



Berry/Vegetable Times

September—October 2006



From Your Agent...
Starting Off the Season Right!

2006 Calendar of Events

Oct. 10, 2006 Pesticide License Testing. Hillsborough County Extension Office, Seffner. 9 am. For more information call Mary Beth Henry, 813-744-5519, ext 103.

Oct. 17, 2006 Fall Blueberry Short Course. Florida Blueberry Growers Association Meeting. Florida Farm Bureau Building, Gainesville Fl. See registration form Page 7.

Nov. 14, 2006 Pesticide License Testing. Hillsborough County Extension Office, Seffner. 9 am. For more information call Mary Beth Henry, 813-744-5519, ext 103.

Dec. 8 & 9, 2006 Florida AG Expo. GCREC, Balm. Equipment displays and demonstrations, field variety trials for viewing, educational sessions, vendor displays and more. CEUs available. Watch more details. <http://www.floridagrower.net/expo/index.html>

Taking Care of Those New Strawberry Plants- Think TLC!

One of the first things we can do to help the new season get off to a good start is to think about the treatment that is given to the strawberry plant from the time the box is brought out of the cooler and taken to the field till the time the plant becomes established in the ground. A little tender loving care (TLC) can help the plant get off to a good start so it will produce lots of early berries. First it is important to keep the transplants as cool as possible while waiting to be planted. Do not bring too many boxes out of the cooler at one time especially during the heat of the day. At lunch time either take plants that are left back to the cooler or put them in the shade. Do not leave bundles of plants out so that their foliage and roots dry out; especially do not leave them out on the top of the bed. Remember to try to keep boxes in the shade as much as possible. If workers use black garbage bags to carry plants in the field remember that black absorbs heat so it can get very hot inside the garbage bag and the plants are warming up very fast. Next the plants are being set in plant holes in black plastic covered beds that have been heating up for several weeks so by the time the overhead irrigation is

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Resolving Restricted Export of Strawberry Plants from Quebec to Florida due to the Golden Nematode

J.W. Noling, CREC

The Golden nematode (GN), *Globodera rostochiensis*, is a major economic pest of potato in Europe and many other high elevation areas of Central and South America. In England, nearly 75 percent of potato acreage is infested and often suffer severe crop losses due to the nematode. GN was

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turned on and the plant foliage is cooled off the plant already could have some damage from getting too hot and dry. This brings me to the next thing to pay close attention to- do not wait too long to turn the overhead irrigation on. The black plastic on bed tops on a hot bright day can be well over 110°F. This is a very important step- the quicker you get the water on the better!

For the next 10-14 days care should be taken to be sure to turn the water on early enough that the plastic on the top of the beds does not have a chance to get hot. Remember the overhead irrigation is not to “water” the plants but is used to keep the foliage from drying out and dying. The plant will start putting out roots quickly and being able to carry water and nutrients to the leaves but until then the overhead irrigation is what keeps the leaves alive. Your plants will get off to a better start and be able to produce flowers and fruit earlier the more leaves you can keep alive so remember to think about how the transplants are treated as soon as they come out of the cooler. Remember when it comes to transplant treatment- think TLC!

Worker Protection Standard and Food Safety

At the start of this new season remember to check over your Central Posting and make sure all posters are readable and the correct emergency medical information is listed. When inspectors come to your farm, Central Posting will be one of the first things they will check. Also remember all new workers will need to be given WPS training by the start of the 6th day of work and to document all training given. Remember do not keep your “Do Not Enter” sign up that you posted for fumigation past the correct time. Inspectors will question why you have workers in a posted field where they should not be. Be sure all bathroom and decontamination sites have adequate fresh water for washing, soap, and single use paper

towels.

With food safety issues becoming more prominent in the media, it is important to instruct all workers to wash hands with soap and water after using the toilet and properly dispose of the paper towels. A good time to tell workers is at WPS training and this could also be documented in the paperwork you have employees sign and that you retain for your records. This would provide a paper trail for third party audits that shows workers have been trained in proper hygiene for food safety.

