Berry/Vegetable Times

September 2005

UNIVERSITY OF FLORIDA
IFAS EXTENSION

2005 Calendar of Events

Sept. 6 - Sanitation of Dump Tanks and Packing Lines, Ritz-Carlton, Naples. Pre-registration, $20, at the door $25. For more information, contact Dr. Steve Sargent, UF/ IFAS, (352) 392-1928, ext 215 or sasa@ifas.ufl.edu. Registration form can be found at www.floridatomatoes.org.

Sept. 7 - Tomato Institute, Ritz-Carlton, Naples, 9:00-3:00. Admission free. For more information contact Phyllis Gilreath at 941-722-4524, ext.229.

Sept. 13 and Oct. 11 - Pesticide License Testing. Hillsborough County Extension Office. Seffner. 9 am. For more information call Dave Palmer, 813-744-5519, ext 103.

December 8 - Cucurbit Production Workshop, GCREC, Balm. Admission free. See article in newsletter. For more information contact Alicia at 813-744-5519, ext. 134 or Phyllis at 941-722-4524, ext. 229.

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From Your Agent...

Syngenta Products

Doug Wilbanks of Syngenta notified me of several changes that have occurred since last strawberry season. For Switch®, the plant back restriction has been reduced to 30 days from the last application and anthracnose control has been added to the label. Previously Switch® only had Botrytis on the label. Now the insecticide Actara® has a label for strawberries for aphids. Thanks Doug for the update!

Mark Your Calendars!

On Dec.8 the first **Cucurbit Production Workshop** will be held by Phyllis Gilreath, Manatee County Extension, and me at GCREC in Balm. There are thousands of acres of cucurbits are grown in the south central Florida region. This important group includes yellow squash, zucchini, cucumbers, cantaloupe and watermelons. The meeting will be in the auditorium from 1:30 pm-4:30 pm. It is being held in the afternoon so growers can harvest in the morning and come to the research center in the afternoon to hear a wide range of talks on this very valuable group of crops. Topics planned are insects and viruses, diseases, herbicides, water and fertilization, nematodes, and varieties. There will be a "trade show" area where you can mingle with industry representatives and learn about the latest products and varieties.

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Switching to Highly-Retentive Mulches to Reduce Methyl Bromide Rates

James P. Gilreath and Bielinski M. Santos, GCREC Weed Science
Phyllis R. Gilreath, Manatee County Extension Service

During the next few years, it is expected that the price and availablity of methyl bromide will be serious limitations to polyethylene-mulched crop production. Currently, most growers use a rate of 350 lb/acre of the 67:33 (w:w) formulation of methyl bromide + chloropicrin. This is based on use of methyl

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bromide with standard low or high density polyethylene film mulch, which has low fumigant retention.

Recent research and grower trials have demonstrated that both virtually impermeable films (VIF) and metalized mulches greatly improve fumigant retention and therefore increase efficacy against soilborne pests. The main advantage of these films is they allow reduction in methyl bromide rates up to one-half of the current recommendations, without significantly losing efficacy on pests, especially hard-to-control weeds, such as nutsedge.

The days of plastic mulch and methyl bromide will soon be history.

With regard to VIF, there are two main concerns: cost and handling characteristics. Today, all VIF is made in Europe and must be imported, thus resulting in much higher cost than standard film. Also, most VIF products are more difficult to lay than standard films in that they are prone to linear sheer under too much tension. Handling characteristics among VIF materials differ significantly, but all are based on polyamides, such as nylon, for their barrier properties and these polyamides do not stretch well. Also, none are embossed at the present time.

The barrier properties of metalized films also have been tested under field conditions, first with Inline and more recently with methyl bromide. In each case, application of Inline or methyl bromide in conjunction with metalized film greatly increased the retention of the fumigant. Rate reduction with methyl bromide works when combined with a highly retentive mulch film like VIF or Canslit metalized film.

In addition to the use of the right film, success requires close monitoring of fumigant flow, assuring not only the correct rate, but also uniform delivery in the bed. Non-uniformity guarantees poor fumigant performance at any rate, but with reduced rates of methyl bromide, the results can be even more dramatic. It would be wise for growers to start experimenting with highly-retentive films before the lack of methyl bromide catches them unprepared.

