Set The Standard For Worker Protection

by Yvette Goodiel, UF/IFAS Martin County

Background: The federal Worker Protection Standard for Agricultural Pesticides (WPS) (40 CFR Part 170) was developed by the US Environmental Protection Agency (EPA) and adopted into the Code of Federal Regulations (CFR) in 1992. The standard was fully implemented in 1995 and has been revised since. The WPS Regulation (http://www.epa.gov/pesticides/safety/workers/PART170.htm), as well as a listing of recent amendments (http://www.epa.gov/opplead1/safety/workers/amendmnt.htm), is available on-line. This federal regulation was designed to protect employees on farms, forests, nurseries, and greenhouses from occupational exposures to agricultural pesticides. Approximately 2.5 million agricultural workers and pesticide handlers, working at over 600,000 agricultural establishments, are protected by the WPS. The WPS requires that agricultural employers take the following steps to reduce the risk of injury or illness when agricultural workers (people involved in the production of agricultural plants) and pesticide handlers (people who mix, load, or apply pesticides) are exposed to pesticides: 1) provide information about exposure to pesticides; 2) provide protections against exposures to pesticides; and 3) offer ways to mitigate exposures to pesticides. This article summarizes the provisions of WPS and related regulations. A good reference for further detail regarding compliance with the WPS is the EPA publication, “How to Comply with the Worker Protection Standard for Agricultural Pesticides: What Employers Need to Know”, available on-line at http://www.epa.gov/agriculture/htc.html.

Related Regulations:
Florida Agricultural Worker Safety Act (FAWSA): The Florida Agricultural Worker Safety Act (FAWSA) (Florida Statute 487.2041), enacted in 2004, gives the Florida Department of Agriculture and Consumer Services (FDACS) responsibility for enforcing the WPS in Florida. The FAWSA is intended to ensure that agricultural workers employed in Florida are informed of the risks of pesticide use and receive protection from agricultural pesticides. Specific requirements of the FAWSA include the following:

For the rest of the article and to take the test and to get 1 CORE pesticide credit please visit the following website: http://www.growingproduce.com/crop-protection/ceu-series/ceu-series-set-the-standard-for-worker-protection/

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Pest Update
By A. J. Palmateer, Edited by E.V. Campoverde, UF/IFAS Extension Miami-Dade County

Downy Mildew on Impatiens. “Fall” is in the air, well at least what we consider fall for Florida standards. With this new season, temperatures start to gradually decrease. Once we reach our signature high humidity with cool nights it’s time to scout for a pathogen attacking our beautiful Impatiens plants.

The Pathogen: Several different species of pathogens can cause Downy mildew, in the case of Impatiens walleriana (gardening impatiens); the causal agent is Plasmopara obducens.
Solarizing Helps Grower Recycle Dumped Potting Soil

by Shawn Steed, UF/IFAS Extension Hillsborough County

It is estimated that growers dump about 10% of all plants produced, creating a large waste problem of used potting soil. Research was conducted with a Southern Sustainable Research and Education On-Farm Grant to see if it was possible to recycle used potting soil with the help of the sun. Availability of both peat and pinebark have been in question at Stardust Farms with the help of John Pearson, we ultimately arrived at using about a 2-3 inch deep pile spread over an area covered by a 4 mil poly plastic (sold as Fall poly) under the soil. Soil is hydrated slightly to help conduct heat through the pile. Another sheet is placed over the soil and tucked under the bottom layer plastic at the edges. This seals in the soil like a sandwich in a plastic bag. Over this, we placed another 4 mil sheet of clear poly under the soil. This top sheet was suspended from 3 to 6 inches above the lower sheet with pipes and then secured at the edges to trap in heat. Most fungi, nematodes, and weed seeds are killed at 140 F for about one hour.

Within one day we were able to reach temperatures of 159 F. The longer you leave the pile cooking the better your reduction in pest organisms. This will depend on ambient temperatures and the amount of sunlight that reaches your pile. In Florida, during the summer, two to three days should be sufficient. You will want to check the temperature of the pile with a soil probe to make sure. Our pile was in the full sun during the end of August. The sunlight turns to heat after passing through the poly and gets trapped inducing a greenhouse effect. This raises the soil temperature enough to cook pathogens and weeds. Two germination studies that were tested showed an average reduction of weeds by 88 and 94% after it was solarized. It would be beneficial to hydrate the soil and let it sit for about a week before covering with plastic so many weed seeds would start to germinate and then get heat killed when the plastic covers them. Nematodes were also counted and found to be killed by the treatments.

