March 2006

Berry/Vegetable Times







2006 Calendar of Events

April 4 Soil Moisture Monitoring Equipment Grower Meeting, GCREC, 14625, CR 672 in Balm at 1:30. CCA credits applied for.

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

May 8 WPS Roadshow. 11:30-4:00. Hillsborough County Extension Office, 5339 CR 579, Seffner. Lunch provided; RSVP needed to Alicia Whidden, 813-744-5519, ext. 134. Pesticide License CEUs and CCA credits available.

A monthly newsletter of the University of Florida IFAS

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From Your Agent VERY IMPORTANT GROWER MEETING Worker Protection Standards Roadshow

On May 8 at 11:30 the WPS Roadshow will come to Hillsborough County. This program is jointly being put on by Florida Dept. of Agriculture and Consumer Services, University of Florida Pesticide Information Office and Florida Fruit and Vegetable Association. The meeting will start at 11:30 at the Hillsborough County Extension office in the new auditorium. Lunch will be provided. This meeting is very important for all agricultural operations. WPS inspections are becoming more frequent, new inspectors are due to be hired and the laws are getting tougher. Ag worker safety issues are very prominent in the news. The WPS Roadshow will give you the latest information and answer questions that pertain to your operation. There will be 2 private applicator CUEs given for this meeting and 2 CCA credits.

The proposed agenda:

10 minutes	Welcome and Overview- M. Aerts, FFVA
45 minutes	Recordkeeping Essentials: Chemical and
	Worker, D. Dubberly, FDACS
30 minutes	Situation- Posting; Central and Field, F. Fishel,
	UF Pesticide Information Office
30 minutes	Revisions to the WPS How-to-Comply
	Manual, D. Dubberly, FDACS
15 minutes	Worker Training, G. Lopez, UF Pesticide
	Information Office

This is a very important meeting for owners, managers and supervisors to attend. Please RSVP to Alicia Whidden, 813-744-5519 ext, 134 by 5 pm. May 4.

IFAS is an Equal Employment Opportunity —Affirmative Action Employer authorized to provide research, educational information and other services only to individuals and institutions that function without regard to race, color, sex, age, handicap, or national origin. U.S. Department of Agriculture, Cooperative Extension Service, University of Florida, IFAS, Florida A & M University Cooperative Extension Program, and Boards of the County Commissioners Cooperating.

Soil Moisture Monitoring Equipment Grower Meeting and Mini Farms Program

Alicia Whidden Hillsborough County Extension Service

On Tuesday, April 4th a grower meeting on soil moisture sensors will be held at the Gulf Coast Research and Education Center in Balm from 1:30 till approximately 3:00. This meeting is designed to update growers of any crop- citrus, vegetables, strawberries, ornamentals, fruit or agronomic crops- on some of the soil moisture probes that are available today. Dr. Larry Parsons of the UF/ **IFAS Citrus Research and Education Center** will present information on several types of probes and cover the advantages and disadvantages of each type. Some of the newer equipment can give a grower a permanent record of changes in soil water status or show when water reaches a certain depth in the soil. Managing irrigation is an important part of best management practices (BMPs) and soil probes are useful for scheduling irrigation to help reduce pumping costs and leaching of fertilizer. This program is sponsored by the University of Florida/IFAS and the Southwest Florida Water Management District's Manasota Basin Board. CCA credits have been applied for. For more information contact Alicia At 813-744-5519, ext. 134.

There is a new cost share program for growers being sponsored by the Florida Dept. of Agriculture and Consumer Services, Office of Agricultural Water Policy. The Mini Farms Program will purchase small items used on the farm such as the soil moisture monitoring devices Dr. Parsons will be talking about on April 4. This meeting will be a great opportunity to learn about these devices and then to use the Mini Farms Program to help purchase them for your operation. Use of these monitoring devices will be one component of the BMP (Best Management Practices) program. Other equipment, such as pH meters, salt meters, weather station, or a permanent mixing station, is eligible for the program. The maximum cost share amount available to an ag operation is \$8,000. The cost share rate is 85%. We will have brochures on the Mini Farms Program at the meeting. Also a representative from the Office of Ag Water Policy will be there to answer any questions about the Mini Farms Program.

Look forward to seeing you on April 4th!

New fungicide labeled for Florida-Forum

Alicia Whidden Hillsborough County Extension Service

Forum, a new fungicide by BASF, is now available in Florida. It is labeled for cucurbits, bulb vegetables, fruiting vegetables, leafy brassica greens, lettuce (leaf and head types), potato and tomato. Forum is a new formulation of dimethomorph which is a cell wall synthesis inhibitor. It is in the Group 15 fungicide category. It has a caution label. The label states it is not to be sprayed alone but is to be tank mixed with fungicides that are not in the Group 15 category. This is for resistance management so this fungicide will continue to work for a long time. The reentry interval (REI) will be 12 hours.

