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Give the New UGA Southern Misses Blueberries a Try

D. Scott NeSmith

The University of Georgia produces and evaluates thousands of seedlings and selections each year seeking new blueberry varieties for commercial growers. There continues to be interest in higher yielding varieties with improved fruit quality. Recently, three new southern highbush varieties were released and we are calling this new series *Southern Misses*. More than 10 years in the making, the *Southern Misses* are intended to target our major southern highbush season with high quality, improved varieties which are well adapted to the area. Overall, this suite of varieties should offer commercial Georgia growers, and others across the Southeast, novel new southern highbush varieties to develop more reliable production strategies. A brief description of each of the *Southern Misses* is given below, along with some data, to help visualize how they might be used.

'Miss Alice Mae™' - This is a main season southern highbush cultivar to consider as a replacement for the older industry standard 'Star'. 'Miss Alice Mae™' will flower a few days later than 'Star', helping to avoid some freeze damage scenarios. However, frost protection measures would still likely benefit 'Miss Alice Mae™' in many years. The new variety should ripen during the peak of southern highbush season, which is around the first week of May in south Georgia. In trials (see data in tables) yields and berry quality have been very good, and the variety will hopefully provide the industry a new main season workhorse. The plant habit is semi-upright and compact. Regular pruning is advised to maintain good berry size on 'Miss Alice Mae™'. Berry size, Brix, and firmness of the variety are very good.

In This Issue

Figure 1: *'Miss Alice Mae™' fruit.*

Figure 2: *'Miss Jackie™' fruit.*

Miss Jackie™' – 'Miss Jackie™' is a high yielding, high fruit quality, late season southern highbush. This new variety is later ripening than 'Miss Alice Mae™' and 'Star', ripening more closely to our 2006 release 'Camellia'. The latter half of May is a production time frame in south Georgia that often has a "fruit gap". This gap occurs as the main season highbush varieties expire; but, before the early season rabbiteye varieties come into significant production. 'Camellia' has proven to help fill this gap, but additional varieties are needed. 'Miss Jackie™' fits the timing of the gap well, and should compliment 'Camellia' nicely. The variety generally flowers later than main season varieties and also ripens later. This variety, like 'Camellia', could be used in production systems without frost protection to achieve later season highbush production. The upright, compact bush habit of 'Miss Jackie™' is generally easier to manage than 'Camellia', which can be overly vigorous, causing excessive plant "leggyness". 'Miss Jackie™' should be a strong companion variety for 'Camellia' and/or 'Legacy', or as a variety offering an additional option to growers in the later season production window.

'Miss Lilly™' – 'Miss Lilly™' is a strongly upright, narrow plant, with large high quality berries. Many growers are looking for reliable main season highbush varieties to produce without having to incur frost protection expense. 'Miss Lilly™' is expected to offer growers fruit that ripens in the main southern highbush season, but without the requirement of frost protection. The new variety flowers very late, yet ripens with or near 'Star' and 'Miss Alice Mae™'. Although 'Miss Lilly™' per plant yield is less than 'Star' on average, yields are steady from year to year due to the late flowering habit allowing the variety to typically escape cold damage. The lower per plant yield for 'Miss Lilly™' can be compensated for by higher density planting, since the plant is very narrow and upright. Higher density planting would achieve comparable per acre yields in that case. Regardless, there are a number of growers looking for an easier to manage, early ripening southern highbush. 'Miss Lilly™' could be grown with 'Camellia' and 'Miss Jackie™' to provide both early and later ripening fruit on the same farm without overhead frost protection.

Figure 3: *'Miss Lilly™' fruit.*

In summary, after more than 10 years of breeding and selection, going through literally thousands of plants, UGA has released three new *Southern Misses* highbush blueberries with high quality fruit, and plants that are well adapted to Georgia growing conditions. The varieties differ in their targeted utility, and growers are urged to give these a trial. The new varieties are all being patented, and plants can only be produced and sold by licensed nurseries. Licensed nurseries for 'Miss Alice Mae™' and 'Miss Jackie™' are Cornelius Farms and Fall Creek Farm & Nursery. Licensed nurseries for 'Miss Lilly™' include Cornelius Farms, Farmer John, and Fall Creek Farm & Nursery. Contact these suppliers today and order plants for trial.

Table 1: Plant and fruit ratings for the new UGA *Southern Miss* blueberry varieties and standards at the Alapaha Research Farm. Data are 5 Year avg.