Whitefly Q Biotype

Phyllis R. Gilreath, Manatee County Extension Service
David Schuster, GCRECEntomology
Paul Stansly, SWFREC Entomology

The whitefly Q biotype is thought to have originated in the Mediterranean region where it is now the most prevalent strain of the sweet potato whitefly *Bemisia tabaci*. It has plagued greenhouses in southern Spain for years, increasing insecticide costs. The Q biotype was first identified in the U.S. in March 2005 by scientists at the University of Arizona and California on poinsettia plants in Arizona that originated from a nursery in California. More recently, the Q biotype has been confirmed in an ornamental greenhouse in northern Georgia; thus, it may be just a matter of time before it's found in Florida.

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The Q biotype is visually indistinguishable from the B biotype (also called the silverleaf whitefly), currently the only biotype of *B. tabaci* in Florida fields. The two biotypes can only be identified by analyzing enzymes, or DNA. The B biotype reproduces and develops more rapidly than the Q biotype on most host plants in the absence of insecticides, and both have a wide range of host plants (more than 500 species from 74 families). However, Q outcompetes B in the presence of many insecticides, and Q can transmit TYLCV faster and more efficiently than the B biotype.

The major problem facing Florida growers is that Q is resistant or tolerant to many of our commonly used insecticides for managing whiteflies, including the nicotinoids such as imidacloprid (Admire) and the insect growth regulators Knack and Courier. Resistance to endosulfan is uncertain, and, while Oberon still seems to be active, the Q biotype does have reduced susceptibility to the nicotinoids Admire, Assail and Platinum. A new nicotinoid from Valent called Venom has yet to be tested under commercial field conditions in Florida, but reportedly is effective. The level of resistance that we see in this pest will depend in part on the origin of the invasion and the history of previous exposure. Unfortunately, and unlike the B biotype, resistance in biotype Q is stable, and does not diminish over time. With the B biotype, susceptibility to the nicotinoids returns after 2-3 generations without exposure to the nicotinoids. This is not the case with the Q biotype, where tolerance to the nicotinoids persists for over a year in the lab, even when the whitefly is not exposed to the nicotinoids. Fortunately, biotype B appears to out-compete biotype Q; that is, in the absence of insecticide use (i.e. organic farm), biotype B predominates.

What can growers do? Keep in mind that if both biotypes are present and we spray heavily, we are selecting for the Q biotype. Thus, there is even more pressure to follow resistance management recommendations, including rotation of chemicals, proper use of nicotinoids (i.e. only once per season) and, especially, the inclusion of a 2-3 month crop-free period into the production cycle. This latter permits biotype Q to move into non-crop, non-sprayed host plants where it will be displaced by biotype B, and also permits the dissipation of any nicotinoid tolerance that may have developed in biotype B. Perimeter spraying is not recommended, because this will increase unnecessary exposure of the whitefly population to insecticides. Additionally, natural enemies such as parasitic wasps are killed that can be helpful in controlling whiteflies, especially the Q biotype. Growers are also urged to refrain from using nicotinoid products on crops where they aren't necessary to further decrease exposure to these important insecticides.

Early detection will be key to any attempt to control this pest. Growers should maintain good scouting activities and good cultural practices (chemical rotation, rouging of infected plants, etc.). Unusual whitefly activity or higher than normal control difficulty, even under an optimal control program, should be reported immediately. As to what the future holds in store….no one knows for sure. There are varying opinions as to how big the potential problem could be, but until we actually have to deal with the pest, this is all speculative. When the B biotype was first confirmed back in the late 1980's, the A biotype was the primary biotype. Biotype A was not a large problem and not well established, so the B biotype established quickly. This time, the B biotype is well established, so some think Q may have a harder time getting established. Looking at the resistance situation, and knowing it can outcompete the B biotype, we can only hope this will be the case. Time will tell.

Reference: FDACS-DPI Pest Alert on Bemisia tabaci (Gennadius) (biotype 'Q'): A potential new biotype for Florida's vegetable and ornamental crops, 4/21/05.

Know the Signs of Heat Stress

Alicia Whidden, Hillsborough County Extension Service

This summer in North Carolina there were several reports of farm workers collapsing in the fields and even dying from heat stroke when temperatures were in the mid-90's. At this time of year when we are preparing fields for the new growing season the temperatures still feel like the middle of summer and can be in the 90's. It is important to know the signs of heat stress and what emergency treatment to take. Also it is very important to make sure your workers are educated about heat stress as part of their WPS training. Remember WPS training of new workers should be done before the start of the sixth day of work.

