Berry/Vegetable Times

September 2007

2007 Calendar of Events

Oct. 1 Restricted Use License training and testing for the CORE and Ag Row Crop category . Training for the CORE will be conducted from 8 - 10:30 followed by the test and training for the Ag Row Crop will be conducted from 1 -3 followed by the test. GCREC Balm. (813) 634-0000,

Oct. 9 and Nov. 13 Pesticide License Testing. Hillsborough County Extension Office, Seffner. 9 am. For more information call Mary Beth Henry, 813-744-5519, ext 103.

Oct. 16 Introduction to Blueberry Growing. 3:30. Polk County Extension Service, Stewart Building, 1710 US Hwy. 17-98 S, Bartow, Fl. 33830. Information about meeting is preliminary; contact Alicia Whidden for more information if interested. 813-744-5519, ext. 134.

Oct. 16 Florida Blueberry Growers Association Fall Blueberry Shortcourse. Polk County Extension Service, Stewart Building, 1710 US Hwy. 17-98 S, Bartow, Fl. 33830. Times and registration information to be determined. Contact Alicia Whidden, 813-744-5519, ext. 134 for more information to be provided if available.

FLORIDA AG EXPO

December 6 and 7, 2007 at Gulf Coast Research and Education Center– Balm http://flagexpo.ifas.ufl.edu.

A University of Florida/IFAS and Florida Cooperative Extension Service newsletter
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From Your Agent:
Looks like it will be a La Niña Winter!

The Southeast Climate Consortium has announced a La Niña watch which means that conditions are right for the development of a La Niña event and this development will be watched to see if it continues for the next one to three months. For those that attended this year's Agritech you heard Clyde Fraisse from UF say that there was a 60% chance of this winter being a La Niña event and 40% chance of it being a Neutral year. Events in the Pacific Ocean are continuing to look like it will be a La Niña which will go through the fall and winter.

For the past few months there have been lower than average water temperatures near the coast of South America and the colder water has been deeper than usual and this is the time of year La Niña usually forms. La Niña is when the sea surface temperatures along the equator in the eastern and central parts of the Pacific Ocean are several degrees lower than average and it lasts for at least five months. La Niña occurs every two to seven years.

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Greetings from the GCREC!

Gary Vallad, GCREC, Assistant Professor - Plant Pathology

I'm grateful for this opportunity to introduce myself and tell you a bit about my research background. I did my undergraduate and initial graduate studies at North Dakota State University, where I received my Master's in Crop and Weed Science studying the genetics of dry edible beans, *Phaseolus vulgaris*. I then migrated from plant genetics to plant pathology at the

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University of Wisconsin, Madison.

For my Ph.D. in Plant Pathology I was part of an interdisciplinary team of scientists investigating the use of bio-solids generated from local paper-mills as a soil amendment, and the impact of these amended soils on the health of potato, snap bean and cucumber grown in a 3-year rotation. The soils amended with bio-solids had a dramatic impact on diseases caused by soilborne pathogens, especially those caused by species of *Pythium*. More interesting, several foliar diseases were also suppressed, but only in field plots amended with composted bio-solids. I demonstrated that this foliar disease suppression was independent of plant fertility, but due to a phenomenon called induced resistance where plants exhibit an elevated defense response against pathogen attacks.

My post-doctoral studies at the University of California, Davis, focused on Verticillium wilt of lettuce caused by the soilborne fungus *Verticillium dahliae.* I worked closely with a lettuce breeding program to identify sources of resistance and to develop and release resistant varieties. I also studied the process by which the fungus colonizes the plant and developed cultural practices to lessen the economic impact of Verticillium wilt on lettuce production. I also initiated population studies to determine the origin of lettuce-infecting isolates and the potential role of infested seed in distributing these isolates.