Berry and plant attributes	Star	Camellia	Miss Jackie™	Miss Alice Mae™	Miss Lilly™
Berry size	7.6	8.9	7.9	7.4	8.4
Berry scar	7.0	7.2	7.5	7.9	7.4
Berry color	7.1	8.7	7.6	7.6	7.8
Berry firmness	7.2	7.2	7.8	7.6	7.8
Berry flavor	7.0	7.8	7.5	7.9	7.8
Cropping	4.7	5.4	5.9	5.9	5.2
Plant vigor	6.3	9.8	8.5	8.4	7.6
Date of 50% flowering	Mar 3	Mar 11	Mar 10	Mar 8	Mar 17
Date of 50% ripening	May 8	May 15	May 17	May 8	May 11
Fruit development period (days)	66	65	67	61	55

Table 2: Yield, berry wt., firmness and BRIX for 3 new UGA blueberry varieties and 2 standards 2010 thru 2013. Data are from the UGA Blueberry Farm in Griffin, Ga.

Year	Star	Camellia	Miss Jackie™	Miss Alice Mae™	Miss Lilly™
	Yield (lbs./bush)				
2011	12.7	9.7	10.0	10.4	8.5
2012	11.7	10.5	17.0	9.1	7.2
2013	3.9	15.9	15.5	14.3	7.3
Avg.	**9.4**	**12.0**	**14.2**	**11.3**	**7.7**
	Berry wt. (g/berry)				
2010	1.53	2.94	1.90	2.07	3.15
2011	1.20	1.97	1.80	1.47	2.08
2012	1.80	1.60	1.55	1.75	2.17
2013	1.79	2.56	1.76	2.00	2.12
Avg.	**1.58**	**2.28**	**1.75**	**1.82**	**2.38**
	Firmness (g/mm)				
2010	196	150	165	208	165
2011	206	166	173	190	188
2012	190	164	168	182	186
2013	191	150	166	208	188
Avg.	**196**	**157**	**168**	**197**	**182**
	Brix (%)				
2012	13.9	14.5	12.0	15.3	12.0
2013	13.5	13.3	13.3	14.0	12.3
Avg.	**13.7**	**13.9**	**12.7**	**14.7**	**12.2**

Effect of Rate and Timing of Alion Herbicide on 'Sunbelt' and Muscadine Grape

Nicholas Basinger, Katie Jennings,
Wayne Mitchem, and David Monks

Introduction. Annual and perennial weeds can be problematic in vineyards and season-long weed control can be challenging without multiple herbicide applications. Alion (indaziflam) herbicide was recently registered for application in grape. Indaziflam can provide weed control for up to 6 months according to the product label and could be a tool to provide season-long weed control and add an additional mode of action for use in vineyards. The purpose of this study was to further investigate some of the restrictions on the Alion label. Most vineyards in the southeast have vines that are not planted 12 inches deep, which is a label restriction to prevent crop injury. The label also states the maximum annual application rate is 5oz/A, and a waiting period of 90 days between applications is also needed to reduce risk of crop injury. This study was set out to determine if crop injury would occur in plantings where vines were planted <12 inches, application rate exceeded the maximum annual rate of 5oz/A and if applications could be made at shorter intervals <90days. In addition to these goals, this study determined the efficacy of weed control by Alion at different application timings and different application rates at and above recommended label rates.

Materials and Methods. Studies were conducted at six locations across North Carolina. Two locations were planted in muscadines for wine production (Mother Vine Vineyard associated with Duplin Winery and Gurganus Vineyard) consisting of 8 year old 'Carlos' vines. Two additional studies were planted in 8 year old 'Summit' and 'Triumph' muscadine vines for fresh market production (Killdeer Farms and Mitchem Farms). In addition

studies were established on 6 year old 'Sunbelt' grape vines at Killdeer Farms and Mitchem Farms. These sites represented varying growing regions for muscadine and grape and were on varying soil types.

Herbicide treatments were applied on April 24, 2015 to Carlos muscadines at the Mother Vine Vineyard and Gurganus Vineyards. The same treatments were applied at Killdeer (Summit muscadine and Sunbelt grape) and Mitchem Farms (Triumph muscadine Sunbelt grape) on April 28, 2015. A second application was made at the Mother Vine Vineyard and Gurganus Vineyard on June 25, 2015. A second application was applied at Killdeer Farms and Mitchem Farms on June 29, 2015 and June 30, 2015 respectively.