Heat stress is an illness that occurs when there is a buildup of body heat that is more than the body can tolerate. It can occur from body heat generated by our muscles as we work or externally by the environment. Heat leaves our bodies by moving from our skin to the air, evaporation by perspiration, exhaling hot air or touching a cool object. High humidity makes it harder to cool ourselves. As we age our ability to sweat decreases so as you get older you need to be more careful about heat stress. For agricultural workers heat stress is a major concern as agricultural workers have more Worker Compensation claims related to heat illness than other occupations. Heat illness impairs our judgment and coordination and can lead to

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Heat Stress Warning Signs and Treatments

Illness	Description	Symptoms	Treatment
Mild heat stress	Results from decreased flow of blood to the brain; may lead to heat exhaustion or stroke.	Dizziness, fatigue or irritability; reduced ability to concentrate.	Move person to a shaded area for half hour or more; loosen or remove clothing; give water to drink.
Heat cramps	Painful muscle spasms (stomach, arm or leg) during or after physical exertion in heat.	Heavy sweating; thirst; muscle spasms.	Move person to shaded area to rest; loosen clothing; give cool fluids to drink, preferably containing electrolytes.
Heat exhaustion	Acute reaction; results from decreased flow of blood to the brain and within circulatory system; may lead to heat stroke.	Heavy sweating; pale, clammy skin; increased pulse and breathing; weakness; dizziness/fainting; excessive thirst	Immediately remove person to cool shaded are and call 911; loosen or remove clothing and splash cold water on body; have person rest lying down; if conscious, give person water to drink (frequently and in small amounts) do **not** give salt.
Heat stroke	Life-threatening medical emergency; results from inability of body to cool itself and decreased flow of blood to the brain and other body organs.	Excessively high body temperature; confusion; irrational behavior; slowed down or no sweating; rapid breathing and pulse (if conscious); possible convulsions and/or coma.	Call 911 immediately; move person to a shaded area and remove outer clothing; cover with thin wet towels or wrap in wet sheet, then pour on water and fan vigorously; if conscious, give water to drink (frequently and in small amounts), do **not** give salt.

Table excerpted from: Mulhern, Barbara. "If You Can't Stand the Heat Get Out of the Greenhouse", Ornamental Outlook, May 2005.

other accidents and injuries.

In farm work there are several factors that influence heat stress:

1. Environmental Factors- temperature, humidity, air movement and sunlight
2. Workload- how difficult the job and the time of day.
3. PPE- personal protective equipment if required for the job; choose the coolest possible to get the job done.
4. Amount of water the person drinks
5. Scheduling- breaks to get out of heat and drink fluids & gradually increasing work load to give the body a chance to adjust to the heat.

One thing that is always stressed is to **drink plenty of water**. One word of caution is that there have been instances in extremely hot conditions where a person drank so much water they diluted their blood potassium level. When your potassium levels are too low you can have muscle weakness, cramping, trouble breathing and cardiac arrest. It is very important to maintain your body's mineral balance so drinking sports drinks can help. When you are profusely sweating remember to replace the fluids you have lost but also think about replacing the minerals as well.

Be sure everyone working in your operation knows the symptoms of heat stress and the first aid treatment to take. **Do not delay treatment**!

Recent Experiments Yield New Ideas: Plant Dip Experiments

Jim Mertely and Natalia Peres, GCREC Plant Pathology

At the AgriTech meeting last month, several growers asked about dipping strawberry plants in fungicides before planting. There were two main questions: (1) Should I dip? (2) What product should I use? Over the past two seasons, we have tested several pre-plant dip treatments for their effects on yield, plant mortality, and anthracnose fruit rot caused by *Colletotrichum acutatum*. The results have not always been consistent, and seem highly dependent on the condition of the transplants to be treated.

