



Berry/Vegetable Times

June-July 2009



Calendar of Events

July 14 & Aug. 11 Pesticide License Testing. Hillsborough County Extension Office, Seffner. 9 am. For more information call Mary Beth Henry at 813-744-5519 ext. 103.

Aug. 1 & 2 Florida Small Farms Alternative Enterprises Conference, Osceola Heritage Park, Kissimmee Fl. For more information go to <http://smallfarms.ifas.ufl.edu>.

Aug. 18 & 19 2009 Florida Strawberry Growers Association Agritech Educational Session & Trade Show, Trinkle Building, HCC Campus, Plant City. For more information and to register contact the Florida Strawberry Growers Association at 813-752-6822.

Sept. 9 The 2009 Tomato Institute, Ritz-Carlton Hotel, Naples, Fl.



October 28, 2009 is the date for the next Florida Ag Expo at GCREC Balm.

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From Your Agent...

Change Comes To the Berry/Vegetable Times

We all know the economy is in a recession and have felt the hard times in our personal finances. Now the hard times have hit the Berry/Vegetable Times. The Extension office has used bulk mail postage to mail the newsletter. (Bulk mail rates are much cheaper than regular mail rates.) Also, we have been able to produce paper copies of the newsletter, complete with color photos, because of the generous financial support of GCREC strawberry researchers. Now, due to budget cuts, UF has eliminated bulk mail, so starting this October we will no longer be mailing out newsletters. If you are currently receiving a paper copy of the newsletter and would like to continue receiving the information it contains, please contact me and give me your fax number or e-mail address. Of course, with fax copies,

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The University of Florida/IFAS and Gulf Coast Research and Education Center are pleased to announce that Dr. Vance Whitaker has accepted the position as the new strawberry breeder for GCREC. Dr. Whitaker will be replacing Dr. Craig Chandler who plans to retire in 2010. Dr. Whitaker grew up on a 20-acre farm in rural North Carolina and began his horticultural career in grade school running a produce business and working as a landscaper in the summers. He received two bachelor degrees from NC State University, one in Horticultural Science and another in Agricultural Economics. Dr. Whitaker earned both his MS and PhD from the University of Minnesota focusing on applied plant science. He will be starting his new position as Assistant Professor of Horticulture in August.



photos will be printed in black and white. I am sorry that the mailing of the newsletter must end.

Have a safe and fun summer,

Alicia

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UF DIAGNOSTIC LABS TO CHARGE FOR SERVICES

Jim Mertely and Natalia Peres

On July 1, 2009, the Plant Diagnostic Labs in Balm, Homestead, and Quincy, as well as the main Extension Plant Disease Clinic in Gainesville, will begin charging a fee of \$40 per sample. Previously, charges for standard samples ranged from \$0 to \$20 each. In the future, labs located in Apopka and Immokalee will make visual assessments only; samples requiring more complete diagnostics will be sent to Gainesville accompanied by a check made out to the University of Florida. This decision was taken by the Office of Dean for Extension, after a series of meetings with the heads of the various Diagnostic Labs and Clinics. As a result of this action, plant diagnostic fees will become more equitable throughout the university system. In addition, plant clinics will become more self-supporting in the face of university-wide budget cuts.

Like other clinics, the Plant Diagnostic Lab at the Gulf Coast Research and Education Center (GCREC-Balm) will begin charging on July 1. After that date, clients visiting the lab will be asked to fill out the sample submission form and to pay \$40.00 per sample by check made out to the University of Florida. Samples sent through

the mail should also be accompanied by a submission form and payment. The submission form is available in the lab and on the internet at <http://strawberry.ifas.ufl.edu/DiagnosticLab/diagnosticpage.htm>.

Regular clients may decide to pay for multiple samples in advance. Checks for individual samples would then not be required. We welcome this procedure, since it will save time and paperwork for the university and the client alike.

The decision to charge clients was made after considerable discussion and some trepidation. It is our hope that UF plant diagnostic facilities will be patronized as in the past, and recognized for the compelling economic value they represent.

**GCREC Diagnostic Lab is open
Monday through Thursday
8 a.m. to 4 p.m.
Samples are not accepted on
Fridays.**

Please remember...

