



# Berry/Vegetable Times

## May 2005



### From Your Extension Agent ...Spring Vegetable and Blueberry Diseases

new lesions will have that “wet greasy” appearance. The heavy rains and prolonged wetting of the plants will spread the bacteria through your crop rapidly. It is very important to correctly identify the disease you are trying to control so that you will use the right product for the problem. Rain will also promote gummy stem blight so melon fields should be scouted regularly. Please see the article on gummy stem blight and strobilurins in this issue.

**In this issue...**

Cucurbit Pollination - What Growers Need to Know	Page 2
Strobilurins and Gummy Stem Blight Control for Melons	Page 4
Recent Experiments Yield New Ideas: Colletotrichum Crown Rot	Page 5
Strawberries in Southwest Spain	Page 5
Interested in Spanish Pesticide License Training?	Page 6
Special Local Weeds Label for Gramoxone Max for Postharvest Plant Dessication of Strawberries	Page 6

It seems like each year we talk about the weather being different but this spring has been wonderful since it has lasted longer than the normal 2 weeks. We also have had more rainfall in March and April this year since these are historically dry months for us. This change in the weather has affected the diseases we are seeing. Diseases we are on the lookout for this time of year in our spring vegetables are powdery mildew, downy mildew, gummy stem blight and bacterial spot. Usually downy mildew is a big problem and bacteria is not as bad since the spring weather is usually dry. The prolonged cool weather this spring has been ideal for powdery mildew to be a problem longer because it likes the mild temperatures. In crops in the south part of the state downy mildew has been a big problem. Around our area instead of the usual downy mildew this time of year I have seen a lot of bacterial lesions on the leaves of various crops. When you first look at the field all the brown leaves give the appearance of downy mildew in the crop. On closer inspection you will not see any fungal growth on the leaf lesions and



In blueberries there have been a number of plants on various farms that have had berry clusters on small twiggy growth shrivel and the stem die back. Also other small stems on the plant may be turning brown at the tip of the stem. I believe this is Botryosphaeria stem blight. During spring pruning the twiggy growth should be cleaned out and any large canes that have died back should be pruned back to healthy looking wood. Also I have noticed leaves that already

*(Continued on page 2)*

**Calendar of Events**

**June 5-7 Florida State Horticultural Society Annual Meeting. Marriott Tampa, Westshore. [www.fshs.org](http://www.fshs.org).**

**June 14 Pesticide License Testing. Hillsborough County Extension Office. Seffner. 9 am. For more information call Dave Palmer, 813-744-5519, ext 103.**

**July 12 Pesticide License Testing. Hillsborough County Extension Office. Seffner. 9 am. For more information call Dave Palmer, 813-744-5519, ext 103.**

**Aug. 16 & 17 Florida Strawberry Growers Association 2005 Agritech Education Session and Trade Show. Arthur Boring Building, Strawberry Festival Grounds, Plant City. For more information contact FSGA, 813-752-6822.**

A monthly newsletter of the University of Florida IFAS Florida Cooperative Extension Service, Hillsborough County  
 5339 CR 579, Seffner, FL 33584  
 (813) 744-5519 SC 541-5772  
 Alicia Whidden, Editor Mary Chernesky, Director and  
 Gulf Coast Research and Education Center  
 14625 County Road 672, Wimauma, FL 33598  
 (813) 634-0000 SC514-6890  
 Christine Cooley, Layout and Design  
 Craig K. Chandler, Co-Editor  
 Jack Rechcigl, Center Director  
<http://grec.ifas.ufl.edu>

have reddish spots and this is most likely *Phyllosticta* leaf spot. The rains we have been having are starting this leaf disease early this year. This will eventually cause premature leaf drop later in the summer which will adversely affect next year's fruit crop. Fungicide sprays will keep this leaf spot disease in check and keep the leaves on your bushes till fall.