My responsibilities at the GCREC are to support the vegetable and ornamental industries of Florida through research and extension. My research will focus on the diagnosis, remediation and management of vegetable and ornamental diseases using traditional and contemporary methods to understand plant-pathogen interactions, limit the impact of disease and improve crop production; with an emphasis on the development of economically sustainable control strategies. Current research efforts are focused on cultural practices to improve the efficacy of several methyl bromide alternatives, and the integrated management of tomato yellow leaf curl. Extension efforts will cater to the needs of local grower, industry, and public interests. I look forward to meeting everyone in the vegetable industry and county extension, especially with the start of a new growing season.

On a more personal level, growing up in rural North Dakota, I'm a natural outdoorsman who enjoys camping, fishing, hunting, and a good game of golf. However, I'm actually a native Floridian from Homestead, Florida. Half of my family tree still resides within the state, which was a great perk to return. With me I brought my wife of 14 years, Susana, my 12 year-old son, Lukas, and 2 year-old daughter, Alyssa. I know we are all excited about our new life in Florida, and the long awaited opportunities it presents…especially enjoying winter on the beach.

Again, I'm excited to be here and look forward to working with everyone in the vegetable industry to meet current and future challenges. **GO GATORS!**

Interesting FACT—

If you watch the hit TV show " Numbers" you know mathematical formulas can be used to help solve crimes. A mathematical formula can also be used to describe how seeds on a strawberry spiral and the curve of a nautilus shell. The formula is the Fibonacci sequence. This is where each successive number is the sum of the previous two numbers:

(0,1,1,2,3,5,8,13,21,34,55,89,144…)

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What La Niña means for us is that from October to March the weather will be warmer and drier for Florida, central and lower Alabama and central and south Georgia. La Niña weather can be good in some situations and bad in others. The dry weather is good for a decrease in strawberry fungal and bacterial diseases and might let you cut back on the number of fungicide sprays you need to apply but spider mites love warm dry weather so be sure to scout for signs of infestation. We may be facing severe water shortages in the spring and with dry warm weather it may be hard to keep spring crops watered well. Also if you have livestock on pasture or produce hay this will not be a good weather cycle for you. The Southeast Climate Consortium looked at past La Niña events and estimated the impacts if we have one this year. For central Florida in January 2008 the chance of having normal or above average rainfall is only 8%. The chance for it to be moderately dry which means rainfall amounts are slightly below normal to half the normal amount is 20%. Unfortunately the chance for conditions to be very dry is a whopping 72%.

Check out the Southeast Climate Consortium website at www.AgClimate.org for more information. Remember to think about the weather as you plan for your winter and spring crops!

Alicia Whidden
Hillsborough County Extension Service

New Herbicide Labels in Vegetables

William Stall, UF/IFAS Horticultural Sciences
Vegetarian Newsletter, 09/07

Rely (glufosinate) labeled in Potato Vine Desiccation. Rely herbicide has received labeling in Florida for the desiccation of potato vines before harvest. Apply Rely herbicide at the beginning of natural senescence of potato vines at 3 pints per acre (0.375 lb ai). Apply only one application per harvest. Thorough coverage of the potate vines to be desiccated is essential. Do not harvest potatoes until 9 or more days after application.

Prowl H2O (pendimethalin) Supplemental Labeling for use on Tomato and Pepper.
Prowl H2O may be applied to tomatoes and peppers (including bell pepper, chili pepper, cooking pepper, pimento, sweet pepper). Prowl H2O may be applied as a post-directed application to transplanted or established direct-seeded tomatoes and peppers at 1.0 to 1.5 pints per acre (0.475 to 0.7125 lb ai). Rainfall or irrigation is needed to activate the herbicide. If this does not occur, mechanical incorporation is needed. Prowl H2O is labeled for a broadcast pre transplant surface application also, but not to rows to be covered with plastic. Do not apply within 70 days of harvest.

Prowl H2O Supplemental Labeling for use on Strawberry. Prowl H2O may be applied at 1.5 to 3.0 pints per acre (0.7125 to 1.42 lb ai) at pre transplant time. Do not apply to the bed or row if plastic mulch is applied. Adequate rainfall or irrigation after application is needed prior to weed emergence for most effective weed control. Do not apply within 35 days of harvest.

