

# Small Fruit News

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North Carolina State University • Clemson University • The University of Arkansas  
The University of Georgia • The University of Tennessee  
Virginia Polytechnic Institute and State University

## SPECIAL REPORTS:

### ***Report on County Extension Agent Training on Food Safety***

***Sponsored by SRSFC in Durham, NC  
in Conjunction with Strawberry Expo  
December 4, 2013***

Christine Bradish,  
PhD Student, NC State University

A training event updating agents within the SRSFC on food safety was held in Durham, NC on December 4, 2013. The event was led by Dr. Betsy Bihn of Cornell University and Dr. Annette Wszelaki of the University of Tennessee, and sponsored by Dr. Tom Monaco and the SRSFC. A total of 18 agents from four member states attended the event. The training consisted of several modules, and provided participants with up-to-date information and usable templates for training and educating growers about food safety. Agents were provided with registration to the Southeastern Strawberry Expo in addition to the training, which was held in the two days following.

Drs. Bihn and Wszelaki are a founding part of the multistate Produce Safety Alliance, which is a nationwide effort to increase understanding of GAPs (good agricultural practices) and implicate standardized food safety procedures in farms

and packinghouses. With up and coming legislation from the Food Safety Modernization Act in place, knowledge and facilitation of GAPs will become increasingly necessary. Training started with an overview of the importance of food safety plans, and a lively conversation about the grower's responsibility in food sanitation practices.

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Next, Dr. Bihn and Dr. Wszelaki went through the decision-tree process for food safety planning, which includes a checklist to prioritize practices and different self-assessments for areas such as postharvest water, wildlife and animal management, and worker health and hygiene. An interactive activity demonstrating how to write SOPs (standard operating procedures) was completed with the agents, as these are important parts of any food safety plan in order to ensure consistency in cleaning and sanitizing procedures. The day concluded with a discussion about how to use the resources provided, and how agents could set

up training modules for growers in their respective states and counties.

Power point presentations from the training are posted at

<http://www.smallfruits.org/CoAgentTraining/FoodSafetyTrainingDec2013.html>.



*Agents participate in an activity to practice writing SOPs (Standard Operating Procedures) for growers to use and include in their food safety plans.*



*Dr. Annette Wszelaki (left), and Dr. Betsy Bihn (right), explain how to incorporate decision trees into food safety training programs.*



*Agents participate in an interactive activity which will help them lead their own food safety training events.*

## **Grape Weather Advisory**

Sara Spayd

Professor/Extension Viticulture Specialist, NC State University

With temperatures in the low to mid teens in many areas January 7, 2014 Tuesday morning, there is a potential that bud and wood injury occurred in muscadine vines. If we get into single digits for low temperatures I am very concerned for all grapes. Bunch grapes with high foliar disease issues last summer and fall are going to be more susceptible to cold injury than healthy vines. Buds will be of particular concern, but wood injury may also occur. If growers have not pruned, they should hold off on pruning until we clear at least this cold weather spell. If there is only bud injury, growers will be able to adjust bud numbers to compensate for at least some of the injury by leaving more buds.

## **Fungicide Schedules for Managing Exobasidium Leaf and Fruit Spot of Blueberry: Field Observations from Georgia**

Harald Scherm and Phillip M. Brannen

Department of Plant Pathology

University of Georgia, Athens

Exobasidium leaf and fruit spot has been an infrequent disease of blueberries in the Southeast. However, during the 2011-2013 harvest seasons, we have had frequent reports of symptoms on rabbiteye and highbush blueberries throughout the region. Although geographically scattered, where Exobasidium leaf and fruit spot occurs it can cause considerable losses (60 to 70% in some locations), primarily because affected fruit are unmarketable and it is difficult to remove all berries with this symptom from the packing line.



In addition, significant pre-harvest fruit drop can occur on some varieties, e.g., Tifblue.