*Alicia Whidden*

Hillsborough County Extension  
813-744-5519, ext.134  
ajwhidden@ifas.ufl.edu

*Hillsborough County Extension Fact Sheet 05-1*

## Cucurbit Pollination - What Growers Need to Know

P. R. Gilreath, Manatee County  
Extension Service  
A. J. Whidden, Hillsborough  
County Extension Service

An estimated 15 to 30 percent of the food we eat directly or indirectly depends on the pollination services of bees. Some of the crops where this is especially critical are the cucurbits, such as squash, watermelons, cantaloupe and cucumbers. Some wild species of bees can be very efficient pollinators of cucurbits, such as bees in the genus *Peponapis*, including squash or cucurbit bees. Honeybees, however, by virtue of sheer numbers, overwhelm the native bees and are thus the pollinators of choice. In recent years, an estimated 50% of commercial bee colonies have been destroyed by either disease

or insect pests, such as the varroa mite, an external honeybee parasite that attacks both the adult and the brood and ultimately will weaken and kill the entire hive. At the same time, wild bee populations have also declined. While the mites that are so devastating to domesticated bee populations have much less effect on wild bees, pesticide use and habitat loss have had a major impact. Although wild bees will never have sufficient numbers to provide enough pollination for large commercial crops, we still should try to encourage their presence as a type of "insurance policy".

Poor pollination, and thus poor fruit set, of cucurbits can be caused by a number of factors, including both environmental and human influences. Depending on the weather and season, host plant flowers may be open at various times or for varying lengths of time and bees must be present during that time. Most cucurbit flowers are only open for one day, thus environmental conditions can be critical. Bees do not fly when it is very windy, cold or rainy. When these conditions exist, flowers may not receive sufficient activity for optimal fruit set and/or development and may abort. Since many cucurbits require as many as 8 to 10 bee visits for optimal pollination, fewer visits may result in poor pollination and thus misshapen fruit due to poor seed development. Flowers are often open very early in the morning, sometimes as early as 5:30 a.m., and are usually closed before noon. They may close earlier if it is hotter, thus there is

a very narrow window of opportunity for pollination to occur. Growers who really want to know what is going on in their fields in terms of bee activity need to be out at the crack of dawn. Much of the pollination takes place between dawn and late morning. Wild bees will often visit first, with domesticated bees following shortly behind. Don't shortchange the benefits of the wild bees and be sure and take into account the peak activity periods of both wild and domesticated bees when making pesticide selection and application timing decisions.

Although bees can fly greater distances, they are most efficient if they can forage within about 200 yards of the hive, thus it helps to spread hives around a field instead of just grouping them in one area. For large fields where the center of the field is less accessible, it may help to put more colonies in the center-most groups along the field edge to increase competition and encourage bees to forage deeper into the field. Honeybees typically set up a 'priority list' of nectar sources. Some pollen is collected as a source of protein for developing bees; however, the bees' primary task is collecting nectar. Growers can only hope that their crop is high on this 'priority list'. Often orange groves, weeds or other native species are a more attractive source. Once bees begin bringing in nectar from a certain plant, they will continue working that type of plant until the nectar supply is depleted, thus it is important that the target crop

*(Continued on page 3)*

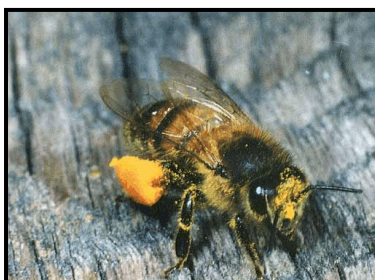


Honeybee on citrus bloom. (Photo: Thomas Wright, UF/IFAS)

plant is the one they find first. Growers are often interested in chemical attractants to increase the attractiveness of the target crop. In general, attractants are helpful only under marginal pollination conditions and have not worked consistently. Remember that bee attractants encourage bee visitation, not necessarily bee pollination. If the flowers are not appealing or there are no bees in the area, nothing will draw them in from a distance.