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introduced to Europe via infested potato tubers transported by Spanish galleon from incursions into Central and South America. Once introduced and established into any new environment, populations can increase rapidly. The nematode invades the plant root, after which the female body becomes round in size and erupts from the root to expose the posterior portion of the female body to the external environment. The remains of female nematode ultimately forms a hardened, impermeable cyst, (an obvious and visible sphere, **Figure 1**), housing up to 500 eggs which can then survive for decades. The Golden Nematode also causes extensive damage to tomatoes, and eggplant, and can reproduce on the roots of wild solanaceous weeds like nightshade. Fortunately, strawberry has been identified as a nonhost GN. The nematode is very difficult to eradicate because of the delayed hatch of eggs and because the egg lie shielded within the hard and impermeable exoskeleton of the dead female (cyst) (**Figure 2**). Canada, Mexico and the United States have all



Figure 1



Figure 2

to imposed domestic and foreign quarantine restrictions to prevent the introduction of the nematode within their borders. Here in Florida, we should all be keenly aware of the types of problems created by introduction of an exotic pest, Citrus Canker and Greening are the most recent.

The problem for Florida strawberry growers began more than a month ago on Aug 16, 2006 when the U.S. Department of Agriculture's Animal and Plant Health Inspection Service (APHIS) announced that they were prohibiting the entry of potatoes and other plant products into the U.S. from the province of Quebec due to the detection of the golden nematode (GN). The APHIS announcement came one day after the Canadian Food Inspection Agency (CFIA) confirmed the presence of the Golden

nematode on a 30-acre farm 13 miles east of Montreal, Quebec. Presence of the nematode was also positively confirmed from on-farm tillage equipment which had been transported and used at other farms 50 miles distant from farm outside of Montreal. Strict quarantine measures were immediately imposed and extensive root and soil sampling of the affected farms by CFIA, under close observation by APHIS, is still underway.

On August 23, 2006, USDA APHIS prohibited certain agricultural products originating in Quebec from entry into the U.S. A relatively long list of prohibited products and equipment were developed. The most important of these restricted articles included (1) plants with roots and (2) plant crowns and roots for propagation including the all important stipulation that they all must be free of any adhering soil. The APHIS restriction effectively quarantined over 30 million bare-root transplants and 3 million strawberry plug plants from three Quebec nurseries (Masse, Lareault, Labrecque). It was estimated that loss of these plants would reduce strawberry planted acreage within Florida by as much as over 20 percent. In subsequent telephone communications with USDA APHIS, it was reported that previous USDA research had demonstrated the inability to eliminate all soil particles from roots, even when various root washing techniques were used. This suggested early on that it was simply not possible to satisfy the soil-free, bare-root transplant product requirement and that other means of phytosanitary certification would have to be quickly developed and approved. On Aug 27th, USDA APHIS scientists arrived in Montreal to discuss and observe the ongoing investigation of Golden Nematode in Quebec. At this time, it was also made abundantly clear that any Canadian protocols developed for Golden nematode sampling and detection purpose had to be preapproved by USDA APHIS before issuance of any

Phytosanitary Certification and entry into the U.S.

Since that time the Florida Strawberry Growers Association (FSGA) has been in continual contact with USDA APHIS seeking a certification standard which would provide plant inspection and adequate assurances to prevent the movement of the nematode out of Quebec and allow export of the plants into Florida. As individual discussions and conference calls frantically continued into mid September, it then became disturbingly clear that CFIA lacked the infrastructure required to use internationally accepted methods to test soil and root systems for the presence of the Golden Nematode in a time frame needed for digging and export of plants to Florida. Here in Florida we were fearful that a comprehensive soil sampling procedure would be required for each nursery to certify the absence of the nematode within each nursery field. The international protocol for soil sampling requires that core soil samples be collected using a grid pattern of 4 to 8 paces throughout a field. Thirty consecutive core samples constitute one testing sample for laboratory analysis. Unmistakably, this is a very intensive sampling proposition which requires special laboratory certification to collect, process and identify nematodes, but also to provide chain of custody documentation from field to lab. It became clearly apparent that there was insufficient time and Canadian infrastructure to provide phytosanitary certification of the three strawberry nursery sites via soil sampling protocols.

Observation of Roots

On cyst nematode infested potato plants, CFIA inspectors typically rely upon direct microscopic observation of potato roots, visually examining roots for the pinhead size adult females which protrude from the root surface. Plant evaluations typically begin

after the flowering stage, a time when the white, yellow, or brown cysts can be found on a potato plant's root system. Inspectors must exercise caution during the root collection phase since simple excavation and removal of plants from soil can dislodge attached females on roots. To satisfy risk considerations and obtain an accurate assessment of whether Golden Nematode is present, 3000 root systems from each suspect field must be separately analyzed. Because of the nonhost status of strawberry to Golden Nematode, it was hoped that it would not be necessary to conduct such a comprehensive sampling of strawberry plants from the three nurseries.

