

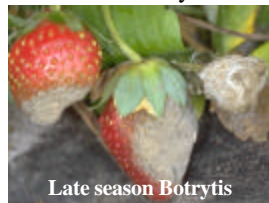
March 2002

## Late Season Disease Control - Dan Legard

As March begins we enter a month when it is often challenging to make disease management decisions. What fungicides should growers apply at the end of the season and when should they apply them? Many factors influence these decisions including weather, cultivar, fruit development stage, and market conditions. Typically, Botrytis fruit rot becomes a less important disease and anthracnose fruit rot becomes more important in March due to seasonal changes in the weather. In February, the weather is usually cooler and there are long periods of fog and dew. These produce conditions ideal for Botrytis fruit rot. Botrytis is also favored by long periods of rainy weather. However, when we enter March, the weather usually warms up, and long dew periods occur less frequently and growers should be more concerned about controlling anthracnose fruit rot.

First we will address late season control of Botrytis fruit rot. In March, epidemics of Botrytis can still occur although they usually happen early in the month. The key to controlling Botrytis fruit rot is to protect the flowers (go to this internet address for more information:

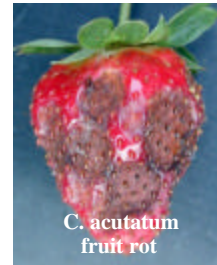
<http://strawberry.ifas.ufl.edu/botrytisfull.htm>). Applications made after flowering are less effective. There are two periods that are important for the development of Botrytis fruit rot. One is during the first few days the flower is open. This is when most infections begin. The other is 7 to 10 days before harvest when heavy rains can damage fruit and cause infected fruit to become diseased. Fungicides applied after heavy rains will not prevent previously infected fruit from becoming diseased but will protect new flowers. Fungicide applications of captan, thiram, Elevate<sup>®</sup> and Switch<sup>®</sup> protect fruit that are harvested 20-30 days later (depending on cultivar and weather conditions). Because of this lag period between fungicide applications and control we do not recommend that growers apply fungicides to control Botrytis as the season progresses into mid March, and Botrytis epidemics no longer develop.



However, we do recommend that growers continue to apply fungicides in March to control anthracnose fruit rot caused by *Colletotrichum acutatum*. Anthracnose infections typically begin in the flowers like Botrytis although they may also become infected 7 to 10 days before harvest (go to this internet address for more information:

<http://strawberry.ifas.ufl.edu/anthracnosefull.htm>). So regular fungicide applications are important from flowering through harvest. Applications of Quadris<sup>®</sup> can effectively control anthracnose but it must be applied for several weeks before

results will be observed. We recommend that growers apply Quadris<sup>®</sup> in alternation with Captan on a 7 day schedule to



control anthracnose fruit rot on susceptible cultivars. Ideally these applications should begin during January or February when environmental conditions (warm and wet) are favorable for the disease, and continue through the end of the season observing label restrictions on the number and rate of application. Links to fungicides mentioned in this article:

Captan – <http://strawberry.ifas.ufl.edu/captan.pdf>

Thiram – <http://strawberry.ifas.ufl.edu/thiram.pdf>

Elevate<sup>®</sup> – [http://www.tomenagro.com/Default\\_US.htm](http://www.tomenagro.com/Default_US.htm)

Switch<sup>®</sup> – <http://strawberry.ifas.ufl.edu/switch.htm>

Quadris<sup>®</sup> – <http://strawberry.ifas.ufl.edu/quadris.htm>

## Development of a Grow-Out Certification Test to Detect *Colletotrichum acutatum* in Nursery Plant Material - Dan Legard

Severe epidemics of *Colletotrichum* root rot and fruit rot caused by *C. acutatum* have occurred in Florida and California this season. It appears that the disease was introduced into fields on infected transplants. This is a particularly serious problem since plants infested with the pathogen are often symptomless in the nursery, and only express the disease after transplanting into fruiting fields. To help nurseries improve their detection and control of this important disease, we are collaborating with several nurseries from California and one from Colorado to evaluate foundation plant material for the presence of *C. acutatum*. In this study we have planted ten different sources of nursery material at the research center in Dover and will allow them to grow for 3-4 weeks. We hope that the environmental conditions during March will be conducive to the production of disease symptoms if *C. acutatum* is present. Before the end of March we will sample the material and look for either symptoms of the disease (*Colletotrichum* root rot) or try to detect the pathogen using a petiole test. This information should help nurseries control *C. acutatum*. We appreciate the willingness of nurseries to collaborate with us and hope by working together to solve this problem we can prevent future epidemics on strawberry.