Most growers have colonies brought in before bloom, but bees will not just sit there and wait on the target crop to bloom. One way growers can help insure that bees work the desired crop is to move the hives in only after the crop begins producing male flowers. Male flowers are produced first, often from 3 to as many as 10 days before female flowers, depending on the crop. This way the bees have a source of nectar as soon as they come in and will be less likely to look elsewhere. A good balance of blooms is also necessary, and more male flowers are produced than female, often 3-4 times as many, but this can be influenced by temperature and day length. Some growers have noted that

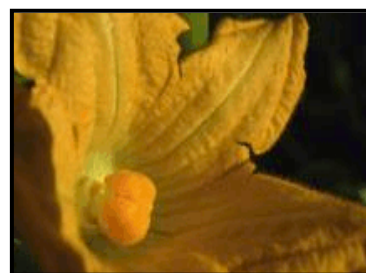
with squash, bees often seem more attracted to female flowers. This can be influenced by variety, but another factor may be the flower structure. Male blooms have 'covered' nectaries, thus it's harder for bees to reach the nectar. Research in Tennessee on zucchini and straight neck squash indicates that while male nectar may be 5-10% sweeter, a greater amount of nectar is produced by female blooms, thus making them a more productive, and possibly more attractive, source. Cantaloupe blooms are visited for both nectar and pollen, but are generally poor nectar sources. Cucumber is not a rich source of pollen or nectar but bees readily visit if there are no more attractive plants nearby.



Bee with pollen load. (Photo: P. Gustofsson, Sweden)

There can be other factors influencing pollination. In California, cucumber pollination is often poor when it is very hot and dry, as the pollen viability drops and pollen tube growth is affected. Also, cucumber beetles tend to feed on the flowers and insecticides used to kill the beetles also may kill foraging bees. The strength of the hive is also important. A colony can have as little as 10,000 to more than 60,000 bees at any one time. Recommendations in the past

were for 1 hive per acre. Most sources now recommend more hives, usually 2-3 per acre, to insure adequate pollination. Each colony must also have adequate food supplies. Although bees may be actively collecting pollen and nectar from a watermelon field, the overall flower density is low and they will not be able to sustain themselves solely on this nutrient source; thus, a supplementary source in the form of stored honey and pollen will be needed to maintain a strong colony.



Open squash bloom. (Photo: Eric Zamora, UF/IFAS)

While there is little a grower can do about the weather, an understanding of beekeeping practices and bee biology will help in the decision-making process. The judicious use and timing of pesticide applications is also an important factor. A table of common insecticides and miticides and their relative risk to honey bees can be found online at <http://pubs.caes.uga.edu/caespubs/pubcd/b11106-w.html> Growers need to be aware of the many variables that can influence effective pollination of cucurbit crops. They should work with a reliable beekeeper and ask questions to insure they are getting quality hives to help insure a profitable crop.

(Continued on page 4)

**References:**

Delaplane, K. S. , P. A. Thomas and W. J. McLaurin. 1994. Bee Pollination of Georgia Crop Plants. University of Georgia Extension Bulletin 1106.

Hodges, Laurie and Fred Baxendale. 1995. Bee Pollination of Cucurbit Crops. Nebraska Cooperative Extension NF91-50.

McGregor, S. E. 1976. Insect Pollination of Cultivated Crop Plants. USDA/ARS Handbook no. 496.

Mussen, Eric. Extension Apiculturist, University of California, Davis. 2004. Personal communication.

Roach, John. 2004. Can Wild Bees Take Sting from Honeybee Decline? National Geographic News. October 20, 2004.

Sanford, Malcolm T. 2003. Beekeeping: Watermelon Pollination. UF/IFAS RF-AA091.

Skinner, John. Extension Entomologist, University of Tennessee, Knoxville. Personal communication.

