 is defined as neutral. Below 7.0 is

considered acidic, and above 7.0 is considered basic. Soil pH governs many soil chemical and biological processes including bioavailability of nutrients, and microbial activity. In turn, microbial activity also affects bioavailability of nutrients as well. So, by maintaining a soil pH in which most plants can thrive, soil microbes can also thrive.

A pH range from 5.5-7.0 is suitable for most vegetable crops and landscape plants. There are a few exceptions but, the vast majority of plants will grow well anywhere within that range. A pH above

7.0 will render necessary elements such as iron, manganese, copper and zinc less soluble and plants may exhibit deficiency symptoms for these elements. However, the availability of calcium and magnesium increases

as pH increases. At pH below 5.0 metal toxicity can occur particularly with aluminum (which is not one of the 18 elements necessary for plant growth) but also with iron, manganese, copper and zinc. So maintaining a pH between 5.5 and 7.0



*Continued on Page 2*

The Institute of Food and Agricultural Sciences (IFAS) is an Equal Opportunity Institution authorized to provide research, educational information, and other services only to individuals and institutions that function with non-discrimination with respect to race, creed, color, religion, age, disability, sex, sexual orientation, marital status, national origin, political opinions, or affiliations. U.S. Department of Agriculture, Cooperative Extension Service, University of Florida, IFAS, Florida A&M University Cooperative Extension Program, and Boards of County Commissioners Cooperating. The Institute of Food and Agricultural Sciences (IFAS) is an Equal Opportunity Institution authorized to provide research, educational information, and other services only to individuals and institutions that function with non-discrimination with respect to race, creed, color, religion, age, disability, sex, sexual orientation, marital status, national origin, political opinions, or affiliations. U.S. Department of Agriculture, Cooperative Extension Service, University of Florida, IFAS, Florida A&M University Cooperative Extension Program, and Boards of County Commissioners Cooperating.

From Page 1...

will ensure that necessary plant nutrients are bioavailable for the vast majority of landscape plants and vegetables.

### Effects on plant pathogens

Some soilborne diseases are closely with soil pH. One example is clubroot disease of cruciferous plants (cabbage, mustard, brussel sprouts etc.). When soil pH is below 5.7 this can be a serious problem for those crops. But if the pH of the garden is between 5.7 and 6.5, the incidence of this disease is dramatically reduced.

### Effects on microbial activity

Soil microbes are a vital part of nutrient availability to plants and soil pH has profound effects upon them as well. Most soil microbes, coincidentally, thrive in a pH range between 6.0 and 7.0, similar to plants. Because soil microbes can increase nutrient bioavailability and promote plant nutrient uptake, vegetable crops and landscape plants can also thrive in this pH range as well. Soil microbes also thrive in soils with adequate organic matter so, maintaining a 2-3 inch layer of mulch and/or adding composted organic matter of some kind is beneficial as well. This is especially true with newer homes where the soil is mostly if not entirely devoid of organic matter.

### Modifying soil pH or choosing plants that will thrive in soil

It is sometimes necessary to adjust soil pH. Most commonly, this means raising the soil pH by adding some form of agricultural lime if soil pH is too low.

In soils that are too acidic, the bioavailability of Ca, Mg and Mo is low and may adversely affect plant growth. Also, some metals such as aluminum may become toxic to plants.



The amount of agricultural lime required to increase soil pH is determined by several factors including; the size of the limestone particle being applied, the buffering capacity of the soil and how much the pH needs to be raised. Buffering capacity refers to the soil's ability to minimize change. The smaller the lime particle, the quicker the neutralization reaction. Soils in this part of Florida are

generally very sandy and have little buffering capacity. Buffering capacity can be increased by adding organic matter. We can do a very basic pH test at the UF/IFAS Extension Office in Volusia County but to get an accurate determination of how much lime is necessary it is best to send a soil sample to the Extension Soil Testing Lab at UF (<http://soilslab.ifas.ufl.edu/>).