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 named 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.

Requiem Insecticide No longer Available in Strawberries

James F. Price

Requiem 25EC, a formulation of *Chenopodium ambrosioides* extract, manufactured by AgraQuest, Inc., was available for use in strawberry culture during the past production cycle to control spider mites and some other pests. Folks at AgraQuest now have decided to remove strawberries from the label. Their decision regarding strawberries does not affect the product's availability on other crops.

'Florida Elyana': First Florida-Bred Cultivar Recommended Specifically for Tunnel and Greenhouse Production

Craig K. Chandler, Bielinski M. Santos, and Natalia A. Peres

Introduction

There are two predominant strawberry production systems throughout the world: Open-field cultivation and production under protective structures (e.g. high-tunnels and greenhouses). In California and Florida, strawberry is produced predominately under open-field conditions, whereas in Japan and in parts of Europe, such as Spain, France and Italy, the latter system is widely utilized. Because of the environmental differences between these two systems, it is necessary to select cultivars that are adapted to each specific situation. 'Florida Elyana' is the first Florida-bred cultivar recommended specifically for tunnel and greenhouse production. It is a short-day plant and produces flavorful fruit. 'Florida Elyana' produces larger fruit than 'Strawberry Festival', which is the predominant cultivar in Florida and it holds a significant market share in Spain, Morocco, and Egypt.

Origin

'Florida Elyana' strawberry originated from a 2000 cross between FL 96-114 and FL 95-200. FL 96-114 resulted from a cross between 'Sweet Charlie', a 1992 University of Florida release, and 'Cuesta' (U.S. Plant Patent 8,662), a Univ. of California cultivar released in the early 1990s. FL 95-200 is a result of a cross between FL 93-46 and FL 93-66, both of which have a number of cultivars in their complex pedigree, including 'Rosa Linda' and 'Pajaro'.

Based on the desirable appearance and firmness of 'Florida Elyana' fruit, it was included in randomized complete block trials at the Gulf Coast Research and Education Center of the University of Florida at Dover and Balm, Fla., respectively, during the 2004-05 and 2006-07 seasons. Ripe fruit were harvested, graded, counted, and weighed twice a week from December through March. For post-harvest quality analysis, sensory panels were conducted at the Gulf Coast Research and Education Center two times during 2006 and three times during 2007. At least 50 untrained panelists participated in these panels, and rated fruit for appearance, texture, and flavor. Panelists were asked to taste the berries following the codes written on their ballot sheets and answer the questions on the ballots. Presentation was randomized across panelists and serving order was balanced so that each sample was tested in each station. Panelists were asked to rate samples for appearance, flavor and texture on a 9-point hedonic scale (1 = dislike extremely and 9 = like extremely). A line for comments was provided after each question. Fresh fruit were analyzed for soluble solids content (SSC) and titratable acidity (TA). Fruit were analyzed for surface color using a colorimeter (Konica Minolta Sensing, Inc., Japan), and firmness using a penetrometer (Instron, Model 4411, Canton, Mass.).

Description

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‘Florida Elyana’ is a short-day cultivar. It is smaller and a lower stature plant than ‘Strawberry Festival’. This habit, along with fruit that are attached to long pedicels, makes the fruit easy to harvest (Fig. 1). ‘Florida Elyana’ produces larger fruit than ‘Strawberry Festival’. It has a mean fruit weight in west central Florida of between 24 and 27 g, compared to between 17 and 21 g for ‘Strawberry Festival’ (Tables 1 and 2). Fruit are mostly medium conic to wedge shaped, with the wedge shaped fruit often showing a longitudinal crease on the broad sides of the fruit (Fig. 2). ‘Florida Elyana’ fruit are quite susceptible to surface cracking, which is due to exposure to free moisture. Thus we are not recommending this cultivar for open-field culture where there is a high likelihood of multiple rain or dew events during the fruiting season. External fruit color is a bright red, and internal color is a light orange red. The calyx is generally medium in size and attractive. Fruit texture is firm (Table 3), and the flavor is usually sweet with a pleasant aroma. The soluble solid content of ‘Florida Elyana’ fruit is as high as or higher than that of ‘Strawberry Festival’ (Table 4), and its SSC/TA ratio is consistently higher than that of ‘Strawberry Festival’.