For more information regarding Golden Nematode—Continue reading.

Golden Nematode Protocol

Chip Hinton, FSGA

By the time the Association was made aware of the problem, we were approaching the first of September, a mere three weeks or so before harvesting was scheduled to begin.

There were at least three major factors weighing heavily against us. The first was the time factor itself. USDA is a very large organization and known for its institutional lethargy. In my thirty plus years of dealing with them, I've noted that policy is set after considerable discussion and thought. Major shifts in direction take years, not weeks to accomplish. Secondly, it was pretty well assumed that whatever protocol was accepted, inspection and analysis would be required. Just certifying the farm soil according to CFIA standards would require over 11,000 soil cores and almost 400 samples. Every lab in Canada was swamped with samples taken to determine the extent of the Golden nematode infection. Some estimates of the backlog exceeded 40,000 samples.

Thirdly, no incident is politically isolated from events that precede it. Earlier, Idaho potato growers found Golden Nematode in their soil and Canada immediately shut the border to US potatoes and soil. When Canada had a similar episode with the Golden Nematode, there was a sentiment that the border should be slammed shut and stay that way until the border was opened to solanaceous commodities heading north.

Over the next two weeks, we employed every asset we could imagine to solve this problem. We were successful in resolving the soil sample problem by separating the farm certification (which required heavy sampling) from the plant inspection to insure the seedlings were safe. That made the sample numbers more manageable.

We contacted Risk Management to determine if the USDA Crop Insurance would cover an inability to obtain plants due to governmental action. For your information, your insurance takes affect only after your plants are planted, and you therefore would not be covered, even if it was the government that made it impossible for you to obtain plants.

We provided pages of data to make USDA more familiar with how strawberry nurseries work and how they dovetail with Florida strawberry production. Dr. Joe Noling was a tremendous help with his knowledge of nematodes and the workings of USDA-APHIS. As a last resort, we contacted Representative Putnam and Senator Martinez.

The interest from our legislators raised the urgency for a solution. On September 15, USDA-APHIS established a protocol for the movement of strawberry plants from Quebec Canada. This was a mere seventeen days from the time we contacted USDA about our problem. There were staff members from USDA that moved mountains

to make it possible for you to get plants. Mike Swett tops that list.

That protocol is as follows:

1. The plants must originate from fields where no host crops have been grown for at least 10 years. In addition, the equipment used in the strawberry fields must not have previously been used in potato fields.
2. The plants must be shaken so that there is a minimum presence of soil.
3. A minimum of 1210 strawberry plants per field must be randomly sampled and processed to ensure they are free of Golden Nematode. If there are solanaceous weeds, such as nightshade, present within or around the edge of the fields, a sample must also be collected and processed.
4. Any host plants and accompanying soil growing within or around the fields must be sampled and tested according to approved protocol.
5. The shipment must be accompanied by a phytosanitary certificate confirming that the strawberry plants have been processed in accordance with USDA protocols.

The very next day, APHIS had its experts on-site in Quebec to observe the fields samples taken by Canadian plant health officials and ensure its laboratory detection methods comply with US protocols. This was a cooperative exercise, with Canadians holding authority for the testing, but USDA establishing a mutually agreed upon protocol. This way, US potatoes were protected and strawberry plants destined for the US were allowed to enter the US.

There were other factors outside of this protocol that have come into play to provide support to the comfort level of those around us.

1. We have obtained information denoting the recipients of the plants from Quebec and provided this information to USDA. This will allow a means for USDA to determine the relationship of farms to producers of solanaceous commodities. It will also provide information should USDA want to sample soil at the recipient farms.
2. We will try to inform growers as to the importance of avoiding solanaceous crops when double cropping following strawberries from Quebec. If you plan to grow tomatoes, potatoes or eggplants, please have them follow strawberries from other provinces or the US. Restrict movement of equipment and clean equipment well if movement is absolutely necessary.

