



Berry/Vegetable Times



September 2003



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Take time to remember the heroes of September 11, 2001.

Calendar of Events

Sept. 21-23 — Annual FFVA Convention, Ritz Carlton, Key Biscayne. For information contact Leslie Curry at 407-894-1351.

Oct. 14 — Pesticide Testing 9 am, Hills. Co. Extension Office, Seffner 813-744-5519.

Oct. 25 — Hills. Co. Extension Office Open House, Seffner, 9 am—2 pm 813-744-5519.

2003 Strawberry Cultivar Update

Craig Chandler
GCREC—Dover

Listed below are some comments on strawberry cultivars currently of interest to growers in west central Florida.

- **Strawberry Festival** is quickly becoming the main cultivar in west central Florida. Productive; easy to harvest; firm, medium sized fruit; uniform color development; attractive shape; large showy calyx; low cull rate. Very susceptible to angular (bacterial) leaf spot.
- **Treasure** has high yield potential; ripens from tip toward the shoulder; deep red color; resistant to abrasion.
- **Camarosa** is a vigorous plant; large, firm fruit; very susceptible to anthracnose fruit rot.
- **Carmine** a new cultivar from the Univ. of Florida. High early season yield potential. Small to medium sized fruit; dark red, but glossy. Moderately resistant to anthracnose and Botryis fruit rots. Some off-types observed in 2002-03 plantings.

- **Gaviota** a less vigorous plant than Camarosa. Large fruit with good flavor.
- **Camino Real** a new cultivar from Univ. of California. Less vigorous than Camarosa. Large, dark red fruit.
- **Ventana** another new cultivar from Univ. of California. Vigor similar to that of Camarosa. Bright red fruit.

To obtain high December and February yields, plant early.

Trials conducted at the Dover research center during the 2001-2002 and 2002-2003 seasons suggest that bareroot plants of 'Festival' and 'Carmine' strawberry should be planted before October 10th to obtain the highest possible December and February yields, and between October 17th and 25th to obtain relatively high January yields.



Intermittent Sprinkler Irrigation for Establishment of Bare Root Strawberry Transplants

J.R. Duval and E.A. Golden
GCREC—Dover

Bare rooted strawberry transplants set in black polyethylene mulched beds are established by irrigating continuously for approximately 8 hours daily with overhead sprinklers for 10 to 14 days.

Irrigation is provided to reduce the water stress from high surface temperature of the black mulch and dry weather condition usually present at time of transplanting through evaporative cooling. Without irrigation, transplants become defoliated; this results in considerable plant mortality and / or a delay in fruiting.

In experimentation conducted at the GCREC-Dover by Albregts and Howard, transplants were subjected to intermittent establishment irrigation. The irrigation intervals (min on/ min off) tested were: 3/17, 5/25, 5/15, 10/20, 15/15 and continuous, which served as the control, the first season, and, 5/25, 5/15, 5/10 and continuous the second season. Irrigation lasted for 12 days. Normal irrigation was then resumed for the remainder of the season.

The longer the “off interval” the greater the leaves lost by the end of establishment period. Irrigation intervals of 3/17 and 5/25 increased plant mortality. Yield of strawberries were not significantly different for 5/15, 10/20, 5/10, and 15/15 intervals and the control.

In summary, foliage should not wilt, low humidity and wind speeds >10 mph accelerate leaf drying, and during the heat of the day, foliage should receive irrigation before drying from the

previous irrigation cycle. Keen observations during the establishment period will determine intermittent irrigation cycles of transplants that can reduce water usage and fertilizer leaching without affecting early or seasonal fruit yield. If your farm has the capability to pulse irrigate during establishment significant reduction in the amount of water used can be obtained using this method without reductions in yield.

How to Deal with Anthracnose Disease in Strawberry Runner Plants

Jim Mertely
GCREC —Dover

One year ago in *Berry/Vegetable Times* I wrote, “Runner plants will begin arriving from northern nurseries later this month. Early indications are that some of these plants will be infected by the anthracnose fungus *Colletotrichum acutatum*”. The same situation seems to be developing this season. Growers should be prepared to deal with infected runner plants. Fortunately we have more experience, and new strategies to lessen the problem this season.

