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Editor and Author:

Eric T. Stafne

Contributors:

- Tom Giles

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Another Year Comes to an End

No severe freezes meant that we had a great opportunity to see a big harvest year. All in all the year was good, not the best year, not the worst. Rain, disease, and SWD had some effect on yields this year. In this issue two other pests are covered, both of lesser importance than SWD. Also, Tom Giles recaps the Brewt Pruning Workshop that was held on his farm this summer. Dr. Stafne covers a blueberry workshop he attended at the American Society for Horticultural Science Annual Conference that was held in Orlando, FL. And the latest numbers on the Economic Impact of Mississippi Blueberries in on page 9. As always it is great to get your feedback on this newsletter — what you like, what you would like to see more of (or less of), and what you dislike. Your feedback gives us opportunity to report back to the MSU administration and also to improve the work we produce. So, I hope you take a few minutes to comment on this newsletter by sending an email to Eric Stafne at the email address listed below and on page 10. Enjoy the remainder of the Fall!

New Contact Information

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

I am happy to report that I have received a new phone through MSU Extension. It is an iPhone and now I will be able to receive emails, texts, and calls even when I am traveling. This should mean it is more convenient for some of you out there to reach me, especially during my busiest time of the year (January through August). I invite you to use this phone to call me, but you can also use the office phone as well.

Office phone: 601-798-9434

Cell phone: 662-769-9708

Email: eric.stafne@msstate.edu (or estafne@ext.msstate.edu)

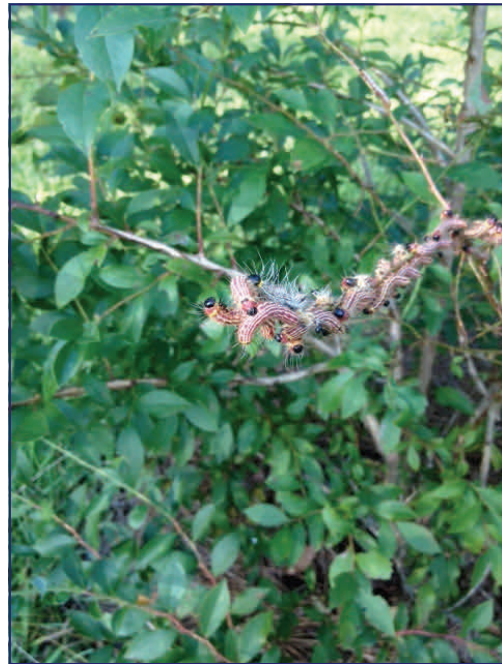
Unusual Blueberry Pest

Eric T. Stafne—Mississippi State University, Fruit Specialist

The Walnut Caterpillar (aka Walnut Datana) (*Datana integerrima*) is a common pest of pecans, walnut, and hickory trees. The adults are moths with light-brown wings marked with dark-brown, wavy lines. The hind wings are lighter brown and without lines. The moths are about 1.5 to 2 inches long, but this is not usually the life stage that is noticed by growers. It is the larvae that cause significant defoliation to plants. Immature larvae are reddish-brown with narrow, cream colored lines that extend the length of the body. Mature larvae are black, about 2 inches long and are covered with long, white or grayish hairs.

The Walnut Caterpillar overwinters as a pupa in the soil. The moths emerge in the spring and deposit white eggs in masses on the underside of leaves. These eggs result in the larvae that form a compact mass. These caterpillars molt several times during development. The larvae feed in groups, but unlike fall webworms (also common on pecans) they do not form webs. They are capable of eating all the leaves on small trees or entire limbs of larger trees.

Although common on walnut and pecan trees, the real surprise this year is that I have reports of them feeding on blueberries (see photos below).



Above are two photos of the Walnut Caterpillar larvae (Photos by D. Van de Werken (left) and F. Fowler (right and next page)). On the next page is one photo of the resulting damage they can do. Significant defoliation can lead to poor winter hardiness and possible reduced fruitfulness next year.

-continued Page 3-

Unusual Blueberry Pest, cont.

Eric T. Stafne—Mississippi State University, Fruit Specialist



So, what to do about them? There are a few options: cut out the branches with worms; use products that contain Spinosad in them (like common Leafminer & Tent Caterpillar Spray); or spray with Sevin (this also kills beneficial insects though). Most of the time the best option is to remove the section of the plant with the larvae and dispose of it. Below are more links that cover this insect.

