

Mississippi *Vaccinium* Journal

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Recapping A Good Year

Thankfully, the Mississippi had a pretty good year in 2016. After the last couple of years it would be understandable to be on pins and needles this year. I know of a few growers who have gotten out of the business for one reason or another. But overall I think the market for blueberries is still strong and will continue to grow as other under-developed markets become more informed about the attractiveness of blueberries. Look at page 6 for an estimate of how many pounds of blueberries will be produced in the near future. This number is staggering. In this issue we also look at blueberry integrated pest management, and a couple of studies on foliar calcium application and mechanical harvesting. And, big news of a blueberry conference happening early next year. If you have suggestions on speaker and content, be sure to let us know.

EVENT COMING JANUARY 2017

The Mississippi State University Extension Service will be hosting a one-day conference for all blueberry growers in Mississippi and the surrounding area. The date and event location have yet to be determined but the conference will happen in Hattiesburg. Lunch will be included in this conference and speakers of interest will be brought in to cover important topics. Right now things are in the planning stages with more information to follow in the coming months.

If you have received this newsletter via email, you will get notification of the conference details. The conference will also be advertised via other outlets as well. Stay tuned for more information — this will be an exciting event!

Blueberry Integrated Pest Management (IPM)

Melinda Miller-Butler

USDA-ARS, TCHSL, Poplarville, MS 39470

Whether you grow blueberries commercially or in your home landscape, you can benefit from identifying typical problems affecting blueberry plants. In the southeast United States we have several fungal diseases that can infect blueberry. Most prominent is Mummy berry (controlled with fungicides) and Stem blight (controlled by removing below the infected area). Fungal diseases of the ripe fruit are gray mold (controlled with fungicides) and ripe rot (controlled with frequent harvest).

Some insects can cause damage to the plant (gall midge and aphids) and others damage the fruit (spotted wing Drosophila), but careful consideration of beneficial insects should be given before applying pesticides.

Information on pesticides can be found in the Southeast Blueberry Integrated Management Guide at <http://www.smallfruits.org>.

See the image on the next page for more information regarding blueberry IPM.

Blueberry Integrated Pest Management (IPM)



Melinda Miller-Butler
 USDA, Agricultural Research Service
 Thad Cochran Southern Horticultural Laboratory



Growth Stages



Growth Stage photos - <http://msue.anr.msu.edu>



- Tips for Healthy Blueberries**
- Plant disease free plants
 - Avoid wounding
 - Irrigate consistently
 - Use herbicides with care

Information on pesticides:
 Southeast Regional Blueberry
 Integrated Management Guide
<http://www.smallfruits.org/>

Root/Crown/Soil



Phytophthora Root Rot: Destroys roots and effects drought-like symptoms. (Avoid planting in wet, poorly drained soils. Photo: R.D.Milholland)



Mummy Berry: Disease overwinters in mummified fruit on the ground. (Remove fallen fruit & cover with 1" soil. Fungicide at pre-bloom or bloom.)



Stem/Foliar



Stem Blight: Infection through wounds, stem dies. (Avoid wounding plants, prune out infected branches to main cane.)



Mummy Berry: First sign is shoot blight.



Aphids: Lady Beetles for control.



Gall Midge and Larvae: Can cause flower buds to abort. Dormant and pre-bloom insecticides. (Photos: B. Sampson)



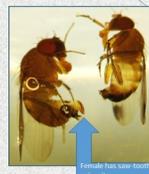
Flower/Fruit



Botrytis Blight: Infects flowers, fruit, and shoot tips. Apply fungicides pre-bloom and bloom or after light freeze injury.



Ripe Rot: Infects fruit. May see orange colored fungal sporulation. Frequent harvest is the best prevention.



Spotted Wing Drosophila: Oviposits eggs in fruit. Can destroy crop. Scout field often, traps, and insecticide. (Above photo: C. Werle)



Mummy Berry: Fruit Damage

Beneficial Insects



Weeds are a persistent problem.