Treatments included Alion at 0, 3.5, 5 or 2.5 followed by 2.5 oz/A (Table 1). Rely 280 plus Surflan and Chateau at 6 oz/A were included as a grower standard. All initial treatments included Rely 280 at 2 qt/A and Surflan at 4 qt/A. Weedy and weed-free checks were included for comparison. Weed-free plots were initially treated with Rely 280 and Surflan and maintained weed-free by hand removal. Data collected included crop injury, weed control, and weed counts taken at 1, 2, 4, and 8 weeks after each application (WAP).

Table 1: Herbicide treatments applied to grape.

	First Application	Second Application
1	Weed-free Rely 280 + Surflan 3 qt/A + 4 qt/A	Maintained weed-free through hand weed removal.
2	Weedy (no herbicides)	None
3	Rely 280 + Surflan 3 qt/A + 4 qt/A	None
4	Rely 280 + Surflan + Alion 3 qt/A + 4 qt/A + 3.5oz/A	None
5	Rely 280 + Surflan +Alion 3 qt/A + 4 qt/A + 5 oz/A	None
6*	Rely 280 + Surflan + Alion 3 qt/A + 4 qt/A + 3.5 oz/A	Rely 280 + Alion 3qt/A, 3.5oz/A
7*	Rely 280 + Surflan + Alion 3 qt/A+ 4 qt/A + 5 oz/A	Rely 280 + Alion 3 qt/A, 5 oz/A
8	Rely 280 + Surflan + Alion 3 qt/A + 4 qt/A+ 2.5 oz/A	Rely 280 + Alion 3 qt/A, 2.5 oz/A
9	Rely 280 + Surflan + Chateau 3 qt/A + 4 qt/A + 6 oz/A	None
10	Rely 280 + Surflan + Chateau 3 qt/A + 4 qt/A + 6 oz/A	Rely 280 + Chateau 3 qt/A, 6 oz/A

*Treaments exceed current maximum labeled rates for crop safety

Results. PRE herbicides (Surflan, Chateau and Alion) were activated with 0.56 in of rainfall at the Mother Vine Vineyard and Gurganus Vineyard on April 29, 2015. However, at Killdeer and Mitchem Farms the first rainfall event occurred approximately 4 and 5 WAP, respectively.

Crop injury. No injury was observed from any treatments at either application timing at all locations. All vines were within 1 to2 phenological stages of one another across all treatments and there did not appear to be any differences among treatments for vine or fruit growth. Preliminary results indicate that Alion could be safe to use on vines that are not

planted the recommended 12 inches deep and time between applications was lessoned to 60 days. Some treatments of Alion exceeded maximum annunal applications (Table 1.) but these plots did not exhibit any injury symptoms. *Weed control.* Initial control of weeds was >90% for all locations due to the burndown activity of Rely 280. Weed control following the second application was > 95%.

Alion (3.5 or 5 oz/A) and Chateau provided the greatest control. At 8 WAP there were no differences in weed control between Chateau and Alion (3.5 or 5 oz/A) at the Mother Vineyard. However, morningglory, sicklepod and prickly sida control was not acceptable (<50%) at the Gurganus Vineyard.

Weed control at Killdeer and Mitchem farms were <40% due to lack of activating rainfall in a timely manner after both of the herbicide applications.

An early application of Chateau was comparable to an early application of the highest rate of Alion and maintained approximately 80% control at 18 weeks after initial application when an activating rainfall occurred. When Alion (2.5, 3.5, or 5 oz/A) or Chateau was applied at the second timing weed control was >97% at 16 weeks after initial application (8 weeks after second application).

Summary. Preliminary results indicate no vine injury or change in phenology, and good weed control with Alion. Weed control from Alion at 3.5 or 5 oz/A was similar. If an activating rainfall does not occur in a timely manner after Alion application, other weed control strategies may need to be implemented. Weed control from Alion at 3.5 or 5 oz/A and Chateau at 6 oz/A was similar. Weed control in plots receiving the Chateau or Alion at the second timing was similar.

Food safety posters developed for pick-your-own farms

Gary Pullano

Originally published Thursday, Jul. 16, 2015, Vegetable Growers News

Keeping food safety on the minds of direct-market farm customers – as well as workers – can often be a simple matter of communication.