Are my transplants healthy? There is no way of knowing for sure, short of testing every plant. While this is not possible, growers should open two or three boxes from each shipment of plants, and carefully inspect about 100 plants per box. *C. acutatum* produces dry, dark, sunken lesions on the leaf stalks (petioles) of infected plants (photo 1). These lesions often appear on young petioles which have not completely elongated. Diseased petioles may be curved, twisted, or broken at the point of infection.

Other pathogens, including other species of *Colletotrichum*, produce similar symptoms. However, *C. acutatum* is usually responsible for lesions of this type on northern transplants. If no lesions are found after a reasonable number of plants are carefully examined, disease pressure was probably low in the nursery. If lesions are present even in low numbers, collect several diseased plants, and bring them to the University of Florida Strawberry Lab for diagnosis. An ideal sample would consist of several whole plants with characteristic petiole lesions. If *C. acutatum* is already producing spores in the lesions, a rapid diagnosis is possible. When no sporulation is present, the petioles are incubated or isolations are made onto petri plates to identify the pathogen. These procedures typically require several days before a diagnosis can be made.



Petiole lesions caused by *C. acutatum*.

If my transplants are infected, what can be done? We have an option this season which was not available to Florida farmers last year. Two products are now labeled for pre-plant dip treatment of strawberry transplants. They are Abound (Quadris), a strobilurin fungicide with a supplementary label for dip treatment, and Oxidate, a hydrogen peroxide disinfectant with dip treatment instructions on the main label. In a UF study last year, both products increased the

(Continued on page 3)

survival rate and the vigor of transplants that were naturally infected by *C. acutatum*. Although Abound has systemic activity, neither product should be expected to cure all the infected plants or free a shipment from disease. Surprisingly, the majority of plants in an infected shipment are probably not diseased (see footnote*). However, these “healthy” plants are often covered by contaminated soil and spores from diseased plants. Dip treatments provide major benefits simply by destroying this inoculum and allowing healthy (but infested) plants to grow without the risk of early infection. When making the decision to dip treat transplants, read the label carefully. Labels of this kind often recommend setting the transplants as soon as possible after treatment. Avoid treating more plants than can be reasonably transplanted the same day.



Root necrosis caused by *C. acutatum*.

With respect to anthracnose disease, not all strawberry cultivars (varieties) were created equal. Numerous cultivars including Aromas, Camarosa, and Treasure are highly susceptible to *C. acutatum*. These cultivars are harder to protect from infection in the nursery, and require more intensive disease

management programs to control anthracnose fruit rot in the production field. Infected transplants of these cultivars are difficult to “water in” or fail to establish due to a root necrosis disease caused by *C. acutatum* (photo 2). Other cultivars such as Carmine and Sweet Charlie are rarely affected by root necrosis disease or anthracnose fruit rot under normal field conditions. ‘Strawberry Festival’ lies somewhere between these two extremes. When an adequate fungicide spray program is maintained, growers see fewer epidemics of anthracnose fruit rot in Festival than in more susceptible cultivars.

Aside from dip treatment and selecting a resistant cultivar, what else can be done? The answer to this question is summed up by the acronym T.L.C. We have observed that weakened transplants are more vulnerable to stunting and mortality caused by *C. acutatum*, and recover more slowly from root necrosis disease, than transplants which were less stressed. These observations formed the basis for advice to dig and plant susceptible cultivars later in the season. Early-dug runner plants are less “hardened” and have lower starch reserves than late dug plants. In addition they are planted earlier when temperatures above the plastic mulch are likely to be high. Holding plants in cold storage is probably not a good alternative, since green top plants deteriorate fairly rapidly in storage. Any practice which reduces stress on the transplant (e.g., proper management of overhead watering) should be helpful.

**If large proportion of plants were infected, symptoms would have been visible in the nursery, and the field would have been destroyed. At least two nurserymen plowed under fields*

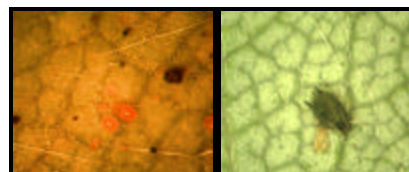
last year to avoid sending infected plants to their customers. Some may be facing the same decision this season.

