



Berry/Vegetable Times

November 2005



From Your Agent... The BMP Manual for Vegetables

Well, after 4 years of talking about a BMP plan for the state's row crops the "Water Quality / Quantity Best Management Practices for Florida Vegetable and Agronomic Crops" manual is at any moment going to be adopted as rule.

A little background first: BMPs are defined as a practice or combination of practices determined to be the most effective and practicable on-location means, including economic and technological considerations, for improving water quality in agricultural or urban discharge. The purpose of this is to reduce water pollution or meet TMDLs. TMDLs stand for total maximum daily loads and means the maximum amount of a pollutant a water body can receive and still maintain its water quality standards. In Florida, the Florida

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2005 Calendar of Events

Nov. 8 and Dec. 13 Pesticide License Testing. Hills. Co. Extension Office, Seffner. 9 am. For more information call Dave Palmer, 813-744-5519, ext 103.

Nov. 16 Frost/Freeze Protection Workshop for Strawberry, Blueberry, and Ornamental Plant Nursery Operations. Hills. Co. Extension Office, Seffner. **Please note this workshop has been cancelled.**

Dec. 8 Cucurbit Production Workshop, GCREC, Balm. Admission free. For more information contact Alicia at 813-744-5519, ext. 134 or Phyllis at 941-722-4524, ext. 229. Please RSVP. More information on flyer in newsletter.

Dec. 14-15 Spanish Pesticide License Training and Testing. Manatee County Extension Office, Palmetto. 8:30-5:00. \$10/day. CEUs offered for those who already have a pesticide license. If seeking a pesticide license you must attend both days. For more information or to register call Betty at 941-722-4524.



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"Worms" are Fall Strawberry Pests

James F. Price and Silvia I. Rondon

For the first few weeks after the strawberry plant establishment period, growers must be alert to infestations of lepidopterous larvae ("worms"). Scouting should start as soon as transplant establishment irrigation ends to determine pest numbers and to be in position to choose among the best control methods. This article discusses the early-season worm problems.



Fig. 1. Larva of the fall armyworm (Credit. J.L.Capinera, UF). Larva has two characteristic dark bands along the side of the body.

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There are two principal species of worms that cause early losses in the Plant City production area. These are the fall armyworm (Fig. 1) and southern armyworm (Fig. 2). These worms are the immature stage of the Lepidoptera family of moths and develop through a complete metamorphosis including egg, plant eating larvae (worm), hidden (moth) stage.

Eggs of both are laid in masses and covered with the mother's body scales (Fig. 3). Larvae feed on young strawberry leaflets and buds as they develop. Dark, small fecal pellets on the tops of the leaves or on the plastic mulch indicate larval feeding.



Fig. 2. Larva of the southern armyworm (Credit J.L. Capinera, UF). Larva has triangular patterns on its upper surface.



Fig. 3. Egg masses of armyworms (Credit. J.K. Clark, UC).

Scouting should be performed once or twice per week during the early season to check for young leaves with holes and missing margins. When larvae are found, pesticidal interventions are usually warranted and most insecticides offer better control when they are applied at early stages of larval development. Several products are available to control these worms. SpinTor® and Entrust® (both have the same ingredient) and formulations of *Bacillus thuringiensis* ("B.t.") can be effective and neither of these is very hazardous to beneficial arthropods, although, of the two, B.t. is the less damaging. For instance, in moderate usage these insecticides are compatible with *Phytoseiulus persimilis*, the predatory mite widely used to control the twospotted spider mite. Lannate® Brigade® and Danitol® can also be effective; however, they are broad-spectrum insecticides that have a detrimental effect on many parasites and predators. None of the latter three insecticides should be applied if *P. persimilis* predators have been released. These predators should not be released within 3 weeks of a Lannate® application or within 6 weeks of a Brigade® or Danitol® application.

Good control of early-season worms helps prepare the crop for the high-value, early-season yields. This alone is sufficient to give worms very special attention at this time of the year.

The Powdery Mildew Season is Coming...