As of today, the samples have been taken and nurseries have been digging and loading their trucks. Plants should be on their way the last week of September, assuming the samples show no golden nematode. All plants will be sent through the Champlain port of departure/entry. We have repeatedly reminded USDA that we have plants that will be traveling across the border from points in Nova Scotia and Ontario. We have asked them to notify Customs that these provinces are not under quarantine.

El Nino Impacts on Agriculture in the Southeast

Clyde Fraisse, UF Climate Extension Specialist

In reference to peach and blueberry crops, seasonal climate variability impacts deciduous fruit production main through changes in the satisfaction of dormancy that occurs by the accumulation of chilling hours (temperatures at or below 45°F) and changes in the accumulation of heat units that promote flowering and fruit development.

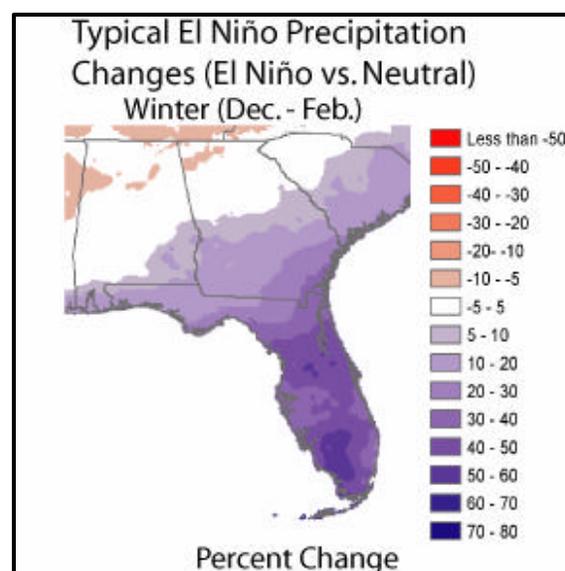
Also affected can be the extent of the threat from freeze damage during flower and fruit development, and the timing and severity of diseases and pests.

El Niño and its Impacts on Strawberry Diseases

Clyde Fraisse and Natalia Peres

El Niño has returned for the first time since 2003 and will have substantial impacts on our climate for the next 3 to 6 months. It appears that El Niño has returned for the first time since the weak event of 2002-2003. El Niño is a name for the unusual warming of the ocean's surface that occurs every 2 to 7 years along the equator in the central and eastern Pacific Ocean. It is very likely that the current El Niño will intensify further and last through the winter of 2007.

The classic El Niño climate pattern during the winter includes more frequent storms, excessive rainfall, and cooler temperatures to Florida and coastal Alabama and Georgia. The figure shows that Central Florida can expect 20 to 40% more rainfall than normal in the winter months. It is believed that the increase in rain and cloudiness associated with El Niño causes



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average temperatures to be cooler than normal during the winter months. For more details, check the El Niño forecast and climate outlook sections at www.AgClimate.org. The *climate tool*, under AgClimate Tools, can also provide detailed information about precipitation and temperature changes that may occur in your county during El Niño years.

Now is a good opportunity to review some of the implications that El Niño has on diseases problems. As mentioned above, El Niño years are expected to be very wet which are usually conducive to fungal diseases such as Anthracnose and Botrytis fruit rots. Although all of the currently grown commercial cultivars are susceptible to these diseases, 'Camarosa', 'Carmine', and 'Treasure' are less susceptible to Botrytis fruit rot than 'Strawberry Festival' and 'Sweet Charlie' under Florida conditions. On the other hand, 'Camarosa' and 'Treasure' are highly susceptible to anthracnose fruit rot,

caused by *Colletotrichum acutatum*, whereas 'Carmine' and 'Sweet Charlie' are quite resistant. 'Strawberry Festival', which represented more than 60% of our acreage in this past season, is considered moderately susceptible to anthracnose fruit rot. During a wet season such as the one expected this year, regular applications of fungicides will be needed often to suppress these diseases especially when moderately or highly susceptible cultivars are grown. In addition, crown rot diseases caused by *Colletotrichum* and *Phytophthora* species can be exacerbated in wet weather. Angular leaf spot caused by the bacterium *Xanthomonas fragariae* is another disease that is favored by cool wet winters. Thus, in contrast with the past season, when we had a La Niña year with drier and warmer than normal conditions and consequently less disease, the coming season will have potentially high disease pressure. Be prepared.