**Strobilurins and Gummy Stem Blight Control for Melons**

Alicia Whidden

In the last issue of the newsletter we had a report from Chemically Speaking about not using strobilurins in melons for gummy stem blight control. Unfortunately the article did not contain the complete story which was brought to Phyllis Gilreath's

attention and she contacted the researchers in Georgia who had done the work. In their work the researchers observed that using strobilurins seemed to make the gummy stem blight worse. This observation does not hold for the product Pristine®. Pristine® is a combination of a pyraclostrobin which suppresses anthracnose and downy mildew and boscalid which is excellent at gummy stem blight suppression. UF pathologists recommend Pristine® for gummy stem blight control. Hopefully this will clear up any confusion caused from the previous article.

**Summary of the 2004-05 Entomology Research Program at the Dover Center**

James F. Price, Curtis Nagle, and Silvia Rondon

The 2004-05 strawberry research season at Dover (Plant City, Florida) was very productive for the GCREC entomology program. From early-November until mid-April, we had biological control and chemical control studies in the field and all went remarkably well.



*Farm workers helping with the release of predatory mites in the field (Credit. UF/IFAS)*

In the biological control area, we seem to be finding that the *Phytoseiulus persimilis*, predator of spider mites, is a better suited for the Plant City area than is the *Neoseiulus californicus* predator; however, *N. californicus* seems to come on strong later in the season. In Gainesville and Charleston, South Carolina, it looks like the *N. californicus* is all around better suited. More investigations are needed to confirm these findings.



*Application of insecticides/miticides on UF chemical trial (Credit. UF/IFAS)*

Acramite®, Agri-Mek®, experimental FujiMite® (Nichino America), Kanemite®, experimental Oberon® (Bayer), Savey®, and Zeal® worked exceptionally well for spider mite control in various programs of application. Florida strawberry farmers are fortunate to have so many good miticides of various modes of action available at one time and to have the prospect of more good ones to arrive in the near future.

A second year of applying Admire® imidacloprid via drip irrigation 2-weeks before the first fall harvest draws us to conclude that this action should keep aphids from being a problem for the entire season.

*(Continued on page 5)*

Actara® thiamethoxam applied once as a foliar spray controlled aphids very well and is a very beneficial addition to techniques available to Florida strawberry farmers.

We are looking forward to the next season!

## Recent Experiments Yield New Ideas: Colletotrichum Crown Rot

Jim Mertely and Natalia Peres

Last season, several field experiments were carried out in Dover to find better ways to control strawberry diseases. Some of the results were surprising. We would like to describe one experiment here and share the results from other experiments in future articles.

Crown rot diseases typically appear after plant establishment in November and December. Infected plants collapse and die. Crown rot may be caused by several organisms, but in Florida, the anthracnose fungus *Colletotrichum gloeosporioides* is frequently involved. This fungus occurs naturally on native vegetation and is carried into fields by wind, especially during rain storms. Fungicides could be used to protect young plants against these incoming spores. However, little is known about which fungicides are effective and when they should be applied.

In December, fungicides were applied two days before or one day after an infection event. The infection event involved

spraying plants with a spore suspension of *C. gloeosporioides*. Over time, inoculated plants that had not been protected by fungicides began to collapse and die. By mid-February nearly 24% of the untreated plants were dead. Applications of Abound, Cabrio, Switch, and Topsin M made before or after inoculation cut these losses at least in half. No plants treated with Captan before inoculation were lost, but 15% of the plants treated one day after inoculation died. Oxidate was ineffective whether applied before or after inoculation. By the end of the season (March 23), 72% of the unprotected plants were either collapsed or dead. However, only 8% of the plants treated with Captan before inoculation died, while only 24% of the plants treated with Topsin M after inoculation died. Captan was an excellent protectant when applied before inoculation and Topsin M showed good curative activity when applied one day after inoculation.

This experiment suggests that regular applications of Captan after crop establishment should reduce losses to *Colletotrichum* crown rot. Applications of Topsin M after rain events in the fall may also be helpful in fields with a history of the disease. We hope to confirm these findings during the upcoming season.