**Symptoms.** The first visible symptoms of the disease are light green leaf spots (ca. 0.5 cm in diameter) on the upper side of infected leaves in early spring (Fig. 1). Leaf spots are often pure white on the leaf underside due to a thin, dense layer of fungal growth. Furthermore, the affected leaf area is slightly thicker than surrounding tissue, and becomes necrotic with age during the summer (Fig. 1). Spots on fruit first appear when fruit turn color, average 0.5 cm in diameter, and are circular and generally regular in appearance (Fig. 1). The diseased fruit tissue is green and unripe, sometimes tinged with a yellow or red color. The spots on berries may be sunken and only occasionally show sparse white fungal growth.



**Figure 1:** Symptoms of *Exobasidium* leaf and fruit spot on rabbiteye blueberry. Early-season leaf symptoms (top left) are light green spots on the upper leaf surface which are white or lighter green on the lower surface. During the summer, leaf lesions become necrotic (top right). Fruit symptoms (bottom left) are green to yellowish, firm spots and blotches that do not mature with the rest of the berry.

**Causal organism.** The cause of *Exobasidium* leaf and fruit spot has been classified recently as the fungus *Exobasidium maculosum* by Dr. Marin Brewer at the University of Georgia. This organism is distinct from the *Exobasidium* spp. causing red leaf disease of blueberry or rose bloom of cranberry in other production regions, or leaf galls on *Azalea* spp. in the southeastern states. County Extension offices can diagnose this disease either directly through in-office examination or through shipment to diagnostic clinics. Microscopic observation of the spores can be used to confirm the diagnosis.

**Disease cycle.** At this point, the epidemiology and life cycle of *Exobasidium* leaf and fruit spot have not been clarified fully. It is assumed that the disease has a 1-year cycle (i.e., is not systemic within the plant), and that the pathogen overwinters in a yeast-like stage on or in infected bud scales and/or on or in the bark. Infection occurs in the early spring as leaf and flower buds expand. The disease is mono- or oligocyclic, given that late-season leaf flushes do not show additional spots. We currently assume that most of the initial infections occur from within the planting, as opposed to outside sources. We further surmise, based on data presented below, that most of the infections occur relatively early in the season, mostly during the leaf expansion and bloom through petal fall periods.

**Host resistance.** In Georgia, *Exobasidium* leaf and fruit spot is generally more common and more severe on rabbiteye than on southern highbush blueberries. Genetic disease resistance is likely present in some cultivars, but no surveys or controlled experiments have been conducted to determine which varieties show resistance. In 2012 and 2013, Premier was highly susceptible, but other varieties such as Tifblue, Star, and Powderblue were affected as well. Limited or no symptoms were observed on Climax.

**Cultural controls.** The disease is generally more prevalent in plantings surrounded by trees (reduced air flow) and/or located next to areas of high humidity (i.e., ponds or low spots where water stands). It is likely that poor air flow, slow drying conditions, and high humidity contribute to an increase in disease intensity. Similarly, it has been observed that symptoms are most severe in the lower canopy and in the bush interior. This likely relates to poor air movement, high humidity, and possibly poor spray penetration. Proper pruning and cane renewal to open up the canopy and allow for better fungicide penetration and air movement may help to suppress the disease.

**Chemical controls.** In general, where plants receive an effective early-season fungicide program (e.g., for controlling mummy berry disease), we have not observed the disease at significant levels. In our research trials in 2013, a single late-dormant application of lime sulfur provided substantial and statistically equivalent management of *Exobasidium* to that afforded by multiple applications of either Captan or Indar applied at a typical mummy berry schedule (Table 1). The high level of disease suppression with late-dormant lime sulfur may indicate that overwintering inoculum and/or early-season infections are of primary importance to disease development. For the in-season spray schedules (between green tip and early cover sprays), the efficacy ranking was Captan > Indar > Pristine, with Pristine performing relatively poorly when applied only in the cover

sprays. All three of these fungicides performed well when applied during the early block regimen (Table 1), again supporting the premise that infections are occurring early during the development of leaves and fruit. No plant injury was observed with any tested fungicide.