Inspect Transplants for Insect and Mites

Jim Price
GCREC—Bradenton

Soon transplants will arrive and a new strawberry season will begin...and a new pest management season too. The fact is that some of our insect and mite problems accompany the strawberry transplants and their presence must be considered at the very beginning of the season.

To minimize losses to infested transplants, growers should purchase stock from the most reputable transplant producers and even then, must insist on high quality transplants. Still, after these precautions, some insect and mite pests will go into the field with transplants.



Spider mites and aphids.

Four insect and mite species easily can be problems on transplants. They are: Twospotted spider mite, cyclamen mite, strawberry root aphid (and sometimes the melon aphid), and corn earworm, sometimes called the “strawberry budworm” in the local strawberry industry. Transplants should be inspected as they arrive to prepare for management tactics for any accompanying pests. It is wise to inspect a 100 transplant sample from each similar group of transplants. A similar group

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would be those transplants of the same source, variety and week of harvest.

The examiner should look for twospotted spider mites and aphids on undersides of leaves. Cyclamen mites (http://creatures.ifas.ufl.edu/orn/cyclamen_mite.htm) should be suspected when transplants have mature leaves with short petioles and wrinkled thickened blades. Emerging leaves from crowns of suspect plants should be inspected with a 14X or greater hand-lens for tiny, clear to light brown cyclamen mites and very tiny, clear oblong eggs in leaf folds. Cyclamen mites missed in this inspection should be suspected a few weeks later when transplants fail to develop normal roots, petioles and leaf blades.

Corn earworms (http://creatures.ifas.ufl.edu/veg/corn_earworm.htm) are rare and often, when present, are in the egg stage and difficult to find. Early, intensive scouting of the planted field may be the best way to detect that corn earworms traveled with the transplants. "Ragged" young leaf blades emerging from the crown can indicate this problem.

Control measures should be applied when cyclamen mites (diazinon, Kelthane[®], or Thodan[®]) or corn earworms (*Bacillus thuringiensis*, Lannate[®], or SpinTor[®]) are detected by this method. Scouting should continue to determine success of the control measures. Biological or chemical controls for spider mites can be withheld until about 5-8% of the leaflets are infested. Providers of Savey[®] miticide suggest, however, that if their product is chosen, the most advantageous application time is as mites infest 2% -3% of the leaflets. Controls for aphids usually can be withheld until natural enemies end their threat or until honeydew becomes a problem on leaves and fruit.

Sap Beetle Facts

Silvia I. Rondon, James F. Price, and Daniel J. Cantliffe
University of Florida

Did you know that ... ?



- Sap beetles are members of the family Nitidulidae (Coleoptera).
- They are called sap beetles because they are attracted to wounds on trees.
- They have a well developed sense of smell and they can respond to chemicals from long distances.
- They feed on a large range of food types including flowers, fruits, fungi, and decaying and fermenting fruits.
- Sap beetles can injure the strawberry fruit by burrowing inside. The damage makes the fruit unmarketable.
- Removing damaged berries from the field and early harvesting can decrease sap beetle populations. Dropping damaged fruit to row middles hastens fruit deterioration and aids in sap beetle management.
- Some biological controls can be found in nature.
- Pitfall traps set into the ground with fermenting yeast as bait can be used to monitor initial populations.



Brief Overview of Reduced Restrictions for Telone Soil Fumigants

(Edited from a memo sent out by Dow Agro Sciences)

Two important changes have been made to the shanked-in formulations of Telone. PPE requirements have been eased.

- Tractor drivers, applicators and shovelmen will not be required to wear respiratory protection when performing "pre-bed, row" applications. This includes the Yetter prebed rig as well as other methods.
- Workers that do not have "liquid contact potential" are only required to wear shoes, socks, long pants, loose-fitting and long-sleeved shirt and eye protection (plus a half-face respirator for broadcast and in-bed applications only). Workers considered not to have liquid contact potential include: applicators, tractor drivers, shovelmen, workers on the treated field during the day of application that do not disrupt the soil at the depth of injection and early re-entry workers (day 1 to day 5) that do not disrupt the soil at the depth of injection.
- No workers are required to wear a full-face respirator, unless air concentrations of chloropicrin exceed 0.1 ppm (identical to other pic fumigants)

Buffer zones have been reduced from 300 feet to 100 feet from an occupied structure.