Soil substrate and chemical tests were run on the treated soil. Solarization was found not to change soil chemical and physical properties except for increasing the amount of NO₃-N (51.52 ppm) compared to untreated soil (29.98 ppm) and lowered the pH (5.6 versus 6.3). This may be from breakdown of organic compounds or residual polymer coated fertilizer remaining in used soil.

We used the treated soil to grow out Viburnum suspensum and ‘Natchez’ crape myrtles. We compared new soil to solarized soil using fresh potting soil at different percentages mixed with solarized soil. We used rates of 100:0, 66:33, and 33:66 (new soil %: solarized soil %). We looked at Viburnum height and width and crape myrtle height. In all cases there was no significant difference in growth attributes using our solarized soil versus the new potting soil. It must be cautioned that contaminates may be found in old soils if the pile has been sitting for a while. There is no telling if someone may have killed weeds growing in a pile with herbicides. There also may be carryover of herbicides, other pesticides or growth regulators depending upon the time of the dumped soil. Growers should know the history of the soil pile before recycling it with solarization.

At the end of the experiments, solarization proved to be an extremely cost effective way to recycle soil. Our recycled soil cost about $4.67 in labor to treat per cubic yard of soil. This was a savings of about $30.33 per cubic yard from buying fresh soil. Our materials were large enough to treat 3.56 cubic yards and the cost of those materials would be recovered in the third use.

If you have any questions about this experiment please give Shawn Steed a call 813-754-5519 ext. 54147. If you would like to attend a recycling used soil workshop, there will be one in Hillsborough County on February 26, 2014, details can be found at the following website http://soilreuse.eventbrite.com We will look at both composting and solarizing to recycle old soil.

Fig 1: Old soil prior to covering

Fig 2: Soild covered and tented for solarization

Fig 3: Solarized soil on left, untreated used soil on the right
**Research Updates**

**Biochar Provides Media Nutrients Slowly**

Biochar is charred organic matter that has been reported to improve soil physical properties and beneficial microbial populations, reduce leaching and provide slow release nutrients. In these experiments, the effect of different types of biochar on leaching of nitrate, phosphate, and potassium was tested in columns packed with sphagnum peatmoss:perlite to simulate soilless media used in greenhouse and nursery production. The 10% biochar amendment was from gasified rice hull biochar (GRHB), sawdust biochar (SDB), or bark and wood biochar (BWB). Different sources of biochar differ because of the size of the particles and the different qualities of the organic matter they are made from. After the columns were packed with the soilless media mixed with biochar, fertilizer was applied and the leachate collected from the bottom over twelve days with water applied each day. The GRHB was actually a source of phosphate, adding more to the leachate than had been applied. All biochar types were a source of potassium, with GRHB being the highest. BWB leached the least potassium, nitrate, and phosphate of all the biochars tested but still supplied more than the fertilizer. All biochars altered the release of nitrate, releasing it more slowly than the media without biochar. Biochar may be a good replacement for some phosphate and potassium fertilizers in greenhouse crops and may provide some nitrate.


**Grow Floating Lettuce and Clean Up Your Runoff**

Nutrient runoff from the nursery/greenhouse industry has become a concern for water quality. Best Management Practices (BMPs) suggest several options to help growers clean up their waste water. Modification of production practices may not be enough to reduce leaching and runoff. Constructed wetlands may be used to capture this runoff water and clean it before it is released into surface waters. There are three different types of constructed wetlands that may be used depending on the amount of runoff, the amount of land available for a treatment system, site topography, and whether the runoff is continuous or intermittent. For low-flow volumes, de-nitrification walls and vegetated/turfgrass buffer strips may be enough. For low to moderate volumes, vegetated ditches may be used. But for moderate to high volumes of runoff constructed wetlands should be used. Nitrogen is efficiently assimilated in constructed wetlands, but phosphorus is variable, so analysis of the runoff is important to deciding which type of wetlands should be constructed.

