A Note From the Editor
by Shawn Steed

It is with great pleasure that UF/IFAS Extension is releasing this first edition of The Plant Producer newsletter to you, the grower. We have been working on this concept for some time now and it is nice to see a finished edition. It's our hope to bring the latest research, solutions, knowledge, and perspectives from the University of Florida and beyond to the environmental horticulture producers of our state. We hope that you will find something in this newsletter that will support you in growing quality plant material and making a profit. If there is something you would like to see added or if you have ideas for future articles please shoot me an email ststeed@ufl.edu. We hope you enjoy! - STS

Bacteria: Xanthomonas on Ficus trees. Florida leads the nation in production of foliage plants, species of Ficus are common ornamental foliage plants used for interior decoration and landscapes. Conditions that are favorable for the production of ficus are also conducive for some pathogens as well. When weather is hot, humid and rainy, conditions are highly favorable for Xanthomonas blight: a bacterial plant pathogen that blooms under these environmental conditions and is spread very successfully in water, especially by irrigation sprinklers and windblown rain.

An Integrated Approach to Controlling Ornamental Production Pests. Integrated is defined as combining or coordinating separate elements so as to provide a harmonious, interrelated whole. This is the basis, or the foundation, of an integrated pest management plan. The harmonious, interrelated whole is maintaining high-quality pest free plants. The combining of coordinating separate elements are the tactics or strategies we use to reduce pests and the damage associated with them. It's important to keep in mind that pest management is not the same thing as pest eradication. There may be levels of pest damage that are acceptable and may not reduce plant quality or sales. When pests are being managed with an integrated approach, there should be a strong emphasis on preventative practices to reduce pests and their damage. Consideration should be placed on management practices that reduce plant stress and minimize pest interference. Here are some of the elements or tactics that can be included in your integrated management plan:

Scouting/Monitoring. To measure is to know. The only way to determine the amount of pests, the damage being inflicted on your crops, or what factors are working towards your advantage, is to monitor and scout your crops regularly. Scouting is to visually sample multiple plants within a crop. This is repeated over the different crops within a nursery or landscape. This is the most important tool in an integrated pest management approach. It's a good idea to scout non-crop areas such as ditch banks, fence lines, driveways, to see what pests or beneficial insects might be located around the

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production or landscape areas. A potential weed infestation or whitely invasion may be averted by scouting non-crop areas. It is also a good idea to monitor any new plants that are purchased or brought into a production or landscape area. Plants are usually weeded prior to shipping, however, weed seeds may be waiting to germinate under favorable conditions. New plants might bring a new weed pest into the area that hasn’t been there in the past. Careful scouting would reveal this outbreak and minimize costly hand weeding and herbicide applications. Scouting may also help to identify other production problems that can create plant stress and reduce profits, such as clogged sprinklers or drainage ditches or leaking pipes.

Reduction plant stress. Just like people, plant health diminishes over time under stressful conditions. Growers must monitor and consider environmental and management factors that contributed to the reduction of plant stress. These may include factors such as temperature, light levels, humidity, airflow, nutrient management, irrigation management, growth regulators, soil or potting medium conditions, and pruning practices. Consideration and management of these factors to minimize plant stress will create a healthier, more robust quality plant. If growers encounter crops of plants that consistently experience problems such as root rot or leaf spots, environmental factors are a good place to start looking. Sometimes environmental factors are not easily manipulated. In this instance a grower may consider changing the production cycle of a particular plant to increase or incorporate more favorable factors during the production cycle. For example, a grower may choose to step up one gallon plants into a three gallon container during the fall instead of late spring to maximize cooler environmental conditions and less humidity to minimize fungal leaf spots. Another option might be to erect a greenhouse or shadehouse to have better control over adverse environmental conditions.

Crop and cultivar selection. We are fortunate in the ornamental nursery industry to usually have many varieties or cultivars to choose from. In some instances the selection of different cultivars may offer an advantage of pest tolerance over another cultivar. This is termed “host resistance”. For example, some cultivars of crape myrtles are resistant to aphid damage and powdery mildew. Another case is that of a fungal leaf spot on Indian hawthorn. Some cultivars have been shown to be able to resist leaf spot disease over others. Experiment with some variety trials if a particular cultivar is susceptible. This may pay back big dividends from a pest management standpoint. If a better host resistant cultivar is found producers may minimize costly applications for combating diseases and plant pests thereby contributing to a more profitable bottom line.