North Carolina State University's (NCSU) Plants for Human Health Institute recently published a series of printable posters to help educate customers and workers about fresh produce safety and optimal postharvest handling at u-pick strawberry farms.

"During strawberry season, we hope that growers will post these resources on their farms to help ensure that the berry-picking experience is not only fun, but as safe as possible from field to table," said Diane Ducharme, NCSU Extension associate in horticulture and food safety.

The free, downloadable posters are available here. Go to Food Safety Messages sections.

North Carolina producers harvest approximately 20.3 million pounds of strawberries annually, with pick-your-own accounting for 25 percent of the strawberries sold.

“The posters are an important educational tool for growers, because while food safety measures are part of standard training procedures for farm workers, consumers visiting pick-your-own operations may not be familiar with best practices for handling fresh produce,” Ducharme said.
Three sets of posters are available. Two sets, targeting consumers and workers, serve as one-page visual reminders, each including a single point such as, “Don’t pick when you’re sick,” and a brief explanation.

The third set of posters is designed in a storytelling manner, where the food safety and postharvest handling messages are delivered by following a storyline about a family outing to a u-pick strawberry farm. Each page asks readers to identify what’s wrong in the story and teaches the corrective action.

In addition, a card with tips for maintaining berry quality after picking was developed as a customer take-away. Growers can customize the card with their farm name prior to printing.

Amy Douglas, owner of The Farmers’ Daughter in Taylorsville, North Carolina, told Extension educators she planned to use some of the posters near hand-washing stations and restrooms at the farm’s pick-your-own field.

“I would also print them all and put them in a three-ring binder to help educate employees and customers,” Douglas said.

The resources were created to provide growers with visual reminders on food safety to use with their direct-market customers.

“In our focus groups, growers also requested that food safety and postharvest information be combined so that one consistent message could be conveyed,” Ducharme said.

The posters (8.5 x 11.5) were created by Ducharme, Katrina Levine, Ben Chapman and Penelope Perkins-Veazie.

Other food safety messages for consumers include: Wash Your Hands; Use Clean and Sanitized Picking Containers; No Pets in the Fields; No Eating, Drinking or Smoking in the Fields; Choose the Ripe Berries; and Chill Quickly.
There’s also the Take Home Card for Consumers: For Best Berries. The card is customizable, with an area at the bottom to add a farm name.

“We found that if we were giving messages to consumers on safe practices while in the field, we needed to have some reminders for both the growers and workers in those same fields,” Ducharme said.

The tips for workers include: Wash Your Hands; Don’t Work When You Are Sick; Clean and Sanitize Containers; Serve Safe Samples; and Keep Samples Covered.

North Carolina ranks third in the United States in strawberry production, based on crop value. Strawberries are grown on more than 1,600 acres and generate more than $29 million in income during the five- to eight-week season. Nearly all North Carolina strawberries are sold for fresh market, direct to consumer or through local grocery chains.

New Alternative To Hedging Could Be A Canopy Management Game-Changer

Ann-Marie Jeffries

Originally published Growing Produce, May 12, 2015

Hedging to reduce excessive vine growth is a common practice among grape growers to ensure shoots don't block light or hinder workers from moving easily through vineyards. The problem is, it's only a stopgap solution and doesn't solve the problem of vine size long-term.

A new alternative to hedging could, though. It's called "palissage," and it has the potential to be a game-changer.

According to Justine Vanden Heuvel, associate professor of viticulture and enology at Cornell University, the palissage technique involves wrapping vertically-shoot positioned (VSP) shoot tips around the top wire of a trellis rather than hedging them.

"The idea behind it is to reduce or prevent lateral emergence in the fruiting zone. We know that we get longer lateral growth in vines that are hedged earlier, and it becomes a vicious cycle where growers hedge, then have to do another leaf removal, and then hedge again," Vanden Heuvel says. "With palissage, the shoot tips are preserved, potentially removing the hormonal trigger for lateral emergence."

She notes that palissage hasn't yet been tested in a fully replicated experiment, but there have been some indications that it holds promise. For example, Thom Bechtold at King Ferry Vineyards in King Ferry, NY, has been using the palissage technique for four years, resulting in reduced vine size.

"We've worked with it for a few years now in some experimental vineyards where we wanted to get accurate pruning weights and have anecdotally noted the same thing," Vanden Heuvel adds. "Fruit zones appear to be more open with increased cluster exposure."

