UF UNIVERSITY of FLORIDA | IFAS EXTENSION

Berry/Vegetable Times

February 2008

Calendar of Events

March 7-10 34th National Agricultural Plastics Congress, Tampa, Fl. For more information go to http://www.plasticulture.org/ASPCongress08/default.htm.

March 9 Daylight Savings time returns. Move your clocks up 1 hour.

March 11 Pesticide License Testing. Hillsborough County Extension Office, Seffner. 9 am. For more information call Mary Beth Henry, 813-744-5519, ext 103.

March 11 2008 Spring Blueberry Meeting and Field Day. Plant Science Research Unit, Citra, Fl. Check newsletter for more information.

April 8 Pesticide License Testing. Hillsborough County Extension Office, Seffner. 9 am. For more information call Mary Beth Henry, 813-744-5519, ext 103.

A University of Florida/IFAS and Florida Cooperative Extension Service newsletter
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Viruses Affecting Cucurbits and Beans

Alicia Whidden, UF/IFAS, Hillsborough County Extension Service,
Phyllis Gilreath, UF/IFAS, Manatee County Extension Service

Over the last couple of years, the number of whitefly-transmitted viruses in some cucurbit fields have increased to almost epidemic proportions. There are 3 major viruses we are now dealing with in cucurbits, all of which are transmitted by the silverleaf whitefly, Bemisia tabaci. The host range is similar (mostly cucurbits) but the symptoms differ.

Most growers are aware of Squash Vein Yellowing Virus (SqVYV). Symptoms of this Ipomovirus were first seen in watermelon in Florida in the mid 1980's. It is widely distributed in SW and West Central Florida and has also been reported from southern Indiana. It is probable that this virus is native to Florida. This virus is the cause of watermelon vine decline (WVD) which Florida watermelon growers have been battling since 2003. It was first isolated from a squash plant here in Dover and this sample led to the breakthrough in figuring out the cause of watermelon vine decline. Cucurbits are hosts (especially squash and watermelon, but Momordica

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New Chilli Thrips Now in Florida Strawberries

James F. Price and Curtis Nagle

Managers of two Plant City area farms recently voiced their concern to Alicia Whidden (Hillsborough Co. Vegetables Extension Agent) of their difficulties to control thrips adequately. Their problems turned out to be a thrips new to American strawberry culture, "chilli thrips" or *Scirtothrips dorsalis*.

This thrips first was discovered in Florida in late 2005 and its problems had been restricted to rose, Indian hawthorn, plumbago and a few other ornamentals. The discovery in strawberries is a first in the US for a field-grown crop and

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charantia (balsam-apple) is also a known host and potentially an excellent reservoir of SqVYV.

Symptoms of SqVYV in watermelon are death of young plants, death of vines of older plants and necrosis in the fruit, especially just inside the rind. Trials for resistance to SqVYV are being conducted by grafting watermelon germplasm onto gourd rootstock and evaluating the watermelon scions for symptoms. Several potential sources of resistance in wild type watermelons have been identified. Also being evaluated are insecticides and use of silver plastic mulch to manage SWF and thus WVD.

Cucurbit Leaf Crumple Virus (CuLCrV) is a begomovirus first seen in Florida in 2006. At the same time it was found in grafted watermelon transplants received in Georgia from a Western U.S. transplant producer. Known hosts include tobacco, bean and at least one weed host—balsam apple, a very common weed in West Central Florida, especially in citrus groves. Like the other viruses, SqVYV and CYSDV (see below), CuLCrV is able to infect most cucurbits including watermelons, cucumbers, squash, and pumpkin (Figures 1 and 2). Initial symptoms include a mosaic pattern on foliage and crumpling of leaves.

Figure 1. CuLCrV on squash.

Figure 2. CuLCrV on watermelon.

Infected plants are stunted. In squash, leaves can be thickened and distorted as well as curled and crumpled. Fruit symptoms vary but severe color break was observed in yellow summer squash in 2006. Now the virus has been found to infect beans in Florida. This is the first report of CuLCrV infecting a host other than cucurbits in Florida. The symptoms on bean are leaf deformation/rugosity and mosaic including chlorotic mosaic.