Forum has activity for downy mildew and late blight, *Phytophthora infestans*. For eggplant, pepper and tomatillo it can suppress *Phytophthora capsici*. A limit of 5 applications per season of a 6 oz per acre rate is on the label. Spray Forum no more than 2 applications in a row. Harvesting can be done on the day of the last application after the spray has dried.

There are plant back restrictions for Forum. You can plant back with the labeled crops at anytime. For planting back with strawberries after cucurbits or tomatoes where you have sprayed Forum you would need to wait 12 months.

Strawberry Diagnostic Summary and Strategies for Control of Early Diseases on Cucurbit Crops Following Strawberries Natalia Peres and Jim Mertely

Considering our diagnostic clinic as an indicator, strawberry diseases were very minor in the late part of this season. From January to March, the diagnostic clinic received only 20 samples, compared to 52 samples from October to December. In the early part of the season, approximately 70% of the samples received had crown rot diseases caused either by Colletotrichum or Phytophthora. In contrast, no major problem was observed on the samples brought in the second part of the season. In fact, many of those plants were brought in because of slow growth and low yield problems where no pathogen was detected. Some of those problems may be related to the unusually warm temperatures in Canada in the weeks prior to digging of transplants. For more information, please refer to Dr. Chandler's article in the January issue.

With the end of the strawberry season, growers who are double-cropping with cucurbits should start considering control early-season diseases on those crops such as Downy mildew and Gummy Stem Blight. Downy mildew is one of the most important foliar diseases of cucurbits and it is caused by the pathogen *Pseudoperonospora cubensis*. Symptoms of this disease first appear on the upper surface of older leaves as small and slightly chlorotic to bright yellow lesions (Fig.1). Lesions expand quickly and often coalesce resulting in necrosis of extended areas and defoliation, which results in sunburned fruit. The disease is spread by wind, worker movement or rainfall. The pathogen requires a period of at least 6 hours of leaf wetness for infection and temperatures ranging anywhere from 41 to 86°F. Control of downy mildew is obtained with a combination of resistant cultivars and fungicide applications (Table 1), but it can be very difficult to control this disease when highly susceptible cultivars are used and environmental conditions are favorable. Gummy stem blight occurs on leaves, stems,

and fruits and it is caused by the fungus *Didymella bryoniae*. Symptoms on leaves appear as circular, tan to dark brown spots that enlarge rapidly to blight the entire leaf (Fig. 2). The fungus survives between seasons on plant debris and weed hosts. The disease is spread by rain and the optimum



Fig. 1 Downy mildew Credit: T. Kucharek, UF, Plant Pathology



Fig. 2 Gummy stem blight. Credit: T. Kucharek, UF, Plant Pathology

temperatures are between 68 and 77°F. For control of gummy stem blight, it is essential to use treated seeds, and a 2-year rotation cycle. There are no resistant cultivars currently available and control may be achieved by regular application of protectant fungicides (Table 1).

Fungicide	Downy Mildew	Gummy Stem Blight
Acrobat 50 WP	$+ + {}^{1}$	0
Aliette 80 WDG	+	0
Amistar 80 DF	+ +	+ +
Bravo	+ +	+ +
Cabrio 2.09 FL	+ +	+ +
Dithane	+ +	+
Equus or Echo	+ +	+ +
Flint 50 WDG	+ /0	0
Gavel 75 DF	+	0
Maneb 75 DF	+	+
Manex II FLs	+ +	+
ManKocide 61 DF	+ +	+
Manzate	+ +	+
Penncozeb	+ +	+
Pristine 38 WG	+ +	+ +
Quadris 2.09 FL	+	+ +
Ridomil Gold Bravo 81W	+ +	+
Ridomil MZ WP	+ +	+
Tanos 50 DF	+ +	?
Topsin M	0	+ +
Various copper formulations	+	+

Table 1. Fungicides for control of downy mildew and gummy stem blight on cucurbits*

 $^{1}++=$ highly effective, += may be effective; 0= not effective

* partially reproduced from Extension Plant Pathology Report no.15, Disease control Program for watermelons by Tom Kucharek and Pam Roberts.

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.

Vegetative Windbreaks to be Studied at GCREC

Craig Chandler, Don Rockwood¹, and Michael Andreu²

The potential benefits of windbreak plants include their use as a management tool to protect crops, and as plants that are themselves marketable (e.g., windbreak trees can be harvested for pulpwood, mulch, or energy wood). In Florida, however, little is known about the specific influence of windbreaks on the performance of citrus, strawberries, and vegetables, as few, if any, controlled studies have been conducted in the state.