Although more research is needed, Vanden Heuvel says the ability to reduce lateral emergence in the fruiting zone could lower the cost of canopy management and reduce disease.

"Leaf removal by hand, for example, is very expensive with many growers estimating costs of up to $150 per pass per acre," she says. "With a more open fruiting zone, there is also the potential of reducing disease incidence, particularly in tight-clustered cultivars."

So far, the technique has been tested only on large, VSP vines that usually need to be hedged multiple times each season, so Vanden Heuvel isn't sure if it will work on all cultivars.

"Palissage probably holds the most potential for large vines in vigorous vineyards," she says. "If vines are small, it's unlikely to have much of an impact, and the potential for reducing canopy management costs is likely only there if the vines require multiple hedgings."

Vanden Heuvel has developed an easy-to-use observation form for growers to use if they are experimenting with palissage, and she invites any growers trying the technique to share their experiences with her. For a copy of the form, contact her at jev32@cornell.edu.

XIth International Rubus and RIbes Symposium put the Carolinas on the map!

Gina Fernandez
North Carolina State University

The XIth International Rubus and Ribes Symposium was held in Asheville, North Carolina, June 21-24, 2015. There was also a pre-symposium tour of research sites and grower locations in NC and SC. We had 190 people registered by the end of the meeting from 26 countries.

This meeting is held every 4 years in regions where these crops are grown. Since hand harvested blackberries are a newer crop, the Carolinas turned out to be a good location for the meeting. We were able to bring in researchers from the region that had not attended the meeting before, as well as veterans of Rubus Ribes. We had 50 oral presentation and 93 posters. Debby Wechsler attended on behalf of the North American Raspberry and Blackberry Association. She will be writing up some articles about the meeting in future issues of the Bramble and other trade magazines. The scientific committee is preparing the official technical report (Acta Hort Proceedings), it will be published late in 2015.

The meeting renewed old and built new professional relationships that will benefit Rubus and Ribes growers around the world. Some of the comments from the participants were:

"Best Rubus Ribes meeting ever"
"I learned something from every presentation"
"This puts Carolina on the Map"

We had strong sponsorship from the industry including the Southern Region Small Fruit Consortium. Thanks also to growers in the region that allowed us to come on to their farms during the peak production season, including Wayne Mitchem, Jeff Crotts, James Cooley, Bob Hall, Ervin Lineberger, Mike Pack Jr and Sr., and Steve Dalton.

If you want to learn more about the sites we visited, the talks presented, and the full list of sponsors, check the Facebook, Twitter and Instagram accounts. They can be viewed at https://www.facebook.com/ISHSRubusAndRibe, https://twitter.com/RubusRibes2015 and under 'RUBUSRIBES2015' on Instagram.

Wendy's Restaurants...and 2 Million Pounds of Blackberries

Article previously published in The Bramble: Newsletter of the North American Raspberry & Blackberry Association, Autumn 2015

On August 17, the *Wall Street Journa*l ran an article on fast food restaurants' efforts to obtain fresh ingredients, and one of its lead examples was efforts by Wendy's restaurants to source blackberries for a new seasonal summer salad offering, following up on the success of a "strawberry fields chicken salad," introduced by Wendy's two years ago.

According to the article, since so much of blackberry production goes into the supermarkets, supplies are tight, and Wendy's had to talk to 30 suppliers before they found two that could agree to supply the large quantities they needed.. They expect to offer the salads in the summer of 2016.

The Packer, the weekly newspaper of the fruit and vegetable industry, then picked up the story and ran its own article on August 20. The reporter, Carol Beach, interviewed Anthony Gallino, vice president of sales for Watsonville-based California Giant, one of the two suppliers. According to Gallino, their growers in California would be increasing their blackberry production to supply this new need. He said he also expected to source from the Southeastern U.S.

The reporter also called up NARBA; we provided the figures cited in the article and NARBA Executive Secretary Debby Wechsler was quoted extensively, saying that anything that puts more blackberries into consumers mouths was good both for them and a growth opportunity for producers, and that Wendy's plans were a sign of increasing consumer interest in blackberries. She expressed the belief that as the blackberry industry was growing, this new demand for berries should not cause major supply or price problems next summer.

