



Berry/Vegetable Times

December 2003



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Calendar of Events 2003-2004

Jan 12 Pesticide Testing, Hillsborough County Extension Office, Seffner, 9am.. 744-5519.

Feb 23-25 NASGA 2004 North American Berry Conference. Hilton Tampa Airport Westshore. For info, www.nasga.org.

Mar 23-27 ISHS Symposium for Protected Culture in a Mild-Winter Climate Kissimmee. For more information visit www.conference.ifas.ufl.edu.

June 21-24 International Symposium on Tomato Disease and 19th Annual Tomato Disease Workshop. Grosvenor Resort, Walt Disney World Orlando. For more information visit <http://plantdoctor.ifas.ufl.edu>.

From Your Agent...

Here are some updated phone numbers to put on Central Posting at your farm locations. The National Poison Control number is 1-800-222-1222. The National Pesticide Information Center, which can give information on pesticide toxicity and symptoms, is 1-800-858-7378. Both of these are very important numbers to keep handy in case of emergency. Be sure and remember to have all required information on your central posting location. You must include: approved EPA safety poster, information on the nearest emergency medical center- name, phone number and address, and what pesticides have been sprayed on the field. Spray information will include location of where the pesticide was sprayed in the field, product name, EPA registration number of product, active ingredient, the time and date you sprayed, the re-entry interval in hours and then the date and time re-entry is allowed.

Happy Holidays!
Alicia Whidden

Update on Blueberry Summer Leaf Spot Disease Control

Alicia Whidden

The Fall Blueberry Short Course, sponsored by the Florida Blueberry Growers Association, was held Nov. 6, 2003 in Gainesville and had an excellent program. A talk was presented by Dr. Jeff Williamson on the fungicide trial conducted this summer to look at fungicides and their control of summer foliar diseases and the current status of Indar® which has a Section 18 through Sept. 14, 2004. The health of the leaves this year is very important for next year's fruit crop. The main foliar diseases in blueberries are Septoria, Rust and Phyllosticta leaf spot. Phyllosticta leaf spot is the main fungal leaf disease for the southern part of the state. Cabrio® did the best job of control in this year. Abound® also did a good job of controlling disease but was statistically ranked second with Indar® not doing as good a job as the other two. When using Cabrio® or Abound®, which are strobilurins, you are limited by the label on the total number of applications you can apply and also you are to apply no more than 2 consecutive applications before you rotate to another product with a different chemistry. You can rotate with Indar, Alliete or Captain which are labeled for blueberries and have a different chemistry from each other.

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Just remember it is important to keep healthy leaves on the bushes into fall to harvest a good crop next year.

Petiole Sap Testing

John R. Duval

Monitoring the nutritional status, over the course of the season, of strawberry plants is critical for optimizing yields. Deficiencies in the early season can decrease yields later in the year. Analysis of plant tissue is the best way to determine how well a fertilization program is meeting the demands of strawberry growth. There are means to determine the plants nitrogen (nitrate) (N) and potassium (K) levels directly in the field. The use of hand held ion specific electrodes (Cardy meters) provide a simple and effective way of doing this in the field. Ten to 15 petioles are removed randomly from actively growing plants then pressed to remove sap from the petioles. This sap is then placed on the electrode and a value in parts per million is given for the specific ion. This information can be used to increase or decrease the fertilization. The sufficiency range of values for N (nitrate) and K are given below. These numbers are a guide. Weather conditions may decrease (if temperatures are cool) or increase (if temperatures are warm) desirable N and K values during December, January, and February.

<u>Month</u>	<u>Petiole sap concentration (ppm)</u>	
	<u>N (nitrate)</u>	<u>K</u>
Nov	800-900	3000-3500
Dec	600-800	3000-3500
Jan	600-800	2500-3000
Feb	300-500	2000-2500
Mar	200-500	1800-2500
Apr	200-500	1500-2000

Use This Method To Check The Vigor of Predator Mites As Soon As They Arrive

Jim Price

Life is difficult during those first few days after predator mites are released into strawberry fields for spider mite control. At that point, the predators already have been washed from cozy plant homes only a leg's reach from food, dumped into bottles of vermiculite, chilled, jostled in the belly of an airliner and on the floor of a delivery van and finally sprinkled into our fields.

Then their work starts. The predators quickly must acclimatize themselves to our fields and for the first time in their lives actually search for food. There may be more than ten plants, each with perhaps 21 leaflets between the predator and her first meal in Florida. And that meal must be found and eaten before her fuel, taken on in California, Holland, or other distant place, runs out. To survive this and lay eggs to start a family in our fields, predators must be in good vigor at the time of release.



A predator's vigor can be related to the health of her parents' colony back home, the time and temperature in transit, the amount of moisture in the vermiculite and other factors. No one can determine with certainty just how well a shipment of predators will perform, but shippers often instruct buyers to stand bottles of predators on end to confirm that the predators are alive

by observing them walking around the bottle neck.

We have developed the "coffee mug method" to help growers make additional inferences about the vigor of predators commonly shipped at about 2,000 predators in a pint bottle. The method to employ this technique is described below.