Surface-flow constructed wetlands are designed with aquatic plants rooted in media with the level of the water flowing across the wetlands part way up the stems of the plants. The plants and the microbes around them remove excess nutrients. Phosphorus is often difficult to reduce in these systems.

Subsurface flow wetlands have plants rooted in special media that helps to grab the nutrients, and the water level is below the surface of the media. Both the plant roots and the media remove the nutrients, but the media will need to be replaced as it fills up with nutrients. The time required before removal and replacement will vary depending on the amount of nutrients in the runoff, which must be monitored frequently. Phosphorus can be efficiently removed with this system depending on the special media used and the frequency of media replacement.

A third type of constructed wetland is a floating treatment. These systems can be installed in existing retention ponds or drainage canals. In this system the plants are floating naturally or on mats, and the roots and microbes around them remove the excess nutrients.

Before the plants die and release the nutrients back into the water, they must be harvested and replaced with new plants. The more plants covering the surface, the greater the nutrient removal power, but the more labor will be required to remove them. One option that could enhance the returns on this system is to grow a useful crop for harvesting in the runoff. Potential crops include lettuce, basil or a biomass crop. This system has proven very efficient in removal of both P and N, depending on the plants used.

Impatiens downy mildew (IDM) can cause major economic losses for horticultural producers and landscape companies statewide.

Downy mildew on impatiens was first detected in numerous landscapes from Manatee, Hillsborough, Collier, Hendry, Broward, Palm Beach, Miami-Dade and Monroe counties in the winter of 2012. Since then, downy mildew has been very aggressive and capable of rapidly spread throughout impatiens plantings.

**Symptoms on the Host:** Once infected, impatiens start to show symptoms; especially on young plants and new growth which are most susceptible. Yellowing of the lower leaves (which can easily be confused with nutritional deficiencies) and rapid defoliation including branch dieback is common. As the disease continues to progress, whitish, downy-looking growth is visible on the undersides of leaves. Diseased impatiens eventually wilt and completely defoliate with bare stems sticking out of the soil. (See Fig.1)

**Management Recommendations:**

1. Monitor your new impatiens plants: When you grow from seed or purchase new Impatiens plants in the nursery, you should make sure to carefully inspect plants looking for early symptoms and reject or discard any symptomatic plants. Closely monitor during evenings where the temperature drops. In the landscape, avoid overcrowded planting areas of Impatiens, because it prevents the plants to dry out and may increase the incidence of this disease.

2. Sanitize the growing area: Disinfectants such as quaternary ammonia compounds (e.g. Greenshield, KleenGrow, etc) are used to clean the surface areas where these plants will grow. If you find yourself with infected plants in the landscape, follow the same protocol as for the nursery, which includes removing and discarding the diseased plants and replacing them with a bedding plant that is not susceptible. Preventative use of fungicides is highly recommended for the establishment gardening impatiens.

If you want to learn more about managing impatiens downey mildew click on the following link: [http://edis.ifas.ufl.edu/pp309](http://edis.ifas.ufl.edu/pp309)

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**New Resource for IPM of Rose, Camellia and Other Major Shrubs**

*by Juanita Popenoe, UF/IFAS Extension Lake County*

Growing five southeastern shrubs is now easier thanks to a free, new IPM resource from the Southern Nursery IPM Working Group. "IPM for Shrubs in Southeastern U.S. Nursery Production" is a compilation of Integrated Pest Management (IPM) information for five major shrubs. This IPM resource was developed for nursery growers although professional landscape managers and collectors of these plants also will find the information valuable. Chapters on abelia, camellia, shrub rose, blueberry and viburnum provide comprehensive information on the species, primary cultivars, production, major pests, diseases, weeds and abiotic disorders, along with sustainable management methods and tables listing labeled pesticides and fungicides by mode of action and site. Future volumes covering additional shrubs are anticipated by the group including Clemson University’s Sarah A. White, University of Tennessee’s William E. Klingeman, and University of Florida NFREC’s Gary Knox and Mathews Paret. This book and others can also be downloaded free through iTunes (http://www.apple.com/itunes/) or each chapter is available as a free pdf through the Southern Nursery IPM Working Group website, [http://wiki.bugwood.org/SNIPM](http://wiki.bugwood.org/SNIPM).

