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Editor and Author:

Eric T. Stafne

Contributors:

- John Adamczyk
- Blair Sampson
- Chris Werle

Inside this issue:

What the Future Holds	1
Poplarville Blueberry Jubilee 2015	1
Final Chill Hours Report	2
Presentations from 2015 BB WS	3
Blueberry Research Update	4
A Visit from Dr. NeSmith, UGA	5
Publications from NABREW 2014	6
Southern Blueberry Pollinators	7-9

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What the Future Holds

For most of us, we don't know what the future holds — it could be bleakness or prosperity. It could be good times or bad times (we have all had our share). But, regardless of the past, we should look to the future with positivity. In this issue, we have positive reports on research, a visit from renowned blueberry breeder, Dr. Scott NeSmith, tons of great information from a recent conference on blueberries, as well as other great stuff to digest. I know that the blueberry biz in Mississippi has been challenging the last couple of years; well, that is farming. But right now the sunshine is shining and everything looks great. The chirping of birds, the fragrant scent of blueberry blooms, and the green, green grass all portent great things. Let's look ahead with all the positive energy we can muster and have a fabulous year. I say this as much for me as for you. Last year was not an easy one for me, so I look forward to this one with expectations of better days. We can all use some of those.

Blueberry Jubilee

Eric T. Stafne, Fruit Extension Specialist, MSU-ES

The 2015 Blueberry Jubilee in Poplarville will be held on Saturday, June 13. As always it will be a fun-filled day with lots of activities and blueberry products for sale. If you are interested in attending the Jubilee, much more information is available on the official website:

<http://www.blueberryjubilee.org/>

I will be there Saturday morning assisting with the blueberry products area, making sure things are set up and running smoothly. Come by and say hello, visit the vendors, and buy some locally grown blueberries!

Final Chill Hours Report for 2014-2015

Eric T. Stafne—Fruit Extension Specialist, MSU-ES

One of the last things one might consider when choosing a blueberry cultivar is chilling requirement. A chill hour can vary depending on the model used, but the most common model in this region defines it as the number of hours below 45 °F. This is a requirement for the plant to satisfy its dormancy and thus to grow and fruit normally the following year. In regions where cold temperatures are more common, plants can remain in a quiescent (waiting for a warm up) phase even after their chill hour requirement has been met. However, in warmer climates this may not be the case, so early flowering is a problem in low-chill cultivars. Five locations in the state kept chill hour measurements for the 2014-2015 fall/winter season: Wayne Co., George, Co., Jones Co., Copiah, Co., and Lee Co.

There are some tweaks we could make to further refine the model here in Mississippi, but I think the numbers we obtained this year are fairly representative of the chill hours received. Some of the limitations are: reporting is not all done on the same day or even regularly (for some sites), and there are no designated begin and end dates.

<u>Location</u>	<u>End Number of Chill Hours Recorded</u>	<u>Last date recorded</u>
Copiah Co.	1367	April 1
George Co.	1126	April 1
Jones Co.	1311	April 1
Lee Co.	1973	April 1
Wayne Co.	1357	April 1

This year was similar in chill hours when compared to last year. Having nearly 2000 hours in Lee Co. is a very high number. Fortunately, it looks as if the high chilling accumulation won't negatively impact most of us, as we are moving out of the frost/freeze danger.

As I said last year, we need to figure out a way to get this information to you on a more regular basis. Mississippi does not have a climate center like other states do. Southeastern U.S. states (including Alabama) have an online system that delivers that information with a click of the mouse. I posted all reported chill hours on my blog site (<http://msfruitextension.wordpress.com/chill-hours>). If you have any suggestions, please let me know.