There are different kinds of lime available and each has its own characteristic with which you should be familiar. Agricultural lime is calcium carbonate ( $\text{CaCO}_3$ ). This form of lime reacts very quickly in the soil and, if over-applied, can injure or kill plants. When applied carefully, it provides rapid results. Hydrated lime, also known as calcium hydroxide, ( $\text{Ca}(\text{OH})_2$ ) has the fastest most dramatic response in the soil. It should be handled carefully around plants and is probably best applied a few weeks before planting the landscape or vegetable garden. Dolomitic lime ( $\text{CaMg}(\text{CO}_3)_2$ ) is the most generally recommended form of lime. In addition to adding calcium, it also adds magnesium which is often deficient in Florida soils, especially as you move farther south. It reacts fairly slowly in the soil and is less likely than the other forms of lime to damage plants.

It is easier to raise soil pH than it is to lower soil pH. If the soil pH is too high due to the over-application



of lime or due to the presence of construction debris then it can be corrected by the application of sulfur, iron sulfate or aluminum sulfate.

As with lime, there are different levels of safety and reactivity. Sulfur is the safest product to apply followed by iron sulfate. Aluminum sulfate is the most reactive but, if over-applied can damage or kill some plants. So, use aluminum sulfate with care.

If your soil pH is naturally elevated, it is not practical to try to lower it any appreciable amount. The calcium that is causing the higher pH will continually neutralize any acid-forming materials that you apply and their effects will be temporary. It is best to plant landscape plants that do well in such conditions. Vegetables should be grown in raised beds, containers or, hydroponically.



From Page 2...



Soils are a dynamic system/ecosystem unto themselves. Managing soil pH is not always a simple, straightforward process. Your local University of Florida/IFAS Extension Office can help you sort this out and help make the right, “Florida

Friendly” decisions that will increase your chances of landscape and gardening

## Pollinator Palaces

Bee Nests or Bee Boxes

See Page 6 For Instructions



2x6s with holes drilled



Old log with holes drilled



Inhabited nest. Note various types of hole closures... mud and grass.

*“The first supermarket supposedly appeared on the American landscape in 1946. That is not very long ago. Until then, where was all the food? Dear folks, the food was in homes, gardens, local fields, and forests. It was near kitchens, near tables, near bed-sides. It was in the pantry, the cellar, the backyard.”*  
~Joel Salatin

*“The soil is the great connector of lives, the source and destination of all. It is the healer and restorer and resurrector, by which disease passes into health, age into youth, death into life. Without proper care for it we can have no community, because without proper care for it we can have no life.”*  
~Wendell Berry

*“Why try to explain miracles to your kids when you can just have them plant a garden.”* ~Robert Brault

*“My rule of green thumb for mulch is to double my initial estimate of bags needed, and add three. Then I'll only be two bags short.”* ~Author Unknown



# View From The Plant Clinic

## KNOCK KNOCK WHO'S THERE

*Wood*

*Woodie Who*

*Would you believe a red bellied woodpecker*

*Pecking on my sliding glass door*

*Must be the season.*

We are getting calls at the Plant Clinic from callers who have the same visitors and this can cause serious damage. One thing the callers have in common is the windows are tinted and old Mr. Woodpecker can see his reflection. What's he doing?

A. Looking for a mate.. which he can 'see' in the window

B. Looking for food.. i.e. spiders

C. Just looking.

Is there a remedy? You can put up screens, you can hang noise makers... tinfoil ribbons that blow in the breeze, but the easiest remedy I found is to use a plush toy and hit the glass on the inside. He doesn't like that and he does not return.

**Q:** A monarch butterfly caterpillar has stripped my fennel plants. Should I remove the plants?

**A:** Monarch butterflies lay their eggs on milkweed plants only. What you are seeing on your fennel plants are probably the larva of the Eastern Black Swallowtail.

