the Southern Region small fruit consortium

Small Fruit News

Volume 8, No. 2 April 2008

NC State University
Clemson University
The University of Arkansas
The University of Georgia
The University of Tennessee
VA Polytechnic Institute and State University

In this issue

Special Reports:

Scouting your fields for Blueberry Red Ringspot Virus

Bill Cline, NCSU Plant Pathology

Blueberry Red Ringspot Virus (BRRV) is hard to see during most of the year, but becomes most visible in late summer and early fall. Symptoms include red rings on both stems and leaves (Figs. 1, 2). Circular blotches or pale spots may also be visible on ripening fruit (Fig 3) though yield is often not affected. The cultivar Ozarkblue in particular can have severely distorted berries (Fig. 4). Unlike fungal leaf spots, the rings caused by BRRV have green centers or pale centers, and usually do not show through to the underside of the leaf (Fig. 2). Rabbiteyes appear to be immune or highly resistant to the virus, while highbush and southern highbush cultivars are susceptible. Plants are infected for life, and cuttings taken from infected plants will also have the disease – so it is very important to scout fields that will be used for cuttings, and avoid or remove any suspicious plants before they are propagated. The vector (carrier) is not known, so the only control for this disease is to look for it in July-Sept and isolate or remove any infected bushes.

Figure 1. Blueberry red ringspot symptoms on stems.

Figure 2. Blueberry red ringspot (BRRV) symptoms on leaves. Note lack of spots on underside of leaf at center.

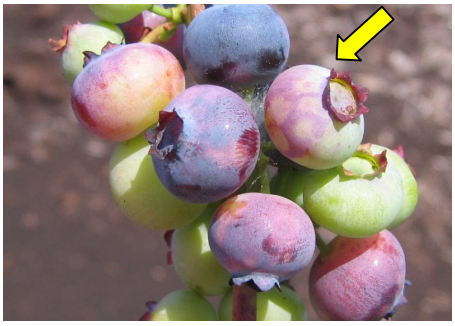


Figure 3. Faint green spots (arrow) on 'Duke' caused by BRRV.

Figure 4. Severely distorted fruit is rare, so far only seen on 'Ozarkblue' infected with BRRV.

Colletotrichum crown rot: Measures to take in the early spring and considerations for sustainability of the industry with regard to the Colletotrichum crown rot problem

Dr. Mahfuzur Rahman and Dr. Frank Louws, Dept Plant Pathology North Carolina State University, Raleigh, NC

Current Situation: Colletotrichum crown rot incidence, caused by *Colletotrichum gloeosporioides* (C.glo) occurred on numerous farms in the fall of 2007. Problems included collapsed or stunted plants soon after field setting and a declining loss of plants with the onset of winter. From Sept 15 to February 20, the Plant Disease and Insect Clinic (PDIC) managed 64 strawberry samples. We identified 14 growers in NC and 1 out-of-state grower (n=15) with *Colletotrichum* problems. Thirteen samples were confirmed to have C.glo, 2 farms probably have C.glo but isolations attempts did not verify the presence of the pathogen, and 3 farms were confirmed or suspected to have *C. acutatum* (the anthracnose ripe fruit rot pathogen) in addition to C.glo. Affected growers suffered moderate to severe losses. Although it is dangerous to provide specific numbers of plant mortality since systematic surveys were not done, the numbers are also helpful. Field observations and grower estimations range from less than 5% up to 60% of the plants died within fields planted to infected plant sources. A rough estimation would put the average plant death at 5-15% with the majority of plants dying in October-November. A second related problem is the planting of non-symptomatic plants (mainly "Treasure") in Florida from NC-sources. Discussions with clinicians, growers and agents in Florida (again without actual surveys) offers numbers ranging from a low percentage (less than 3%) up to 40% incidence, with an average estimated problem of 15% or less collapsed plants. Although the problem could be related to specific plant sources in most cases, the correlation was not always straight forward, making room for the hypothesis that plant infection from other sources is possible at any stage of the production cycle. Other strawberry problems have been diagnosed. With the dry hot fall weather some fields had low moisture levels in the bed and plants were stunted from drought injury. Three additional NC samples were confirmed to have *Phytophthora* crown rot and three had angular leaf spot. Both of these diseases could cause stunting and *Phytophthora* will cause plant collapse.