Presentations from the 2015 Blueberry Workshop

Eric T. Stafne, MSU

1-1:30 pm

Dr. Barakat Mahmoud (MSU-ES): [Overview of the Revised FSMA Rule on Produce Safety Standards](#)

1:30-2 pm

Dr. Tim Rinehart (USDA-ARS, Poplarville): [An Update on Rabbiteye Blueberry Genomics](#)

2-2:30 pm

Aaron Rodgers (Mississippi Dept. of Agriculture and Commerce): **Mechanical Harvesters vs. Hand Labor: Examining the Economic Decision-making of Blueberry Harvests** (no link available)

2:30-3 pm

Dr. Eric Stafne (MSU-ES): [Scale-neutral Harvest-aid System and Sensor Technologies to Improve Harvest Efficiency and Handling of Fresh-market Highbush Blueberries](#)

3-3:15 pm Break

3:15-3:45 pm

Dr. Barbara Smith (USDA-ARS, Poplarville): [Blueberry Disease Control Recommendations](#)

3:45-4:15 pm

Dr. John Adamczyk (USDA-ARS Poplarville): [Pollinators and You in our Blueberries: Are We Taking It For Granted?](#)

4:15-4:45 pm

Dr. Blair Sampson (USDA-ARS, Poplarville): [SWD in Mississippi Blueberries](#)

4:45-5 pm Questions

Click on the titles to be taken to the presentation slide set as a PDF file.

Blueberry Research Update from SR-ASHS 2015

Eric T. Stafne, MSU

Recently I attended the Southern Blueberry and Small Fruit Workers meeting in Atlanta, GA. It is held as part of the Southern Region of the American Society for Horticultural Science annual conference. Below are some new things I learned about at the meeting:

- Ring nematode is prevalent in Georgia blueberry plantings
- The nematode problem is worse in re-plant situations and may require fumigation
- Southern highbush blueberries have more problems with nematodes than Rabbiteyes, especially in re-plant situations
- Using pine bark mulch appears to reduce nematode populations
- The addition of humic acid to the soil does not appear to benefit blueberry plants
- Botrytis resistance to fungicides has happened in GA. Use of Captan or Ziram is now recommended because of low resistance possibility
- Mummy berry sprays should be applied starting at first sign of green tissue. Indar, Orbit, Pristine, and Proline (a new material) showed efficacy. Serenade, an organic product, also had some efficacy. Regalia, another organic product, had no effective control of the disease.
- Exobasidium is becoming resistant to Pristine in GA. 'Premier' has high infection rates, as does 'Tifblue'. A full Captan spray schedule is effective (about 8 sprays in GA), but not using Captan as a delayed dormant spray. Use Lime Sulfur or Sulforix for best control as a delayed dormant spray.
- Xyllela (blueberry scorch) has been found in various states. In Rabbiteye's it leads to chronic symptoms, but in Southern Highbush scorch symptoms are readily apparent. There may be different strains of this disease and more work is being done.
- Blueberry Necrotic Ring Blotch is a non-systemic viral disease that is only in leaves. Mites spread it. It can lead to defoliation of the plant.
- Broad mites have been found in blueberries and blackberries in Arkansas. Damage resembles Roundup injury. Leaves have a "silvery" look, with rosetting and stunting of plants, and necrosis of the petiole. It will kill shoot tips.
- Blueberry rust is a problem in Gulf Coast areas of Alabama.
- Foliar calcium spray trials in GA on rabbiteyes have shown no efficacy
- Three new Southern Highbush blueberries are being released from UGA soon.
- One new Rabbiteye cultivar is also being released from UGA – 'Krewer', an early, large fruited cultivar that should pair well with 'Titan'

A Visit From Dr. Scott NeSmith, UGA Blueberry Breeder

Eric T. Stafne, MSU

Recently, Dr. Scott NeSmith, blueberry breeder from the University of Georgia, came to Poplarville for a visit. We talked about the current state of the Mississippi blueberry industry (as well as what is happening in Georgia). He stated that some early blooms may have got nipped some from cold events in the last few weeks there, but he was unsure how much loss to attribute to it. He was really interested in the cultivars currently being grown in Mississippi, so we headed on over to visit Luis Monterde. At his farm we saw most of the bushes in full bloom, with scads of pollinators buzzing from bush to bush. Dr. NeSmith asked if he had any Georgia releases. Luis said yes ('Alapaha' and 'Vernon') and showed them to us. Luis was high on 'Alapaha' but expressed some reservations on 'Vernon'. Dr. NeSmith said that in Georgia, high fertility was to the detriment of 'Vernon', which preferred low fertility management. He also suggested that the new cultivars 'Titan' and 'Krewer' might be good options here in Mississippi. As plants have been difficult to get, not much of it is planted here yet, so only time will tell on that. He did say they would split in the rain ('Titan' more so than 'Krewer').