Cucurbit Yellow Stunting Disorder Virus (CYSDV) was not seen in Florida until 2007. It infects melons, cucumbers, gourds and winter and summer squash. Symptoms appear first on older leaves toward the center of the plant, progressing outward along vines toward growing points. Symptoms often mimic water stress. Then a yellowing between the leaf veins appears and the leaves later turn bright yellow (Figure 3). On some, small green spots develop on leaves of certain varieties. Older leaves drop as the plant's internal transport system breaks down. This virus does affect fruit quality by reducing fruit size and sugar content, plus shortening the product's shelf life. It was first identified in cucumber and melon crops in the Middle East more than 15 years ago and in cucumbers and melons in Spain about 10 years ago. In 2003-04, it

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was identified in Central America and the Rio Grande Valley, Texas, and 2006 in Arizona and California where it and CuLCrV caused significant yield losses. It is not known if this virus infects wild cucurbits or other uncultivated hosts. As with some other viruses, it may cause symptomless infections in some hosts.

Management recommendations for these viruses are not that dissimilar to recommendations for tomatoes and TYLCV. They include:

- Select the most vigorous and well adapted varieties.
- When using transplants, use pathogen-free, whitefly-free transplants Do not buy transplants that were produced in the western U.S.
- Use reflective mulches.
- Treat prior to planting with nicotinoids to manage whiteflies in the field.
- Apply appropriate insecticides for whitefly control during production in the field.
- Don't plant in old established fields, volunteers can be a significant reservoir for these viruses.
- Post-production sanitation – pull up the plastic and plow fields under Prevent grower of volunteers or remove all volunteers.
- Maintain a host-free period between spring and fall crops.

Figure 3. Melon plant infected CYSDV showing typicalsymptoms on the older leaves. Photo courtesy of W. Wintermantel (USDA, Salinas, CA).

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raises concerns for the strawberry and vegetable industries, particularly the pepper component.

Chilli thrips tend to be found on strawberry petioles and leaves less than on flowers as is common with current pest thrips. Even more problematic, they may hide and feed in folded, young leaves where it is difficult for insecticide sprays to reach.

Chilli thrips look much like normal flower thrips, but adults are shorter, possess more outwardly-bowed abdomens, and the setae of their wings create an almost black line down the adult's back when the wings are folded there at rest. These characteristics are best seen when the suspected chilli thrips is compared directly to a common flower thrips (Figure 1).

Figure 1. Notice the length of the shorter chilli thrips (left) and the longer, common flower thrips (right).

Suggested measures to control chilli thrips in strawberries are taken from experiences among Florida's ornamentals industries. Given their experiences and the materials permitted in strawberries, it seems that abamectin, nicotinoid sprays, oils (remember the phytotoxicity caution in strawberries!) new spinetoram, and spinosad may be the best materials presently available for control. Given that limited applications of these

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materials are permitted, that these materials are useful for other problems, and that chilli thrips could become problematic on farms, it may be wise to reserve some use of these materials for a possible appearance of chilli thrips.

The strawberry industry has experience in remediating cyclamen mite problems from crowns and young, folded leaves. The industry's technique with high volume sprays to deliver toxicants to plant interiors and buds may be valuable to manage chilli thrips there. But the fact is, we do not yet have sufficient experience to define best techniques.

Lance Osborne and other IFAS and FDACS scientists have provided considerable information on our current understanding of this new pest at: http://edis.ifas.ufl.edu/IN638; http://mrec.ifas.ufl.edu/lso/thripslinks.htm; or http://www.doacs.state.fl.us/pi/enpp/ento/chillithrips.html.

IFAS scientists are working on the chilli thrips problem in strawberries and by next season will have more definitive management procedures to suggest.

Assessment of sensory and chemical characteristics of several selections of strawberries over a period of 2 years

Celine Jouquand[1], Anne Plotto[2], and Craig Chandler[1] ([1] University of Florida, Gulf Coast Research and Education Center, 14625 CR 672, Wimauma, FL 33598; [2] USDA-ARS, Citrus & Subtropical Products Laboratory, 600 Avenue S, NW, Winter Haven, FL 33881)

'Festival', the main cultivar grown by the large commercial strawberry farms in Florida, can produce firm, attractive and sweet fruit with a strong aroma. However, 'Festival' has low yields in early December and the overall flavor of its fruit tends to be low in March. New selections are being evaluated by the University of Florida, as potential complements to 'Festival' in December and March. The USDA-ARS Citrus and Subtropical Products Laboratory has evaluated sensory and chemical characteristics of the most promising of these selections over 2 seasons (2006 and 2007).