Use least toxic pesticides to preserve beneficial insects. Sometimes one of the most overlooked aspects of a pest management plan is the recruitment and utilization of natural systems to the benefit of production plants. It is always a good idea when scouting to focus not only on pest insects and diseases, but also keep an eye out for the beneficial predators, parasites, and parasitoids. These might come in the form of spiders, dragonflies, lady beetles, predator mites, predator wasps, and flies. Sometimes we also overlook fungi as potential beneficial organisms. There are good fungi that can reduce insect and disease causing pathogenic fungi populations. It is wise to use least toxic pesticides such as horticultural soaps and oils, for example, in order to preserve any beneficial organisms that might be present. This will also reduce the amount of potentially negative impact in pesticides released into the environment. Growers may also want to think about the larger area surrounding the production area. There might be areas in the surrounding locale that might house a reserve of beneficial organisms that can help keep pest populations to a low-level. Some farms have successfully incorporated birdhouses, bat houses, and owl nest boxes to reduce the amount of destructive pests that are in the area. Other operations have incorporated banker plants to increase predators. Banker plants serve as insect hosts for non-destructive insects and their predators. These predators then can reproduce and prey on plant pests.

Spot spray. If scouting reveals a pest outbreak has occurred above the pest threshold and least toxic chemicals have not cleared the problem, then pesticides should be directed where the outbreak is occurring. Targeting pest organisms in a specified area within a production area is called spot spraying. This method reduces the negative impact on the environment and employees, and preserves any beneficial organisms that may be present on non-affected plants. This method helps replenish any beneficial organisms outside the treated area from resident populations nearby. Remember to use a properly calibrated sprayer and to read the label. THE LABEL IS THE LAW!

Pest removal. There are times during plant production when pests gain the upper hand. At these points it might be necessary to remove a source of a pest or disease inoculum by destroying infested plants. A quick removal of plants that will not recover to a profitable salable level might be the best remedy for an expanding pest infestation. This decision is made by looking at the possible economic cost of destroying a plant versus trying to treat plants and having the pest or disease population increase to infect other plants.

Summary. Controlling pests can be difficult at times. Using as many different successful tactics as possible will help minimize the amount of economic damage sustained by plant pests. An integrated approach using scouting, beneficial organisms, targeted pesticides and spot treatments, host resistance, and growing healthy plants can help to maximize profit and reduce pests. If you are using an integrated approach or plan to, remember to allow for flexibility in the management to implement new ideas or modify your approach if something is not working or different pests are discovered.

1. True or false, your local extension office can help with pest identification?
   A. True
   B. False

2. Integrated pest management means the same thing as organic production
   A. True
   B. False

3. An integrated approach to pest management uses many tactics to reduce pest numbers and damage on plants
   A. True
   B. False

4. What is the most important factor in integrated pest management?
   A. using host resistant plants
   B. destroying infected crops
   C. using least toxic pesticides
   D. scouting crops regularly

5. True or False, spot spraying is method that reduce the amount of pesticides used in the environment.
   A. True
   B. False

6. Choosing a cultivar for beneficial properties that tolerate pests better is called
   A. spot spraying
   B. host resistance
   C. beneficial organisms
   D. pest tolerance

7. All the following are examples of reducing plant stress except,
   A. growing plants in a controlled environment
   B. under watering to reduce water and fertilizer runoff
   C. pruning properly
   D. spacing plants out to get more light

8. When using an integrated approach to pest management, a grower should never have a flexible plan. Tasks should be done the same all the time.
   A. True
   B. False

9. Ladybugs, predatory mites, spiders, and dragonflies are examples of
   A. plant pests
   B. spot spray targets
   C. beneficial organism
   D. host resistance

10. A new bacterial disease infestation is found on a few plants in a greenhouse while scouting. It is unlikely that they can be cured. What is the best approach to this problem?
    A. spray all the plants of that crop with a systemic bactericide
    B. spot spray the local affected area
    C. sell all the plants at a reduced rate
    D. destroy the few infected plants and scout the area regularly