Labeling for these herbicide uses must be in the possession of the user at the time of pesticide application.

Some Interpretations of Intrepid® and Sevin® Strawberry Labels

James F. Price and Curtis Nagle, GCREC

Pesticide labels communicate the lawful use of pesticides and applicators must comply with label provisions. Sometimes, though, the meanings of the label statements are subject to interpretation that can expand or restrict usage. This article discusses the interpretation of provisions stated on Sevin® (carbaryl) and Intrepid® (methoxyfenozide) labels.

Intrepid® has been available for over a year to control armyworms and other worms on strawberries. Its label for strawberries states the product should be used, "For early season applications only to young crops and small plants." Responsible folks at Dow Agrosciences (provider of Intrepid®) declare that this does not limit the use of Intrepid® to early season, but that it can be used at any time during the season.

This is good news for growers who wish to have an additional mode of action available for season-long armyworm control. Intrepid® is applied at 6 to 12 fluid ounces per acre per application and a maximum of 64 fluid ounces per acre per season.

Sevin® is available to control some beetles, worms, and tarnished plant bug in the pre-fruiting period (it has an unfortunate 7-day pre-harvest interval (PHI)). The Sevin® label states, "Do not plant rotational food or feed crops not listed on this or other carbaryl labels in carbaryl treated soil." There seems to be no end to the prohibited planting period. Responsible folks at Bayer Cropscience LP and at Drexel (providers of Sevin®) relate that the restriction is for 1 year following application. Additionally, the restriction is relevant regardless if Sevin® were to be applied to the soil or to the plant. Acceptable rotational food crops important in the Plant City area include tomato, pepper, eggplant, melons, squash, cucumber, bean, southern pea, okra, and others, but do not include onion.

Understanding the limitations of these labels results in more effective, safer, and compliant pest management.

The Concept of Yield Dispersion and Compression Due to Temperature

Steven MacKenzie and Craig Chandler

Over the last couple years we have been conducting studies to find better ways to predict fruit yield. Predicting yield in advance will always be a challenge to both growers and shippers. The primary reason why it is difficult to predict yield prior to a harvest interval is because the fruit development time (the time from flowering to harvest) for strawberry is dependent on temperature and temperature fluctuates throughout the season. If temperature remained constant throughout the season one could simply count the flowers opening over a predefined interval before a harvest and obtain a consistent estimate of yield. This scenario is illustrated in figure 1, case A. In this scenario there is a hypothetical cultivar in which the time from flowering to harvest is exactly 4 weeks at 63.5°F. If the temperature were to remain at exactly 63.5°F over the time fruit developed, flowers from the one week flowering interval depicted in figure 1 would all ripen during week five. Unfortunately, average temperature fluctuates from week to week resulting in phenomena that we have termed yield dispersion and yield compression. The concept of yield dispersion and compression is illustrated by two scenarios depicted in figure 1 in which temperature suddenly drops

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or rises during the harvest week. In scenario B, temperature is at 63.5°F from the beginning of flowering to the end of week four when fruit would just begin to ripen. During the 5th week temperature suddenly drops to 59°F and remains there. Fruit development times lengthen when temperature declines. For fruit just about to ripen (those which flowered on the Saturday of the flowering interval), temperature wouldn't effect the fruit development time that much because the fruit were almost fully developed. However, for fruit from flowers that opened later during the flowering interval the fruit development time would get substantially longer. The result of this is that only flowers from Saturday to Thursday of the flowering interval would ripen during the harvest week and yield would decline from that observed in scenario A. In scenario C, it is assumed that temperature remained constant over the first four weeks and suddenly rose to 68°F during the course of the harvest week and remained there. Because the temperature increased, fruit development times would shorten. They would also shorten to a greater extent for fruit from flowers opening later because the increase in temperature would have begun when these fruit were younger. The result is that not only would fruit from flowers open during the initial one week flowering interval ripen during the harvest interval, but fruit from flowers after this interval would ripen too. Ultimately, the yield observed during the harvest week in scenario C would be greater than that observed in scenario A. Scenario B, where temperature declined from the time flowers opened to when they produced fruit, is consistent with temperature behavior at the beginning of the season and helps explain why yields are typically more dispersed early on. Scenario C, where temperature increased from the time flowers opened to when they produced fruit, is more consistent with temperature behavior late in the season and helps explain why yields are more compressed toward the end of the season. An unfortunate byproduct of yield compression is that the increase in yield observed over a harvest interval comes at the expense of yields at other times. Temperatures typically fluctuate around historical averages and abnormal highs give way to abnormal lows which lengthen development times and produce yield shortfalls.