GCREC-Balm appears to be an ideal site for these types of studies. The center sits on 475 acres of flat, open land, and this land, combined with a large commercial vegetable field just north of the GCREC property, make for an area that is often quite windy. Windy conditions can cause fields to be eroded when they are tilled between crops. They can also cause damage to vegetable and strawberry crops by hindering plant establishment, breaking stems, scaring fruit, and spreading bacterial and fungal pathogens. Thus, we have begun planting vegetative windbreaks at GCREC that should start reducing wind speeds in the cropping areas within the next few years.

This is part of a larger effort proposed by us and seven other IFAS faculty. We have submitted a grant proposal titled "Windbreaks for Florida's Agriculture" to UF's 2006 Seed Grant Program. If fully funded this grant will provided \$100,000 for research to determine the best plant species, designs, and management techniques for windbreaks.

In the study at GCREC, we plan to evaluate nine windbreak species; five row configurations (1, 2, 3, 4, and 8-row configurations); two within row spacings (3' and 6'); and several cultural regimes (initial irrigation only as a minimal culture to irrigation + compost + mulch as the most intensive culture). During the week of March 10-17, we planted windbreak trees and shrubs on the north and west borders of the strawberry production area, and the south border of the vegetable production area. Additional windbreak plants will be planted as time and resources permit, with most of the windbreaks being completed later this year.

¹Don Rockwood is a UF Professor of Forestry based in Gainesville. Dr. Rockwood specializes in forest tree improvement.

²Michael Andreu is a UF Assistant Professor of Forestry based at GCREC-Plant City. Dr. Andreu specializes in forest systems.





Abandoned Citrus and Strawberries Don't Mix James F. Price

James F. Price

A second case of citrus root weevil, *Diaprepes abbreviatus*, has been diagnosed at GCREC and likely there are many undiagnosed cases.

An affected strawberry plant wilts, dies, and turns brown to appear as though it has died from anthracnose. A quick method to separate the two causes of death is to gather the recently dead leaves into a bunch and attempt to pull the entire plant from the bed. A plant that has died of anthracnose will hold fast to the bed while one that died from the citrus root weevil will readily come up because most of the anchoring roots have been eaten way.

Digging around a strawberry plant recently killed by the citrus root weevil will usually yield one to a half dozen ³/₄ inch or smaller white, legless beetle grubs that appear much like white grubs of lawns (the lawn kind usually have three pairs of legs though).

The immigrant citrus root weevil is widely distributed throughout central and south Florida in ornamentals and particularly in citrus. The problem in strawberries begins when a citrus orchard is abandoned or not managed carefully. Weevil populations feed and build up on roots. Adults can fly or walk, usually not much more than 1,000 feet, to a strawberry field, particularly when the orchard is uprooted for development.

Since strawberry fields are fumigated pre-season, most problems cannot begin until after that point, and since the grubs require many weeks to kill a strawberry plant, damage usually appears mid to late season. Yield reductions may occur earlier on living affected plants.

Effects of elimination of methyl bromide fumigation of strawberry fields on citrus root weevil are unknown. Ending the practice probably will compound the problem.

Brigade® (Capture®) bifenthrin has

been used as a broadcast soil application in citrus for control of this weevil. Soil applications via trickle irrigation may be effective in strawberries, but no studies have been performed to determine efficacy and plant safety at an efficacious rate. Additional investigations must be performed.

Photos of various life stages and additional information on this insect are found at the University of Florida IFAS EDIS <u>http://</u> <u>edis.ifas.ufl.edu/IN147</u> and at <u>http://</u> <u>edis.ifas.ufl.edu/IN151</u>

Pesticide Registrations and Actions

- ?? The Florida Department of Agriculture and Consumer Services (FDACS) registered the fungicide cyazofamid (Ranman®) for control of diseases on cucurbits, potato, and tomato. The EPA registration number for the ISK Biosciences product is 71512-3. (FDACS PREC Agenda, 1/12/06).
- ?? The EPT has extended the time-limited tolerances for the fungicides fenbuconazole in grapefruit and thiophanate-methyl in fruiting vegetables until 12/31/08. (Federal Register, 12/21/05).
- ?? On January 12, the FDACS conditionally registered the insecticide flonicamid for use on pome and stone fruit, potato, cucurbit/fruiting/leafy vegetables (Beleaf®), and cotton (Carbine®). The EPA registration number for the ISK Biosciences Corp. product is 71512-9. This is an cyanomethany tribluoromethyl nicotinamide insecticide with a different mode of action that other products. It is effective against aphids, thrips, leafhoppers, plant bugs, and other sucking pests. It provides rapid anti-feeding

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behavior and in non-toxic to beneficial insects. (FDACS PREC Agenda 2/2/06).