11. A pest is found on a crop plant but is not interfering with production or economics. Some beneficial organisms are using the pest as prey. What would be the best economic option at this point in time.
    A. Do nothing and scout to follow up on the situation.
    B. Spot spray to eliminate pests.
    C. Apply contact pesticide.
    D. Destroy plants.
Symptoms of a Xanthomonas disease: *Xanthomonas* species enter plants through wounds or naturally openings such as stomata (breathing pore) or hydathodes. Then, it moves through the whole plant. Initially, with small, water soaked circular lesions with irregular borders near the leaf margin. After 1 or 2 weeks you will see bigger lesions that turn brown with greenish yellow borders resulting in premature senescence and leaf drop.

What Ficus are susceptible? Several *Ficus* species and their cultivars are susceptible to this pathogen including *F. benjamina*, *F. buxifolia*, *F. triangularis*, *F. mexicana*, *F. maclellandii* ‘Alli’, *F. retusa* ‘California Nitida’ and ‘Green Gem’ and *F. Green island*. The bacterial disease appears to affect the plants at all stages and is capable of killing young plants. Host range studies conducted at the UF/IFAS Tropical Research and Education Center (TREC) indicated that several economically important cultivars including ‘Burgandy’, ‘Robusta’ and ‘Cabernet’ are equally susceptible to the disease.

How can I protect my Ficus? With *Xanthomonas* disease, prevention is the best option to manage the leaf blight on Ficus. First, you must confirm that is *Xanthomonas* blight on Ficus. Submit samples to a plant disease diagnostic laboratory and contact your local UF/IFAS Extension agent for assistance and follow up. Remember, managing bacterial pathogens requires a long-term strategy and actions that reduce the opportunity for spread or re-introduction of the pathogen. There is not a magical tactic or product to eliminate this disease from your plants. Below are some general recommendations. For more information and symptoms on the plant, visit the University of Florida EDIS publication: [http://edis.ifas.ufl.edu/pdffiles/PP/PP30500.pdf](http://edis.ifas.ufl.edu/pdffiles/PP/PP30500.pdf)

Some general recommendations:
1. Monitor incoming plants into your commercial operation
2. Scouting for early symptom development
3. Practice good Sanitation
4. Water management
5. Chemical control.

**Producer Highlight**

*by David Holmes*

**Recycling: A Strategy for Tight Times.** It is no secret the past several years have been a financial challenge for most businesses. When profits decline cost cutting becomes a necessary survival tool and nurseries have considered the variety of means at their disposal to invoke savings including labor reduction, slicing marketing budgets, forgoing weed suppression, cutting annual rates of fertilizer application and many more. Sometimes it is the simple things that can actually be quite innovative in surviving the recession to make it to better days. In a conversation with Brian DeVane recently, of Kingswood Nursery in Ocala, he expressed his appreciation for the use of a return system to save on the cost of purchasing plant containers. Having a system in place to encourage customers to return their used pots saves tremendous cost over the purchase of new containers. Brian indicated this idea was something his dad, Harold, developed and promoted when he managed the nursery several years ago. When times are flush and plant material is moving regularly out the gate one may not give much thought to implementing a reward system for the return of used containers. One of the things that allows this program to be successful is the amount of return business the nursery experiences. Customers know they will receive a credit toward their next purchase for returning used pots, engendering their participation and cooperation. In addition to the savings the nursery experiences by not having to purchase new containers, the customer has incentive to return to the nursery resulting in additional sales. Moreover, re-using these pots keep them out of the landfill, which benefits the community as a whole. When times get tight, methods that save money certainly don’t have to be extravagant to be innovative.
**Mycorrhizal Differences.** Inoculum of arbuscular mycorrhizal fungi is being used more frequently in horticulture to increase plant growth. There are two ways that the inocula may be produced, and the results of this study indicate that the differences between the two may account for some of the varying results reported with the use of mycorrhizae. Researchers tested the beneficial fungi produced in vivo (in symbiosis with living host plants), or in vitro (in a test tube with transformed roots of host plants). Researchers measured the spore size of *Rhizophagus irregularis* and the effect of its inocula produced in vivo and in vitro on the growth of leek plants. Spores produced in vitro were smaller than in vivo. All mycorrhizal propagules used were able to colonize plants, however the leek plants inoculated with in vivo propagules had significantly higher colonization rates than plants inoculated with in vitro inocula, and in vivo inocula were the only treatments increasing plant growth.