Kansas State: <http://www.hfrr.ksu.edu/doc1741.ashx>

Ohio State: <http://entomology.osu.edu/bugdoc/Shetlar/factsheet/ornamental/FSwalnutcat.htm>

LSU: <http://www.lsuagcenter.com/NR/rdonlyres/D82E3661-1540-4EF3-9FE5-3598F5B42711/33404/pub1959walnutcaterpillar.pdf>

Brewt Pruning Workshop

Tom Giles—Giles Farm, Waynesboro, MS

Blueberry growers from around the state gathered at the Giles Farm in Waynesboro in July to participate in a “hands on” pruning information and training session. Butch Rhoton from Brewt Power Systems provided the group with tons of very useful information about the benefits and necessity of pruning, along with an engaging field demonstration on the use of the Brewt power pruners.

With approximately 90% of all fruit on the blueberry bush coming from new growth, stimulating that new growth is essential to maximizing the yield from any blueberry plants – regardless of the variety. Every pruning cut can generate as many as 2-4 new shoots of plant growth, and subsequently new areas of blueberry fruit production. Failure to properly prune the bush will result in new plant growth occurring at an increasingly higher portion of the bush, and potentially out of reach for convenient, efficient and economical harvesting.

Furthermore, by annually pruning 15% - 20% of the old wood from the base of the plant, you can essentially have a new, healthier bush every 5-6 years, thereby dramatically increasing the life span and productivity of the blueberry plant.

Following the presentation on the benefits and proper procedures of pruning, Butch took to the field for a hands-on demonstration of the use of the Brewt power pruning tools; displaying the variety of sizes of pruners available, and the best application of those sizes. Where growers lamented the problems they have in attempting to cut branches of 1” – 2” or larger, the Brewt power tools cut through 2” branches and larger like hot butter.

Thanks to Butch and Brewt for an extremely productive session on this often overlooked and vitally important topic for maintaining the health and productivity of our plants and industry. If you’d like to contact Butch for more information concerning pruning procedures or specific information about any of the Brewt Power Pruning tools, his contact info is:

Butch Rhoton
Brewt Power Systems, Inc.
400 Grogan Avenue
Merced, CA 95341
800-255-9180
209-726-7276 Fax
butch@brewtpowersystems.com

Photos from the Brewt Pruning Workshop

Tom Giles



Blueberry growers meet with Butch Rhoton to discuss Brewt Pruning technology.



Out in the blueberry field to get an explanation of the product.



Hands-on training shows how effective and easy-to-use the pruners are in the field.

Soft Wax Scale on Blueberry

Eric T. Stafne—MSU-ES

Recently, it was brought to my attention that one of the potted blueberry plants here at the station in Poplarville had scale on it. A couple months ago, I blogged about another type of scale on grapes. The scale I saw today was different. Both were soft-bodied scale, but the type on the blueberry is a soft wax scale (*Ceroplastes* spp.). It may even be Indian Wax Scale (*Ceroplastes ceriferus*). These types of scale infest a lot of different plant species in the eastern U.S. Since these are here in the summer they are feeding on the blueberry canes and maturing (thus becoming more tolerant of pesticides) so that they can overwinter.



If you have these insects on your plants and would like to know what to do about it, this link has some good info on that: <http://www.ces.ncsu.edu/depts/ent/notes/O&T/shrubs/note13/note13.html> Below is a photo I took a couple years ago of a plant in the field. The infestation is more significant.



These insects will overwinter as adults and start their lifecycle again in the following spring. Left untreated they can cause significant damage or even stress the plant to the point of low productivity or even lead to plant death.

Unique Blueberry Production Practices for Subtropical and Tropical Climates

Eric Stafne—MSU-ES

At the end of July, I attended the American Society for Horticultural Science Annual Conference in Orlando. Every year, the American Pomological Society sponsors a workshop on a different fruit-related topic. This year it was blueberries. The speakers were Gary England (University of Florida), Jim Olmstead (University of Florida), Jeff Williamson (University of Florida), Fumi Takeda (USDA-ARS, Kearneysville, WV), and Michele Warmund (University of Missouri).