## Strawberries in Southwest Spain

Craig Chandler

On May 3<sup>rd</sup>, 4<sup>th</sup>, and 5<sup>th</sup>, Jim Price, Natalia Peres, Jack Rechcigl (GCREC Director), Al Herndon (Ferris Farms), and I toured strawberry fields and packinghouses in southwestern Spain, along with our hosts, Carmen Sanchez and Naty Osa of Ekland Marketing Company.

Spain is the second largest producer of strawberries in the world (the U.S. is number one), and 85% of Spain's strawberries are produced in the Atlantic coastal area of Huelva. The fall and winter climate of southwest Spain is cooler than that of west central Florida, so strawberries are grown under clear plastic tunnels to "advance" the crop and allow for winter production.

Fresh dug, leaf-off plants are planted in October, with harvest generally beginning by the first week of February and continuing until sometime in June or early July. Most transplants are obtained from high elevation nurseries located in north-central Spain.

Until recently, the Huelva industry relied almost exclusively on a single cultivar at a time. The industry started in 1964 with 'Tioga', and followed in succession with 'Douglas', 'Chandler', 'Oso Grande', and 'Camarosa'. Now it is becoming accepted in the industry that more than one cultivar is needed to produce high quality fruit over the entire five month harvest season. A combination that is currently being used successfully by some growers is that of

'Festival'/ Candonga<sup>®</sup>. 'Festival' excels during the early to mid season, while Candonga<sup>®</sup>, a new cultivar from the Spanish nursery company Planasa, excels during the mid to late season.

The standard production system in Spain is the two-row bed system, where beds are fumigated with a 50-50 mixture of methyl bromide/chloropicrin and covered with black polyethylene mulch. But increasingly, growers are converting to a system where plants are grown in peat, rockwool, or coconut fiber filled bags. The bags are typically used for several seasons and then replaced. Water and fertilizer is supplied to each bag via drip tubing.

Fruit is usually divided into at least two classes by the picker. Ripe fruit is placed in wooden boxes that hold about 2 kg (4.4 lbs) of fruit. This fruit, which is not suitable for long-distance shipment, is sold to the domestic market. Mature, but not fully ripe, fruit is placed in clear plastic containers (called punnets by Europeans). These containers hold between 400 and 500 grams of fruit, and are similar to our 1 lb clamshell containers, excepts that they don't have lids). This fruit is typically shipped to other western European countries, primarily Germany, France, and the United Kingdom. A third class of fruit includes fruit that are small, misshapen, or over-ripe. This fruit is sold for processing.

Fruit in the clear plastic containers is brought to the packinghouse and cooled to maybe 45° F and then inspected and a plastic lid placed on the

container by hand. Or various plastic wraps are applied mechanically to seal the container. When fruit prices are high, packinghouse operators have the ability to weigh each container automatically, shunting containers in three directions based on whether they are the correct weight, too light, or too heavy. Then workers can add fruit to the containers that are too light and remove fruit from the containers that are too heavy.

### Interested in Spanish Pesticide License Training?

Manatee County Extension is trying to set up a time in June to have a 2 day training/testing course for the Private Applicator Pesticide License. The training will be in Spanish. Cesar Asuaje from Palm Beach County Extension has agreed to come teach the course. Since he will be traveling there is a 20 person minimum needed to hold the course. The first day will be training for the General Standards exam with the exam given in the afternoon. The second day will be training for the Private Pesticide license and the test will be given in the afternoon. Both tests must be passed to receive a Private Applicator License. Remember the test is given in English but having the training in Spanish has resulted in better scores on the tests for others who have taken the training. If you are interested contact Phyllis Gilreath or Betty at the Manatee County Extension

Service at 941-727-4524 for more details.