What Should I do? Problem sources were identified and if you are aware of a potential plant source infestation, you may have to be extra vigilant in the early spring in spite of no noticeable plant collapse yet. In many cases plants with lower levels of infection are stunted even though crown tissues do not show any characteristic reddish brown discoloration. In our research and diagnosis, we were able to isolate *C. gloeosporioides* from crowns of stunted plants with no typical symptoms. With the onset of increasing temperatures in the spring, some of these plants may start showing typical symptoms followed by plant collapse. Correct diagnosis is important and this is the best time to send stunted/collapsing plants to your local clinic for further diagnostics. These plants may be distributed randomly in the field in an otherwise vigorous healthy looking strawberry field.

For growers with confirmed problems: If you have been dealing with the problem from late fall or early winter, there is enough reason to be extra careful with the spray program to effectively manage crown rot together with other diseases that may be prevalent at this time. When it comes to fungicidal control of the disease, resistance management or use of effective doses becomes an essential consideration for disease management. Experience in Florida has demonstrated regular applications of captan prevent spread within the field and Topsin-M has shown good systemic activity to reduce disease levels. In our most recent work, highly preliminary at this time, *C. gloeosporioides* isolates collected from a few strawberry farms were used for fungicide tolerance studies in the lab with Topsin-M. Results from this study indicated a high tolerance of two isolates out of four to Topsin –M. However, these four isolates when tested against a QoI fungicide (such as Cabrio) with a combination of captan, better growth inhibition was obtained. These observations and results suggest affected growers will need to rely on captan and the QoI fungicides (Group 11 fungicides = Abound, Cabrio or Pristine) in between captan+Topsin-M applications or to start use of QoI fungicides earlier in the fields where crown rot has been detected. There is a danger to use the QoI fungicides too much and resistance could develop in the pathogen population. Therefore, use the following rules to develop a spray program: Where QoI fungicide products are applied solo, do not exceed 33% of the total number of sprays or a maximum of 4. Where mixtures (co-formulations or tank mixes) are used do not exceed 50% of the total number of sprays (should be a maximum of about 5 for strawberries). Use a maximum of 1 QoI fungicide spray out of every 3 fungicide applications.

Therefore, in our current situation, the best strategy is to include captan when applying a QoI product. Alternate sprays should rely on captan plus other products as needed. Growers with Botrytis pressure may elect to use Pristine, especially during bloom, since it has a QoI component and a good botryticide component. The QoI products also have fairly good activity on powdery mildew.

In our nursery trial at a research station, we have seen the dispersal of inoculum from the source diminishes rapidly over short distances despite overhead sprinkler use, unlike the quick spread of ripe fruit rot caused by *C. acutatum*. This observation indicates that removal of symptomatic plants (collapsing or stunted looking and diagnosed to have C.glo infection) together with a few neighboring ones should limit the spread of the crown rot fungus in the field. A fungicide program as outlined above should also help in minimizing spread of inoculum in the field. Plants already infected will continue to collapse and will produce many spores so rouging and/or fungicides will be an important IPM strategy. Our research with the bare root plants from the research station nursery trial, where mother plants were spray inoculated with *C. glo*, showed low plant mortality in the fruiting field after a strobilurin dip (Quadris/Abound) before planting. This data also suggests the QoI fungicides will be an important and effective part of a spring fungicide program. Based on our preliminary research findings and existing situation in the field, especially fields with suspected *C. glo* infestation our recommendations are to:

1) Include Qoi fungicides earlier in the spray program (no later than 10% bloom) and follow the rules above
2) Use nitrate sources for nitrogen in the fertility management program
3) Finish diagnosis of suspected plants in your field
4) Scout your field and rogue suspected plants

What does the future hold? Crown rot problems may not be a recurrent major problem every year with high severity index. However, in the strawberry plant business, it is not a question “if” but “when” will these types of diseases show up. The C.glo is a problem of an enduring nature due to the presence of wild inoculum sources. For the future of the strawberry industry and keeping the impact of this problem to its minimum, the following points need to be considered.