Jim Mertely and Natalia Peres

Florida strawberry growers often find themselves fighting powdery mildew this time of the year. Powdery mildew is caused by *Sphaerotheca macularis*, a fungus that typically colonizes strawberry leaves, flowers,

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and fruit. Infected parts are covered with a white powdery growth that may have a distinctive dusty or fishy odor. The growth consists of fungal strands (hyphae) supporting chains of barrel-shaped spores (conidia) that are easily dislodged in the wind. Powdery mildew infections are commonly observed on the undersides of the leaves (Fig. 1). Cultivars react differently to infection. The fungus grows sparsely on leaves of ‘Camarosa’ and ‘Camino Real’ and may be hard to see with a hand lens. However, the leaves react fairly rapidly by forming irregular brown spots with red to purple margins. ‘Sweet Charlie’ and ‘Winter Dawn’ support more extensive fungal growth. Their leaves react by rolling upward along the edges (Fig. 2), but eventually the infected areas turn purple and brown as well. Early flower infections may cause the fruit to dry up and abort. Later infections produce seedy fruit or fruit with visible growth on the seeds (Fig. 3).

S. macularis is favored by moderate temperatures and high humidity, but not rain. In west central Florida, strawberry powdery mildew is most troublesome in November and December. Leaf infections decline as the temperatures drop in December and January, but fruit infections may persist into early spring.

Powdery mildew is a disease the grower needs to find early, before it has had a chance to develop extensively in the field.

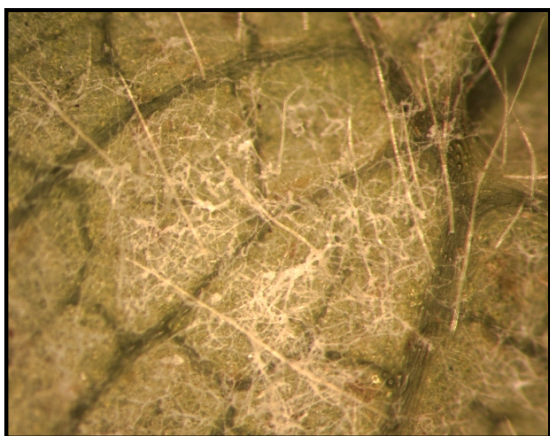


Fig. 1. PM growth on underside of leaf.



Fig. 2. Leaf curl caused by PM.



Fig. 3. PM growth on “seedy” fruit.

When many leaves are colonized, vast numbers of spores are produced, and the disease becomes difficult to control. Fields should be scouted regularly after the transplants are watered in, looking for upturned leaves, and deliberately turning leaves over to look for powdery growth. When powdery mildew has been found, special fungicides may be needed to suppress the disease, at least until winter weather arrives.

The protectant fungicides captan and thiram are often applied during the early season for general disease control. Unfortunately, they are not very effective at controlling powdery mildew. Some fungicides labeled for powdery mildew control include **wettable sulfurs** (Kumulus,

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Microthiol, Sulfur 6L, Thiolut, etc.), **triazoles** (Nova and Procure), **strobilurins** (Abound, Cabrio, and Pristine), **spray oils** (JMS Stylet oil, Prev-Am, Saf-T-Side, Sporan, Trilogy, etc.), **bicarbonates** (Armicarb, Kaligreen, and Milstop), **biologicals** (AQ-10, Serenade, and Sonata), benzimidazoles (Topsin), and **hydrogen peroxide** (Oxidate). The wettable sulfurs have been used for years to suppress powdery mildew. However, they also suppress predatory mites, and can be phytotoxic when temperatures are high or when applied within two weeks of a spray oil application. Triazole fungicides will control powdery mildew when resistant populations are not present. Tank mixes of Procure plus thiram have worked well in our trials. The strobilurins are labeled for disease suppression, and may be a good alternation partner for a triazole. The bicarbonates are probably best used for disease suppression. Their effectiveness is reduced when combined with acidic fungicides or fertilizers. In addition, the crop should be monitored for signs of phytotoxicity. We have done little testing of the biological, spray oil, and hydrogen peroxide products for powdery mildew control here at the Gulf Coast Research and Education Center. However, some biological products will be tested this season.

Caution should be used when tank mixing unfamiliar products for powdery mildew control. Read the labels carefully for statements of incompatibility with other products or recommendations on how or when the product should be applied. If in doubt, consider using the old painter's test. Apply a test mixture to a couple of beds and make your observations. Signs of direct phytotoxicity usually develop rapidly, often within 1-2 days.

Many of the powdery mildew products mentioned above have only contact or protectant activity against the powdery mildew fungus. For this reason, applications should be made in sufficient water to thoroughly wet the plant, including the undersides of the leaves

where the fungus typically grows. This requirement may necessitate a higher spray volume than for regular applications made to small plants in November and December. Adjuvants such as spreader stickers can help increase coverage, but should only be used when recommended on the label. Fungicide applications for powdery mildew control are typically made at 7- to 14- day intervals.