Herbicide Injury is common. Flower buds may appear to have become vegetative growth.



Specialty Crop & Green Producer Workshop

**Mississippi Farm Bureau Federation
Specialty Crop & Green Producer Workshop
Cotton Blues Restaurant
6116 Highway 98
Hattiesburg, MS
October 26, 2016**

10:00a.m. Welcome & Opening Comments

*Mike McCormick, President
Chris Shivers, Staff
Mississippi Farm Bureau Federation*

10:10a.m. Legislative Policy Update on Food Safety & Modernization Act & Labor Issues

Kristi Boswell, American Farm Bureau Federation

10:45a.m. U.S. Department of Labor Regulatory Update

Susan Denham, Wage & Hour Division-U.S. Department of Labor

11:10a.m. Mississippi Department of Agriculture & Commerce Update (FSMA, Grant Opportunities, & Market Development Programs)

Paige Manning, MS Department of Ag & Commerce

11:30a.m. Update from MSU Department of Ag Economics

Dr. Alba Collart, MSU Economist

12:00p.m. Lunch

12:30p.m. Updates from Bureau of Plant Industry & Worker Protection Standards

Jasper Cobb, MS Department of Ag & Commerce

1:00p.m. Risk Management Products for Specialty Crops

*Demetrice Evans, Farm Service Agency Program Specialist (NAP)
Terri Lemire, Senior Risk Manager (Whole Farm)*

1:40p.m. Loan Opportunities for Specialty Crop

Grayland Fredericks, Farm Service Agency Loan Staff

2:00-2:15p.m. Closing Comments & Adjournment

*Mike McCormick, President
Chris Shivers, Staff
Mississippi Farm Bureau Federation*

To RSVP contact Chris Shivers at (601)408-7787 or cshivers@msfb.org

The Effect of Foliar Calcium Treatments on Fruit Weight and Firmness of Rabbiteye Blueberry

The abstract below from work done in Georgia, discusses how foliar applications of calcium can effect, or not effect, some rabbiteye blueberry cultivars. In this case there are few positive effect from using calcium.

Journal of the American Pomological Society

Volume 70 Number 2 Article 3 Pages: 74-81

Year 2016 Month 4

Title: The Effect of Foliar Calcium Treatments on Fruit Weight and Firmness of Rabbiteye Blueberry (*Vaccinium virgatum* Aiton)

Author: Erick D. Smith

Abstract:

Foliar calcium applications are used in many fruiting crops to minimize disease and physiological disorders. In blueberry (*Vaccinium* spp), it is used to improve fruit firmness with varying success. Two applications of foliar calcium applied to rabbiteye blueberry (*V. virgatum* Aiton) cvs. Alapaha and Powderblue as calcium nitrate [$\text{Ca}(\text{NO}_3)_2$], neutralized calcium carbonate (CaCO_3), and chelated calcium (calcium glucoheptonate, $\text{C}_{14}\text{H}_{26}\text{CaO}_{16}$) were made at the label rate of $2.3 \text{ L}\cdot\text{ha}^{-1}$ applied in a volume of $935.3 \text{ L}\cdot\text{ha}^{-1}$ (697 ppm, 108 ppm, and 604 ppm Ca per application, respectively). The applications were made at 30 and 15 days preharvest in 2013 and 2014. Fruit were hand harvested at 40% ripe and evaluated for berry weight, color, firmness, soluble solids, and acidity. In 2013, fruit were stored at 1°C with 85% relative humidity and evaluated again at 7 and 15 days. In 2014, fruit and tissue samples were evaluated for Ca concentration. In 2013, 'Powderblue' had a 5% increase in firmness from the CaCO_3 treatment when compared to control fruit. The chelated calcium treatment significantly increased fruit weight by 12% compared to the control for 'Alapaha'. Fruit firmness increased 5% and fruit weight decreased 10% for the $\text{Ca}(\text{NO}_3)_2$ treatment compared to control for 'Alapaha' fruit sampled after 2 weeks of storage. In 2014, none of the treatments significantly increased fruit firmness or berry calcium concentration. For 'Powderblue' in 2014, all treatments significantly decreased firmness. Leaf Ca concentration was increased by 18% for 'Alapaha' and decreased by 26% for 'Powderblue' when comparing the chelated calcium treatment to non-treated leaves.