The issue of growing southern highbush blueberries also arose in our conversation. Luis said he has mostly given up on them (although he had one row), as they were difficult to keep alive for very long. One suggestion Dr. NeSmith had was to try 'Camellia' and/or 'Suzibleue'. He believes they are "tougher" plants and can stand up better than other cultivars that have been tried in the past. Luis asked him what Georgia growers were doing with 'Premier', and Dr. NeSmith responded "pulling it out" due to the unreliable yields.

After about 1.5 hours, we bid Luis goodbye and I took Dr. NeSmith back to Wiggins where he was staying. He doesn't make it over here very often, so it was good to be able to spend some time with him and pick his brain about new potential cultivars for Mississippi.



Publications From NABREW 2014 Now Available

You may recall reading last year that I attended the North American Blueberry Research and Extension Workers (NABREW) conference held in Atlantic City, NJ. It was a great meeting and if you want to see more about it you can visit [here](#) and [here](#). Well, at long last the proceedings from that meeting have been published and are available for anyone to read. All the publications are housed on the Rutgers University Community Repository (RUCore). Below are the names of the relevant publications for Mississippi growers and the links to read them in their entirety.

[Next generation sequencing of rabbiteye blueberry \(*Vaccinium virgatum* ‘Premier’\) and transcriptome comparisons to blueberry genomic resources](#) T. Rinehart

[Expanding the Vision for Blueberry Extension](#) E. Stafne, K. Morgan and G. Pavlis

[Molecular Characterization and Population Structure of Blueberry Mosaic Associated Virus](#) T. Thekke-Veetil, J. Polashock, M. Marn, I. Pleško, K. Keller, R. Martin, T. Ho, and I. Tzanetakis

[Advances in Organic Blueberry Management](#) W. Sciarappa

[Initial Identification of Issues with Spray Coverage in South Georgia Blueberries](#) R. Holland, G. Rains, and P. Brannen

[Coville’s Serendipitous Association with Blueberries Leading to the Whitesbog Connection](#) M. Mainland and R. Coville

[Self-fruitfulness of Rutgers’ Advanced Blueberry Breeding Selections](#) N. Vorsa and J. Johnson-Cicalese

[Integrated Pest Management Strategies to Combat the Invasive Spotted Wing *Drosophila*](#) O. Liburd, L. Iglesias, and T. Nyoike

[Leonardite: A mined source of humic acid](#) E. Smith and J. Jacobs

[Utilizing *V. constablaei* and *V. ashei* in germplasm and cultivar development](#) M. Ehlenfeldt and L. Rowland

[Flower Morphology Influences Pollinator Community with Implications for Cross-Pollination: Observations in Rabbiteye Blueberry \(*Vaccinium ashei* Reade\)](#) S. Rogers, D. Tarcy, and H. Burrack

[Transcriptome Analysis of the Blueberry-Mummy Berry Pathosystem](#) J. Polashock, T. Smolinski, and K. Shim

[The Use of *Vaccinium elliottii* Chapm. in Breeding Highbush Blueberry](#) P. Lyrene

[Breeding Southern Highbush Blueberries Suitable for Machine Harvest for Fresh Marketing – Progress and Prospects](#) J. Olmstead, K. Blaker, D. Norden, and W. Collante

Southern Blueberry Pollinators

Blair Sampson, Chris Werle, and John Adamczyk, USDA-ARS Thad Cochran Southern Hort. Lab, Poplarville, MS

Southeastern Blueberry Bees



Blueberry bees resemble bumble bee workers on blueberry bushes, but if you see many small bumble-bee-like bees working your bushes, chances are you are seeing blueberry bees in action. These bees are generally black in color with whitish to pale yellow fur behind their head, in the middle of their body, and on the apical band of their abdomen (see photos). Unlike bumble bees, they have no bright yellow fur, they are fast fliers, and male blueberry bees, which have a white spot on their face, often cruise along bushes seeking females. Female blueberry bees buzz pollinate blueberries. Females use their bodies to shiver at a high frequency thereby shaking pollen out of blueberry flowers onto their bodies, which they then collect, transfer to their hind legs, and bring

