

Representing all Blueberry Growers in North Carolina

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www.ncblueberry.org



Avoiding Rabbiteye Quality Problems During a Drought

Charles M. "Mike" Mainland,

Horticultural Science Department, NCSU

The Drought. The blueberry area of southeastern North Carolina is in an extended drought. The rainfall deficit since the beginning of 2011 is about 11 inches. More importantly, rainfall during the last five weeks has only been 0.90" at the White Lake weather station, 0.54" in at the Black River station and 0.81 at Castle Hayne as of Friday June 24th. Normal rainfall during this period is about 6". The dry harvest season was excellent for maintaining highbush fruit quality. Picking wasn't delayed by extended rainy periods. Berry skins were not softened by too much water, cracking and splitting didn't occur and conditions were not favorable for the usual berry rotting organisms. I have never handled berries with better resistance to decay or breakdown in storage than in 2011. Shippers should have had few problems with fruit rejections. However, adequate irrigation was required to maintain fruit size and healthy bushes.

Rabbiteye are Different. Highbush and rabbiteye fruit have been observed to respond differently to drought stress. Severe highbush drought stress

that causes fruit to shrivel is permanent. Berries remain shriveled and do not recover. These berries continue to dry and either fall to the ground before harvest or are removed by the blowers on the harvester or sorter. They seldom get into the finished pack. Rabbiteye fruits, on the other hand, are able to shrivel but become plump again when water is available. There will be no indication that shriveling ever occurred. The berries may be slightly smaller as a result of the stress but they can't be detected by soft sorters, color sorters or human sorters.

Rabbiteye blueberries are native to the South where droughts are common. Plants that could survive droughts and still produce berries with viable seeds were more likely to survive. Shriveling didn't affect the seeds.

Problems with Drought- Stressed Rabbiteye

Fruit. Rabbiteye fruits that have undergone shriveling and then recover to plump, normal appearing berries seem to have permanent changes in the skin and flesh texture. Fresh berries become more chewy. This seems to be a result of a thickened, tougher skin. Changes in the flesh are less notice-

Continued on page 2

able. The undesirable effects of drought shriveling on berries for processing are probably more serious than for the fresh market. The frozen berries will develop a “woody” texture. A large baking company that gets a few 30 pound boxes of “woody” berries will be pretty unhappy and may no longer be a customer. Fluctuations in freezer temperatures that cause moisture to move from the berries to the box liner as ice crystals are also likely to contribute to woodiness. Minimize fluctuations.

Steps to Prevent Problems. Maintain good soil moisture to avoid plant stress and berry shriveling. Remember that cultivars like Tifblue and Brightwell will start splitting when the fruit remains wet for about 18 hours. Night watering will maximize the benefit of the water you have.

Most fields have spots that are too wet in wet periods. These bushes are then shallow rooted and show drought damage when the rest of the field has adequate moisture. Berries from these spots that have been stressed should not be included with berries from bushes that were not stressed during berry development. Probably the best practice is to shake the berries on the ground. This is simple with a rear-loading harvester. A little more effort is required with a top loader. Hope your rabbit-eye season goes well and you can deliver a quality product.



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The recent publication of *The Packer's 2011 Guide* offered some fresh trends including that almost half of all shoppers bought blueberries in the last year; almost 60 percent of shoppers in the Northeastern US purchased blueberries and the likeliness of purchase increases as household income goes up.

The average retail price per pound increased from \$4.26 in 2009 to \$4.50 in 2010 and in 2010 blueberries were 2.1% of all produce sales.

The U.S. Highbush Blueberry Council has updated its website with new graphics and a new marketing strategy, the leading character is "The Little Blue Dynamo." Preview all the changes at <http://blueberrycouncil.com>.

The site has video enhancements and information about a photo contest with a \$2500 grand prize.

See if your young blueberry growers at home can answer this quiz located in the kids section on the new blueberrycouncil.com website

A True Blue Scramble

Unscramble the scrambled word in each sentence to discover a tasty blueberry fact. Write the answers in the spaces provided.