Blueberry industry aims for 1 billion mark

By Andy Nelson June 28, 2016 THE PACKER

U.S. blueberry production could approach 1 billion pounds in the next three years.

A projected 940 million pounds will be grown in 2019, up from 750.2 million pounds in 2015, according to the Folsom, Calif.-based U.S. Highbush Blueberry Council.

Production in 2016 will likely surpass 750 million pounds again, and worldwide production could top 1.4 billion pounds, according to a news release.

Soaring demand for blueberries will continue to mean increased U.S. production, according to the council. From 2010 to 2015, per-capita consumption in North America increased by almost 50%.

Also, Americans polled in 2013 said they were almost twice as likely as they were in 2004 to buy blueberries in the coming year, and 84% said they were aware of blueberries' health benefits, up 115% from 2004.

In 2015, fresh retail sales of blueberries in the U.S. totaled nearly \$1.5 billion, up 7% from 2014 and making them the No. 2 berry seller behind strawberries.

As U.S. blueberry production grows, exports will continue to grow, according to the council. About 10% of the U.S. crop is exported, with more than 79 million pounds shipping to other countries in 2015, up 60% from 2005.

The council said it will work hard in coming years to expand exports to existing markets and to open access to countries where U.S. blueberries currently can't be shipped, including Australia, Chile, China, the Philippines, South Africa, South Korea and Vietnam.

California, Florida, Georgia, Michigan, New Jersey, North Carolina, Oregon and Washington are the top blueberry-producing states in the U.S.

The Economic Feasibility of Adopting Mechanical Harvesters by the Highbush Blueberry Industry

R. Karina Gallardo and David Zilberman
HortTechnology June 2016 vol. 26 no. 3 299-308

Summary

Mechanical harvesters engineered for fresh-market highbush blueberries (*Vaccinium corymbosum*) have the potential to relieve the burden associated with relying on human labor for harvesting a crop. However, such devices must be effective and maintain fruit quality to be economically viable. Results from an empirical economic model and a series of sensitivity analyses signal that shortening the gap between prices for the fresh and processing market would increase the likelihood of adoption, especially if prices for the fresh market drop by 26% and prices for the processing market increase by 63%. If changes in prices would occur at the same time, then prices for fresh-market blueberries would have to drop by 23% and for processing blueberries would have to increase by 9%. Increases in labor wages of 61% would make mechanical harvesters more profitable than hand harvesting. A 63% reduction in yield losses due to mechanical harvest in the field must occur for mechanical harvesters to become a profitable alternative. If only quality losses (e.g., presence of bruises on the external surface of the fruit) are reduced and yield losses are kept constant, then a 43% reduction in quality losses must occur for mechanical harvesters to become a profitable alternative. If both yield and quality losses are reduced, then a 20% reduction in yield losses and 29% reduction in quality losses would be required for mechanical harvesters to become profitable. We found that a mechanical harvester in its current incarnation is not yet a proven profitable alternative for fresh-market blueberries, given all initial assumptions considered in this study. The industry urges technical improvements to decrease harvest-induced loss from mechanical harvesting in the field and loss due to presence of bruises on the fruit external surface to ensure the massive adoption of mechanical harvesters, especially for fresh-market blueberries.