Sensory evaluation

Sensory evaluation was performed on February 2 and March 9 in 2006, and on January 4, February 13 and March 15, in 2007. Five genotypes were tested in 2006: FL 95-269, FL 99-164, FL 99-117, FL 00-51 and FL 01-116 with 'Festival' included as a reference. In 2007, four genotypes were retained: FL 99-164, FL 99-117, FL 00-51, FL 01-116, and two named cultivars were added in February and March, 'Rubygem' and 'Sugarbaby', with 'Festival' still used as a reference. Panels took place at the University of Florida's Gulf Coast Research and Education Center (Figure 1). Panelists were asked to rate strawberries for appearance, flavor, texture, sweetness and tartness.

Figure 1: Panelists tasting strawberry selections at the University of Florida's Gulf Coast Research and Education Center

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Results for flavor preference indicate that FL-00-51 was always preferred for flavor and sweetness, and with high ratings for flavor (above 6) (Table 1 and Table 2). 'Festival' was rated with high flavor in February 06 and 07, but its rating declined in March 06 and 07, as well as in January 07 (Table 1 and Table 3). 'Rubygem' was also rated high for flavor liking and sweetness preference but this cultivar was only evaluated in 2007 (Table 4).

Table 1: Flavor liking (9-point hedonic scale) for eight strawberry genotypes evaluated over two harvest seasons.

Selection	Feb. 06	Mar. 06	Jan. 07	Feb. 07	Mar. 07
Festival	7.30 a	6.16 b	5.92 bc	6.93 a	5.20 d
00-51	7.32 a	7.04 a	6.53 a	6.68 a	6.17 ab
99-164	7.14 a	6.46 ab	5.65 c	5.47 c	5.39 cd
99-117	5.60 b	6.45 ab	6.47 ab	5.86 bc	6.02 bc
01-116	5.86 b	6.47 ab	5.91 bc	6.36 ab	4.89 d
95-269	6.26 b	5.30 c	-	-	-
Rubygem	-	-	6.32 ab	6.36 ab	6.74 a

Table 2: Flavor liking – FL 00-51

Category	LS means	Groups		
Feb 06	7.32	A		
Mar 06	7.04	A	B	
Feb 07	6.68		B	C
Jan 07	6.53		B	C
Mar 07	6.17			C

Table 3: Flavor liking - Festival

Category	LS means	Groups		
Feb 06	7.30	A		
Feb 07	6.93	A		
Mar 06	6.16		B	
Jan 07	5.92		B	
Mar 07	5.20			C

Table 4: Flavor liking – Rubygem.

Category	LS means	Groups
Mar 07	6.74	A
Feb 07	6.36	A
Jan 07	6.32	A

'Rubygem' and FL-00-51 seemed to have constant sensory characteristics while the other genotypes showed greater variation. Genotypes with a low flavor rating (FL 95-269 in March 06, FL 99-164 in January and February 07, 'Festival' and 01-116 in March 07) were always described as "not sweet enough" by the panelists, thus clearly linking flavor liking to sweetness preference. However, 'Sugarbaby' had low flavor preference in February and March 07, despite the high percentage of "just right" rating for sweetness, indicating sweetness is not the only indicator of good quality for strawberries.

Chemical composition

The chemical composition of each genotype was determined in order to evaluate the influence of harvest date and /or genotypes on titratable acidity (TA), soluble solid content (SSC) and volatile compounds. Data were also used to interpret flavor preferences.