1. Blueberries are a source of vitamin C and (brfei). _____
2. Blueberries grow in clusters on (esbshu). _____
3. The silvery sheen that highlights the blue color on a blueberry is called the (mlboo). _____
4. Blueberries are packed in clear plastic containers that are called (lmac) shells. _____
5. People used to believe that blueberry (psryu) could cure a cough. _____

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World's Blueberries Protected in Unique, Living Collection

By Marcia Wood

Familiar blueberries and their lesser-known wild relatives are safeguarded by U.S. Department of Agriculture (USDA) scientists and curators at America's official blueberry genebank. The plants, collected from throughout the United States and more than two dozen foreign countries, are growing at the USDA Agricultural Research Service National Clonal Germplasm Repository in Corvallis, Ore.

The blueberries are maintained as outdoor plants, potted greenhouse and screenhouse specimens, tissue culture plantlets, or as seeds, according to research leader Kim E. Hummer.

The genebank's purpose is to ensure that these plants, and the diverse genepool that they represent, will be protected for future generations to grow, enjoy, study and improve. For example, plant breeders can use plants in the collection

as parents for new and even better blueberries for farm or garden.

Likely the most comprehensive of its kind in the United States, the blueberry collection nevertheless continues to expand, Hummer reports. Some acquisitions, referred to as accessions, are donations from breeders. Others are acquired through collecting expeditions, which have taken plant explorers to Russia, China, Ecuador and Uruguay, among other places, as well as throughout the United States to find new blueberry plants for the repository.

If breeders can put color on the inside of berries through cross-breeding the internal-color berry plants with highbush plants, the breeders may be able to produce a berry that gives fuller color to processed blueberry jams, jellies, juices and dried or frozen fruit.

Read more about this and other blueberry research in the May/June 2011 issue of *Agricultural Research* magazine. ARS is the USDA's chief intramural scientific research agency. You can read this and previous issues at: <http://www.ars.usda.gov/is/AR/>



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TASKS FOR AUGUST

FERTILIZER: Apply fifty pounds per acre of diammonium phosphate 18-46-0 in mid-August to maintain plant vigor if phosphorus is low or leaching has been severe.

LEAF DISEASES: Assess disease severity and apply labeled fungicides again as needed for leaf spot control. In dry years (like 2007), late-summer fungicide applications may not be needed, or may only be needed on certain cultivars like Star and Duke. Leaf spots are best controlled by sprays applied BEFORE disease is visible – so now is the time to write down your observations on disease incidence on your farm, as a guide to future spray scheduling. Was disease control adequate in 2007? If not, how will you change your spray program?

STUNT AND SHARPNosed LEAFHOPPER CONTROL: Fields with a history of blueberry stunt disease should be sprayed to control the leafhopper insect that carries (vectors) the disease from bush to bush. Following sprays, bushes with stunt symptoms should be removed.

SOFTWOOD CUTTINGS: Blueberry cuttings for softwood propagation (under intermittent mist) are usually collected beginning around August 1. For a complete discussion of propagation see: <http://tinyurl.com/439prsy>. Scout cutting fields ahead of time to avoid propagating from stunt-or virus-infected plants.

WOODY PERENNIAL WEEDS: Post-harvest control is essential for managing woody weeds – sumac, smilax (greenbriar), brambles, and other trees and vines. August and September are good months to apply glyphosate products (Roundup and others) with a directed, shielded sprayer for control of woody weeds in blueberry fields. DO NOT allow the spray solution to contact green blueberry leaves or stems – injury will definitely result. Glyphosate injury can also occur if the spray solution is allowed to soak into the soil around the roots, so keep the spray head moving and avoid over-wetting.

Original Source in 2008: Bill Cline, NCSU, Researcher/Extension Specialist, Plant Pathology.

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Governor Purdue Signs E-Verify House Bill 36 in Law

Many of you made phone calls and wrote letters to voice the need for a version of this bill that would be fair to blueberry growers in North Carolina. Our governmental affairs directors, Stevens Lobby, spent many hours in Raleigh protecting your interests. To view the bill in its entirety visit :

<http://tinyurl.com/3r5p72s>

"§ 64-26. Verification of employee work authorization.