Efficacy of fungicides for management of blueberry rust

Russell Ingram, Plant Pathology Ph.D. Student; Phillip Brannen, UGA Extension Specialist & Plant Pathologist; Shane Curry, Appling County Extension Agent; Morgan Joe Slusher, Ware County Extension Agent; William Lovett, Bacon County Extension Agent; Jeremy Taylor, Lanier/Clinch County Extension Agent

Until the last 3-4 years, blueberry rust has largely been a minor issue in Georgia. However, due to record breaking mild winters over the past few years, the disease has become of increasing concern. Mild winters are cause for concern because they often result in a higher retention rate and overwintering of infected leaves on the bush, which may therefore lead to earlier infection of new spring leaves, greater season-long disease levels, higher rates of defoliation, plant health issues, and reduced yields. Characteristic rust symptoms begin as small yellowish spots on the upper leaf surface of young leaves. As the disease progresses, orange masses of spores are produced within spots on the lower leaf surface and the margin of spots on the upper leaf surface become red to purple with a brown center (Fig. 1). In cases where leaves are severely affected by disease, the entire leaf will yellow and/or brown and then prematurely drop.

With the recent introduction of several demethylation inhibitor (DMI) fungicides to the market, the question arose as to which of these, if any, were better than the others. In addition, strobilurin-containing fungicide products, Pristine and Abound, were also recommended for rust management, and there have been numerous questions from producers as to the efficacy of these fungicides as well. As a means of addressing the relative efficacy of these fungicides for blueberry rust management, we developed a multi-county fungicide trial to compare the levels of disease control obtainable by currently labeled fungicides. In addition, non-registered materials with purported rust activity were also tested. Field trials were conducted from March until July at commercial production sites in Appling, Bacon, Clinch and Ware Counties. Out of the eight fungicides that were tested, Proline® (prothioconazole) provided the greatest level of control at all experimental sites, and Pristine® (boscalid+pyraclostrobin) performed the worst (Fig. 2) It is important to note that the four other DMI fungicides, along with the SDHI fungicide Aprovia® (benzovindiflupyr; not currently labeled for use on southern highbush and rabbiteye) provided adequate levels of control. In addition to a better understanding of the efficacy of registered fungicides, such as the DMIs, this information will allow growers to confidently develop resistance-management programs for managing rust and other diseases of blueberry. As with all fungicide regimens, resistance management is an absolute necessity. Both DMI, strobilurin, and SDHI fungicides can develop resistance, so they should always be used as part of a rotational spray program designed to discourage resistance. Due to the significant control observed on plants treated with Aprovia® and the constant need for new chemistries to reduce fungicide resistance, we hope to see this product labeled for use on southern highbush and rabbiteye blueberries in the coming years, adding yet another mode-of-action chemistry to the arsenal for rust management.