We have developed a yield prediction model for 'Strawberry Festival' that uses flower count data as an input. The model incorporates typical dispersion and compression trends

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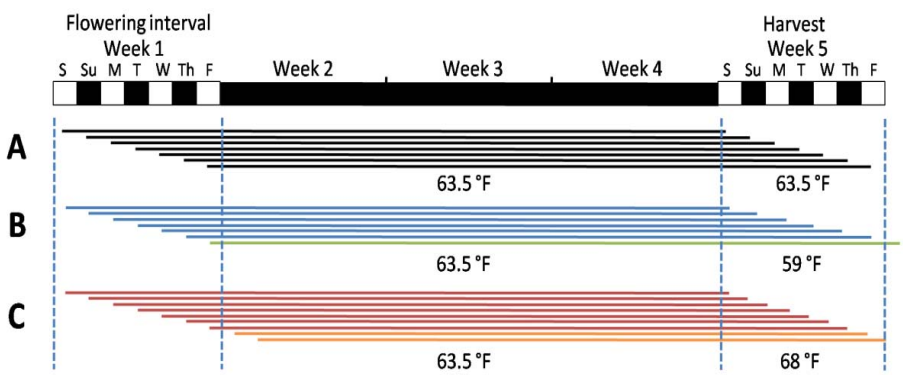

Figure 1. Narrow bars below the main bar represent the time between flowering and fruit ripening. Black bars are for fruit developing under scenario A, where temperature remains at 63.5°F throughout the 5 week period. Blue and green bars are for fruit developing under scenario B, where temperature is 63.5°F for 4 weeks and then declines to 59°F during the harvest week. Red and orange bars are for fruit developing under scenario C, where temperature is 63.5°F for 4 weeks and then increases to 68°F during the harvest week. The green bar depicts the development of a flower open during week 1 that produced a ripe fruit after the harvest interval (week 5) and the orange bars represent flowers open after the flower interval that produced ripe fruit during the harvest interval.

observed over the course of the season to come up with a forecast. The yield forecast can also be adjusted to accommodate abnormal expected temperatures when temperature forecasts become available leading into harvest weeks. Predicting yield is not as simple as predicting the number of fruit expected to ripen. Yield is also dependent on the size of fruit. Bigger fruit add weight and when fruit are large they are less likely to be culled. A method to predict fruit weight and the proportion of fruit culled is also included in the model; however estimating these variables reduces lead time and adds to model complexity. For this reason a model that doesn't rely on fruit size determination is also going to be available. If any individual would like to try the models they will be available soon in an excel spread sheet. To request the model equations and instructions on how to use them email your request to Steven MacKenzie (sjmac@ufl.edu).

New Tomato Breeder on Board at GCREC

Dr. Jeremy Edwards is just one of the newest additions to the GCREC faculty. A former employee of UF/GCREC, Dr. Edwards will be developing a new tomato breeding program that will compliment the current program directed by Dr. Jay Scott. After receiving his Ph.D. from Cornell University in plant breeding and genetics, Dr. Edwards worked as a postdoctoral researcher at the University of Arizona. He is committed to applied research aimed at cultivar development using state of the art techniques. Watch for more from this new breeder in future BVT issues.