'Festival' runner plants were used in the 2003-04 dip experiment. Although they looked vigorous, 2 to 6% of the transplants showed typical anthracnose lesions on the leaf stalks or petioles (Fig. 1), and some plants also had unusually dark roots (Fig. 2). These symptoms were caused by *Colletotrichum acutatum*, the anthracnose fungus responsible for root necrosis leading to poor establishment, and for anthracnose fruit rot. Plants from this shipment were dipped for five minutes in Abound, Oxidate, or Switch just prior to planting. Other treatments included planting without dipping (the dry control), dipping in water alone (the wet control), washing the plants before planting, applying extra fertilizer (Osmocote), or spraying plants and plastic mulch with white kaolin clay (Surround). The last two treatments were applied immediately after the plants were watered in.

In 2003-04, little anthracnose fruit rot occurred in the experimental plots, and marketable yields were relatively high. Over the entire season, the highest marketable yields were produced by the kaolin clay treatment (33,800 lb/acre), followed by the Switch dip (33,300 lb) and the Abound dip (32,000 lb) treatments, although these yields are not statistically higher than the comparable wet control (30,000 lb) or the dry control (30,700 lb). During the December to January period, the Oxidate dip treatment and the extra fertilizer treatment produced lower marketable yields than the controls because more plants had died in these treatments. During the February to March period, plants dipped in Switch (28,600 lb) yielded significantly more than the wet control (24,500 lb).

'Treasure' runner plants were used in the 2004-05 experiment. In addition to anthracnose infections, these transplants had

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been exposed to unusual conditions in transit, and showed signs of deterioration caused by *Botrytis* and other microorganisms. The same treatments were applied to these plants, but with very different results.

Plant mortality was an important factor in the 2004-05 experiment. By 7 weeks after planting, 39% of the dry control plants had died. However, only 25% of the wet controls died, suggesting that the plants were dehydrated and benefited from a 5-minute dip in water before planting. Plant mortalities were highest in the Oxidate dip (44%) and extra fertilizer (41%) treatments and lowest in the Abound dip (6%) and Switch dip (7%) treatments. Yields over the entire season were low due to plant mortality and poor growth of the surviving plants in some treatments. Dipping in Switch gave the highest marketable yield of 18,400 lb/A (Fig. 3). The Abound dip treatment produced the second highest yield (9,200 lb), which was not signifcantly better than the wet control (6,300 lb, Fig 4). The stress-reducing effect of kaolin clay (4,700 lb) did not significantly increase yield over the dry control (3,900 lb).

Although these experiments may not answer the grower's questions directly, they may provide some helpful insights. Considering product expense, labor requirements, pesticide disposal issues, and worker safety considerations, strawberry transplants should not be routinely dipped in fungicides before planting. However, dipping may be necessary when susceptible cultivars have been infected by *C. acutatum* in the nursery. 'Camarosa' and 'Treasure' are highly susceptible to anthracnose, and are more at risk for infection in the nursery and development of root necrosis disease following transplant. Shipments of 'Camarosa' and 'Treasure' containing plants with petiole and root symptoms shown in Figures 1 and 2 are good candidates for dip treatment. Aromas, Camino Real, Gaviota, and Ventana are less popular cultivars that are also susceptible to *C. acutatum*. 'Festival' is less susceptible than 'Camarosa' and 'Treasure'; however, 'Festival' may still become infected in the nursery and fail to establish properly in the field. 'Carmine', 'Sweet Charlie', and 'Winter Dawn' are highly resistant to *C. acutatum*, and presumably would not benefit from a dip treatment.

Fig. 1. Petiole lesions caused by C.acutatum.

Fig. 2. Root necrosis caused by C. acutatum.

Abound, Oxidate, and Switch are currently labeled for pre-plant dip treatment of strawberry transplants. Switch gave the best results in our experiments. Before dipping, the main labels and supplementary dip labels

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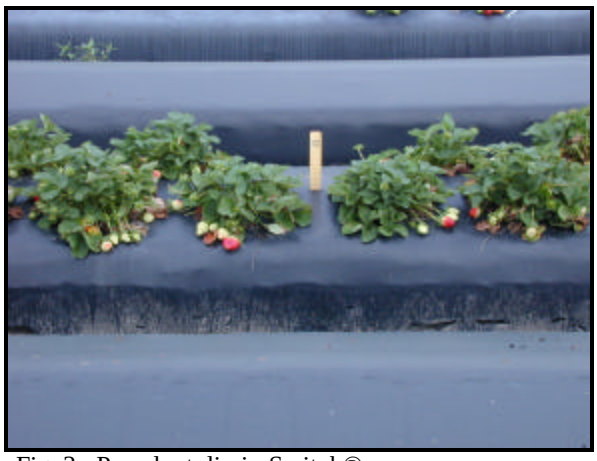

Fig. 3. Pre-plant dip in Switch®.