-continued Page 9-

Efficacy of fungicides for management of blueberry rust

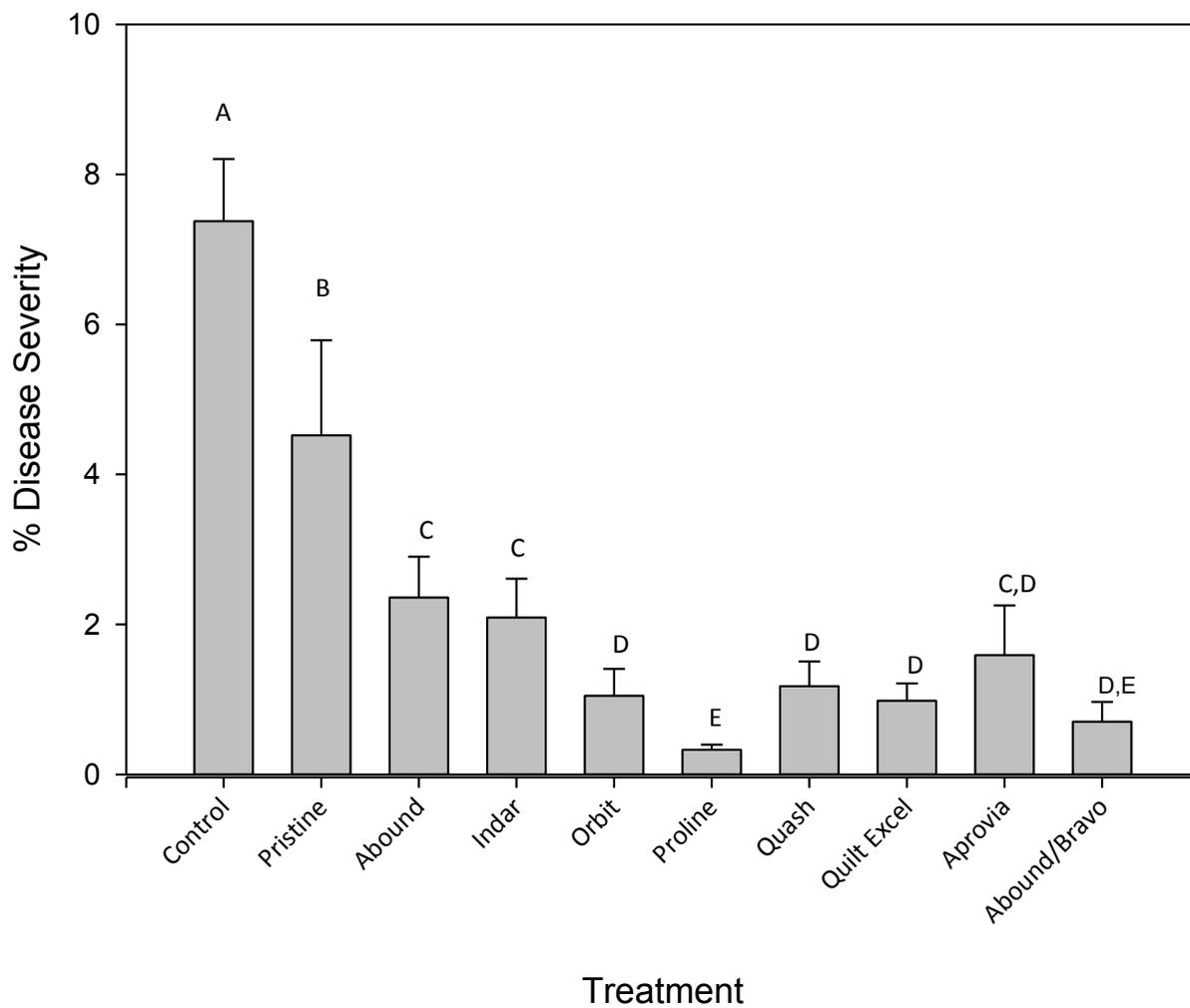
Figure 1. Rust symptoms on 'Rebel' blueberry.



-continued Page 10-

Efficacy of fungicides for management of blueberry rust

Figure 2. Blueberry rust disease severity (% of leaf covered by spots) of treated southern highbush variety 'Rebel'. Clinch County, GA June 15, 2016. Treatments with different letters are significantly different from each other.





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Mississippi Vaccinium Journal

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Late Season Irrigation

Eric Stafne, MSU-ES

Late summer and early fall have been exceedingly dry for many areas of Mississippi. Drought conditions in these latter stages of the growing season can have some negative effects on blueberry plants, including loss of feeder roots, early dropping of leaves, tip die back, reduced return bloom, and reduction of cold hardiness. There fore it is a good idea to fill up the soil profile with sufficient water prior to the cold weather of late fall and winter. The key is to not overwater, thus pushing the plant into a new growth spurt. Irrigate enough to sustain the plant and keep it stress free going into the potentially damaging cold of winter.

Below are some resource links regarding irrigation of blueberries:

[Blueberry Irrigation Methods](#)

[Determining When To Irrigate Highbush Blueberry](#)

[Irrigating Blueberries](#)

[Trickle Irrigation Design for Blueberries](#)

[Commercial Blueberries](#)



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