Usually, plants that have been stripped by butterfly larva will recover. So all is not lost, plus you will have beautiful butterflies to enjoy in your yard.

**Q:** My sago palm is turning yellow. The last time it was fertilized was 2 years ago. What is the problem?

**A:** A sago needs to be fed granular fertilizer, 18-6-8, four times a year, once in March, in May, in July and in September. Avoid fertilizing in summer. It is too hot. A sago can also turn yellow if given too much water. The roots will lack the ability to obtain nutrients and oxygen from the soil. We recommended taking a soil sample to determine if the sago also

needs micronutrients. (Editor's Note: Sagos are actually cycads not palms. Cycads are quite ancient and date back about 280 million years ago. The Coontie is the only native cycad.)

**Q:** My house is on a little knoll and there is serious soil erosion for about 3 feet around the house. What can I do to stop the soil, which is really sand, from being washed down into the lawn.

**A:** Planting a ground cover such as Asiatic Jasmine will be attractive and the roots of the plant will also act as a deterrent to the soil being washed away. Adding some soil amendments will do two things. It will help to strengthen the soil and also will give the plants the needed nourishment for growth in that area.

**Q:** I have 2 oak trees that are dying. They are in a clump of oak trees, but the other trees are fine. There has not been any heavy equipment over the roots, there are no insects or evidence of insects on the leaves. But the leaves of these two trees have wilted and turned brown.

**A:** We have had several severe storms lately and the dying trees could have been damaged by lightening.

**Q:** When do I start tomatoes from seed for the fall garden?

**A:** It takes 4 to 5 weeks to grow tomato plants to 4 to 5"

Fall planting time for tomato plants is between August 15 and Sept 1<sup>st</sup> and you can gauge your seed starting time from that. Also recommended reading the Bulletin #HS 508, Tomatoes in the Florida Garden, found in the University of Florida website solutionsforyourlife.com.

**Q:** I have a Queen Palm and the top is tilted over at about 45 degrees. It is green and looks healthy. I pulled on it and it is firmly attached to the tree. Can you tell me the problem?

**A:** This problem is due to a deficiency in the micro-nutrient boron. Application of boron will, unfortunately, not reverse the tilt of the top of the top. Details for the fertilization of palms (including micronutrients) can be found at... <http://edis.ifas.ufl.edu/pdf/EP/EP27300.pdf>

*Thanks to Jean Porter for her input to this column.*



# Family Photo Album



**Two photos shared by Myrna Moore**



**Some whimsy in the Williams' veggie garden.**



**Change of seasons... Tomatoes at an end and Okra just beginning.**



# Pollinator Extravaganza

Wow! The number of bees and other pollinators in the yard is amazing this year. Everything seems to be coming together this year... plants and pollinator palaces.



Amazon Neon Dianthus

box once again.

I has been entertaining watching the antics. Females having disagreements with other females trying to use their nest holes. Also seeing a female enter a nest hole head first, come back out and turn around then back into the hole... leaving food then laying an egg. Remember, these are solitary bees and wasps and pose no threat. They do not seem to care when I am working around the nest area.



Pentas

Of course all the flowers in the yard are benefiting. Some plants seem to be having better success than others. Native bees are on the *Helenium*, Purple



Purslane

Cone flowers and Purslane in very large numbers gathering pollen. There must be a lot of larvae to feed. Butterflies of numerous species are being attracted to the Pentas and Amazon Neon

The pollinator palace in the garage has been incredibly active this year. A few weeks ago all the nest holes were completely filled with larvae. Recently the larvae emerged as adults. Now females are populating the nest

is that the Milkweed has attracted no Monarchs. A few other people have said there have been no Monarchs in their yards either.

All in all our property has seen a general in-



*Helenium*



Purple Cone Flower

crease in pollinators (not counting the honey bees) in the past years. Hopefully putting out the nest boxes has been a help as well as the increased variety of

flowering plants.