Immediately after the shipment arrives, randomly select bottles of predators to be tested. Five or six bottles of a small shipment, or at least one bottle from each shipping container of a large shipment should be checked. Rotate each bottle end over end and along its axis for 15 seconds to distribute the predators evenly within the vermiculite. Pour a bottle capful (about 10 ml) into a white coffee mug warmed to room temperature. A Styrofoam coffee cup is not suitable. Wait 10 minutes and immediately count the predators that have climbed to the top of the mug.

If ten or more have reached the top in 10 minutes, the bottle contents have arrived in good condition. If none or very few reach the top in 10 minutes, remix the contents and take another sample. If the second results are consistent with the first, then the contents likely will not be effective. In any case, draw inferences concerning the entire shipment based on results of tests on several bottles. Claims against suppliers or shippers should be supported also by the whole bottle test described on the packaging.

Do not unnecessarily delay releasing the predators into the field. Their vigor declines each day the predators remain in post-shipment cool storage.

Finding spider mite food and laying first eggs are big tasks for predators in strawberry fields and only those in good vigor are likely to get the job done. This method removes some of the uncertainty about whether a shipment can accomplish this and

helps a successful strawberry season get off to a good start.

Ideas for increasing Florida strawberry growers' profit. Part II

Craig Chandler

In part one of this article, which appeared in last month's issue of Berry/Vegetable Times, the focus was on production costs. This month, I present some thoughts on supply and demand.

Increasing fruit yield per acre can increase profits. Higher yields allow growers the option of either selling more fruit or reducing their acreage and harvesting the same amount of fruit as they did before the yield increase. We may, however, be reaching the limits for yield in strawberry. The average seasonal yield for Florida strawberries is currently about 25,000 lbs/acre, which is substantially higher than for other fresh fruit crops grown in the southeastern U.S. For example, the average yield for high-density blueberries in Florida is only about 6,000 lbs/acre, and the average yield for peaches in Georgia is about 8,000 lbs/acre (www.usda.gov/nass/). Also, the wisdom of developing cultivars with greater total yield per plant may be questionable, because high yield can result in low soluble solids (an important component of flavor). In fact, the pineapple breeder in Queensland, Australia, Garth Sanewski, is breeding for *lower* yield per plant, resulting in sweeter and better-flavored fruit.

Even if higher total yield is not possible or advisable, it is possible (and highly desirable) to increase *marketable* yield. For example, marketable yield can be increased by eliminating or reducing losses due to diseases, arthropod damage, fruit malformation, and cracking. Certainly great strides have been made in the areas of

disease and pest control, and I have no doubt that additional progress will be made in the future. As for fruit malformation and cracking, breeders are working diligently to develop cultivars that produce symmetrically shaped and crack-resistant fruit over a range of environmental conditions.

The timing and consistency of yield is also amenable to manipulation. Increased yields during a desirable market window can result in increased profit for the grower. For information on how to modify the timing and consistency of strawberry yield, please see "Smoothing out the peaks and valleys in winter strawberry production" in the Sept. 2002 issue of Berry Times (<http://strawberry.ifas.ufl.edu>).

Another way for growers to increase their profits is to obtain higher overall prices for their fruit. This requires increased demand for the fruit. From the research side, I think we can create a greater demand for strawberries by developing cultivars and cultural practices that result in more desirable fruit. Traits that would make the fruit more desirable include uniform shape and color, better flavor, and greater health benefits.

In conclusion, I believe research and development efforts can help lower production costs, increase marketable yield, and create fruit that is in high demand by consumers.

Pesticide Regulations and Actions

Chemically Speaking

- On September 5, the FDACS registered the insecticide Proclaim® (emamectin benzoate) for control of certain lepidopterous larvae on fruiting vegetables, including brassica and turnip greens. The EPA registration number for the Syngenta Crop Protection

product is 100-904. (FDACS PREC, October Agenda)

- On September 25, FDACS sent a letter to Florida Fruit and Vegetable Association to inform them that the EPA had granted a specific exemption for the use of Indar® (fenbuconazole) fungicide (EPA Reg. #62719-421 or 707-239) for control of leaf spot and rust on bearing blueberry. The exemption expires on September 14, 2004. (FDACS letter of 9/25/03)
- The time limited tolerance for vinclozolin (Ronilan®) on snap bean has been extended until September 30, 2005, which is also the last date of legal use of this fungicide on this crop. (Federal Register, 9/30/03)
- Based on a request from Syngenta Crop Protection, tolerances have been obtained for the herbicide trifloxysulfuron in citrus (0.03 ppm), cotton undelinted seed/gin byproduct (0.05/1.0 ppm), sugarcane (0.01 ppm), and tomato (0.01 ppm). (Federal Register, 9/17/03)
- Based on a request from Valent U.S.A. Corporation, tolerances have been obtained for the insecticide etoxazole in cotton undelinted seed/gin byproduct (0.05/1.0 ppm) and strawberry (0.5 ppm) as well as commodities such as meat and milk (0.01 to 0.02 ppm). (Federal Register, 9/26/03)
- Based on a request from BASF, tolerances for the insecticide chlorfenapyr in fruiting vegetables. The fruiting vegetables uses will only be for greenhouse-grown vegetables, and they will be found on the Pylon® label. (Federal Register, 9/26/03 and personal communication, D. O'Byrne, 9/26/03)

Powdery Mildew

Jim Mertely

Recently, powdery mildew has been a problem in scattered strawberry fields (and in some laterals here at GCREC Dover). A few words about this pathogen might be helpful.