back to the earthen burrow as food for their larvae. Blueberry bees are not social; they are actually solitary bees, whereby a female blueberry bee alone digs a burrow in sandy soil somewhere close to blueberry fields. She then provisions it with pollen and lays an egg on each pollen provision she fashions. A female blueberry bee will die without having seen her adult offspring emerge the next blueberry season. Solitary bees like blueberry bees do not aggressively defend their nests and so they are very docile and unlikely to sting in any situation. They are perhaps the most important pollinators of rabbiteye blueberries in the southeastern United States, particularly in Mississippi. A foraging density of one or more blueberry bees per bush is considered optimal for fruit set and berry yield.



— continued on page 8 —

Southern Blueberry Pollinators, cont.

Blair Sampson, Chris Werle, and John Adamczyk, USDA-ARS Thad Cochran Southern Hort. Lab, Poplarville, MS

Honey Bees & Carpenter Bees



Most people are familiar with honey bees, brownish bees that live in highly social colonies presided over by a queen. As large and powerful as honey bee colonies are, their worker bees have difficulty foraging from blueberry flowers. In fact, honey bees avoid blueberry blossoms if they can find forage that is more suitable. Honey bee tongues are a little too short to tap the deeply recessed nectaries of blueberry flowers. They do not even buzz flowers like blueberry bees do. Therefore, honey bee workers rarely, if ever, gather blueberry pollen. Honey bees are however clever in that they can rob blueberry flowers

of nectar by probing robbery slits previously cut into the bases of blueberry flowers by impressively large bees known as carpenter bees. Carpenter bees are large robust bees, which resemble bumble bees, but their abdomens generally lack hair and thus have a shiny metallic black-blue luster. Carpenter bees also have very short tongues, too short to probe for nectar in the long tubular corolla of blueberry flowers. Carpenter bees do however possess stout tongue sheathes (galea), which they use like scissors to slice holes close to nectaries. The hole will eventually brown around the edges and attract honey bee thieves (see photos). Honey bees and mostly male carpenter bees, which have a whitish-yellow facial spot, generally enter into this arrangement of nectar robbery when as few as 5% of blueberry flowers are slit. Because carpenter bees and honey bees work blueberry blooms from the side and not from below, where the female parts of the flower (long stick-like green pistil) are, these bees were thought to circumvent blueberry pollination. However, field studies verified that two robbery visits by a carpenter bee followed by a honey bee were as effective as a single blueberry bee visit. Since carpenter bees and honey bees can be very abundant, they too must contribute significantly to southern blueberry production.



-continued on page 9-



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Coastal Research and Extension
Center
South Mississippi Research and
Extension Center
810 Hwy 26 West
Poplarville, MS 39470
Phone: 601-403-8939
E-mail: eric.stafne@msstate.edu

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Southern Blueberry Pollinators, cont.

Blair Sampson, Chris Werle, and John Adamczyk, USDA-ARS Thad Cochran Southern Hort. Lab, Poplarville, MS

Bumble bees



Bumble bees are rather rare pollinators of southern blueberries because, although they are social, their colonies do not persist longer than a year. That is, like native solitary bees, bumble bee colonies are annual. Only the large, mated queen survives the winter months; the old queen, her drones, and workers die at the end of the season. The new queen emerges in spring and builds her nest from scratch. A few months later, her first daughters emerge around May and they will take over the colony's duties, leaving the queen to stay in the nest to lay eggs and keep order. Her daughters will forage for food and tend to the brood. Therefore, bumble bee populations do not reach their full size until well after blueberry bloom. Bumble bee queens however have long tongues, buzz pollinate flowers, and gather blueberry pollen to feed to her first brood of larvae. Hence, the few bumble bee queens that visit blueberry bushes are in fact highly efficient pollinators. If you see bumble bees on blueberry bushes, they will probably be the large queens (see photo). Bumble bees may be easily mistaken for carpenter bees, or vice versa. The big difference between the two is that bumble bees are hairy all over, whereas carpenter bees have a shiny metallic abdomen, often with bluish or purplish reflections. Most carpenter bees at blueberry flowers will be male and so they will have a distinct whitish spot on their face. All bumble bees at blueberry flowers will be female and so their faces will be entirely dark.