Fig. 1. Plants of ‘Florida Elyana’ strawberry in



Spain.

Performance

‘Florida Elyana’ is as productive as ‘Strawberry Festival’ in December and January, but not as productive later in the season (Tables 1 and 2). This could be due to the fact that ‘Florida Elyana’ plants stay relatively small throughout the season, whereas ‘Strawberry Festival’ plants are more vigorous in terms of producing new branch crowns. However, in a high tunnel trial at the Gulf Coast Research and Education Center in the 2006-07 season, total season yield for ‘Florida Elyana’ was not significantly different from that of ‘Strawberry Festival’. Growers may be able to increase the productivity of ‘Florida Elyana’ on a per unit area basis by planting this cultivar at a higher than standard density. ‘Florida Elyana’ is moderately resistant to the two most serious disease problems on strawberry in Florida: Botrytis fruit rot (caused by *Botrytis cinerea* [de Bary] Whetzel) and anthracnose fruit rot (caused by *Colletotrichum acutatum* Simm.). In an unsprayed trial during the 2007-08 season, only 3% of the ‘Florida Elyana’ fruit harvested from mid-February to mid-March showed symptoms of anthracnose fruit rot, compared to 53% for ‘Treasure’, the susceptible control. ‘Florida Elyana’ also appears to have resistance to wilts which are most likely caused by *C. gloeosporioides* (Penz.) Penz. and Sacc. and *Phytophthora* spp.



Fig. 2. Fruit of ‘Florida Elyana’ strawberry.

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In summary, ‘Florida Elyana’ is recommended for winter and spring production areas where strawberries are grown in tunnels or greenhouses.

Availability

Information on nurseries licensed to propagate ‘Florida Elyana’ can be obtained from the Florida Foundation Seed Producers, Inc. (<http://ffsp.net>).

Table 1. Performance of strawberry cultivars at Dover, Fla. during the 2004-05 season in open-field culture^z.

Cultivar	Marketable fruit yield					(g/fruit)
	December	January	February	March	Total	
	(g/plant)					
Florida Elyana	76 a ^y	108 b	178 a	353 a	715 a	27.1 a
Strawberry Festival	37 b	144 a	155 b	592 a	928 b	20.6 b
Significance (P<0.05)	*	*	*	NS	*	*

^z Mean fruit weight was determined by dividing total marketable fruit yield per plot by total marketable fruit number per plot.

^y Means based on four replications of 10 plants each. Mean separation within columns by Fisher’s protected LSD test, P<0.05

Table 2. Performance of strawberry cultivars at Dover, Fla. during the 2006-07 season in high-tunnel culture^z.

Cultivar	Marketable fruit yield					(g/fruit)
	December	January	February	March	Total	
	(g/plant)					
Florida Elyana	46 a ^y	99 a	159 b	322 a	626 a	24.4 a
Strawberry Festival	65 a	94 a	218 a	459 a	836 a	17.3 b
Significance (P<0.05)	NS	NS	*	*	*	*

^z Mean fruit weight was determined by dividing total marketable fruit yield per plot by total marketable fruit number per plot.

^y Means based on four replications of 10 plants each. Mean separation within columns by Fisher’s protected LSD test, P<0.05

Table 3. Mean acceptance scores (9-point hedonic scale) for appearance, texture, and flavor of ‘Florida Elyana’ and ‘Strawberry Festival’ strawberry evaluated over two harvest seasons.

	Feb. 06	Mar. 06	Jan. 07	Feb. 07	Mar. 07
<i>Appearance</i>					
Florida Elyana	6.6 b ^z	7.5 a	5.9 a	6.4 b	6.0 a
Strawberry Festival	7.8 a	6.8 b	6.2 a	7.2 a	6.3 a
<i>Texture</i>					
Florida Elyana	7.4 a	7.1 a	6.9 a	6.9 a	6.2 a
Strawberry Festival	7.5 a	6.6 a	6.4 a	6.8 a	6.2 a
<i>Flavor</i>					
Florida Elyana	7.3 a	7.0 a	6.5 a	6.7 a	6.2 a
Strawberry Festival	7.3 a	6.2 b	5.9 b	6.9 a	5.1 b

^zMean separation within columns by Fisher’s protected LSD test, P ≤ 0.05.