**Table 1.** Effect of fungicides and application schedules on incidence and severity of *Exobasidium* fruit and leaf spot on Premier rabbiteye blueberry in Bacon County, GA, 2013.

	Treatment and rate/A	Application timing <sup>z</sup>	Leaf spot incidence (%) <sup>y</sup>	Leaf spot severity (spots/leaf) <sup>y</sup>	Fruit spot incidence (%) <sup>x</sup>
1.	Untreated control.....	---	48.0 a	2.9 a	32.4 a
2.	Lime Sulfur 5 gal....	1	5.7 cd	0.1 c	2.8 de
3.	Captan 4L 2.5 qt....	2-6	8.3 cd	0.2 c	4.4 cde
4.	Indar 2F 6fl oz.....	2-6	23.1 b	0.5 c	12.3 bc
5.	Pristine 22 oz.....	2-6	24.0 b	0.5 c	10.3 bcd
6.	Captan 4L 2.5 qt....	7-9	6.7 cd	0.1 c	12.2 bc
7.	Indar 2F 6fl oz.....	7-9	15.5 bc	0.3 c	16.6 b
8.	Pristine 22 oz.....	7-9	39.2 a	1.8 b	31.0 a
9.	Captan 4L 2.5 qt....	2-9	1.3 d	0.0 c	1.0 e
10.	Indar 2F 6fl oz.....	2-9	4.4 cd	0.1 c	4.0 cde
11.	Pristine 22 oz.....	2-9	25.0 b	0.7 c	14.4 b

<sup>z</sup>Treatment dates and corresponding plant phenologies: 1 = 5 Feb (late dormant); 2 = 14 Feb (early green tip); 3 = 28 Feb (green tip, 4% bloom); 4 = 14 Mar (32% bloom); 5 = 21 Mar (58% bloom); 6 = 28 Mar (84% bloom); 7 = 1 Apr (petal fall); 8 = 12 Apr (first cover); 9 = 19 Apr (second cover).

<sup>y</sup>Recorded for 20 shoots per plot with ~7 leaves per shoot on average. Means followed by the same letter are not significantly different when using Tukey's test ( $P = 0.05$ ).

<sup>x</sup>Recorded for ~300 fruit per plot on average. Means followed by the same letter are not significantly different when using Tukey's test ( $P = 0.05$ ).

It is interesting to note that fungicide evaluation trials in other states, specifically Mississippi and North Carolina, reported better efficacy of Pristine against *Exobasidium* leaf and fruit spot. The fact that we have observed relatively low levels of disease control with this product in our trials for the past 2 years may indicate insensitivity of *E. maculosum* isolates against the active ingredients in Pristine at our test locations in Georgia.

Lime sulfur does not currently have *Exobasidium* on the label, but it is labeled against other blueberry diseases such as *Phomopsis* twig

blight, and producers can legally apply lime sulfur for these other diseases. Apply lime sulfur at bud swell, about 2 weeks before first green tissue or flowers are exposed.

It is likely that we will have numerous questions relative the use of lime sulfur as we move into next year. Lime sulfur is a caustic and dangerous material, so producers need to read the label carefully and follow all PPE recommendations. Liquid lime sulfur has "Danger" (not "Warning" or "Caution") on the label. It will burn the eyes and skin. It should not be applied within 14 days of an oil spray or at high temperatures, as phytotoxicity (plant injury) can occur.

We will continue to expand our knowledge of *Exobasidium* biology and control recommendations over the next few years. However, we are hopeful that the above information will help manage the disease as we continue our research.