- ?? In a new and historically unusual move, the EPA has classified the soon-to-be registered soil fumigant iodomethane as "Not likely to be carcinogenic to humans at doses that do not alter rat thyroid **hormone homeostasis.**" There is compelling evidence indicating that iodomethane induces thyroid follicular cell tumors through an antithyroidal mode of action (MOA). Although the fumigant has been shown to be mutagenic in vitro, the weight of evidence supports the antithyroidal MOA, as evidence by the observation that only male rodents exhibit increases in thyroid tumors, a common response for this MOA. In addition, the increases of cell growth (hyperplasia) progressing to follicular cell tumors were only seen in the presence of thyroid/ pituitary hormone changes, thus exhibiting a pattern of both dose and temporal concordance. **Do to** this classification, and the fact that the material is quickly degraded or metabolized into non-toxic degradates, the EPA has granted an exemption from the requirement of a tolerance for iodomethane when applied as a pre-plant fumigant for pepper, strawberry and tomato.
- ?? The FDACS registered the biological Nematicide *Paecilomyces lilacinus* strain 251 (Melocon® WG) from Prophyta on November 4. The EPA registration number for this product is 72444-2. This fungus affects root-know, burrowing, and cyst nematodes in a variety of crops, which includes citrus, vegetables, strawberry, ornamentals, and turf. (PREC Agenda, 12/1/05).

Pesticide Potpourri

- ?? Odors from foods ranging from garlic and onions to ginger and strawberries may be nutritional signals that the human nose has learned to recognize. Researchers Stephen A. Goff and Harry J. Klee reported in Science that, "Studies of flavor preferences and aversions suggest that flavor perception may be linked to the nutritional or health value" of foods. Flavor is complex and uniquely challenging to plant breeders, they note, and as a result has not been a high priority. The story explains that Klee and Goff analyzed two types of tomato, the wild cerasiforme and the commercial variety Flora-Dade. Except for one chemical that also affects color, the sugars, organic acids and volatile compounds associated with tomato flavor were reduced in the commercial product. For example, one of the volatile compounds associated with the "tomato" or "grassy" flavor is called cis-3-hexenal, which is also an indicator of fatty acids that are essential to the human diet. They found that the wild tomato contained more than three times the amount of that chemical than the cultivated version. Two other contributors to tomato flavor, 2- and 3-methylbutanal, are indicators of the presence of essential amino acids and are also three times more common in the wild tomato. In addition to tomatoes, those chemicals are also important constituents of the flavors of apple, strawberry, bread, cheese, wine and beer. Goff and Klee also noted that the scent compounds produced in many spices are associated with health properties. (AP, 2/9/06).
- ?? In a breakout of the benefits of pesticides to agriculture, the CropLife Foundation has determined that Florida receives about nine

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times the return on investment (ROI) for herbicides, and 32 times the ROI on fungicides. Over 90 percent of citrus, cotton, peanut, strawberry, sugarcane, and tomato are grown with herbicides in Florida, and the \$96 million spent on weed control provides \$841 million in benefits. In addition to weed control component which considers production and value, herbicide use also reduces erosion (140 million pounds) and the need for hand labor (100,000 workers). Over 95 percent of the citrus, cucumber, pepper, tomato, and watermelon are treated with fungicides in Florida, and the \$59 million spent on disease control provides almost two billion dollars worth of produce. (CropLife Foundation presentation by N. Reigner).

?? On November 16, the EPA released voluntary labeling guidelines to aid manufacturers in their effort to reduce resistance to pesticides. The guidelines provide examples of symbols and statements on avoiding pest resistance that could be added to product labels. The basic black on white narrow rectangle should appear in the upper right quadrant with the appropriate class, based on IRAC, HRAC, or FRAC groupings. These guidelines are similar to those in Canada, as well as those in Australia, which are mandatory. (Chemical Regulation Reporter, 11/28/05).

Two New Faculty Members for GCREC

Christine Cooley

Gulf Coast REC is pleased to announce the addition of two new faculty members. Dr. Bielinski Santos has already begun his new position as an Assistant Professor of Horticulture. Dr. Santos has been a part of GCREC for several years as a research associate. He has worked with both vegetables and fruit crops, and will be a great asset to the GCREC horticultural program.

In June, GCREC will welcome Dr. Amy Shober as an Assistant Professor of Landscape Nutrient/Runoff Management. Dr. Shober received her PhD at the University of Delaware and studied soil chemistry. She spent several years conducting research on a topic of national importance—water quality. Her skills and expertise will benefit the GCREC research program in the new and rapidly growing field of landscape management.



Dr. Bielinski Santos, Assistant Professor of Horticulture.



Dr. Amy Shober, Assistant Professor of Landscape Nutrient/Runoff Management.