Table 4. Soluble solid content (SSC) and titratable acidity (TA) of ‘Florida Elyana’ and ‘Strawberry Festival’ strawberry evaluated over two harvest seasons.

	Feb. 06	Mar. 06	Jan. 07	Feb. 07	Mar. 07
<i>SSC (°Brix)</i>					
Florida Elyana	10.2 a ^z	8.2 a	7.7 a	9.6 a	7.3 a
Strawberry Festival	7.5 b	7.5 b	6.9 b	9.8 a	6.2 b
<i>TA (%)</i>					
Florida Elyana	0.82 a	0.58 a	0.78 b	0.71 b	0.69 a
Strawberry Festival	0.75 b	0.63 a	0.91 a	0.87 a	0.73 a

^zMean separation within columns by Fisher’s protected LSD test, P ≤ 0.05.



Wednesday October 28, 2009
Gulf Coast Research and Education Center
Registration is Free. For details and information visit the Ag Expo Website.
<http://flagexpo.ifas.ufl.edu>

Industry Impacts from the new EPA's Reregistration Eligibility Decisions

Joseph W. Noling and Alicia Whidden

Over the past few years, the U.S. EPA has been in the process of reregistering soil fumigants. As you all can testify, it's been a long time in the coming and we've suffered a fair amount of anxiety over it. Well, on June 3, 2009, EPA released the final and revised Re-registration Eligibility Decisions (RED) for methyl bromide, chloropicrin, metam sodium (Vapam) and metam potassium (Kpam). They are decisions because only after successfully passing through the technical health and safety screen and public review and comment process does EPA decide whether the fumigants are eligible for re-registration and grower use. In many regards, the new RED's turned out not to be as bad as expected. In apparent response to new soil emissions data and a 'bunch' of critical comments from industry and agriculture, EPA has significantly downgraded many of its original demands. Don't be mislead, these new RED's clearly enumerate a number of very significant regulatory changes that are still forthcoming. With completion of the RED's, these new changes which will be mandated to appear on the fumigant pesticide label within two years will include requirements for buffer zones, posting and notification, respiratory protection including OSHA training, fit testing and medical certification, good agricultural practices, fumigant management plans, fumigant site air monitoring, and emergency response plans among others. We do not have the liberty in this newsletter article but to only highlight a few of the more significant changes. Table 1 attempts only to provide broad overview. Growers are encourage to visit the various online EPA website

addresses found at the bottom of Table 2 to learn more about the new risk mitigation measures being imposed by EPA for use of soil fumigants in Florida.

Buffer Zones: Based on the final RED's, it would appear that buffers are no longer a significant issue for typical use rates of chloropicrin, vapam, or kpam, particularly if some attempt is made to take advantage of buffer zone reducing credits offered by EPA. For example, EPA provides a buffer zone reducing "credit" of 60% when growers combine use of virtually impermeable plastic mulches (VIF) to reduce fumigant use rates and emissions from soil. In the newly amended RED's, there appears to no longer be a direct benefit to reducing buffer zone distance requirements by applying the fumigant via drip rather than shank or chisel application. For example, EPA will only mandate a buffer zone of 25 to 36 feet for chloropicrin use rates within the range of 100 to 150 lbs per acre (a gracious plenty) and treating as many as 5 to 40 acres per day (Table 1.). In addition to Chloropicrin, Table 1 documents buffer zone distances for typical applications of Telone, Metam sodium (Vapam), Metam potassium (Kpam), methyl iodide (Midas), and methyl bromide. One of our new problems in strawberry is how to effectively use a Telone product, when to do so will require a buffer setback of 100 feet from any occupied structure. Since Telone was reregistered in 1998, none of the new buffer zone reducing credits apply. EPA has also determined that buffer zones may overlap as long as 12 hours has elapsed since the end of one day's application until the start of the next application. Air monitoring of the field periphery of the buffer zone is still required, with growers expected to determine and record a sensory perception (smell test) of whether pungent odors exists 4 times a day for the duration of the buffer (ie., 6am, 12 noon, 6pm, 12 midnight). EPA has also indicated that for

fumigation scenarios where a buffer of less than 300 feet is required, then fumigant applications will be permitted within 1/8th of a mile (660 feet) of schools, licensed day care centers, nursing homes, assisted living facilities, hospitals, clinics or prisons.