## Building A Nest Box

Want to increase the native bees and wasps in your yard. The following are basic instruction to make them. Remember that native bees and wasps are not aggressive. The bees pollinate. The wasps predate and parasitize other insects many of which are pests in the garden... especially the vegetable garden.

1. Use **untreated lumber**. 2X6 is a good size. Log pieces may also be used.
2. Drill holes into the wide dimension (6"). Do not drill all the way through. You want holes about 5 ½ inches deep. Holes 3" to 8" deep are good range about 1 inch on centers.
3. Make different sized holes. Good sizes are 1/8", 3/16" and 3/8" diameter
4. Multiple boards may be glued together using water proof wood glue.
5. Boards may be hung horizontally or vertically but not with the holes facing up. Do not allow to touch the ground to prevent rot.
6. Mount the board(s) so they will not swing. That is, do not hang by wire or string.
7. Mounting in shade is better than full sun.
8. Most activity will be in the spring and early summer but they may be left up all year.

For more information check out Native Buzz web page of the UF Honey Bee Research and Extension Laboratory... <http://www.ufnativebuzz.com>.

*Text and Photos by Ed Williams*



## Demo Garden Update

Stand back... lead, follow or get out of the way! Work on the Florida-friendly Demo Garden ECHO grant project is on the move. On Thursday, the 26th, work began in earnest for Area 1. Debbie Pell and her crew from Lindley's Garden Center led the way with donation of labor with plants to come once irrigation is in. Master Gardeners turned in good numbers.



*Cutting and removing turf.*

There was a lot to do. First turf had to be cut up and removed. Major job made easier with the turf cutter. Many plants were removed. Most of the plants were salvaged for use in other areas of the project. These plants had to be potted to withstand the wait for their new location to be ready. Surprisingly it was hot and sweaty work.



*Turf cutting and removal continues.*

Lots of other things going on that are not necessarily as visible as the garden work but just as important. There is a lot of work to do so get ready.



Thanks to everyone who took part in the Area 1 work day.

**Important... if you have worked on the demo garden project make sure your volunteer hours are entered in VMS. Accurate and timely reporting is required for the ECHO grant.**



*Hey, can someone tell me which end of the shovel to hold?*

*Photos by Terri Olson.*

***"But make no mistake: The weeds will win; nature bats last."***

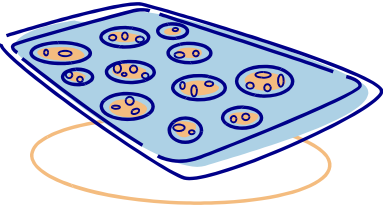
**Robert M. Pyle**

***"Weeds are nature's graffiti."***

**Janice Maeditere**

## Make Your Own Custom No Bake Energy Bar

The measurements are flexible. Feel free to add more or less of any ingredient. Vary the ingredients by adding what you like or what you find in your pantry. This is just one of hundreds of recipes. Share your favorite with us!



Mix ingredients in a bowl with a large stiff spoon or spatula, don your kitchen gloves and mix by hand or use your food processor.

- 1 Cup Oatmeal - Quick Oats give a finer texture than Steel Cut
- 1/2 to 2/3 cup protein or whey powder - your choice of flavor. Chocolate pairs well with peanut butter.
- 2/3 Cup coconut
- 1/2 Cup peanut butter - creamy or chunky depending on your taste
- 1/4 Cup ground flaxseed
- 1/3 Cup Florida honey

- 1 Tablespoon pure Vanilla extract
- Optional: chocolate chips, nuts like pecans, almonds or walnuts, raisins, cinnamon

Mix in a bowl until nicely combined.  
Spread on parchment paper to form a thick rectangle.  
Fold sides of paper around the mixture. Slip into plastic bag. Refrigerate.  
Later, slice into bars or roll into balls.  
Can be eaten warm or cold.  
Great to pop in your mouth when you need a quick boost of energy!