(a) Employers Must Use E-Verify. – Each employer, after hiring an employee to work in the United States, shall verify the work authorization of the employee through E-Verify.

(b) Employer Preservation of E-Verify Forms. – Each employer shall retain the record of the verification of work authorization required by this section while the employee is employed and for one year thereafter.

(c) Exemption. – Subsection (a) of this section shall not apply with respect to a seasonal temporary employee who is employed for 90 or fewer days during a 12-consecutive-month period.

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Phil Gore, Manager

The North Carolina Blueberry Council, Inc. sponsored the luncheon for the Health Fair at East Coast Migrant Head Start in Ivanhoe—on May 21st, 10 a.m. to 2 p.m. Migrant families and attendees were provided a nutritional meal prepared by Creation Station during a busy day. In addition to Julie Woodcock, who represented the Council, other attendees were:

- *CommWell Community Health Clinic - Dental Unit*
- *Bladen County Free Clinic - Ruth Huggins and Dr. Senthe*
- *Department of Labor*
- *Legal Aid of NC*
- *Dept. of Social Services*

The mission statement for East Coast Migrant Health Center is: East Coast Migrant Head Start Project is committed to preparing young children for educational success – especially the children of migrant and seasonal farm workers – by providing holistic, high quality early childhood services for families in a nurturing, culturally sensitive environment. Our growers in the area routinely support the needs of the Center and the Director, Cathy Cobb, expressed appreciation for grower generosity. This year the Center provided for more than 140 children.



Wellness checks are important to all children, the NC Blueberry Council Inc. was glad to support the Health Fair for migrant families.

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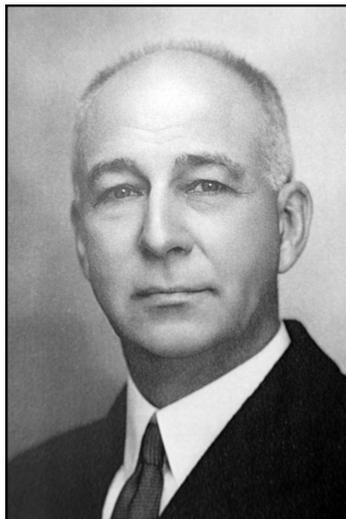
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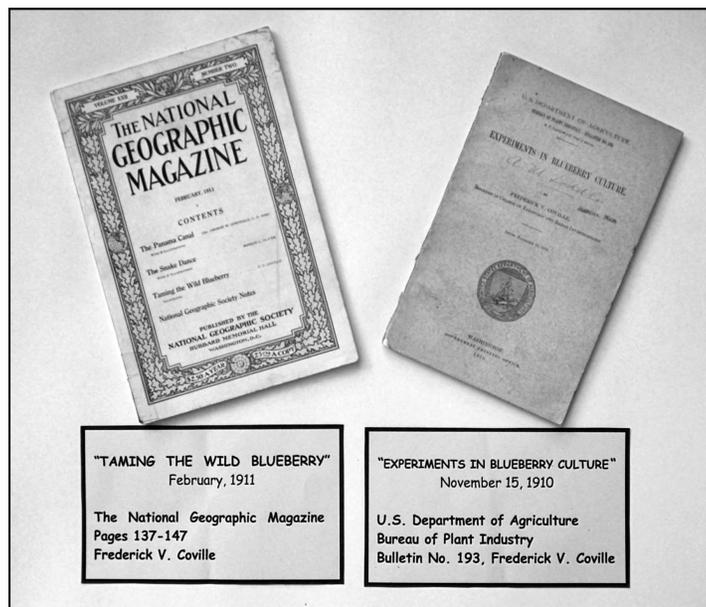
Dr. Frederick Vernon Coville (1867-1937). In 1911 he revealed to the world the techniques for growing and improving blueberries.