Fall Blueberry Short Course Pre-registration

October 17, 2006

Florida Farm Bureau Building, Gainesville, FL

Please pre-register for FBGA Fall Short Course by **October 7, 2006**.

Please complete the FBGA Short Course pre-registration form below and return with your check postmarked by October 7 to:

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

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



Please cut here and return to the above address with your pre-registration fee.
Make check payable to Florida Blueberry Growers' Association

Name(s) attending Short Course: _____

Short Course pre-registration fee enclosed\$ _____

(Note: FBGA member pay \$10 per person. Non-members pay \$20 per person)

Fungicides approved for management of strawberry diseases in Florida

Trade Name	Maximum Rate/Acre			Min. Days to Harvest	Disease or Pathogen	Remarks
	Fungicide Group ^a	Per applic.	Per season			
Abound	11	15.4 fl oz	62 fl oz	0	Anthracnose, Powdery mildew and suppresses Botrytis	Do not make more than 2 sequential applications or more than 4 total applications per crop year. See main label for drip treatment.
Aliette WDG	33	5 lb	30 lb	12 hr	Phytophthora diseases	Do not tank mix with copper.
Cabrio EG	11	14 fl oz	70 fl oz	0	Anthracnose, Leaf spot, Powdery mildew, and suppresses Botrytis	Do not make more than 2 sequential applications or more than 5 total applications per crop year.
Captan 80 WDG	M3	3.75 lb	30 lb	1-day REI	Anthracnose, Botrytis fruit rot, Leaf spot	Rate per treated acre. Special use label allows 24 applications per season.
Catevate 68 WDG	M3 + 17	5.25 lb	21 lb	0	Botrytis fruit rot, Anthracnose	Do not make more than 2 consecutive applications.
Copper many brands¹	M1 or M9	varies	varies	1-2	Angular leaf spot	May damage leaves during hot weather.
Elevate 50WDG	17	1.5 lb	6 lb	0	Botrytis fruit rot	Do not make more than 2 consecutive applications
Nova 40W	3	5 oz	30 oz	0	Powdery mildew, Leaf spot, and leaf blight	30-day plant back restriction for rotational crops not on Nova label
Potassium bicarbonate many brands²		varies	varies	1	Powdery mildew	Do not mix with highly acid products, e.g. Alliette.
Potassium phosphate many brands³		varies	varies	0	Phytophthora diseases	May burn leaves if applied with copper-based products.
Pristine	11 + 7	23 oz	115 oz	0	Botrytis fruit rot, Anthracnose, Powdery mildew and Leaf spot	Do not make more than 2 consecutive applications or more than 5 per crop year.
Procure 50WS	3	8 oz	32 oz	1	Powdery mildew	30-day plant back restriction for leafy vegetables, 60 days root vegetables and 1 yr. for rotational crops.
Ridomil Gold EC	4	1 pt	3 pt		Phytophthora diseases	Rates are for treated acre. See label for use in drip irrigation.
Scala SC	9	18 fl oz	54 fl oz	1	Botrytis fruit rot	Do not make more than 2 consecutive applications or 3 (or 6) per season.
Serenade Max		3 lb		0	Powdery mildew, Botrytis fruit rot, Anthracnose	Should be used in combination with other fungicides.
Sulfur many brands⁴	M1 or M9	varies	varies	1	Powdery mildew	Do not use during hot weather.
Switch 62.5 WG	9 + 12	14 oz	56 oz	0	Botrytis fruit rot, Anthracnose	Do not make more than 2 consecutive applications. 30-day plant back restriction for non-label crops.
Thiram Granflo	M2	4.4 lb	22 lb	3	Botrytis fruit rot	Do not make more than 5 applications per crop cycle.
Topsin M 70WP	1	1 lb	4 lb	1	Botrytis fruit rot, Leaf blight, Colletotrichum crown rot, Leaf scorch, Powdery mildew	Tank mix with other fungicides for disease resistance management.

1 e.g. Kocide, Champion, Champ, Cuprofix Disperss, Copper Count-N, Norodo⁸, Nu Cop; 2 e.g. Kaligreen, Armicarb, Milstop; 3 e.g. Fosphite, Helena Prophyt; 4 e.g. Micro Sulf, Sulfur 90W, Super-Six, Microthiol Disperss, Wettable Sulfur, Kumulus