Article adapted from HortScience July 2013 vol. 48 no. 7 897-901.

**Colored Shade Cloth Affects Growing Environment.** UF’s own Bob Stamps and Steven Arthurs in collaboration with Frank Giglia of Signature Supply researched the changes in environment caused by the use of colored shade cloth. Previous research had shown that different plants responded differently to the shade cloth colors. This work looked at what the shade does to the environment to try and understand why the shade cloth causes responses. They tested red, blue, pearl, and black nets, all with 50% shading factor, in central Florida for 12 months, looking at the amount of light, light quality, temperature, wind, and humidity. Photosynthetic radiation was reduced most by black nets and least under red nets with blue and pearl nets intermediate. Both ultraviolet-B and ultraviolet-A were reduced most by pearl nets and least by red nets. Blue nets had distinctive peaks at blue and far-red wavelengths, while red nets had a minor peak at violet and a large peak at red and far red wavelengths. No nets had red/far-red ratios significantly greater than outdoor light. They also noted elevated temperatures and wind resistance (but not relative humidity) under colored and pearl nets compared with black. This was probably due to the different net porosity, and may provide some protection from storm events.

Article adapted from HortScience August 2013 48:975-979.

**Soil Moisture Sensor-controlled Irrigation Produces Plants with Less Water.** Researchers wanted to test the amount of water that could be saved without affecting plant quality using a soil moisture probe to control the irrigation of ‘Panama Red’ hibiscus. Shoot dry weight and plant height increased with increasing water use. In all studies, increased irrigation volume led to increased growth; but water use efficiency (the weight of plant produced per gallon of water used) decreased at a certain point close to the middle of the range tested. Production of salable plants was achieved at moderate soil water thresholds. Sensor controlled irrigation is feasible and soil moisture thresholds can be adjusted to control plant growth.


**Controlled-Release Fertilizer with Bedding Plants.** Controlled-release fertilizers (CRFs) are not often used in floricultural production because of lack of research. This research compared the growth and quality of bedding impatiens when grown with typical water-soluble fertilizer (WSF) to different combinations of longevity and rates of a single formulation of CRF. The CRF used was 16N-3.9P-10K, formulated for 3-4, 5-6, 8-9 or 12-14 months, and used at rates of 1.4, 3.4, 6.8, 10.2, or 13.6 kg per cubic meter. Plants were grown in the greenhouse and consumer evaluations were performed at market maturity. Commercially acceptable plant quality was achieved with CRF application rates between 3.4 and 6.8 kg per cubic meter. At low CRF application rates, the shorter longevity formulations produced larger plants with greater flowering potential than longer release rate CRF. At higher application rates, longer longevity formulations outperformed the faster release rates. CRF-grown plants were smaller than WSF when CRFs were applied at the lowest rates. No differences were found between WSF and CRF when plants were grown at a rate of 6.8 kg per cubic meter of CRF of any longevity. Growers should adjust CRF application rates according to CRF longevity.

Article adapted from HortTechnology April 2013 vol. 23 no. 2 157-164.
**General Interest Articles**

**Globally Harmonized System of Classification and Labeling of Chemicals, by Shawn Steed**

OSHA has revised its Hazard Communication Standard to align with the United Nations globally harmonized system of classification and labeling of chemicals. This will change the labeling elements of hazardous material labels and the Material Safety Data Sheets (MSDS), now called Safety Data Sheets(SDS), and the information the labels will contain. The revised standards require employers to train their employees by December 1, 2013. So make sure that you are compliant. There are a set of required topics that employees must be trained in. Training on label elements must include: product identifier, signal word, pictogram, hazard statement, precautionary statement(s), and chemical manufacturer, distributor, or importer contact information. Training on how an employee might use the labels in the workplace(e.g., to properly store the materials, or for first aid emergencies), and a general understanding of how the elements work together on a label (e.g., if a chemical has multiple hazards, different pictograms are used). Training on the format of the SDS must include information on: standardized 16-section format, how the information on the label is related to the SDS. Remember that OSHA requires employers to present information in a manner and language that their employees can understand. OSHA has a website for more information and training materials to train your employees. You can visit http://www.osha.gov/dsg/hazcom/index.html