a) Growing strawberry transplants in a safe distance from the wild inoculum source. This will require identification of wild alternate hosts in North Carolina and determining the “safe” distance of inoculum dispersal experimentally from the source.
b) Introduction of drip irrigation systems for nursery production instead of overhead sprinkler. This would help in drier years but if we get regular rains the impact will be low.
c) Do not overwater plugs using overhead sprinklers and minimize sprinkler irrigation for plant establishment in the fruiting field
d) Development of effective sampling methods followed by sensitive diagnostic protocols to detect latently infected plants at every stage including assaying tips before entering into the plug production facility and plugs/bare root plants before entering into fruit production fields.
e) If problems are suspected and growers need to use the plants, then discard suspected plants at each step or keep problem plants separate to follow highly stringent production protocol such as
    i) Use of fungicide drenches of a registered QoI fungicide that is known to have systemic activity through the xylem
    ii) Revising fungicide spray programs based on population structure in North Carolina and their sensitivity to fungicides

These points do not replace the priority of developing resistant/tolerant varieties, nor the continued need to grow plants under strict production protocols (e.g. certification-type standards) to be included in the

integrated disease management program for the sustainability of the strawberry industry in North Carolina.
When growers get the problem one year and want to use the same piece of land for growing strawberries in the next year, a common concern is the carryover of the inoculum to the next crop. This is not a soilborne pathogen and research in Florida has shown that pathogen does not survive in stubbles until the next crop. It is highly unlikely for the same pathogen to go to the next crop although North Carolina soil type and weather conditions are slightly different from Florida and empirical assessment of this issue is warranted. However, in such situations, fumigation of the land before the second strawberry crop will be important.

New Rely Formulation

W.E. Mitchem
Orchard and Vineyard Floor Management

Bayer CropScience is marketing a new formulation of glufosinate called Rely 200. Rely 200 will replace Rely 1L which has been widely used by grape and blueberry growers for non-selective postemergence weed control. The Rely 200 formulation is more concentrate than Rely 1L and therefore use rates have been reduced. Weeds less than 6 inches tall should be treated with 58 fluid ounces per acre. Rely 200 may be applied at rates up to 115 fluid ounces per acre for taller weeds. In addition to weed control Rely 200 can be used for grape sucker suppression or elimination by treating suckers less than 12 inches long with 77 fluid ounces per acre followed by a second application 4 weeks later. Rely 200 should be applied in a spray volume of 20 to 40 gallons per acre. Rely 200 has a 14 day pre-harvest interval of 14 days for grape and blueberry.

Southern Region Small Fruit Consortium Awards $117,233 in Grants

Tom Monaco, Coordinator, SRSFC

The Steering Committee of the Southern Region Small Fruit Consortium (SRSFC) awarded $117,233 in research and extension grants at their annual meeting held January 2008 in Savannah, GA. Twenty-eight research proposals and four extension proposals were submitted to the SRSFC. Twenty-one research proposals totaling $101,733 were funded and all four-extension proposals for a total of $15,500 were funded. SRSFC grants are made available to faculty from the university consortium members. The maximum awarded per grant is $5000. For 2008 two research grants were awarded at VPI; NC State University received seven research grants and three extension grants; one research grant was awarded at Clemson University; five research grants were awarded at the University of Georgia; three research grants and an extension grant were awarded at the University of Tennessee and three research wards were awarded at the University of Arkansas.

The IR-4 Performance program added a half match to five of the research proposals which added $12,500 in additional funding so the total amount invested in research for 2008 is $114,233.

Research projects funded for 2008 include:

SRSFC 2008-01A Raspberry breeding for the southern region. Fernandez, Ballington, Pesic-VanEsbroeck, Sosinski, Lockwood, Deyton, Pattison $5000

SRSFC 2008-02 Evaluation of advanced blueberry selections for regional adaptation and mechanical harvest potential. NeSmith, Cline $2500

SRSFC 2008-03 Evaluation of self- and cross-fertility and increased heat tolerance of primocane-fruiting blackberry genotypes. Clark, Garcia $4312

SRSFC 2008-04 Blueberry red ringspot virus: prevalence in Georgia and North Carolina and yield losses associated with the disease. Scherm, Brannen, Cline $5000

SRSFC 2008-05 Epidemiological significance of Colletotrichum gloesporioides infestation of nursery plants on crown rot of strawberry in the Southeast. Rahman, Louws $5000