## You Can See Spider Mites Invading from the Sky - Jim Price

Twospotted spider mites become established in fruit production fields by two important means. The first is by accompanying transplants from the nursery and mites introduced this way are most likely to pose chemical control difficulties. These are the mites that have been exposed to pesticidal selection pressures in the nursery, and may possess an even longer history of pesticidal selection pressures from pesticide use in the foundation nursery.

The second means of introduction for spider mites is by arriving, after the crop is established, on strands of silk carried in air currents. These mites may be from non-cultivated plants and not possess the history of intensive pesticide selection pressure. Thus these mites should not be as difficult to control with modern miticides.



Growers can actually observe the movement of spider mites within their fields or from their fields to perhaps their neighbor's field, and the sight is an interesting one. When spider mite colonies become overcrowded and mite feeding has reduced the food quality of the strawberry leaves, mites will disperse. That is nature's way of preserving the species from extinction by starvation.

Dispersal begins with the immature mites attaching a strand of silk to the strawberry leaf, and then dropping over the edge. A breeze can lift the strand and allow more to be extended. At some point the strand breaks and the mite and remaining strand are released into the air currents.

Growers can observe this in heavily infested fields on warm days in February, March, or April when air movement is very light. As the sun begins to lower at about 3:00 p.m. or 4:00 p.m., one who looks across the infested field in the direction of the sun can see the glistening strands of spider mite silk just becoming airborne. It is exciting to watch this process of nature and to gain a clearer understanding of the ecology of spider mites in our community.

## Pamera Bugs Run Amuck on Mulch in Springtime - Jim Price

Pamera bugs can become plentiful on the plastic mulch around strawberry plants as the strawberry season draws to an end. They shouldn't cause economic damage to the crop under most conditions experienced in Florida, but their control may be desirable if they accompany the harvested fruit to the market.

Adults are brown, about 1/8 to 1/4 inch long, and longer than they are wide. Also they have an obviously enlarged upper portion of their front legs. The easiest diagnostic feature may be, however, that they run from the base of plants as the leaves are disturbed.



These insects can fly, but rarely do so. Young are usually mixed with the adults and possess a similar behavior, but they are smaller. Pamera bugs are very common in our environment and often are the insect most caught in an entomologist's sweep net along ditch banks and weedy fields. Because of their abundance in areas surrounding fields, they are more problematic along field margins than in interiors of large fields.

Pamera bugs are true bugs (Hemiptera) in a family that includes seed feeders (pameras) and natural beneficial predators (big-eyed bugs). They have piercing and sucking mouthparts and suck nourishment from seeds, including strawberry seeds.

Good weed control within and around the farms is useful to reduce pameras, but when populations require control, several of the broad-spectrum pesticides used in strawberry production can be effective. It is when these products are not used that pameras become noticeable, a consequence of reduced pesticide use associated with biological control of spider mites. Usually a single application of a broad spectrum insecticide is sufficient to control pameras for the remainder of the season. No insecticide is registered specifically for pameras on strawberry, but labeled insecticides generally considered effective on bugs include neem oil, organophosphates and pyrethroids.

## Summary of Rule Changes to Pesticide Certification and Licensing Effective March 1, 2002 - Erin Rayfield

### *Fee Increases*

License fees will increase for pesticide applicators and dealers licensed under the Florida Pesticide Law, Chapter 487, Florida Statutes, effective March 1, 2002. The new fees are as follows: Private Applicator \$60 for a 4-year license; Public Applicator \$60 for a 4-year license; Commercial Applicator \$160 for a 4-year license; and Pesticide Dealer \$175 for a 1-year license.