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Department of Environmental Protection identifies impaired bodies of water and has primary responsibility to clean up the state's waterbodies. FDACS is responsible for developing and implementing the BMP manual.

As soon as the rule is passed, growers can sign up to participate in the program. First there will be a check list you will go over for the type farming operation that you have, which for most of you is plasticulture. You will list the BMPs you are currently using and any that you will be using in the future and then file a Notice of Intent (NOI) with the Florida Department of Agriculture and Consumer Services (FDACS). Additional information needed for the NOI is the property location, farm name, acreage and tax ID for the particular farm. For your part you will need to keep certain records (the manual will tell you which ones these are) and have a farm BMP plan. Once enrolled you will receive a waiver of liability and then will be granted a presumption of compliance. Also you will be eligible for cost-share programs in the future. Another **big bonus** is those who are signed up will not be required to conduct water quality monitoring which can get very expensive. Growers in the area who for years have been using plastic mulch and drip irrigation have been going many of the BMPs and will not find it difficult to participate in the program. If you would like a copy of the BMP manual get in touch with me. I will be happy to help you

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sign up. Also an implementation team should be set up after the first of the year to conduct educational programs and assist growers with on-farm assessment. It is important for everyone to participate in the BMP Plan so that in the future more stringent regulations are not imposed on agriculture.

Alicia Whidden

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2005-2006 Winter Weather Watch

Chris Oswalt, Citrus Agent, Polk/Hillsborough

The 2005-06 winter is predicted to be a “neutral”, El Niño Southern Oscillation (ENSO) phase. This means that the ENSO phase is neither El Niño nor La Niña. Historically devastating freezes in Florida have occurred in neutral years. The exception was the freeze of 1977 as the following table shows.

Freeze Event	Climate Phase
December 1894	Neutral
February 1899	Neutral
December 1934	Neutral
January 1940	Neutral
December 1962	Neutral
January 1977	El Niño
January 1981	Neutral
January 1982	Neutral
December 1983	Neutral
January 1985	Neutral
December 1989	Neutral
January 1997	Neutral

Growers should begin preparations for cold protection practice now in advance of this winter. One way to get off on the right foot is to attend one of the Winter Weather Schools offer by the Extension Service. The meeting

times and locations are listed in this newsletter. This is a great way to get the latest information on using weather information to better protect crops, and lunch is included. Don’t forget to pre-register!

Additionally, weather information can be obtained from the Winter Weather Watch. This program provides agricultural weather forecast information 24 hours a day, 7 days a week from November 15th thru March 15th. Included with the \$100.00 subscription price is a Winter Weather Watch Manual full of information to help growers understand forecasts and prepare for the winter. The cornerstones of the program are the daily county agricultural weather forecasts, weekly outlooks and additional freeze/frost weather forecasts from Fred Crosby, former Meteorologist-in-charge from the National Weather Service Tampa Bay. The Cooperative Extension Service has provided this program to growers now for over 40 years.

This year we are upgrading our ability to provide these forecasts on a continuous basis throughout the week and during freeze/frost nights. The new system will have a local access number in Tampa and a toll free 800-type number for subscribers throughout Florida. The new system will have a short push-button menu to allow growers to select only the forecasts products they wish to hear. This system will allow us to update individual forecasts throughout the night without having to re-record the entire message. A registration form for the Winter Weather Watch can be obtained by calling Gail at 863-519-8677 ext. 111.

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.

The Occurrence of *Colletotrichum* Crown Rot in North Carolina Certified Strawberry Nurseries*

Strawberry crown rot caused by *Colletotrichum gloeosporoides* was found in plantings of 'Chandler' at several certified nurseries in North Carolina this year. The following questions and answers are presented to explain its occurrence and how the N.C. certification program is addressing the problem.

Why did this disease become a problem in a few certified nurseries in 2005?

The fungus was able to contaminate some 'Chandler' plants in a one-acre field at one of the registered nurseries in 2004. This field had been inspected by NCCIA and certified to be free of *C. gloeosporoides* crown, runner, petiole, and leaf infections. But because only a very small percentage of the plants were apparently infected with *C. gloeosporoides* (probably less than 0.5%), it was virtually impossible to detect the disease.

Where did the initial inoculum come from?

This is not known for sure. However, we suspect that it came from infected sicklepod plants growing adjacent to the nursery. We do know that both registered and certified nurseries growing strawberry plants in North Carolina can become infected with *C. gloeosporoides* if precautions are not taken and protocols not strictly adhered to.