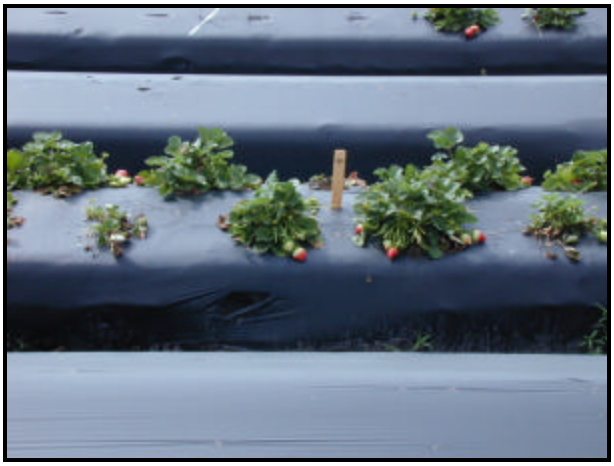

Fig. 4. Wet control (dipped in water alone).

should be read carefully. Labels for Abound and Switch can be found at www.cdms.net. The Oxidate label is available at www.biosafesystems.com. According to the labels for all three products, plants should be set in the bed as soon as possible after treatment. Plants which have been treated the day before and stored in the shade or in the cooler may show stunting, burning, root abnormalities, and other symptoms of phytotoxicity.

Examine Transplants To Get a Jump on Insect and Mite Problems

Jim Price, GCREC Entomology

Some of our insect and mite problems begin entirely or in part with infested transplants. A little time spent examining the stock on transplanting day can pay dividends in allowing us to react to problems early. Insects and mites that typically arrive on our transplants include cyclamen mites, spider mites, and aphids.

In order to assess the status of insects and mites on transplants, growers should select one transplant from as many crates and bundles as practical from each homogenous planting unit. A homogeneous planting unit is the area planted from one week of transplanting of one cultivar from one farm. The fully expanded leaves of the selected transplants should be examined for spider mites and aphids with a 5 X hand lens and the still-folded leaves within the crown should be examined for cyclamen mites with a 14 X hand lens.

If pests are found then plans should be developed to treat the plants early or to watch the pests especially closely for quick reaction once thresholds are reached.

Comparison of UF/IFAS Cultivars Recommended for Commercial Plantings in West Central Florida

Craig Chandler, GCREC Strawberry Breeding and Alicia Whidden, Hillsborough County Extension Service

Traits/Cultivars	Carmine	Festival	Sweet Charlie	Winter Dawn
Recommended planting dates	Oct. 10-17	Oct. 1-21	Oct. 1-15	Sept. 24 – Oct. 7
Recommended within row spacing (inches)	12-14	14-15	12-14	12-14
Runner production in fruiting field	moderate	high	moderate	low
Average fruit wt.	< 20 g	< 20 g	<20 g	18-22 g
Fruit shape	Primary – medium conic or wedge Secondary/tertiary – short conic	mostly conic	Primary - wedge Secondary/tertiary - conic	Primary – medium conic to wedge; sec./ tert. - short conic
Fruit color – external	deep red, glossy	red	orange red	deep orange red
Fruit color – internal	warm red	bright red	orange streaked with white	warm red fading into white
Calyx size	medium	large	large	medium
Fruit firmness	med.-firm	firm	soft-medium	medium
Flavor intensity	medium	med.-high	medium	low-medium
Sweetness	low	medium	high	low
Fruit production pattern	early	mid	early	very early
Susceptibility to Botrytis fruit rot	low	moderate	high	low
Resistance/susc. to anthracnose fruit rot	low susceptibility	moderate suscepti-bility	resistant	low susceptibility
Susceptibility to Col-letotrichum Crown rot	low to moderate	high	low to moderate	low
Comments	high antioxidant (anthocyanins) levels in fruit	best combination of fruit quality and yield when planted Oct. 10-17	may be more suscep-tible to Phytophthora root rot than the other UF cultivars	propagation in Florida a possibility because of crown rot resistance

'Carmine'

'Festival'

'Sweet Charlie'