SRSFC 2008-06 Enhancement of bramble production in the southeastern U.S. through micropropagation, virus-indexing, and field evaluation for trueness-to-type. Pesic-VanEsbroeck, Ballington, Fernandez $5000

SRSFC 2008-07 Utilizing diverse strawberry germplasm for developing genetic improvement strategies for the southeastern United States. Pattison, Poling, Ballington $5000

SRSFC 2008-08 Evaluation of cultivars, plug establishment date, and plant spacing for

greenhouse strawberry production. Deyton, Sams, Takeda $5000

SRSFC 2008-09 Vector and transmission investigations for blueberry red ringspot virus in the Southeast. Cline, Burrack, Kennedy $4923

SRSFC 2008-10 Alternative management tactics for green June beetles in grape. Johnson $4998

SRSFC 2008-11 Thrips prevalence and management in southeastern blackberries. Burrack, Fernandez $5000

SRSFC 2008-12 Enhancing the productivity and fruit quality of forced strawberries through manipulation oflight quality in high tunnels in the 2nd year. Dufault $5000

SRSFC 2008-13 Antifeedants, repellants, and organic controls for plant-feeding bugs, Japanese beetle and green June beetle on caneberries. Pfeiffer $5000

SRSFC 2008-14 Development of methods to reduce ground drops during mechanical blueberry harvest. Krewer, Takeda, Andrews $5000

SRSFC 2008-15 Agricultural water quality and transfer of foodborne pathogens in grapes and strawberries. Phister, Fisk $5000

SRSFC 2008-16 A preliminary survey of bacterial leaf scorch of blueberry in Georgia. Brannen, Chang $5000

SRSFC 2008-17 Evaluation of potential synergistic combinations of synthetic herbicides and/or biofumigants for weed control in small fruits. Armel, Sams, Deyton, Stribling $5000

SRSFC 2008-18 Blueberry shelf life prediction and postharvest diseases detection using the electronic nose. Li, Krewer $5000

SRSFC 2008-19 Exploring banker plant systems for IPM of off-season greenhouse strawberry production. Sams, Deyton, Hayden $5000

SRSFC 2008-20 Estimated costs and returns of producing, harvesting and marketing raspberries in the southeastern United States. Safley, Fernandez $5000

SRSFC 2008-21 Pruning management for primocane-fruiting blackberry production in hightunnels in Arkansas. Rom, Garcia $5000

The IR-4 performance program will add a half match to the following proposals:2008-4 - $2500, 2008-5 - $2500, 2008-10 - $2500, 2008-11 - $2500, 2008-13- $2500.

Extension proposals funded for 2008 include:

SRSFC 2008E-01 Use of Dura-Line monofilament as a replacement for high-tensile wire in trellis construction and netting support with small fruit crops. Lockwood, Wills, Honea, Stribling $5000

SRSFC 2008-02 Development and publishing of IPM-based management of the major plant pathogens of strawberry: an extension project. Louws $5000

SRSFC 2008-03 Frost/freeze advisories for southern region strawberry growers. Poling $3000

SRSFC 2008-04 Weed management practices used in blueberry production: a survey of blueberry growers in North Carolina. Coneybeer, Jennings, Monks $2500