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## **Spotted Wing Drosophila Here To Stay**

Matt Milkovich

Article first published online in [Fruit Growers News](#)



The spotted wing drosophila (SWD) is now established throughout the United States. A native of Asia, the invasive pest of berries, stone fruit, grapes and other fruit crops made its first North American appearance in California in 2008. Since then, it has spread to most of the fruit-growing regions in the United States. As of 2012, it had been detected in 38 of the continental states, according to North Carolina State University (NCSU).

A common theme of SWD's spread is a single detection, followed by intensive trapping, followed quickly by detection over a broad geographic range, according to Washington State University (WSU).

Like other vinegar flies, SWD appears to have a short life cycle (one to several weeks, depending on temperature) and may have as many as 10 generations per year. This rapid developmental rate allows it to quickly develop large populations and inflict severe damage to a crop, according to the University of California (UC).



SWD might be a relatively new pest, but it's already caused "tens of millions of dollars in crop damage annually to cherries, raspberries, blackberries, blueberries and strawberries," according to NCSU.

If the pest can't be controlled, researchers estimate the losses could climb into the hundreds of millions of dollars. Some think SWD has the potential to destroy 40 percent of the blackberry and raspberry crops in the eastern United States, according to NCSU.

Common drosophila species will only attack damaged, overripe or dropped fruit, but SWD can attack undamaged fruit still on the tree, according to WSU.

Female SWD flies use serrated blades on the tips of their abdomens to cut through the skin of ripe fruit and lay their eggs. The eggs hatch into larvae that feed on the flesh of the fruit until they reach maturity – ruining the fruit in the process, according to NCSU.

Growers and researchers across the country are concerned about the increased use of pesticides, loss of income and greater input costs associated with SWD. They're still searching for the best ways to manage the troublesome new pest.

For more information, read FGN's [SWD Special Report](#).

## **Rely 280 SL Not Available in 2014**

W.E. Mitchem  
Vineyard and Orchard Floor Management  
N.C. State, Clemson Univ., and Univ. of Georgia, Cooperatively

Grape growers have used Rely 280 SL (glufosinate) for non-selective postemergence weed control for years with much success. Rely has a lot favorable attributes; safe to handlers, effective on perennial weeds, good on grass and broadleaf weeds are just a few. Unfortunately it will not be available in 2014 and

it is unclear when availability will improve. The shortage of Rely is due to the necessity for Bayer, the manufacturer, to meet the demand for Liberty 280 SL. Liberty contains the same active ingredient (glufosinate) as Rely but is used to control weeds in genetically modified soybean, cotton, and corn varieties (Liberty Link Technology) which are an alternative to Monsanto's "Roundup Ready" trait used in agronomic crop varieties.

It is very important that growers realize this is not a short term issue and Rely availability may be impacted well beyond 2014. Growers who depend heavily on Rely have several options listed below.

1. Reckon 280 SL is a generic alternative to Rely 280 SL. Reckon is formulated by Solera which markets a variety of generic pesticide products in the U.S. In 2013 there was a limited amount of Reckon marketed in western NC. At least one distributor has a limited supply to market in 2014. Due to demand (acres of production) Reckon was marketed heavily on the west coast in 2013 and that will be the case again. I am encouraging growers to be proactive with their suppliers and try to secure quantities they need for 2014 ASAP.
2. Paraquat is a non-selective postemergence herbicide that is marketed as various trade names (Gramoxone, Parazone, Firestorm, Helmquat, Paraquat Concentrate, etc.). Unlike Rely and Glyphosate, paraquat is a very toxic herbicide and applicators have to take precautions not usually required for applying herbicides so make sure you follow the safety requirements outlined on the label. The use rate varies between Gramoxone SL and the other formulations. Paraquat does require the addition of a non-ionic surfactant.
3. Glyphosate (Roundup and others) is an alternative to Rely to use in late winter and spring. Glyphosate should not be used after June until vines are completely dormant to prevent serious crop injury.

4. Use a good preemergence herbicide program that limits the need for non-selective postemergence herbicides. There are a number of options and combinations of preemergence herbicides to consider which are noted in the Bunch and Muscadine Grape Spray Guide.