See the WSJ article at www.wsj.com/articles/fast-foods-big-challenge-freshingredients-1439890200?mod=e2fb and The Packer's article at www.thepacker.com/news/wendy%E2%80%99s-needs-2-million-pounds-blackberries. You can also find links to the stories on NARBA's website home page and Facebook page.

Leaf nutrient concentration in blackberry recommended standards and sampling time should differ among blackberry types

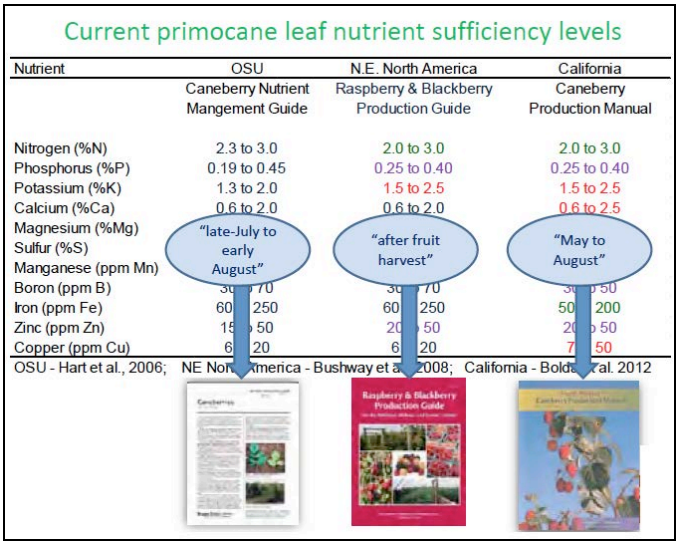
Bernadine C. Strik, Oregon State University, Corvallis, OR bernadine.strik@oregonstate.edu

Article previously published in The Bramble: Newsletter of the North American Raspberry & Blackberry Association, Autumn 2015

Leaf tissue sampling is a critical aspect of a nutrient management program in commercial blackberry production. Current, published recommendations for time of sampling and nutrient sufficiency levels are general for all caneberries (raspberry and blackberry), including floricane- and primocane-fruiting types. In blackberry, floricane-fruiting trailing, erect, and semierect cultivars and primocane-fruiting erect cultivars differ in fruiting season and pruning or training method. Thus, it is

reasonable to assume that tissue nutrient levels and sampling requirements may differ among these blackberry types. Two studies were conducted to assess the impact of blackberry type and cultivar on tissue nutrient concentration of leaves sampled every 2 weeks over two growing seasons. In 'Prime-Jan'® and 'Prime-Jim'®, primocane-fruiting blackberry, the best time to sample primocane leaves coincided with a phenological stage (green fruit on the primocane) rather than on a given calendar date (standard method). In the second study we examined leaf nutrient levels in trailing, erect, and semi-erect cultivars. Large differences between cultivars, even within blackberry type, were found frequently throughout the season, confirming the importance of sampling cultivars separately for nutrient management. In most cultivars, primocane leaf phosphorus, potassium, calcium, and copper were consistently below the current published sufficiency levels. New sufficiency levels and recommended sampling times based on blackberry type are presented. Fertilizer recommendations that are based on leaf nutrient sufficiency levels specific to the diverse types of blackberry grown will aid growers in improving nutrient management programs and potentially reduce over application of nutrients that are not required.

More on this topic: Dr. Strik is scheduled to present at the NARBA conference in March 2016 on caneberry nutrition and sampling recommendations and new sufficiency levels. Learn more there! She will also be speaking at the NARBA-organized caneberry track at the SE Regional Fruit & Vegetable Conference in January 2015 (and several other meetings). You can see a 37-minute video of a presentation by Dr. Strik on caneberry nutrition in March 2014 at a workshop in Oregon on YouTube: www.youtube.com/watch?v=0VLWKKlfR70



A review of a few southeastern blueberry disease issues from 2015 and implications for 2016.

Philip Brannen

This last year was a relatively benign year for blueberry diseases, but this is largely a testimonial to good spray programs and active fungicides – not a lack of opportunities for disease development. The following are my observations from the last year relative a few diseases of interest across the Southeast.

Exobasidium leaf and fruit spot (Fig. 1). This disease continues to spread and increase in importance. We really do not have a good explanation as to why Exobasidium has increased throughout the Southeast. However, increased disease incidence is not specifically related to fungicidal resistance development, though that is occurring. Testing continues to show that lime sulfur and Sulforix, applied at a late dormant timeframe, are very effective management tools. When applied during bloom,

petal fall, and early cover sprays, Captan also adds substantially to control.