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Fig 1: Underside of a leave showing characteristic white fungal growth on impatiens

Fig 2: A plot of gardening Impatiens that were rapidly killed by downy mildew in the landscape.
Gardens of the Big Bend: A New Botanical and Teaching Garden in North Florida

by Gary Knox, University of Florida/IFAS North Florida Research and Education Center

Gardens of the Big Bend is a new botanical and teaching garden located on the grounds of the University of Florida/IFAS North Florida Research and Education Center in Quincy. The goals of these gardens are to evaluate new plants, promote garden plants adapted to the region, demonstrate environmentally sound principles of landscaping and provide a beautiful and educational environment for students, visitors, gardeners and Green Industry professionals. Located just 10 miles south of the Georgia-Florida border in Florida’s “Big Bend,” the Gardens are in USDA Cold Hardiness Zone 8b and have sandy-clay soils more typical of continental conditions than those of peninsular Florida.

Gardens of the Big Bend is a series of gardens, each with a theme or plant focus:

- **The Discovery Garden** contains over 170 species or cultivars of new, improved or underutilized trees, shrubs and perennials. The garden’s purpose is to help gardeners, landscapers and nursery growers “discover” new plants.

- **The Magnolia Garden** is part of the National Collection of Magnolia in recognition of its more than 200 species and cultivars, including some of the rarest magnolias in the world (http://www.publicgardens.org/napcc).

- **The Crapemyrtle Garden** includes six species and over 100 cultivars.

- **Conifers** can be found throughout the Gardens but are featured in the new “Jurassic” garden. More than just pines and junipers, the Gardens contain over 50 conifer species and cultivars, many of which are rare. In recognition, the American Conifer Society has designated the Gardens as a “Conifer Reference Garden”, the only one in Florida, and the southernmost in the U.S. (http://conifersociety.org/organization/reference-gardens/).

- **The Dry Garden** is the newest addition and contains about 140 different types of agave, aloe, cactus, dyckia, sedum, yucca, bulbs and other dry-adapted plants. It consists of a south-facing berm of boulders, gravel and sand about 160 feet long, 35 feet wide and 6 feet tall.

- **Other gardens** feature native, shade, Southern heritage, and weeping plants as well as collections of Japanese hydrangea and shrub roses. Additional gardens will be installed as time and funding permit.

Gardens of the Big Bend formally began in 2008 thanks to the happy marriage of a new volunteer organization coupled with this University of Florida off-campus facility and plant collections I developed as part of research and extension projects. The volunteer organization, Gardening Friends of the Big Bend, Inc., formed in 2007 to support horticulture research and education. This group quickly seized on the idea of transplanting these existing plant collections into a series of gardens. Accordingly, its members hold fundraisers, provide volunteer labor and sponsor extension programs to raise awareness, provide funds and support garden development and maintenance.

Gardens of the Big Bend is located in Quincy at I-10 Exit 181, just 1/8 mile north on Pat Thomas Highway (SR 267). The gardens are free and open to the public during daylight hours year-round; professional staff are only available during normal business hours. To make a gift to the Gardens, please go to https://www.uff.ufl.edu/OnlineGiving/FundDetail.asp?FundCode=017075. Come visit us and watch the Gardens grow!

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**Fig 1:** Gardens of the Big Bend

**Fig 3:** Weeping false butterfly bush
Operation Cleansweep
by Shawn Steed, UF/IFAS Extension Hillsborough County

If you have old chemicals and want to get rid of them at no cost (up to 500 lbs.) then here is a program for you. Again in 2014-2015, Operation Cleansweep will provide farmers, nursery operators, golf course operators, and pest control services a one-time safe and economical way to dispose of their cancelled, suspended, and unusable pesticides. Now is your chance to get rid of those jugs and bags in your pesticide shed that are unknown products, before you have an inspection. You will need to schedule a pickup. Your business can register for free pickup and disposal of cancelled, suspended or unusable pesticides by email (cleansweep@freshfromflorida.com) by phone at 877-851-5285. If you want to get rid of more than 500 lbs of material then there are provisions for that. You will need to pay a reduced rate but a fee will need to be paid on extra poundage. Click on the hyperlink for more information and contacts. [http://www.dep.state.fl.us/waste/categories/cleansweep-pesticides/](http://www.dep.state.fl.us/waste/categories/cleansweep-pesticides/)