*Editor's note: We may need these at future demo garden work days.*

*"It pleases me to take amateur photographs of my garden, and it pleases my garden to make my photographs look professional." ~Robert Brault*

*"Earth is here so kind, that just tickle her with a hoe and she laughs with a harvest."*

*~Douglas William Jerrold*

*"We have neglected the truth that a good farmer is a craftsman of the highest order, a kind of artist."*

*~Wendell Berry*

## What Does It All Mean?

**Geocarpy**... production of diaspores (think seeds) underground. This is a very rare characteristic in the plant kingdom. Probably the best known plant that exhibits geocarpy is the peanut.

**Inflorescence**... Shoots that produce flowers, typically leafless.

**Indigenous**... Native to an area.

**Basal**... At the bottom of a plant or plant organ.

**Ephemeral**... Lasting for one day only. May more be more broadly used to indicate temporary existence.

**Dioecious**... Plant having only male or female flowers.

**Monoecious**... Single plant having male and female flowers

**Hermaphrodite**... A plant with flowers that have functioning stamens (male) and pistils (female). Often

called 'perfect' flowers.

**Drupe**... A fruit that is fleshy and has one seed... peaches, plums, coconut.

**Cordate**... Heart shaped.

**Cultivar**... A variety of plant obtained asexually from one plant.

**Glabrous**... Smooth, without hairs.

**Adventitious**... Becoming by chance... out of place.

**Anthesis**... Opening of flowers.

**Berry**... A pulpy fruit which does not split open (tomatoes and blueberries)

**Sessile**... Without a stem or stalk.

**Petiole**... A leaf's stalk.

**Vegetative**... The stems, leaves and roots of a plant.

*Compiled by Ed Williams*



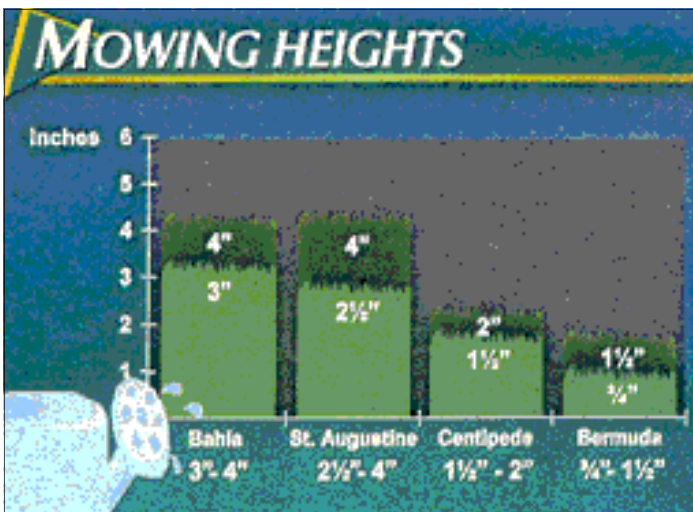
# Master Gardener Tips

## Summer Lawn Care Tips from Mary Wright

Let your lawn tell you when it needs to be watered. Take a look at the leaf blades. Are they open, green and growing? Don't water. Did it rain within the last 4 days? Don't irrigate. Rain water is like magic for yards.

Are the leaf blades kind of yellow? June is the month to apply Iron especially for St. Augustinegrass. From UF: Iron applications help maintain green color and unlike nitrogen, do not promote excessive top growth. Here is a good link to help you understand more: <http://gardeningsolutions.ifas.ufl.edu/lawns/lawn-care/fertilizing-your-florida-lawn.html>

The best approach to weed control, according to UF research, is to maintain a healthy, vigorous turf. To achieve a healthy lawn use the proper mowing height, proper fertilization = not too much too often and use slow release. Water as needed, not because your calendar now gives you two days a week to water.