### *Core CEUs*

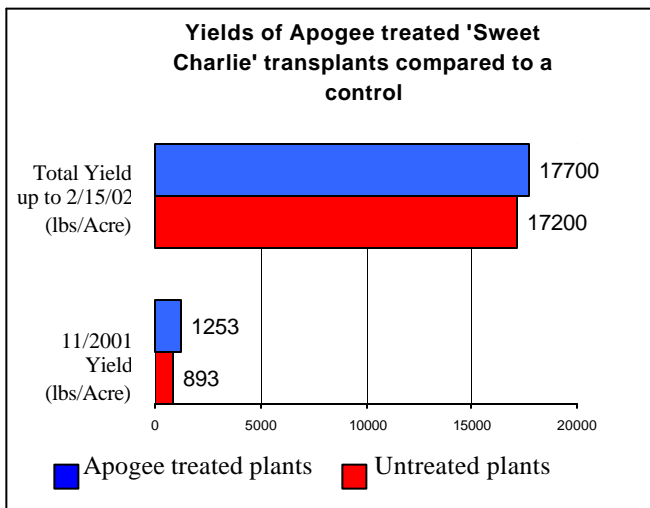
Effective January 1, 2005 all applicators licensed under Chapter 487, F.S. who renew their licenses using Continuing Education Units (CEUs) will be required to have 4 core CEUs in addition to the number of category CEUs now required. At that time, all category CEUs must be approved for the specific category. There will no longer be a requirement for having 2 core CEUs per primary category, and core CEUs will no longer apply to the required number of category CEUs. Applicators will have the option of retaking the core and/or category exams if they do not have enough CEUs for renewal. For example, effective January 1, 2005, private applicators will be required to have 4 core CEUs plus 8 CEUs approved for the private applicator agriculture pest control category. A private applicator that has 8 private applicator CEUs and only 2 core CEUs may choose to take the core exam instead of earning 2 additional core CEUs.

### Direct Supervision

Licensed applicators who supervise unlicensed individuals who mix, load, or apply restricted use pesticides will now be required to be immediately available by voice communication to the unlicensed individuals to provide direction and instruction during all times restricted use pesticides are being used

### On-going Trials at GCREC-Dover Concerning the Use of Plant Growth Regulators - John R. Duval

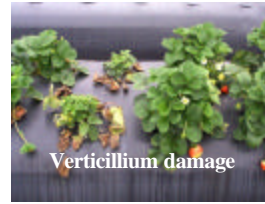
On going trials at the GCREC-Dover concerning the use of plant growth regulators to increase early yield and reduce water use during establishment are showing great promise. Apogee, classified as a reduced risk agri-chemical by the EPA, is being tested at various rates and timings during transplant production in Nova Scotia. Treated plants have shorter petioles and larger crowns than untreated plants. Treated plants grown out at Dover have shown increased early and total yields. In addition, Apogee treated plants have shown reduced runnering during the early parts of the season. The manufacturer BASF has shown interest in the use of Apogee in strawberry production, not only as a means to increase the quality of transplants but also as a method to prevent runner production in the fruiting field. BASF has conducted trials on these aspects in California and Quebec. However, formal investigations of this compound in Florida have only been conducted on 'Sweet Charlie'. Informal work indicates that different cultivars react differently to Apogee, and more work is needed to determine optimum rates and timing for these cultivars. Therefore it may be several years before Apogee can be commercially used in strawberry.



**Late Breaking News – Jim Price**  
**The new miticide, Acramite (by [Crompton Uniroyal](#)) received final approval on 3/7 for use on strawberries in Florida.**

### Spotlight on Diagnosis - Jim Mertely, Ph.D.

The Strawberry diagnostic lab has been much quieter over the last two months than earlier this season. Since



January 1, approximately 50 samples have been received. Colletotrichum root rot and slow decline was often diagnosed in January (perhaps due to the unusually warm weather), while Botrytis fruit rot became prominent

in February. Several cases of Verticillium wilt have also been diagnosed. This fungus causes a vascular disease on strawberry. Infected plants die slowly, with the older leaves turning uniformly yellow, then brown. While soil fumigation this fall should eliminate the threat to the next strawberry crop, spring-planted crops such as cantaloupe, peppers, and squash may experience losses. *Verticillium dahliae* is a persistent soil-borne pathogen that infects many vegetable and field crops.

### Center Update - Christine Manley

Our center is a popular stop for educational tours during strawberry season and this year has been no exception. In the past few weeks, our faculty and staff have hosted several groups: home-schooled students and their parents, a group of Junior Master Gardeners, and a group of Hillsborough County Career Specialists who assist students in determining their career paths. Many of these



career specialists work with students in Tampa and the immediate downtown area, and this tour gave them some information that many inner-city students may not have access to regarding agriculture and the opportunities available in this field.

As always, we welcome any group to our center in order to educate the public as well as allow our faculty and staff to illustrate the research that is conducted at our center. If you are interested in having a tour at our center, please call (813) 744-6630 #60 or e-mail [cmanley@ufl.edu](mailto:cmanley@ufl.edu) to schedule one.