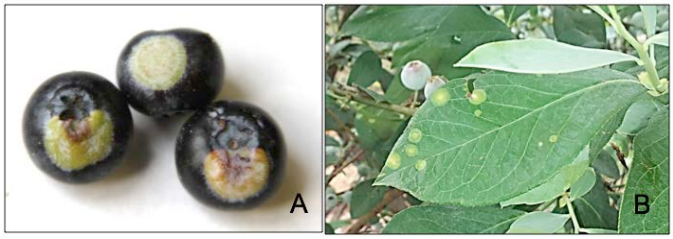


Figure 1: *Symptoms of Exobasidium fruit (A) and leaf spot (B). Fruit symptoms are green, firm spots and blotches that do not mature with the rest of the berry. Leaf symptoms are light green spots on the upper leaf surface which are white or lighter green on the lower surface.*

Where Exobasidium has shown up, resistance to the active ingredients found in Pristine is often observed; resistance to Exobasidium has therefore rendered Pristine an unacceptable product for use against mummy berry, since bloom applications of Pristine would allow unchecked Exobasidium infections. The Pristine label specifically prohibited mixture with other products of any kind, so tank mixes with other Exobasidium-active fungicides was not allowed by label. However, due to testing conducted at the blueberry research farm (Alma, GA) in 2015, BASF has now approved application of Pristine + Captan in a tank mix. Testing of the tank mix combination was conducted on numerous rabbiteye and southern highbush cultivars, and no phytotoxicity was observed after multiple applications of these products (Pristine or Captan) in solo or mixed applications applied during bloom and early cover sprays. This is the only tank mix combination that has been approved, so Pristine cannot be legally mixed with any other product when applied to blueberries. However, the combination of Pristine + Captan now allows for application of Pristine for mummy berry, while adding extra protection against the Exobasidium leaf and fruit spot pathogen, *Exobasidium maculosum*, through Captan. This will be important, in that this tank mix provides a resistance management partner for the DMI materials (e.g. Indar, Proline, Quash, Tilt, etc.) when controlling mummy berry, while also controlling Exobasidium.

Mummy berry (Fig. 2). Mummy berry was prevalent in unsprayed berries in 2015, but otherwise, little was observed. Producers are doing a much better job of applying early green tip fungicides for management, and this has allowed for better control. In 2014 and 2015 trials, Proline provided exceptional control of both mummy berry leaf/bloom/shoot strikes and mummified fruit. In 2016, we will conduct head-to-head comparisons of the DMI fungicides for mummy berry control. This should allow us to determine whether any of the DMIs are more effective than the others at this time.

Figure 2: *Early-season symptoms of mummy berry strikes. Mummy berry spores can infect young tissues of leaves, blooms, and stems, causing extensive damage and losses.*

Blueberry necrotic ring blotch virus (Fig. 3). This viral disease, though not prevalent, has caused significant damage in some locations in 2015. The good news is that this is not caused by a systemic virus, and disease severity can vary dramatically from year to year. We still assume that an arthropod vector, likely a mite, is responsible for this disease.

Figure 3: *Blueberry necrotic ring blotch virus symptoms. Defoliation results in reduced yields the following year.*

Fruit residues. At one point, there was a potential concern about phosphite residues from phosphonate fungicides, but this concern was short-lived. However, while discussing MRLs for the EU, etc., I had some further discussions with some of the packers relative fruit residues in general. To my surprise, I was told that many of the fungicides utilized during bloom can still be detected as fruit residues at harvest – even if they are only utilized during bloom. The levels of these fungicides would be minimal and legal based on MRLs, but this brings up an important point. I think most blueberry producers are really careful to utilize only registered fungicides, as they realize that an illegal residue could grind the whole industry to a halt (as an example, see the quote below from a 13 January 2012 article in the Southwest Farm Press; illegal residues of carbendazim [related to thiophanate methyl found in Topsin M] were involved in shutting down orange juice imports from Brazil). All products that blueberry producers utilize should be fully labeled. I fear that products that might be labeled for some other fruits (but not blueberries) might accidentally be utilized at some point. Many producers are growing multiple fruit commodities, so one can see how this might happen. Please make sure that you utilize the correct fungicides during bloom, as mistakes could hurt the whole industry.