**Moving Nursery Producers Towards Sustainable Practitioners, by David Holmes**

The economics of the nursery industry has been in a state of change for a few years now and growers are always on the lookout to improve their situation. Increasingly, higher levels of rigor are being demanded from outside sources to manage resources, inputs, waste byproducts, labor, and profit levels to maintain an existence growing plants. Dr. Gary Knox and a team of collaborators have produced a few excellent videos with the help of a Southern Agriculture Research and Education Grant to get operators thinking about moving their environmental horticulture production operation towards sustainability. The list of topics is below and they can be viewed by going to the webpage http://blog.caes.uga.edu/snpp/sustainability-videos/#recyclingrepurposing

**Why Is Sustainability Important?**
- Sustainable Options for Nursery Containers
- Improving Energy Efficiency in Nurseries
- Effective Overhead Irrigation
- Low-Volume Irrigation
- Managing Nursery Runoff to Remove Contaminants
- Use of Reclaimed Water for Irrigation
- Recycling and Re-Purposing in the Nursery

**Crapemyrtle Bark Scale in China - and in the U.S.? by Gary Knox**

Given crapemyrtle’s reputation for plant vigor and pest resistance, I was shocked to see Chinese crapemyrtles significantly affected by a previously obscure pest. Last November I had the privilege of traveling to China with Dave Creech (Stephen F. Austin University), Mengmeng Gu (Texas A&M) and Yan Chen (LSU-Hammond). Crapemyrtles, *Lagerstroemia* spp., are native to Asia, and China is regarded as the first to cultivate crapemyrtle as a flowering tree. As a crapemyrtle enthusiast, I eagerly looked forward to seeing *Lagerstroemia* collections in Chinese botanical gardens. What we saw in Beijing surprised us.

One of the few Asian pests of crapemyrtle is crapemyrtle bark scale, *Eriococcus lagerstroemiae*. Long considered a minor pest of crapemyrtle, our Chinese hosts indicated this scale recently exploded in numbers, significantly infesting crapemyrtle in some areas. Affected crapemyrtle had greatly reduced vigor and the infestations were just plain ugly (Fig. 1). We did not have an entomologist available to confirm identity of the scale we saw, but our Chinese scientists believed the pest was crapemyrtle bark scale.

**Symptoms, Appearance and Distribution in China.** An early symptom of crapemyrtle bark scale is black sooty mold covering extensive areas of leaves and stems as a result of honeydew exuded by the scale. Individual scale insects are white to gray in color and ooze pink when crushed (Fig. 2). Large populations build up in branch crotches and extend up branches, appearing crusty white to gray. This scale usually is not present on new growth, leaves or slender stems unless infestations are heavy.

We found this scale on crapemyrtle in all four cities we visited, across hardiness zones roughly equivalent to USDA Cold Hardiness Zones 6b to 9 (Beijing, Zone 6b/7a; Nanjing, Zone 8a/8b; Shanghai, Zone 8b/9a; and Kunming, Zone 9). However, this scale was not found on all crapemyrtle. My personal observation is that stressed plants appeared more susceptible to this scale, as exemplified by infestations on freeze-damaged crapemyrtle in Beijing (Fig. 3) or in a poorly maintained planting in the Nanjing Airport parking lot. Our hosts indicated the problem appeared to be more severe on hybrid cultivars introduced from the U.S., and our observations mostly confirmed that.

**In the U.S.?** Unfortunately, crapemyrtle bark scale or a similar scale may already be in the U.S. A new scale insect believed to be a species of *Eriococcus* was first discovered in the Dallas, Texas, area in 2010 where it is problematic on landscape crapemyrtles. It has not been definitively identified by entomologists yet and management recommendations are still being developed. However, this scale has since been observed in Shreveport, LA, Memphis, TN, and Little Rock, AR, undoubtedly being moved with plants. The expanding distribution of this scale and my personal observations of crapemyrtle bark scale throughout China suggest this scale could have a widespread and severe impact on crapemyrtles in landscapes.