Recently a small group of musical senior citizens known as the Silver Strings toured our center. However, they had to work for their tour. They performed several songs for the enjoyment of our faculty and staff. The group travels throughout the immediate Plant City/Brandon area during the winter months performing at various venues. These



snowbirds include my mother, Charla Pfeffinger, who directs the band as well as several other musical groups involved at the SunBurst Mobile Home Park in Dover. Many of the residents there have had the pleasure of receiving our strawberries over the last few seasons and this was their way of thanking us. It was an enjoyable performance of about one hour, but we had the feeling that if given the chance, they would have played all afternoon.

## Early Season Performance of Selections in the 2001-02 Row Trial - Craig Chandler

Each year, in the front section of the field at GCREC-Dover, we plant 1-3 beds each of several standard cultivars and promising selections. This “row” trial is planted primarily so there will be an area where growers and other center visitors can observe various strawberry clones growing side-by-side. The rows are 150 feet long and are currently harvested twice weekly into quart containers by a volunteer group of senior citizens. The number of quarts harvested from each row is recorded before these volunteers consolidate the fruit and take it home.

This season nine entries were planted in the trial.



Plants of four entries (Sweet Charlie, Strawberry Festival, Aromas, and Treasure) came from Canadian nurseries, plants of three entries (Camarosa, Gaviota, and FL 95-256) came from a North Carolina nursery, plants of one entry (Earlibrite) came from a Michigan nursery, and plants of one entry (FL 97-39) came from a Hillsborough County, FL nursery. All plants were planted on October 12<sup>th</sup> except those of Treasure, which were planted on October 19<sup>th</sup>. Each row contains 246 plants (which is equivalent to 17,860 plants per acre).

FL 95-256 produced the highest December yield (Table 1), followed by Earlibrite and Gaviota. FL 95-256, Earlibrite, and Gaviota’s December yields were 60, 37, and 8% higher, respectively, than Camarosa. (Camarosa is currently the major cultivar in Florida.)

For January, FL 95-256 again was the highest yielding entry, producing over 500 flats on a per acre basis. Treasure came in second with 490 flats per acre, while FL 97-39 was third at 366 flats per acre.

FL 97-39 was clearly the most productive entry during February with a yield of over 1300 flats per acre. This is a 58% higher yield than was produced by its nearest competitor, Earlibrite (839 flats per acre), and a 400% higher yield than was produced by Camarosa (263 flats per acre).

FL 97-39 had the highest total yield (Dec.-Feb.), followed by FL 95-256 and Earlibrite. These three entries are products of the UF/IFAS strawberry breeding program. Yields for Strawberry Festival, another UF/IFAS cultivar, were very low in this trial, probably because many of the Strawberry Festival plants suffered from *Colletotrichum* root rot, a fungal disease caused by *Colletotrichum acutatum*.


Despite the large differences in yields between cultivars, growers should be cautious when using these data to make decisions on which cultivars to plant. Data from only

one season is presented here, and, there are factors in addition to yield that make for a great cultivar (e.g., harvest efficiency, shipping ability, and buyer acceptance). The data presented in Table 1 does, however, provide further evidence that the University of Florida strawberry breeding program is accomplishing one of its main goals, which is to create cultivars that have high early season yield potential. This is important because fresh strawberries produced in December, January, and February generally command high prices. The average price per flat (4.65 kg) during the five seasons between 1995 and 2000 was \$17.38, \$11.57, and \$10.51 for December, January, and February respectively, whereas the average price per flat for March during the same five-season period was \$7.27 (Florida Agricultural Statistics, [www.nass.usda.gov/fl](http://www.nass.usda.gov/fl)).

Table 1. Fruit yield\* from seven strawberry cultivars and two UF/IFAS selections grown at GCREC-Dover during the 2001-2002 season.

	December	January	February	Total
Aromas	449	204	227	880
Camarosa	458	254	263	975
Earlibrite	626	318	839	1,783
FL 95-256	733	556	647	1,936
FL 97-39	462	366	1,325	2,153
Gaviota	495	240	585	1,320
S. Festival	163	145	227	535
S. Charlie	345	222	690	1,257
Treasure	318	490	517	1,325

\* Flats per acre. These yields were calculated using the following equivalency: 8 quarts = 1 flat (instead of the more standard 6 quarts = 1 flat). This was done to take into account the small and misshapen fruit that were likely placed into the quart containers by the volunteer pickers.


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