Sugar (SSC) and acid (TA) levels were good indicators of sweetness and tartness preferences. Both were highly affected by harvest date. In 2007, all selections had higher SSC in February than in March and January. Figure 2 shows the sugars/acid ratio for 'Festival', FL-00-51, 'Rubygem' and 'Sugarbaby'. The SSC/TA of 'Festival' was always lower than for FL-0051 and 'Rubygem'. 'Sugarbaby' had the highest SSC/TA ratio, mostly due to both high SSC (10.5 °Brix) and low TA (0.59 %). As indicated above, the high sugar content of 'Sugarbaby' was not an indication of quality for that selection. Volatile analysis provided more information

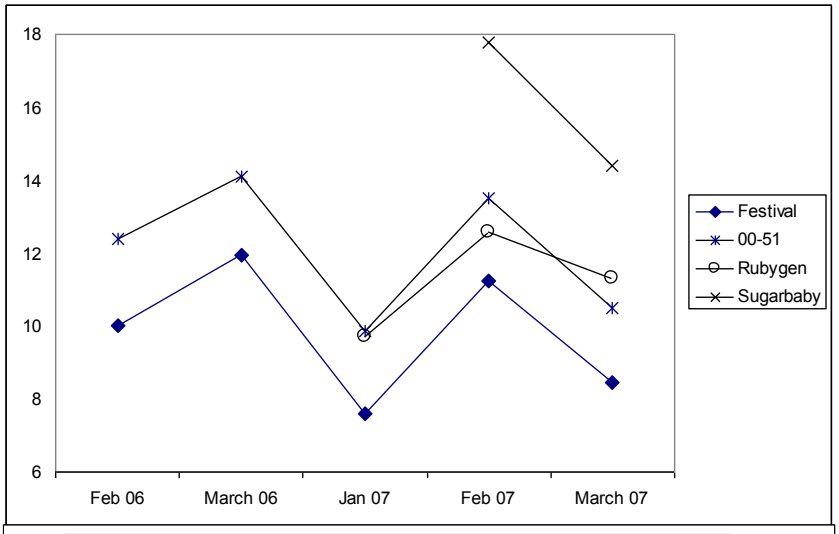

Figure 2: SSC/TA ratio for 'Festival', FL-00-51, 'Rubygem' and 'Sugarbaby' over the harvest season in 2006 and 2007.

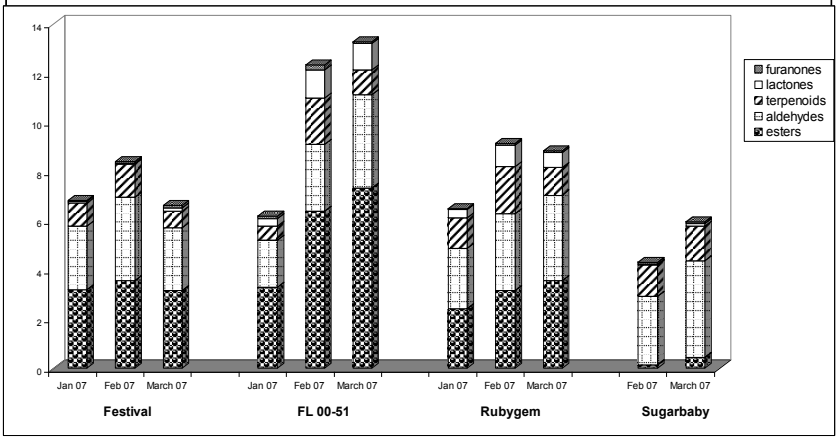

Figure 3: Sum of esters, terpenoids and aldehyde/alcohols for 'Festival', FL-00-51, 'Rubygem' and 'Sugarbaby' (sum of relative peak area for each compound in each chemical group).

All genotypes had the same volatiles (same quality) but with different proportions of esters, terpenoids, acids, lactones, furanones and alcohols/aldehydes. Esters, lactones and furanones are known to impart a desirable sweet/fruity flavor, terpenoids impart an earthy to medicinal flavor (when in high amount), and alcohol and aldehydes impart a "green" flavor that may give an impression of freshness, but also of unripe fruit if present in large amounts. Different proportions of these volatile compounds may result in very different aroma or flavor profiles in fruit. For example, FL 00-51 had the highest proportion of esters, lactones and furanones (Figure 3), which explains why it had high preference ratings over time. 'Rubygem' also had high amounts of lactones, but less esters than FL-00-51. 'Sugarbaby' had the least amount of esters, and was generally not liked, in spite of its high sugar content. Panelists' comments for this variety indicated "very sweet", but it tastes "artificial", like "peach", "apricot", "blueberry".