Save this link as your go - to source for help with your yard and gardens: [http://solutionsforyourlife.ufl.edu/lawn\\_and\\_garden/maintenance\\_and\\_care/](http://solutionsforyourlife.ufl.edu/lawn_and_garden/maintenance_and_care/)

## Organize Your Potting Media From Ed Williams

We do a lot of planting, potting, transplanting, dividing... that is gardening. We use a lot of potting media which can be awkward to store and handle. Here is our solution.

Storage tubs! We have one for regular potting media, one for ready to use compost and one for recycling older mix from potted plants (never if plants were diseased). Using two cement blocks on each end and two four foot lengths of landscape timbers run across the top block provide a stand for the storage bins. This puts the bins at a height that is back friendly which I sure need. The tops of the bins keep out rain but any wet soil is still able to dry out.



*Photo by Ed Williams*

Another feature of this set up is neatness. When putting media into a pot just put the pot in the bin with the media. Any media that falls out of the pot falls into the bin leaving no cleanup or wasted media.

The cost to set these bins up is minimal and well worth the increased efficiency and lower back comfort. Give it a try.



*Planning, plotting and strategizing for demo garden work day.*

*Photo by Terri Olson*



## Master Gardener Program Vision Statement

To be the most trusted resource for horticultural education in Florida

## Master Gardener Program Mission Statement

To assist extension agents in providing research based horticultural education to Florida residents

## Can You Name This?



Ed Williams

Answers on  
page 11



Jerry A. Payne, USDA Agricultural Research Service,  
Bugwood.org

# Like us on Facebook...

[www.facebook.com/ UniversityOfFloridaIfasVolusiaCountyExtension](http://www.facebook.com/UniversityOfFloridaIfasVolusiaCountyExtension)



## July & August 2014 Calendar of Public Events

Activity	Date	Location
<b>Independence Day - office closed</b>	<b>7/4</b>	<b>Independence Day - office closed</b>
Native Bees and Wasps - beneficial Neighbors (1.5 CEUs)	7/5	Debary Historic Hall
Ormond Bch Library/Plant clinic	7/7	Billie Birdsong, Vivian Bowden
Palms for Central Florida (1 CEU)	7/10	Debary Historic Hall
Pest Control (1.5 CEU)	7/12	Debary Historic Hall
Vertical hydroponics (1.5 CEUs)	7/12	Lyonia Environmental Center Deltona
MG Plant Clinic NSB Library	7/15	NSB Library
Sugar Mill Garden Q&A	7/16	Sugar Mill Garden
<b>Preparing for the Fall Vegetable Garden - Cost: \$5 (2 CEUs)</b>	<b>7/19</b>	<b>Ag Center</b>
Dirt Talk - soil presentation (1 CEU)	7/20	Deltona Library
Herbs (1 CEU)	7/24	Debary Historic Hall
Ormond Bch Library/Plant clinic	8/4	Ormond Beach Library
Vegetable Gardening (1 CEU)	8/7	Debary Historic Hall
Lawn Care (1.5 CEU)	8/9	Debary Historic Hall
<b>Invasive Plants in Volusia County - Cost: \$5 (2 CEUs)</b>	<b>8/16</b>	<b>Ag Center</b>
MG Plant Clinic NSB Library	8/19	NSB Library
Sugar Mill Garden Q&A	8/20	Sugar Mill Garden
Containing Gardening (1 CEU)	8/21	Debary Historic Hall
Home and Garden Show	8/22	DB Ocean Center

[www.facebook.com/ UniversityOfFloridaIfasVolusiaCountyExtension](http://www.facebook.com/UniversityOfFloridaIfasVolusiaCountyExtension)

### Can You Name This—Answers

**Guava & Gulf Fritillary Caterpillar**

**Volusia County Agricultural Center**

**3151 E. New York Ave. (S.R. 44),**

**Deland, FL 32724**

**At the Volusia County Fair Grounds**

**West Volusia... 386-822-5778**

**Daytona Beach... 386-257-6012**

**New Smyrna Beach... 386-423-3368**

**Email questions to... [mastergardener@volusia.org](mailto:mastergardener@volusia.org)**