The labels can be viewed at www.dowagro.com and www.cdms.net.

Check list for Good Efficacy when using Vapam/ K-Pam

Edited from a Presentation by Mike Herrington at AMVAC Meeting

- Determine target pests and location
- Soil preparation (seed bed ready) and determine soil type
- Soil moisture (60-80% field capacity)
- Avoid skips in the treatment zone
- Obtain a good seal
- Post application rainfall can diminish efficacy near the soil surface
- Dissipation window (14-21 days)

Recommendations for drip chemigation application of K-Pam:

- Begin with good soil moisture
- Firm bed compaction
- Thoroughly pre-wet the bed—pulsing: (2 hours on—1 hour off)
- Determine rate per treated acre—apply K-Pam at a uniform rate throughout the duration of the anticipated run time
- Purge (thoroughly flush) the drip lines
- Wait 14-21 days for MITC to dissipate
- No worker exposure

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How Colorful is Your Diet?

Consumer Reports on Health

Eating your greens every day is not enough. According to the National Cancer Institute, people should eat at least one item from the five color group daily, the reds, white, blues/purples, yellows and greens. That advice stems from studies showing that different-colored produce contains different phytochemicals, including antioxidants and other disease-fighting substances. Below is a list of the possible benefits of the phytochemicals in fruits and vegetables of different colors. For additional information, go to www.5aday.gov.

Phytochemical: Lycopene and *Anthocyanins*

Red fruit or vegetable: *Lycopene*—guava, pink grapefruit, tomatoes, and watermelon. *Anthocyanins*—beets, cranberries, kidney beans, raspberries, red apples, red cabbage, red onions, strawberries, and cherries.

Possible Benefits: *Lycopene*—reduced prostate cancer risk. *Anthocyanins*—lowered blood pressure; protection against circulatory problems caused by diabetes.



Phytochemical: *Alliin*

White fruit or vegetable: Garlic, leeks, and white onions.

Possible Benefits: reduced risk of cancer spread and heart attack, lowered cholesterol and blood pressure; enhanced infection defenses.

Phytochemical: *Anthocyanins* and *Phenolics*

Blue/Purple fruit or vegetable: *Anthocyanins*—black berries, black currants, blueberries, elderberries, purple grapes. *Phenolics*—eggplant, plums, prunes, and raisins.



Possible Benefits: *Anthocyanins*—reduced risk of cancer, heart disease, and age-related memory loss. *Phenolics*—slowing of some effects of aging.

Phytochemical: *Beta-carotene* and *Bioflavonoids*

Yellow fruit or vegetable: *Beta-carotene*—apricots, butternut squash, cantaloupe, carrots, mangos, peaches, pumpkin, and sweet potatoes. *Bioflavonoids*—apricots, clementines, grapefruit, lemons, nectarines, oranges, papaya, peaches, pears, pineapple, tangerines, yellow peppers, and yellow raisins.



Possible Benefits: *Beta-carotene*—reduced risk of cancer and heart disease; maintenance of good vision; increased infection fighting ability. *Bioflavonoids*—together with the Vitamin C in these fruits, reduced cancer and heart-attack risk; maintenance of healthy skin, bones, and teeth.

Phytochemical: *Lutein* and *Indoles*

Green fruit or vegetables: *Lutein*—broccoli, green peas, honeydew melon, kale, kiwifruit, leafy greens, romaine lettuce, spinach. *Indoles*—arugula, broccoli, brussel sprouts, cabbage, cauliflower, kale, rutabaga, Swiss chard, turnips, watercress.

Possible Benefits: *Lutein*—maintenance of good vision; reduced risk of macular degeneration and cataracts. *Indoles*—reduced risk of breast and prostate cancer.



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.