Gary England gave an overview of the Florida blueberry industry. He stated that in 1997 there were 1,360 acres, increasing by 2002 to 1,646, to 2,376 in 2007 and to around 6,000 by 2012. As far as cultivars go in Florida, 'Emerald' is the main one now. Other popular cultivars, 'Star' and 'Jewel' are falling out of favor. 'Star' is no longer recommended by UF. 'Jewel' has soft fruit and gets rust. 'Springhigh' and 'Primadonna' are being looked at for earlier harvest. Some newer cultivars for mechanized harvest are 'Farthing' and 'Meadowlark'. Three newer low chill cultivars from UF are 'Flicker', 'Kestrel', and 'Chickadee' (all Southern Highbush). Some challenges that Florida blueberry growers face are: Hydrogen Cyanamide (HC; i.e. 'Dormex') use leads to variable results, high establishment costs using pine bark mulch, freeze protection due to early flowering and limited water availability, labor costs and availability, and competition from Mexico, Spain, and other countries.

Dr. Jim Olmstead talked on the topic of low chill cultivars with high fruit quality. He started out saying that low chill cultivars often have HC applied to them, but the plants still need a certain amount of chilling hours for the application to work well. Improper application of HC can cause bud damage. HC hastens budbreak or increases percentage budbreak. It also helps with vegetative budbreak. 'Emerald' has a chilling requirement of about 200 hours, but 60% of the advanced selections in the UF blueberry breeding program have a requirement of 150 hours. An "Evergreen" system (keep plants growing with leaves on throughout the winter) is being explored in Florida.



Above: 'Farthing'. Credit: Jeffrey G. Williamson, UF/IFAS.
Right: 'Springhigh'. Credit: James W. Olmstead, UF/IFAS



Unique Blueberry Production Practices for Subtropical and Tropical Climates, cont.

Eric Stafne

Dr. Jeff Williamson spoke on the role of Plant Growth Regulators (PGR) under low chill conditions. In Florida there are currently two types of production systems in blueberries: 1. The traditional deciduous production system (uses HC) and 2. An evergreen, or non-dormant production system. Both have challenges associated with them. For the traditional system, variable winter temperatures cause problems with variable and unpredictable bloom periods and flower buds that emerge too early leading to freeze damage. The evergreen system requires low chill cultivars with evergreen tendencies, growers must extend their disease management regime, bloom and harvest seasons are extended, freeze protection is a must, and the extra expense of high tunnels (if used). Dr. Williamson also spoke on the benefits and disadvantages of using HC. The benefits include: earlier advanced harvest, increased fruit size and yield, concentration in bloom and harvest times, and more leafing. The disadvantages are: not all cultivars respond the same, possibility of phytotoxicity, and erratic response following warm, low chill conditions. If HC is applied at Stage 1 or Stage 2 then there will be little to no chance for injury, but if it is applied at Stage 3 or later than damage to buds is possible. Bronzing symptoms that occur after a spray is normal, but dark brown buds indicate that the buds have been killed. Several factors influence the use of HC, including cultivar, bud stage, concentration of spray applied, winter chilling, weather at time of application, spray volume, application method, time of day (night sprays cause more damage), surfactant used, bud density, height and density of plants, juvenility of plants, and nutrition of plants.

Dr. Fumi Takeda gave a talk on growing blueberries with shade and using Surround. He did a study that applied Surround to plants in winter to reduce head load and using shade to reduce sunlight, improve bud viability, and induce earlier bloom. Shading had better results. He found that shading averaged 2.5 °F lower than the ambient temperature during the day and 4 to 5 °F warmer at night. Shading may be useful for small scale and organic growers, but a cost analysis needs to be done first before recommending it. The shade covering also needs to be retracted prior to bloom otherwise botrytis is worse.

Dr. Michele Warmund did some work with chilling models. The most common models are the Chandler model, the UTAH model, and the Dynamic model for warm climates. Components of chilling models include chilling inception (when to start), range of temperatures where units are accumulated and/or subtracted and the weighted variable associated with them, and the phenological event when rest is considered complete within a specific time period. Rest intensity is not well understood but should also be considered. In general Rabbiteye and Highbush blueberries require 6 to 8 weeks of photoperiod less than 12 hours, although some rabbiteyes require less than 10 hours.

The program lasted about 2 hours and was very informative. I hope that by summarizing it here you can gain a little bit of insight in to blueberry production in subtropical and tropical climates.