For anyone who has read the new fumigant RED's, they know that the real impact from EPA's fumigant re-registrations will go well beyond buffer zones, with the need for Fumigant Management Plans (FMP), posting and notification, emergency response, and requirements for medical certification, safety training, and fit testing of workers to satisfy EPA respirator requirements when and if needed in the field.

Fumigant Management Plan (FMP): EPA still believes that the FMP is necessary to reduce worker risks and to confirm that growers are complying with fumigant labels. Let there be no mistake about this new requirement for the FMP, it will be a royal and costly pain to collect and record the data, and then to archive the reports for 2 years. To refresh your memory, the FMP requires the certified applicator supervising the application must develop a site-specific FMP for each application block he or she fumigates on a daily basis. A simplified list of the elements that must be addressed in the FMP and provided upon request to workers or other local, state, federal agency include:

- general site information (location, map, proximities to residences, etc.)
- applicator information (name, address, license numbers, training, etc.)
- authorized personnel present
- application procedures(products, rates, equipment, calibration, mulch, etc)
- measurements taken to verify compliance with good application practices,

- how buffers were determined,
- worker protection information,
- procedures for air monitoring,
- posting,
- training of applicators supervising fumigations,
- communication among key parties,
- hazard communication,
- record keeping,
- site-specific response and management activities,
- emergency plans,
- procedures for controlling fumigant releases in case of problems during or after the application.

Within 30 days of completing the application portion of the fumigation process, the certified applicator supervising the application must also complete a post fumigation application summary that describes any deviations from the FMP that occurred, measurements taken to comply with Good Agricultural Practices (GAPs), as well as any complaints and/or incidents that have been reported to him/her. This summary must again include the actual date of the application, application rate, and size of application block fumigated for that day.

Respiratory Protection and Air Monitoring: Many current fumigant labels require handlers (field workers) to use respirators outright or only when air concentrations in the area where they are working reach certain action levels. In general, the new RED's will not initially require any formal air monitoring with expensive colorimetric tubes to determine if the action levels have been reached in the field. The new fumigant labels will however require certified applicators or handlers to either stop work or put on respirators if they experience sensory irritation, ie. if they smell any strong, pungent, irritating odors. Thus, growers are no longer required to initially monitor fumigant concentrations with the colorimetric tubes during application but must rely upon sensory

Table 1. Modifications from 2008 to 2009 Amended Soil Fumigant Re-registration Eligibility Decisions.

Mitigation Measure	Change from 2008 to 2009
Buffers	-New data support smaller buffers for some fumigants (chloropicrin) and larger buffers for others (methyl bromide).
Buffer Credits	New data support buffer zone reducing credits of as much as 80%, i.e., use VIF mulch reduce buffer 60%
Rights of Way	Permission from local authorities to include roadways within buffer is only required when sidewalk is present
Buffer Overlap	Buffers may overlap but only when field applications are separated by at least 12 hours
Restrictions for Difficult-to-Evacuate Sites	Maintain $\frac{1}{4}$ mile restriction but allow a reduced restricted area of 1/8 mile for fumigant applications when buffer zones of less than 300 feet are mandated.
Respiratory Protection	-Allow sensory irritation (smell test) properties of the fumigants to trigger additional measures for respiratory protection with MITC and chloropicrin application. - Respirators will be required for methyl bromide formulations with <20% chloropicrin content (80/20;98/2)
Emergency Response and Preparedness	- Same basic measures - Monitoring of buffers required only during peak emission times of the day; irritation acceptable trigger for MITC and chloropicrin in lieu of devices; methyl bromide requires devices

irritation of workers as the trigger to determine whether a respirator is required. Workers can only resume work without respirators if and when two consecutive breathing-zone samples taken 15 minutes apart with the colorimetric tubes show levels of the fumigant have decreased below the specified threshold level.