## **Blackberry and Raspberry Seasonal Checklist Winter 2013-14**

Gina Fernandez, Small Fruit Specialist  
North Carolina State University

This checklist was originally developed for blackberry growers in North Carolina. Many of the items apply to raspberry production as well. You may have to adjust your work activities either earlier or later depending on your location. For more detailed information, check the Southern Region Integrated Bramble Management Guide and the Southeast Regional Bramble Production Guide at:  
<http://www.smallfruits.org/SmallFruitsRegGuide/index.htm>.

Check the items off as they get done. This list is very general, but should help get you to think about what types of activities occur at various times of the year. If you would like other items to be added to this list, send them to me and I will add them next time.

### **WINTER**

#### *Plant growth and development*

- ✓ Plant is not visibly growing during the winter months although many blackberries will retain their leaves through the winter
- ✓ Some differentiation is occurring in the

flower buds

- ✓ Low chilling cultivars can break bud in January after adequate winter chilling. You can monitor chilling hours accumulated in eight states in the eastern US by accessing this site:  
<http://www.nc-climate.ncsu.edu/cronos/blackberry/index.php>
- ✓ Developmental stages for IPM guide:
  1. Dormant
  2. Delayed dormant (swollen bud) to green tip

#### *Pruning and trellising*

- ✓ Pruning should occur in late winter. However, in some areas winter ice storms can do tremendous damage to plants and trellis systems. If you produce blackberries in one of these areas, pruning can take place early winter to help avoid severe damage.
- ✓ Make trellis repairs after plants have defoliated but before pruning and training.

#### *Erect types*

- ✓ Prune out the spent floricanes
- ✓ Tie canes to wires in a fan shape
- ✓ Cut lateral branches back to 8-12"
- ✓ Thin canes to 6-8 canes/ hill (4 ft spacing)

#### *Trailing types*

- ✓ Prune out spent floricanes
- ✓ Tie or weave canes to wire so that they do not overlap
- ✓ Prune side laterals to 12-18"
- ✓ Thin canes to 6-8 hill (6-8ft spacing)

#### *Primocane fruiting raspberries and blackberries*

- ✓ Prune (mow) primocane fruiting types to ground level

### *Weed control*

Check the Southern Regional Bramble integrated Management Guide for recommendations. [www.smallfruits.org](http://www.smallfruits.org)

- ✓ Many summer weed problems can be best managed in the fall and winter using preemergent herbicides. Determine what weeds have been or could be a problem in your area. Check with local extension agent for cultural or chemical means to control these weeds.

### *Insect and disease scouting*

Check the Southern Regional Bramble integrated Management Guide for recommendations. [www.smallfruits.org](http://www.smallfruits.org)

- ✓ Scout fields for insect and disease damage and remove those canes
- ✓ Remove wild blackberries and raspberries by the roots if they are within 600 ft of your planting during the winter

### *Planting*

- ✓ Take soil tests to determine fertility needs for spring plantings.
- ✓ There are some new raspberry and blackberry cultivars available each year. If you have not tried them or it is not known how they will do in your region, it is best to order a small quantity to see how well they will perform in your area
- ✓ For larger growers, prepare list of cultivars for 2015 plantings and order now. Smaller quantities of plants can be ordered in early 2014 for spring 2014 planting
- ✓ A commercial small fruit nursery list at <http://www.fruit.cornell.edu/berry/nurseries/>

### *Water management*

- ✓ Make repairs to irrigation system (check pumps, lines, etc)
- ✓ Plants generally do not need supplemental water in winter