Economic Impact of the Mississippi Blueberry Industry

Economic Impact of the Mississippi Blueberry Industry

Production and Marketing

As a response to increased consumer demand, blueberry acreage in Mississippi has significantly increased in the past decades, from about 80 acres in 1981 to 2,700 acres in 2012. Production in the state consists mainly of Rabbiteye or Southern Highbush varieties, 50% of which is sold wholesale through marketing cooperatives. The remaining blueberries are sold on a pick-your-own basis or independently through farmers' markets and small stores. Blueberries are typically sold at price premiums. At the retail level, a 6 oz. package of conventional blueberries has an average price of \$2.90, while that of organic blueberries is \$3.99 (USDA-NASS). Given consumers' rising health and nutrition concerns, and the antioxidant compounds found in blueberries, it may be expected that this industry will continue to grow. This report summarizes the economic impact of the blueberry industry to Mississippi's economy.

Economic Impact

Economic impacts of the Mississippi blueberry industry were estimated using statistical data available from USDA-NASS on the total value of production. The volume of blueberry production in 2012 was determined by multiplying the area harvested (2,700 acres) by the average yield per acre (3,330 pounds per acre). Of almost 9 million (Mn) pounds produced, 39% were used in the fresh market, while 61% were used in the processed food market. The average price per pound for blueberries (fresh and processed) in Mississippi was \$1.73 per pound, resulting in an average value of production of \$15.55 Mn.

The IMPLAN® input-output economic modeling system was used to derive the economic multipliers that capture the secondary impacts of intermediate purchases by blueberry firms from other economic sectors (indirect effects) and household consumer spending by individuals employed by the blueberry industry (induced effects), in addition to direct impacts for output/sales, labor income (wages and salaries), employment, value-added (the residual value of a sector's output after it pays for its inputs), and taxes paid. Impact estimates for 2012 are expressed in 2014 dollars using the GDP Implicit Price Deflator to account for inflation.



Table 1. Total Economic Impact of the Mississippi Blueberry Industry

Impact Type	Output (\$Mn)	Labor Income (\$Mn)	Employment (jobs)	Value-Added (\$Mn)
Direct Effect	15.55	15.12	92	8.65
Indirect Effect	5.87	2.09	69	2.79
Induced Effect	17.60	6.49	160	10.66
Total Effect	39.02	23.70	320	22.10

Economic impacts for the Mississippi blueberry industry in 2012 were estimated at \$39.02 Mn in output, \$23.70 Mn in labor income, 320 jobs, and \$22.10 Mn in value-added (Table 1). Output by the Mississippi blueberry industry totaled \$15.55 Mn in 2012. Adding this to indirect and induced effects resulted in a total impact of \$39.02 Mn. This estimate does not include the economic impact of taxes paid by producers, workers, and input suppliers in the industry. Blueberry industry workers within Mississippi earned a total of \$15.12 Mn in wages and salaries from production and sales of blueberries. Combining this with secondary impacts, which totaled \$8.58 Mn, resulted in a total labor income impact of \$23.70 Mn. More than 63% of this total labor income effect was from the wages and salaries earned at the producer level throughout the state. The industry also employed 92 people directly to produce its output, while intermediate purchases and household consumer spending supported the employment of an additional 229 individuals. Finally, direct value-added impacts were estimated at \$8.65 Mn, which combined with \$13.45 Mn in secondary impacts, resulted in a total value-added impact of \$22.10 Mn.

The total economic impact of the Mississippi blueberry industry extends beyond its initial output/sales, labor income, employment, and value-added values. These activities create income for state workers and taxes for local, state, and federal governments, which also create secondary impacts in the form of indirect and induced effects. The total effect of taxes paid to state/local and federal governments was estimated at \$3.75 Mn. Overall, the economic impact of the blueberry industry to Mississippi's economy is significant as reflected in the measures of economic activity described.

By Dr. Alba J. Collart, Assistant Extension Professor, Horticultural Marketing; Dr. Ken Hood, Extension Economist, Horticultural Marketing; and Dr. James Barnes, Assistant Extension Professor, Community and Economic Development.

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UNIVERSITY

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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Opportunity to Provide Feedback

Eric T. Stafne, MSU-ES

This issue represents the final issue for 2014. I have had a lot of fun putting these newsletters together and I hope they are useful and educational for you. As with many of our Cooperative Extension activities, feedback from those receiving information is very important. Therefore I would like to extend this opportunity to all who read this newsletter (and any of the past newsletters) to tell me what you liked about it or what needs to be improved.

Any feedback can be sent to me at eric.stafne@msstate.edu. I will compile any response that I get and go through it carefully so that the next volume in 2015 is even better.

Thanks for reading the award-winning Mississippi Vaccinium Journal.