Powdery mildew of strawberry is caused by the fungus *Sphaerotheca macularis* f. sp. *fragariae*. This pathogen produces superficial white strands on the strawberry leaf which absorb nutrients through root-like structures called haustoria (Photo 1). Vertical shoots (conidiophores) rise up from these strands and end in a chain of spores (Photo 2). Powdery mildew spores are easily dislodged by the wind and relatively short lived. Young leaves are infected when temperatures are mild and relative humidity is high. Heavily colonized leaves respond to infection by cupping upward, turning purple or brown in colonized areas, and dying prematurely (Photo 3). Flowers and fruit may also be infected. Such infections result in flower abortion, distorted fruit, or "seedy" fruit. Powdery mildew also grows on the seeds when conditions are favorable (Photo 4).

The current outbreak of powdery mildew is the result of inoculum from diseased nursery plants and favorable conditions for infection that occurred several weeks ago. With the crop already in the ground and the disease already established, chemical sprays are our only option. Numerous products are labeled for powdery mildew control on strawberry. These include the strobilurin fungicides Abound (Quadris), Cabrio, and Pristine. To avoid the development of resistance, no more than five applications of products from this group should be made during a single season. The strobilurin fungicides are also our best materials for controlling anthracnose fruit rot (*Colletotrichum acutatum*), which is often a far more serious problem in the spring than powdery mildew is in

the fall. Therefore, these fungicides should be conserved for use later in the season. If possible, keep your powder dry! Nova and Procure are highly specific products for powdery mildew control that have consistently controlled or suppressed the disease in our experimental trials. Hydrogen peroxide (Oxidate), potassium bicarbonate (Armicarb, Kaligreen), and Topsin M are also labeled for powdery mildew control in strawberry, but have not been independently tested for effectiveness here. However, a discontinued compound closely related to Topsin M (i.e., Benlate) was moderately effective in previous trials.

Sulfur fungicides (Microthiol, Sulfur 6L, Thiolux, etc.) are inexpensive, and fairly effective against powdery mildew. Growers have decreased their use of elemental sulfur over the years for several reasons: availability of alternatives, fear of phytotoxicity, and suppression of predatory mites. Sulfur fungicides may burn strawberry foliage when applied at high temperatures, or when combined with other materials which facilitate penetration into plant tissues. Therefore, sulfur should not be applied when temperatures higher than 85 F are expected within three days of application. It is less well known that sulfur fungicides are not as effective at temperatures below 65 F. Do not combine sulfur with spreader stickers or other products containing emulsifiers or petroleum solvents (e.g., an EC formulation). Also, avoid the use of sulfur within two weeks of an oil spray application. Modern sulfur fungicides are produced with more uniform particle sizes than older products which reduces the risk of phytotoxicity. If the precautions on the label are followed and low to moderate dosages are applied, the risk of phytotoxicity is low. When *P. persimulus* has been released for two-spotted spider mite control, sulfur fungicides should be used sparingly. However, Dr. Jim Price believes that one or

two applications at lower rates are not too damaging to predatory mite populations.

In Florida, powdery mildew epidemics typically occur in November. We may have seen the peak of this outbreak since winter weather has recently set in. Temperatures and relative humidity have been low since the beginning of December. These conditions are not favorable for powdery mildew. Keep in mind that infected leaves may continue to turn brown over the next several weeks even though *S. macularis* is no longer actively growing or spreading. Although the situation bears careful monitoring, it is probably too late to start an effective spray program for powdery mildew this fall.

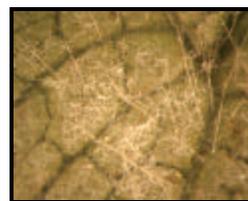


Photo 1—Haustoria



Photo 2—Conidiophores



Photo 3—Cupped leaves



Photo 4—Infected fruit

**Happy Holidays
from the faculty
and staff of
the
Berry/Vegetable
Times.
Wishing you all
the best the
season can bring.**

**A Strawberry Farmer's
Christmas**

Twas the night before harvest
and all through the farm,
not a creature was stirring
till they heard the alarm.

A hard freeze was a' coming,
and all they could do
is get that water going,
sit up, and stew.

With the water's protection
the berries were fine.
The farmers were tired,
but got their pickers in line.

Soon baskets were full
and off to market they went.
To places up north is
where they were sent.

The strawberries of Florida
are a northerner's treat.
During the holiday season
they can't be beat.

So thanks to the farmers
and their hard working hands
for bringing some sweetness
to those cold barren lands.

**Happy Holidays from
a Yankee turned
Floridian**