Gramoxone Inteon vs. Firestorm – *It's a Tie!*

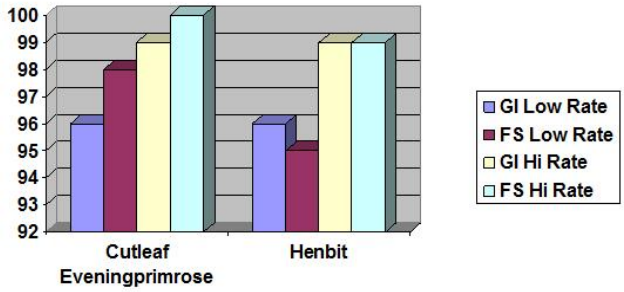
Wayne Mitchem

A couple of years ago Syngenta replaced Gramoxone Max with a new paraquat formulation called Gramoxone Inteon. Gramoxone Inteon has been used in fruit preemergence herbicide trials as a standard non-selective postemergence herbicide. During the past 2 or 3 years Gramoxone Inteon has provided excellent non-selective weed control, however growers (from different states, growing different crops, more than 1 year) have expressed concern about Gramoxone Inteon activity on weeds. Firestorm, a generic paraquat formulation, is being marketed to growers across the Southeast and it has a favorable reputation with growers. In an effort to address grower concerns a trial was conducted this winter comparing Gramoxone Inteon and Firestorm. Each formulation was applied at two equivalent rates. Their effectiveness was evaluated 7 and 14 days after treatment. All treatments provided 100 % control of common chickweed 7 days after treatment. Observations made 14 days after treatment indicated that cutleaf eveningprimrose control from Gramoxone Inteon and Firestorm ranged from 96 to 100 % (Fig. 1). Henbit control 14 days after treatment ranged from 95 to 100 % (Fig. 1) with Firestorm and

Gramoxone Inteon. Data was subjected to statistical analysis and there were no differences in control related to the herbicide treatments.

Results from this trial do not indicate any control advantage associated with the use of Firestorm rather than Gramoxone Inteon. However one can conclude that Firestorm is just as effective as Gramoxone Inteon at controlling these common winter annual weeds. As a grower you can use this information and the market place to determine your product of choice.

Figure 1. Percent control of cutleaf eveningprimrose and henbit 14 days after treatment with Gramoxone Inteon and Firestorm applied at two equivalent rates[1].



[1]GI = Gramoxone Inteon; FS = Firestorm; Low Rate = 0.63 lb ai A^{-1}; Hi Rate = 1.0 lb ai A^{-1}

Natchez Thornless Blackberry

John R. Clark, Professor
University of Arkansas

The University of has released the fifth thornless blackberry adapted to the southern region of the U.S. Natchez is intended to serve as an early season variety to replace Arapaho (a 1993 release from Arkansas). Plants will be available in 2008, although the major supply will mostly likely be available in fall and winter of 2008 and 2009. For sources of University of Arkansas fruit varieties visit the website http://www.aragriculture.org/horticulture/fruits_nuts/default.htm.

Natchez will be a patented variety as are other Arkansas blackberries, and those interested in becoming licensed propagators for nursery sales should contact me at jrclark@uark.edu

Origin: University of Arkansas, 2007

Season of Ripening: Early, near that of Arapaho and occasionally 2-3 days earlier. First ripe date on average is June 3, compared to Ouachita June 10 and Apache June 19. It is intended that Natchez be used as a replacement for Arapaho for the early season.

Yield Potential: Recorded yields for Natchez have been twice that of Arapaho in research plantings. Yields are usually comparable to Ouachita and Apache.

Berry Size: Berries are large, on average 8 to 9 g, often comparable in size to Apache and larger than Arapaho, Ouachita, and Navaho. Berry size remains large for the fruiting season.

Quality: Good, rated comparable to Arapaho in flavor but slightly lower than Apache, Navaho and Ouachita. Soluble solids averages about 9.5% in most measurements, slightly lower than Ouachita and Navaho. White drupelets have seldom been seen on Natchez.

Post-harvest Handling Potential: Very good, with performance usually exceeding Arapaho and comparable to the other thornless Arkansas cultivars. Fruit firmness was rated slightly lower for Natchez compared to other Arkansas thornless, but storage performance did not show firmness concerns, and had low leak and reddening ratings after one week of refrigerated storage. Natchez is recommended for planting for shipping.

Canes: Erect to semi-erect, thornless. Canes are not as erect as Ouachita or Apache. Although Natchez cane be grown in a hedgerow, it is recommended that support wires on either side of the cane row be utilized to maintain an upright canopy as is common in current commercial blackberry culture.

Disease Resistance: No substantial common diseases observed, with only slight anthracnose seen in one year of the observation period. No orange rust observed. Not screened fully for double blossom/rosette resistance although no evidence of this disease has been seen. It is assumed Natchez will have resistance to double blossom comparable to other Arkansas thornless.

Root Sprouting: In a single-year evaluation, root sprouting of 94% was observed.

Hardiness: Not well evaluated for winter hardiness due to moderate winter temperatures in recent years. Withstood lows of 7F at Clarksville with no damage.
Chilling requirement: Not measured but has had good budbreak with 500-600 hours. Anticipated to have similar chilling requirement of Arapaho of 400-500 hours or possibly lower.