Quote from a 2012 Southwest Farm Press article on orange juice contaminated with carbendazim:

> "On Jan. 11, the FDA announced it was temporarily halting all imports of foreign orange juice over fears some foreign orange juice, especially juice imported from Brazil, contains traces of carbendazim, a fungicide currently banned from use on oranges in the United States. Fungicides like carbendazim are used to control fungi or fungal spores in agriculture. Carbendazim is still legal in Brazil, and the European Union allows foods to contain up to 200 parts per billion of the fungicide. As recently as 2008, the fungicide was used to kill black fungus on Florida oranges, but recent studies linked it to increased rates of cancers and infertility, causing the FDA to restrict the use of the chemical in all U.S. food products. But according to the Juice Products Association in Washington D.C., one of the fungicides of which carbendazim is a breakdown product (Thiophanate-methyl) is currently allowed for use on a number of food crops in the U.S."

Needless to say, I hope that 2016 will be a great year for blueberry production in Georgia. I hope we capture the #1 national production spot without issue, and disease management will be critical to achieving maximum production. We continue to have disease challenges, both new diseases and expansion of old diseases. To date, we have been able to keep our heads above water. But as I often say, though my head is above water, I am always looking for a snorkel.

Blackberry and Raspberry Seasonal Checklist Fall 2015

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FALL

Plant growth and development

- ✓ Primocanes continue to grow but growth rate is slower
- ✓ Flower buds start to form in leaf axils on summer-fruiting types
- ✓ Carbohydrates and nutrients in canes begin to move into the roots
- ✓ Primocane fruiting types begin to flower in late summer/early fall and fruit matures until frost in fall
- ✓ Primocane leaves senesce late fall

Harvest

- ✓ Primocane-fruiting raspberry harvest
- ✓ Primocane-fruiting blackberry harvest

Pruning, trellising and tunnels

- ✓ Spent floricanes should be removed as soon as possible
- ✓ Optimal time to prune is after the coldest part of the season is over. However pruning can start in late fall if plantings are large (late winter for smaller plantings).
- ✓ Start trellis repairs after plants have defoliated
- ✓ Remove covers on three-season tunnels

Weed management

- ✓ 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 your states agricultural chemical manual and local extension agent for the best-labeled chemicals to control these weeds.

Insect and disease scouting

- ✓ Continue scouting for insects and diseases.
- ✓ Remove damaged canes as soon as possible to lessen the impact of the pest.
- ✓ Check the Southern Regional Bramble integrated Management Guide for recommendations. http://www.smallfruits.org

Planting

- ✓ Growers in warmer areas (e.g. extreme southeastern NC) can plant into early December. Preparations for winter planting should have already been made. If you have questions about winter planting please contact your local county extension agent
- ✓ In cooler areas, prepare list of cultivars for next spring's new plantings. Find a commercial small fruit nursery list at http://www.fruit.cornell.edu/berry/nurseries/

Fertilizer

- ✓ Take soil tests to determine fertility needs for spring plantings.
- ✓ Non-nitrogenous fertilizers are best applied in the fall to established plantings.
- ✓ If soil is bare, plant an overwintering cover crop (e.g. rye) to build organic matter and slow soil erosion.

Marketing and miscellaneous

- ✓ Order containers for next season
- ✓ Make contacts for selling fruit next season

Make plans to attend Grower meetings! Blackberries and raspberries are part or all of these programs.

- 2016 North American Raspberry & Blackberry Conference: March 2-4, 2016 at Colonial Williamsburg, in Williamsburg, Virginia.
- Southeast Regional Conference and Tradeshow, with sessions on blackberry JANUARY 7-10, 2016, at the Savannah International Trade and Convention Center http://www.seregionalconference.com/hotel-info/
- Southeast Strawberry Expo, November 16-18, 2015 in Concord NC. Visit ncstrawberry.com for information.

Key Resources:
Southern Region Integrated Bramble Management Guide and the Southeast Regional Bramble Production Guide:
http://www.smallfruits.org/SmallFruitsRegGuide/index.htm

Blackberry and Raspberry Grower Information Portal:
http://rubus.ces.ncsu.edu

Social Media links:
Twitter: @NCTeamRubus
Facebook : Team Rubus
Blogs: http://teamrubus.blogspot.com/

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