FLORIDA AG EXPO

Session Preview
Thursday Morning
December 6, 2007

Moderator: Alicia Whidden, Hillsborough County Extension Service, Seffner

8:50 am **Welcome** *Dr. Jack Rechcigl, Director, UF/IFAS, GCREC, Balm*
Dr. Jimmy Cheek, Vice President, UF/IFAS, Gainesville

9:00 am **Increasing Efficiency with Harvest Aid Equipment for Vegetables** *Dr. Steve Sargent, UF/IFAS, Horticultural Sciences Dept., Gainesville*

9:20 am **Cucurbit Insects and Related Viruses** *Dr. Susan Webb, UF/IFAS, Entomology & Nematology Dept., Gainesville*

9:50 am **Using GIS Technology to Study Changes in Whitefly Density and TYLCV Incidence in Tomato?** *Dr. Dave Schuster, UF/IFAS, GCREC, Balm*

10:10 am **Break and Visit Vendors**

Alternative Crops for Florida Growers

10:40 am **The Three P's: Peaches, Plums and Persimmons** *Dr. Jeff Williamson, UF/IFAS, Horticultural Sciences Dept., Gainesville*

11:10 am **Raspberry – A Potential New Crop for Central Florida** *Dr. Craig Chandler, UF/IFAS, GCREC, Balm*
Dr. Adam Dale, Univ. of Guelph, Simcoe, Ontario

11:25 am **Development of Ethanol Production in Florida** *Dr. Bradley Krohn, President & CTO, US EnviroFuels*

11:50 **Lunch and Visit Vendors**

Special GCREC Fact Sheet

Charcoal Rot of Strawberries Caused by *Macrophomina phaseolina*

Natalia A. Peres and J.C. Mertely

Introduction

Charcoal rot, caused by *Macrophomina phaseolina*, is a relatively new disease in Florida. This disease was first observed in December 2001, when collapsed and dying strawberry plants from a commercial field were submitted to our Diagnostic Clinic. During the 2003–2004 season, *M. phaseolina* was isolated from dying strawberry plants taken from the original field and two additional farms. Since then, a few additional samples have been received in our Diagnostic Clinic every season. Affected plants are often found along field margins or other areas inadequately fumigated with methyl bromide. Charcoal rot has also been reported on strawberry in France, India, and Illinois.

Causal Agent and Symptoms

Symptoms caused by *Macrophomina phaseolina* are similar to those caused by other crown-rot pathogens such as *Colletotrichum* and *Phytophthora* species. Plants initially show signs of water stress and subsequently collapse (Fig.1). The cut crowns of affected plants reveal reddish-brown necrotic areas on the margins and along the woody vascular ring (Fig.2). To confirm a diagnosis, a sample must be submitted to a Diagnostic Clinic and the pathogen must be isolated from the diseased crowns and identified.

Disease Development and Spread

Very little is known regarding this disease on strawberries. *M. phaseolina* is a common soil-borne pathogen in many warm areas of the world and has a very broad host range. Many vegetable crops planted as second-crops after strawberry such as squash, cantaloupe, and peppers, among others, are susceptible. In addition, legumes planted as summer crops are also susceptible. Those infections may increase inoculum levels of *M. phaseolina* in the soil. In general, high temperatures and low soil moisture favor infection and disease development.

Control

No fungicides are labeled for control of charcoal rot on strawberries. Topsin M® is labeled for control of charcoal rot on other crops. Our preliminary results with Topsin M® have shown that application of this product may help delay onset of symptoms. Studies are currently being conducted to determine if cultivars differ in susceptibility to charcoal rot. This disease may be an emerging threat as the Florida strawberry industry transitions from methyl bromide to other fumigants.

Fig.1. Plant wilting symptom of charcoal rot.

Fig.2. Internal crown symptoms of charcoal rot.