Additionally, EPA is still requiring that if a respirator is to be worn, then they must be on-hand and available when needed, and that handlers be:

- fit-tested to ensure respirators will provide the protection they are designed to provide;
- OSHA standard trained in how to properly use a respirator; and
- determined to be physically fit enough to wear the respirator to ensure they have no health problems such as a heart condition that could make use of the respirator dangerous.

With all of this now said, the question becomes: Where do we stand and where do we go from here? In general, if a buffer zone distance is unacceptable, then the optimizing strategy is to reduce the buffer zone requirement by using a high barrier or VIF mulch to take advantage of the 30 to 60% buffer zone reducing credit. The high barrier mulch will allow reduced rates of

application, with the added costs of the mulch likely to be offset somewhat by the increasing cost we're seeing in fumigant pricing. It also seems reasonably clear to us that worker protections and grower responsibilities and liabilities for noncompliance with these new EPA fumigant use standards significantly increasing. Not only must growers carry the burden of the increased liability, but they must formally document their daily measures and procedures used to mitigate bystander and worker risks. With this in mind, we are still of the belief that use of drip fumigation rather than soil (shank) injection treatment is a much preferred path to reduce grower liabilities in the long run. This is however, not something that has to be decided or transitioned to overnight. We probably have as much as two years to figure it out before the new fumigant pesticide labels make there official appearance. Methyl bromide, on the other hand, is not likely to be around at that time so we better start developing a plan as soon possible. You should also be aware that EPA has announced it will begin the next round of fumigant re-registration in 2013, and heaven only knows how much more stringent the regulation may become after they finish. In total, changes required to respond to and implement the new RED's will be complex and comprehensive, adding a new burden of grower responsibility and cost.

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Table 1. Strawberry: The range of buffer zone distances without credits derived from the appropriate 2009 EPA Fumigant Re-registration Eligibility documents for use of various methyl bromide alternative fumigants used on Florida crops. The table provides the range in buffer zone distances, measured to the property line, for a range of different application rates (expressed as rates of active ingredient per acre (treatments occurring only within 62% of an entire acre) and a range of 5 to 40 acres treated per day.

Fumigant	Per Acre Use Rates (lb ai./acre)	Acres treated Per day	Buffer Zone ¹ Distance Range (ft)
CHISEL APPLICATIONS-Bed Treatments			
Chloropicrin	100 - 150	5 to 40	25 - 36
Metam Sodium or Metam Potassium	80	5 to 40	25 - 50
	100	5 to 40	25 - 57
	160	5 to 40	25 - 75
	200	5 to 40	38 - 163
1,3 dichloropropene (Telone)	94 – 140	1 to 40	100 ²
Methyl Iodide	88 lb ai./treated acre	5 to 10	50
		10 to 20	150
		20 to 40	250
Methyl Bromide	100 - 200	5	69 - 275
		10	127 - 454
		20	215 - 696
		40	338 - 1071
DRIP APPLICATIONS			
Chloropicrin EC	100 - 150	5 - 40	30 - 40
Metam Sodium or Metam Potassium	80	5 - 40	25 - 75
	100	5 - 40	25 - 82
	160	5 - 40	25 - 100
	200	5 - 40	38 - 125
1,3 dichloropropene (Telone EC)	94 – 140	1 to 40	100 ²
With the exception of 1,3-D, up to 80% reduced buffer zone distances are possible with EPA approved credits. Examples of buffer zone reducing credits include: high barrier tarps (up to 60%); use of potassium thiosulfate (15%); high organic soils (10-30%).			
For 1,3-D, Buffer zones are measured to occupied structure and not property line			
All information used to produce this table was derived from the following EPA Re-registration Eligibility Documents (REDs): http://www.epa.gov/opprrd1/REDs/chloropicrin-red-amended.pdf for chloropicrin.			
http://www.regulations.gov/fdmspublic/component/main?main=DocumentDetail&d=EPA-HQ-OPP-2005-0125-0519 for Vapam and Kpam.			
http://www.regulations.gov/fdmspublic/component/main?main=DocumentDetail&d=EPA-HQ-OPP-2005-0123-0716 for methyl bromide.			