SRSFC Food Safety Training for County Agents

Powell Smith, Extension Associate,
Clemson Extension Service

At the Southeastern Fruit and Vegetable Conference (SFVC) in Savannah, Ga. held on 10 – 13 January, 2008, the Southern Region Small Fruit Consortium (SRSFC) sponsored an in-service training event to teach county extension agents the basics of on-farm food safety. The in-service training was conducted on Thursday before the actual conference began on Friday with tour to a local packing shed on Wednesday afternoon. University, FDA, and industry speakers highlighted the basics of Good Agricultural Practices (GAP's) for the packing shed and fields, the microbiology of water, legal aspects of food safety, Hazard Analysis and Critical Control Points (HACCP), and the third party auditing process. The training was attended by 28 agents and one specialist and included four agents from our newest member of the SRSFC, Arkansas.
The SRSFC sponsors several trainings per year with at least one in conjunction with a major commodity conference. The SFVC has become one of the premier fruit and vegetable educational and trade show events in the nation. This year over 1500 people were registered for the conference. This gives agents some extra opportunity for education, networking, and fun besides the scheduled in-service training. Food safety in all aspects of food production and processing has become extremely important today, and well-versed agents are needed to help growers, packers, and processors begin to develop food safety/GAP programs for their businesses.
On Wednesday afternoon, attendees were treated to a tour of Gerrald's Sweet Vidalia Onion operation in Statesboro, Ga. Due to logistics and seasonality, we weren't able to tour any small fruit operation with a food safety program. The owners of Gerrald's were excellent hosts, and the agents enjoyed the tour and found it to be very informative. They were packing locally produced carrots and onions imported from Peru and Chile. The agents were able to see a food safety/GAP program in action and asked many questions about the operations that they saw. The tour received high marks on the evaluations by allowing the agents to see a plan in action. Beth Bland, of the Georgia Fruit and Vegetable Growers Association, was the 'tour guide' and was very knowledgeable about on-farm food safety programs.
In the classroom training on Thursday, Bill Morris from the University of Tennessee gave a very interesting lecture about the Microbiology of Water, Bill Hurst of the University of Georgia presented an informative talk about GAP's for the Packing House, and Chris Gunter of North Carolina State University talked about GAP's in the Field. Linda Stewart, with the FDA, tied the HACCP approach into GAP's and on-farm food safety. Pete Hatfield from AIB International, a large auditing firm, explained the process of the third-party audit to the agents and used many interesting examples from his extensive experience in the food-processing industry. Pete was a beer taster for the Pabst Company at one time.
The highlight of the classroom portion may have been the presentation by David Babcock, an attorney

with Marler Clark, a firm specializing in representing plaintiffs in food safety litigation. David's presentation, entitled "The Legal Basis of Food Borne Illness Litigation", was a well-presented introduction to the many factors entering into the settlement of such claims. The presentation received more positive comments that any of the other talks and, obviously, opened many eyes and minds to the 'other' side of food safety issues.

Overall the training was well received, was rated excellent, gave a diverse group of agents an opportunity to meet new agents from all around the South, and allowed them to take home some basics of on-farm food safety, GAP's, and the third party audit process. Also, the legal presentation gave some food for thought about the ramifications of food safety incidents for both the victims and the food industry. From the many comments that I fielded from the attendees, a visit to Georgia's historical port city, Savannah, was an added benefit. I was busy with the tour logistics and did not take any pictures, but many attendees took pictures on the tour. I thank Mary Helen Ferguson, of the North Carolina Cooperative Extension Service for the photos shown below. These and more are posted at: http://randolph.ces.ncsu.edu/content/hort .

Attendees gather at Gerrald's Sweet Vidalia Onions to tour the packing operation.

Terry Gerrald talks to the tour group about the carrot

Workers pack imported, out-of-season sweet onions at

Packed and palletized Peruvian sweet onions; note the slotted floor to facilitate air circulation.