America has a long history of nonnative organisms becoming invasive and causing significant problems in agriculture, landscapes and natural areas (i.e., chestnut blight, Japanese beetle, kudzu, Dutch elm disease, granulate ambrosia beetle, laurel wilt, etc.). It is important for all of us to be vigilant in identifying potential invasiveness of organisms, preventing their introduction and spread, and taking actions to minimize or eradicate these invasive organisms before they get “out of hand.” Let’s keep an eye out for this scale and other potential invasives and work together to control or eradicate them. For more information, please contact your local county Extension agent.
“Hot” New Ebony Crape Myrtles! by Shawn Steed

Rarely do I use the words “Hot” to describe plants. In fact I don’t think I ever have, but I think in this case it is warranted. These releases are making their way out of the breeding program from USDA Agricultural Research Service, Thad Cochran Southern Horticultural Laboratory in Poplarville, MS and into the plant production world. Five new dark-leafed ‘Ebony’ crape myrtles are now out: ‘Ebony Embers’, ‘Ebony Fire’, ‘Ebony Flame’, ‘Ebony Glow’, and ‘Ebony and Ivory’. The names represent the leaf and the flower color. These cultivars came from different plant breeding crosses of Chocolate Mocha (sold under the Delta Jazz trademark), ‘Arapahoe’, and the Whitcomb varieties (‘Whit I’, ‘Whit VII’, ‘Whit VIII’). The breeders mention that their dark foliage will not fade throughout the growing season. These crapes are large shrub to small tree size and have a growth habit of 6’-12’. They have dense crown branching with excellent foliage coverage. Propagation is easily done from softwood stem cuttings treated with 2000 ppm IBA or as hardwood cuttings in the winter. In communications with Dr. Cecil Pounders, he mentioned that plants can be bought from Simpson Nursery in Monticello, FL and van der Giessen Nursery in Semmes, AL. Contact those nurseries and they should have plants for sale if you are interested in trying them out. I’m sure they will be a big hit with consumers.


LEFT: Ebony Flame crape myrtle
MIDDLE: Ebony and Ivory crape myrtle
RIGHT: Ebony Embers crape myrtle

Business & Tech

by Ed Skvarch

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Building a Successful Business

Every year there are over a million people in the United States who open a small business in search of the great American dream of being their own boss. Unfortunately there are statistics that indicate by the end of the first year at least 40% of new owners will go out of business. Within five years, that percentage will increase to 80% or 800,000 and don’t breathe a sigh of relief because your business has made it to the five year plateau, because more than 80% of the small businesses that survive the first five years, fail in the second five.

Why do you suppose this is? With heaps of information out there on the World Wide Web or contained in the pages of those antiquated rectangles called books, why are business failure numbers so high?

One reason may be that the business is run by a “Technician” that person who knows how to do the technical work involved in the business.

The fatal assumption here is that just because the business owner understands the technical work of the business that does not mean the owner understands how a technical business works!
Local Interest

by Elizabeth Felter

Knox Nursery Wins CARES Award. Knox Nursery is the first ornamental nursery producer in central Florida to receive the Florida Farm Bureau CARES award. The CARES program showcases producers that practice environmental stewardship through their management of natural resources.

Florida Farm Bureau has assumed a lead role in recognizing the environmental conservation practices adopted by farmers and producers in Florida. The program began 14 years ago, when leaders within the organization helped establish the County Alliance for Responsible Environmental Stewardship (CARES) program. They collaborated with business owners, other organizations, governmental agencies and others to recognize deserving growers in public meetings.

The CARES program has been expanded so that it now includes areas in central and south Florida. More than 550 agricultural producers have earned the CARES award.

The basic component of the program is the appreciation for voluntary implementation of state-of-the-art systems to conserve Florida’s natural resources. Evaluation of the systems on farms, ranches and nurseries is performed by outside experts to determine who receives a CARES award. Other states think so highly of this program that it has become a national model. According to the Florida Department of Agriculture and Consumer Services, for example, agricultural producers save 11 billion gallons of water each year by their conservation practices.