In this study, the aroma profile (variations in proportion of volatile compounds) was determined more by harvest date (environment) than by selection (genotype). In February 2006, most genotypes were characterized by a lack of terpenoids and alcohols/aldehydes and a high amount of TA. In March 2006, fruit had high contents of lactones, esters, and furanones, and high SSC, SSC/TA. In January 2007 fruit had low volatile content and SSC, while in February 2007 fruit had a high terpenoid and alcohols/aldehydes content. FL 00-51 was an exception because it was always characterized by a high quantity of volatiles and SSC (except in January 07). This observation might explain consistent high ratings for flavor liking and "just-right" for sweetness attributed to this selection. In March 2007, genotypes with the lowest flavor ratings – 'Festival' and FL 01-116 – showed a lack of volatile compounds and low SSC (similar to what was observed among all the selections tested in January).

In conclusion, the sensory evaluation of strawberry genotypes over 2 seasons showed a great variation month by month, except for FL 00-51, and 'Rubygem'. FL 00 -51 and 'Rubygem' were the most preferred selections, but 'Rubygem' needs to be evaluated over another season to confirm the 2007 results. FL-00-51 may give the Florida strawberry industry an opportunity to provide consumers with a sweeter and more flavorful product in March. However, its storability was inferior to 'Festival' in this study (data not shown).

BMAPs are Coming in 2008!

Jemy West Hinton, Sr. Engineer BMP and Alicia Whidden, Hillsborough County Extension Agent

And growers better be ready! By now you probably have heard about the Florida TMDL (Total Maximum Daily Load), the state's response to the federal Clean Water Act mandate to protect ground and surface waters. This is a process whereby the Florida Department of Environmental Protection (DEP) assesses the health of the state's water-bodies, identifies impairments and determines what must be done to regain a healthy system. By using detailed scientific methodology, DEP is well into the TMDL process of monitoring state waters, identifying pollutants, and determining the reduction in pollutants that is necessary to achieve target water quality in the system. Once the TMDL is identified and set for a water-body, the next step in the process is developing a Basin Management Action Plan (BMAP) which projects the actions needed to meet restoration goals.

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DEP's strategic approach for implementing BMAPs is one of collaboration. The BMAP process in most watersheds will be a stakeholder driven public/private working partnership that uses existing local knowledge to best manage a system. The BMAP working groups will consist of landowners, public utilities, water supply authorities, state, district and local agencies, educational entities, agricultural groups, environmental groups and any other interested parties.

By using local stakeholders with local knowledge, the BMAP process will encourage a proactive, incentive based educational approach to developing the plan. The plans will include agricultural Best Management Practices (BMPs), stormwater BMPs and retrofits, local ordinances, financial and regulatory incentives, education and more education. All actions will be coordinated with community outreach.

Permitting will still continue and will remain an option. However, the preferred avenue will be a process that involves the community developing a BMAP resulting in a personal ownership by all participants. All parties will be sitting at the same table, sharing ideas, information and resources. All will be embracing the same watershed goals and working together to attain them.

BMAPs will be coming soon to a watershed near you. You can be ready. Producers can now voluntarily enroll in the Agricultural Best Management Practices Implementation Program (BMP) by initiating legally adopted practices applicable to their operations. Agricultural BMPs are practical, cost-effective actions that agricultural producers can take to reduce the amount of pesticides, fertilizers, animal waste and other pollutants entering our water resources. While the program is voluntary in much of the state, in areas of the state where DEP has developed a BMAP that includes agriculture, farmers must sign up for the BMP Implementation Program or conduct water quality monitoring **at their own cost.**

For information on the Agriculture Best Management Practices Implementation Program in your area, you may contact Jemy West Hinton jwh@ufl.edu, or (813)478-6630, Alicia Whidden, Hillsborough County (813)744-5519.