Bramble Chores
Spring 2008

Gina Fernandez, Small Fruit Specialist
North Carolina State University

SPRING

Plant growth and development

- √ Plants deacclimate quickly
- √ Bud differentiation (additional flowers formed)
- √ Bud break
- √ Flowering
- √ Primocane emergence

Pruning and trellising

- √ Finish pruning and make sure all canes are tied to the trellis before budbreak
- √ Rotate shift trellises to horizontal position before budbreak, rotate to upright position immediately after flowering

Weeds

- √ Weed growth can be very vigorous at the same time as the bramble crop peaks, don't let weeds get out of control
- √ Weed control is best done earlier in the season before harvest commences.
- √ Handweed perennial weeds in and around plots

Insect and disease scouting

The period of time in the spring when the plant is flowering is the most important season for chemical control of **insects** and diseases. Know what your pests are and how to control them. Check the Southern Regional Bramble integrated Management Guide for recommendations http://www.smallfruits.org/SmallFruitsRegGuide/Guides/2006/BrambleSprayGuide61506.pdf

Insects

- √ Raspberry crown borer burrows into cambium
- √ Stink bugs (white drupelets in summer)
- √ Rednecked cane borer adults (starting at bloom)
- √ Raspberry cane borer adults
- √ Thrips
- √ Tarninshed plant bug
- √ Japanese beetle
- √ Raspberry fruit worm
- √ Midge
- √ Raspberry sawfly
- √ Blackberry psyllid
- √ Two spotted spider mites
- √ Aphids
- √ Whiteflies

Diseases

- √ Antracnose
- √ Botrytis (gray mold)
- √ Spur blight
- √ Cane blight
- √ Septoria leaf spot
- √ Leaf and cane rust
- √ Powedery mildew
- √ Viruses

Water management

- √ Bramble plants need about 1"-2" water/week, and this is amount is especially critical during harvest.
- √ Consider installing an overhead system for evaporative cooling. Turn on once or twice a day from 10 am to 3 pm for short periods of time (approx. 15 minutes) until mid afternoon

Nutrient management

- √ Apply second half of nutrients if doing split application
- √ Take leaf samples after harvest and send to a clinic for nutrient analysis for recommendations for next year

Marketing and miscellaneous

- √ Service and clean coolers
- √ Make sure you have enough containers for fruit next season
- √ Prepare advertising and signage for your stand
- √ Contact buyers to finalize orders
- √ Hire pickers
- √ Prepare signage for field orientation, it is easier to tell pickers where to go if rows are numbered

Quarterly Strawberry Plasticulture Checklist

Gina Fernandez, Small Fruit Specialist
North Carolina State University

This checklist was originally developed for growers in North Carolina. You will have to adjust your work activities either earlier or later depending on your location. For more detailed information, check the Southern Region Integrated Strawberry Management Guide http://www.smallfruits.org/SmallFruitsRegGuide/Guides/2007/Strawberry%20Integrated%20Management%20GuidefinalcopyJennings%202%208%2007%20_3_.pdf and the Southeast Regional Strawberry Plasticulture Production Guide http://www.smallfruits.org/SmallFruitsRegGuide/Guides/2005culturalguidepart1bs1.pdf

Spring (March-May)

- Send in leaf samples to testing lab every 14 days starting in late February/March
- Adjust fertility according to the recommendations
- Scout fields for mites, insects and diseases. Botrytis, anthracnose, powdery mildew, aphids, thrips, mites and clippers will be your primary pest problems at this time
- Remove old leaves and open plastic where any branch crowns might be growing underneath plastic
- Get pest problems under control with dormant, pre-bloom, pre-harvest and harvest

sprays, customers don't like to see sprayers in the field when they are harvesting
- Make sure your irrigation systems for frost protection and drip are ready
- Monitor weather forecasts closely, frost protect as needed, start on a date that is typical for your area, any earlier may result deformed fruit and unnecessary loss of sleep
- Check your frost alarm to make sure that it is working properly
- Control weeds or ryegrass in aisles with herbicide if not done so already
- Apply straw mulch in aisles, if rye grass did not take
- Place 2 hives of honeybees/acre near your field
- Schedule picking and sales labor
- Order portable toilets and emphasize proper sanitation for farm labor and the public
- Get sales stand ready, tidy up, paint, make new signs, get new baskets…
- Check and organize supply inventory
- Clean out and fire-up refrigeration units
- Have scales checked by proper authorities in your state
- Harvest each plant 2x week (start early to mid April)
- Figure out a system to collect customer names etc for your mailing list
- Keep harvest records even when you are busy

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Editor and Contributor..... Tom Monaco

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