### *Marketing and miscellaneous*

- ✓ Order containers for next season
- ✓ Make contacts for selling fruit next season
- ✓ Attend grower meetings:
  - The 2014 North American Raspberry & Blackberry Conference Meeting
    - ✓ January 27-29, 2014 in Hershey PA.  
<http://www.raspberryblackberry.com/local.cfm?doc=webdocs%2F2014NARBAConferenceOverview%2Ehtm>
  - 2014 SE Regional Fruit and Vegetable Conference
    - ✓ Jan 9-12, 2014 Savannah GA
    - ✓ <http://www.seregionalconference.com/>
  - The North Carolina Commercial Blackberry and Raspberry Growers Association
    - ✓ Feb 6, 2014. Shelby NC. For more information contact [Daniel\\_Shires@ncsu.edu](mailto:Daniel_Shires@ncsu.edu) or Josh Beam <[josh.beam@dole.com](mailto:josh.beam@dole.com)>

For more information on growing caneberries see:

<http://www.smallfruits.org/>  
<http://rubus.ces.ncsu.edu/>



## **Strawberry Seasonal Checklist January- March Growers Checklist**

Jeremy A. Pattison  
Strawberry Extension Specialist  
North Carolina State University

### **Post-Planting Maintenance**

- ✓ Deer predation can continue throughout the winter months. Maintain fence perimeter to eliminate deer passage. A double row of electrified fence (tape or wire type) has been effective when installed early in the season. Consider attaching foil, paper plates or grocery store plastic bags at regular intervals to increase the visibility of the fence.
- ✓ Scout for pest injury, especially for mites if row covers are part of your production strategy. See Dr. Burrack's posting regarding the impact of row covers on spider mite populations <http://entomology.ces.ncsu.edu/2014/01/row-covers-and-spider-mites/>
- ✓ Check for dead plants and send suspicious-looking plants to the Disease & Insect Clinic for positive ID; However, plant growth during the winter months is very limited and disease development is also severely reduced which makes scouting difficult. Weekly scouting in uncovered fields (no row covers) is still advisable to hedge off any biological, environmental or mechanical issues in the planting.
- ✓ If strawberry plants formed runners in the fall after planting, cut these runners off – hand scissors or pruners do an excellent

job. Runner removal may be combined with hand-weeding operations.

- ✓ If annual ryegrass was seeded, check to see if it is getting tall. It is getting too tall when it reaches 10 inches and begins to provide excessive shade to the bed shoulders. A spray with Poast to stunt the annual ryegrass but not to kill it may be a good strategy. Lower rates of Poast can be very effective. Contact your agent for more information.
- ✓ If considering Stinger herbicide for vetch control or other labeled weeds, first check the Dow AgroSciences website to see if the required supplemental label exists for your state; it is important to download the label specific to your state. See [www.cdms.net/LabelsMsds/LMDefault.aspx?manuf=11&t=1,2,3,4](http://www.cdms.net/LabelsMsds/LMDefault.aspx?manuf=11&t=1,2,3,4)

### **Row cover management for the winter months**

- ✓ Winter applications of row covers during “normal temperatures” in the Piedmont of NC has resulted in minimal yield increases compared to uncovered treatments...
- ✓ However, winter injury due to “extreme” cold can be a potential threat to strawberry plants when temperatures enter the middle teens. Primary damage in this temperature range is due to leaf desiccation which can reduce the photosynthetic capacity of plants in the late winter and early spring and potentially delay harvest and promote botrytis on the dead tissue.
- ✓ Colder temperatures (below 15°F) can be damaging to internal tissues (crown and flower buds) and potentially reduce yield

therefore row cover intervention becomes a cost effective strategy.

- ✓ As a rule of thumb, if temperatures during the winter are forecast to be in the mid to lower teens (<15°F) the best course of action is to cover the planting with row covers. Under some conditions, this temperature may or may not cause winter injury, however, at this point of the season (early January) approximately 80% of your yield potential has been made and the minor labor expense of row cover deployment is well justified. Keep it simple!
- ✓ Keep track of local weather to be informed of adverse conditions that may require management actions. Several free sites such as those offered by the National Weather Service and local forecasting agencies are sufficient to raise the alert. Remember...if caution is the rule and resources (ie covers) are on hand, always apply row covers when temperatures are forecast to plunge below the mid teens!
- ✓ After the coldest part of winter has past and before new plant growth commences, leaf sanitation can be a beneficial practice to reduce botrytis fruit rot pressure (especially important in organic or no spray cultivation). Caution on leaf sanitation: Don't hand prune if anthracnose is known to be present.