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 & Actions

- The Florida Department of Agriculture and Consumer Services (FDACS) has approved the special local needs (SLN) registration of hexythiazox (Savey ® 50 DF) ovicide/miticide with a reduced plantback interval (30 days for snap beans or cucurbit vegetables and 60 days for fruiting vegetables) after application to strawberry on plastic mulch. The registration is FL-080001. (*PREC Agenda*, 2/7/08).
- Based on requests by Nippon Soda and IR -4, the EPA has approved tolerances for the insecticide acetamiprid (Assail ®). Tolerances of importance in Florida include blueberry and onion. (*Federal Register*, 1/16/08).
- Based on a request by Valent USA, the EPA has approved tolerances for the fungicide fluopicolide (proposed name Infinito®). This is a member of acylpicolides, a new chemistry and mode of action with systemic properties. It is active against water molds and downy mildew. Tolerances of importance in Florida include: fruiting vegetable (group 8), cucurbit vegetables (group 9), and tuberous and corm vegetables (subgroup ID). (*Federal Register*, 1/30/08).
- Based on a request by Syngenta, the EPA has approved tolerances for the fungicide mandipropamid (proposed name Revus®). This is a carboxamide—which binds with the wax layer in plant tissue and is stable for a longer period of time. It is active against water molds (except *Pythium*). Tolerances of importance in Florida include: fruiting vegetables (group 8), cucurbit vegetables (group 9), leafy vegetables except bassica (group 4), head and stem brassicas (subgroup 5A), leafy green bassicas (subgroup 5B), tuberous and corm vegetables (subgroup 1C), okra, onion, and potato. (*Federal Register*, 1/16/08).
- Based on a request by Syngenta, the EPA has approved tolerances for the fungicide difenoconazole (Dividend ®). Tolerances of importance in Florida include: sweet corn, cotton, fruiting vegetables (group 8), and tuberous and corm vegetables (subgroup 1C). (*Federal Register*, 1/9/08).

Spring Blueberry Field Day

Tuesday, March 11, 2008
Plant Science Research and Education Unit
2556 W. Hwy. 318, Citra, FL

8:00 am Late Registration

8:45 am Welcome– Dr. Daniel L.

8:55 am Update on blueberry

9:15 am Another disease of blueberry,

9:35 am Fertigation of blueberries – Mr. Bryan Hobbs, president, B.B. Hobbs Company, Palmetto, Fla.

9:55 am Update on horticultural blueberry research at the University of Florida – Dr. Jeff Williamson, extension horticulturist, Horticultural Sciences Dept., IFAS, University of Florida

10:10 am FBGA Business Meeting – Ms. Donna Miller, FBGA president, presiding

10:25 am Instructions for Tour of the PSREU – Dr. Jeff Williamson and Dr. Paul Lyrene, Horticultural Sciences Dept., IFAS, University of Florida

10:35 am Depart for field tour of blueberry research and breeding plots at the PSREU - Dr. Jeff Williamson, extension horticulturist, Horticultural Sciences Dept., IFAS, University of Florida

11:45 am Lunch – provided for pre-registrants compliments of Agri-Source and Driscoll's.

1:00 pm Depart for field tour of area blueberry farm - Maps will be provided.

More details on Page 10.

Information about the short course -

Registration - Please find a ***pre-registration form*** for the Spring Blueberry Field Day below. **This form must be returned postmarked by March 6 to guarantee your meal at the field day.**

Directions to the UF Plant Science Research and Education Unit, Citra, Fla. – Directions from I-75 - Exit I-75 at exit #368 (W Hwy 318). Head east on Hwy 318. After approximately 5 miles, you will cross over 441. Keep heading east for approximately 2.5 miles. The Plant Science Unit is on the right. **Directions from Hwy 441** - Where 441 and W Hwy 318 intersect, turn east onto W Hwy 318. The Plant Science Unit is approximately 2.5 miles east from the intersection on the right.

2008 Spring Blueberry Meeting and Field Day
Pre-registration

Where: **Plant Science Research Unit, Citra Fla.**
When: **Tuesday, March 11, 2008.**

Pre-register now for the Annual FBGA Spring Field Day. Pre-registrations must be postmarked by March 6, 2008 to guarantee a meal.

About the Field Day - On-site registration will begin at 8:00 a.m. **Note:** Meals will be provided only to those who have preregistered. The trade show will open at 8:00 a.m. Research and educational presentations and a tour of research plots will be followed by lunch and an afternoon tour of an area farm. We are planning to offer Florida CEU credits for this meeting.

Location of the Spring Meeting – The 2008 Spring Meeting and Field Day will be held at the Plant Science Research and Education Unit in Citra, Fla. The address is 2556 W. Hwy. 318, Citra, FL.

Thank you for your continued support of the Florida Blueberry Growers' Association!

Florida Blueberry Growers' Association
P.O. Box 163
Island Grove, FL 32654

Please cut here and return to above address.

Name(s) attending the Short Course _____
_____
_____
_____