What is the likelihood that other nurseries will be affected or that infection will be found in other cultivars?

The risk is real. Thorough inspection and proper diagnosis of the pathogen is very important. We anticipate that workshops with nurseries and implementation of additional safeguards will reduce the likelihood of having *C. gloeosporoides* infections occur in nurseries but will not eliminate it.

Why was it not prevented by the existing protocols?

We did not fully appreciate the risk of *C. gloeosporoides* spreading from native weeds, such as sicklepod, and other plants to strawberry.

How do growers know if their supplier has infected plants?

Strawberry plants infected with *C. gloeosporoides* cannot be sold as "certified". 'Chandler' plants from nurseries where symptoms of crown (or runner) rot was *not* found were certified, while 'Chandler' plants from nurseries where symptoms of crown (or runner) rot was found were either destroyed or were not certified. The nurseries that intended to sell these "non-certified" 'Chandler' plants were told to inform their buyers the reason for non-certification. They could tell the purchaser that the plants met the other requirements for certification (trueness-to-type, quality, freedom from exotic diseases and pests) but could not be certified because of the presence of *Colletotrichum* crown rot disease in the nursery. This only pertained to 'Chandler'. Other cultivars were certified because no infected plants were found during inspections.

*This article was adapted from an article that appeared in the October 2005 issue of The Strawberry Grower (a newsletter of the North Carolina Strawberry Association).

Note to Florida Strawberry Growers concerning *C. gloeosporioides*

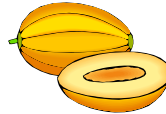
Jim Mertely

C. gloeosporioides is one of several species of *Colletotrichum* that causes anthracnose diseases of strawberry. The fungus is also present on native plants in Florida, and can move to strawberry during periods of warm, wet weather. Infected plants collapse and die one month to several months later from crown rot disease. Under Florida conditions, *C. gloeosporioides* does not normally infect strawberry flowers or fruit.

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Plant to plant spread of *C. gloeosporioides* is almost completely suppressed by regular applications of captan or thiram. Therefore, plants that were infected in North Carolina may die when transplanted into the production field, but further losses can be prevented by routine fungicide sprays.

Further information on Colletotrichum crown rot is given on our website <http://strawberry.ifas.ufl.edu>. Click on "Plant Pathology" in the index on the left hand side of the page, then on "Plant Pathogen Fact Sheets", and finally on "Colletotrichum Crown Rot". Copies can also be obtained at the UF Gulf Coast Research and Education Center in Balm.



Cucurbit Production Workshop
Thursday, December 8, 2005
 Gulf Coast Research & Education Center, Balm

If you grow watermelons, cantaloupe, squash or cucumbers, this meeting is a must. Learn about current pest problems, new control measures, varieties and irrigation/fertilizer management. Visit with vendor/sponsors to learn more about the latest control materials and what's coming for the future.

Agenda

- 1:30 pm **Cucurbit virus and insect problems.** New control materials.
Dr. Susan Webb, UF/IFAS, Extension Entomologist, Gainesville
- 1:55 pm **Major cucurbit diseases and control measures. Watermelon vine decline update.**
Dr. Pam Roberts, UF/IFAS, Pathologist, SWFREC, Immokalee
- 2:20 pm **Nematode problems in cucurbits. Life after methyl bromide?**
Dr. Joe Noling, UF/IFAS, Nematologist, CREC, Lake Alfred
- 2:40 pm **Weeds, weed competition and weed control.**
Dr. Bill Stall, UF/IFAS, Extension Weed Specialist, Gainesville
- 3:00 pm **Break** – Enjoy refreshments and visit with vendors.
- 3:30 pm **Fertilizer and irrigation management for cucurbits, including doublecropping.**
Dr. Eric Simonne, UF/IFAS, Extension Specialist, Gainesville
- 3:50 pm **Personal melons, melon pollinizers and new melon varieties.**
Dr. Don Maynard, UF/IFAS, Professor Emeritus, GCREC, Balm
- 4:10 pm **Squash, cantaloupe and cucumber variety update.**
Alicia Whidden, UF/IFAS, Extension Agent, Hillsborough County
- 4:30 pm **Adjourn**, visit with vendors

Meeting is free. Pre-registration is requested.
 Please call Alicia at 813-744-5519 or Phyllis at 941-722-4524.
 2 CEUs and 2.5 CCA credits have been approved.