### **Preparation for frost protection**

- ✓ Purchase your digital thermometer before you need it! Calibrate all thermometers to read a true 32°F in an ice bath.
- ✓ Monitor weather forecasts closely – consider a subscription to a custom weather report/service. Even with custom

services, your local conditions can be quite different. When frost is likely, plan on tracking hourly temperatures in the field so you can respond to your actual conditions.

- ✓ Check your irrigation system and consider doing a “wet run” prior to an actual frost protection event to ensure proper pump and nozzle operation and coverage. Better to find problems in the daylight rather than trying to solve an issue in the middle of night by yourself!
- ✓ Preparing for the spring frost season will always pay dividends!

### **Preparation for spring fertility**

- ✓ Supplementation of plant nutrition (nitrogen) typically begins in the late winter/early spring when new leaf growth and development begins but prior to bloom.
- ✓ Preceding the need for fertigation, its best to check the drip irrigation system (pumps, filters, pipes/lay flat and drip tape connectors) by performing a “wet run” to check for adequate flow and pressure and repair any leaks or clean filters as needed.
- ✓ Typical sources of nitrogen range from UAN (Urea ammonium nitrate), calcium nitrate, potassium nitrate and various complete fertilizer blends.
- ✓ Typical amounts range from 0.5 to 1 pound of actual nitrogen per acre per day. Actual rates will be affected by soil type, crop load and cultivar. Tissue sampling is the best way to determine the appropriate rates for macro (N,P and K) and micro (Boron and possibly others depending on soil type and chemistry) nutrients.

<http://www.ncagr.gov/agronomi/pdf/s/berrypta.pdf>

## **Preparing for Pest and pathogen management**

- ✓ Spray programs for fruit rotting pathogens should begin at 5 to 10% bloom.  
<http://www.smallfruits.org/SmallFruitsRegGuide/Guides/2014/2014SEStrawberryIPMGuide.pdf>
- ✓ Prior to initiating your spray program, visit your state's pest management guides and check your chemical inventories to ensure the proper tools are in your box.
- ✓ De-winterize your sprayer, inspect the entire system for leaks, clean primary filters and screens, check nozzles for proper flow rates (replace when old tips exceed specified flow rate by 10%) and calibrate the sprayer for the appropriate rate of water per acre.  
[http://www.nccropprotection.org/FactSheets/Calibrating\\_boom\\_sprayer.pdf](http://www.nccropprotection.org/FactSheets/Calibrating_boom_sprayer.pdf)
- ✓ Continue to scout your planting for pest and pathogen pressure as the season continues and adjust the standard spray recommendations accordingly to your actual situation.

## **Harvesting and marketing considerations**

- ✓ Plan on purchasing bee hives to help with flower pollination and good fruit set.
- ✓ Check inventories of harvest containers, roadside signs and other marketing necessities.
- ✓ If marketing berries to wholesalers or other third party intermediaries off the farm, contact buyers to discuss

expectations regarding volume, timing and price.

- ✓ Labor is one of the most significant components to the cost of production. Ensure you have an adequate labor force to accomplish the massive undertaking of harvest. Effective marketing strategies can help keep PYO fields filled with customers while identifying and securing a dependable harvest crew can keep pre-picked fruit on the shelf. Both are important for most operations.

**Best of luck as you enter and pass through the winter months. Keep in touch with your local extension agent, regional agronomist or state specialist if you have any questions or concerns. We are here to serve!**

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Editor and Contributor Tom Monaco

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