### Special Local Weeds Label for Gramoxone Max for Postharvest Plant Dessication of Strawberries

William Stall, *Vegetarian* 02-2005

A special local needs label (24C) has been issued for the use of Gramoxone Max (Paraquat) herbicide for use as a Postharvest desiccant in strawberries. Gramoxone Max is labeled as a broadcast spray at 1.3 pts per treated acre for the dessication on strawberry plants following harvest.

A nonionic surfactant or a crop oil concentrate must be added to the finished spray. Applications are to be made where harvest operations have finished for the season. More than 3 applications may not be made and more than 3.9 pints of Gramoxone Max herbicide may not be made per acre per season

*The use of trade names in this publication is solely for the purpose of providing specific information. It is not a guarantee or warranty of the products names and does not signify that they are approved to the exclusion of others of suitable composition. Use pesticides safely. Read and follow directions on the manufacturer's label.*

## Pesticide Registrations and Actions

### Chemically Speaking

- Based on a request by AMVAC, use of the herbicide Dacthal® (DPCA) will be terminated for a number of crops. Those of importance to Florida include beans, cucumber, eggplant, kale, pepper, potato, sweet potato, squash, turnip, and yam. (*Federal Register*, 2/16/05).
- Based on a request by Dupont, tolerances are approved for use of the herbicide Assure® (quizalofop). Tolerances of importance to Florida include snap bean, cowpea hay and forage. (*Federal Register*, 2/16/05).
- Based on a request by Syngenta and IR-4, tolerances are approved for use of the insecticide/miticide Agri-mek® (abamectin). Tolerances include avocado, herbs (excluding chives), mint, fruiting vegetables (group 8), leafy vegetables except brassica (group 4) and goat/hog/poultry/sheep meat and meat byproducts. (*Federal Register*, 2/16/05).

## Pesticide Potpourri

### Chemically Speaking

The UF/IFAS Pesticide Information Office collaborates with the Southern Region IPM Center, located at North Carolina State University. The website maintained by the Center has many pesticide related data

sources such as the International Maximum Residue Limit Database, and the site can be browsed without a username or password. Please review some of these sources at: <http://www.sripmc.org>.

## Site Approved for Strawberry Museum and Hall of Fame

On Tuesday, February 2, 2005, the Hillsborough Board of County Commissioners voted unanimously to transfer property to The Florida Strawberry Research and Education Foundation for the development of a Florida Strawberry Museum and Hall of Fame.

The 21-acre parcel was the location of the UF/IFAS Gulf Coast Research and Education Center in Dover, the only research center in the nation solely dedicated to strawberry research. The UF faculty at the Dover center have now relocated to the new Gulf Coast REC in Balm (Wimauma).

The strawberry community has long sought a means to display the unique archives of the century old Florida strawberry industry. The vacating of the Dover facility, itself rich in strawberry history, made the location for the Florida Strawberry Hall of Fame and Museum a natural.

This is but the first step towards making the Museum and Hall of Fame a reality. FSREF is looking for artifacts and development resources within the community. If you have an

interest in being a part of this endeavor, contact the Growers Association at (813) 752-6822.

## GCREC New Diagnostic Clinic Opens

The GCREC Diagnostic Clinic is now officially open at the new regional research center in Balm (Wimauma). Dr. James Mertely from the Dover Center is available to receive samples and/or answer questions regarding plant diseases. Growers and industry representative can find the necessary forms and instructions for submitting samples at <http://gcrec.ifas.ufl.edu>. The service is free of charge and results can be expected within 3 to 7 days depending on the situation. Operating hours for the clinic are 8 am to 5 pm, Monday through Friday. If you have questions, call (813) 634-0000.

## Dedication of University of Florida's New Gulf Coast Research and Education Center

Over 600 guests were on hand at the University of Florida's Gulf Coast Research and Education Center (GCREC) on April 1st for the dedication of a new facility at Balm (Wimauma). The new \$16 million regional facility, authorized by the Florida Legislature in 2003, combines

(Continued on page 8)