It was 1911 and William Howard Taft was President. The US Army bought their second and third planes from the Wright Brothers. Government specifications required a top speed of 40 mph from the planes but a blazing 42 mph was achieved in trials! The first Indianapolis 500 was held with a winning speed of 74.6 mph. Henry Ford's Model T was in the third year of a 19 year production run.

Less noteworthy in 1911, but of great importance to those us involved with blueberries, was an article in the February issue of National Geographic Magazine. The title was "Taming the Wild Blueberry" and the author was Frederick Vernon Coville. In a publication circulated throughout the world was the information required for growing and improving wild blueberries. "Taming the Wild Blueberry" was based on the U.S. Department of Agriculture's scientific publication, Experiments in Blueberry Culture, Bulletin 193, published November 15, 1910. Most attempts to move blueberry plants from the wild and maintain them in managed culture had been unsuccessful prior to these studies.

It was by coincidence that this research occurred. Coville, a botanist with the U.S. Department of Agriculture in Washington D.C., was concerned that his four children, (Stanley 11, Katherine 9, Cabot 3, Fredrick 1) growing up in the city would never learn the rural skills that he had acquired in his childhood in central New York state. A geologist friend told him about a farm for sale in Greenfield, New Hampshire. He bought 40 acres, abandoned house and barn for \$400 on May 2, 1905. It was the abundant populations of blueberries, both highbush and lowbush that flourished in the surrounding fields that sparked his interest.

In the short four-year span from 1906 to 1910 he determined that blueberries required a moist but not



Left: The Feb. 1911 National Geographic Magazine that revealed the techniques for growing and improving blueberries. Right: The USDA scientific bulletin that described the research results



'Pioneer', released in 1920 was the first cultivar from Dr. Coville's breeding program. This 'Pioneer' growing in Indiana was planted in 1936 and has been maintained by the author. Coville pointed out the long potential productive life of blueberry plants.

wet soil with a low pH. Also the plants had a low nutrient requirement, and required winter chilling. Identifying the requirement for soils with low pH was at the heart of his success. He developed propagation procedures by cuttings, grafting and budding.

In 1909 he recognized that self-sterility could be an issue after few seeds and no plants resulted from selfing 'Brooks' an outstanding wild plant found near Greenfield, NH. This was the first attempt to improve blueberries through controlled crosses.

Elizabeth C. White, a commercial cranberry grower in Whitesbog, NJ, contacted Coville after reading Experiments in Blueberry Culture

and offered encouragement and assistance. Cooperation in selecting wild breeding material, growing of seedlings and cultivar selection continued for the next 26 years. 'Pioneer' in 1920 was the first cultivar released from their breeding effort, however, 'Rubel', a selection from the wild that is still grown today, was released in 1912. A total of 15 cultivars were released before Coville's death in 1937. Another 14 of his crosses were released after his death. These 29 cultivars still accounted for 75% of the commercial U.S. acreage in 1992.

Coville's early cultural research and variety development provided the basis for commercial plantings in New Jersey. Interest spread to other states with the first planting in Michigan in 1924, North Carolina in 1928 and Washington in the 1930s. By 1949 there were 2674 acres in New Jersey, 1731 acres in Michigan, 568 acres in North Carolina, and 207 acres in Washington, according to the U.S. Bureau of Census. Two of the Coville children became involved with blueberries. Stanley grew blueberries in New Jersey and became manager of the first blueberry marketing cooperative, TruBlu. Son Fredrick became a grower near Atkinson, North Carolina. Could Dr. Coville have envisioned a U.S. industry with 68,000 acres harvested and a return to growers of over 590 million dollars in 2010? And his blueberries grown in scores of other countries would be available fresh throughout the year in U.S. grocery stores.

See "Centennial of Coville's Blueberry Culture Studies" in the 2011 Proceedings of the North Carolina Blueberry Council, pages 5 to12, for more details and other Coville contributions.

What does the "Dirty Dozen" mean for IPM?

The Environmental Working Group's (EWG) annual "Dirty Dozen" list of the produce most likely to contain pesticide residues has been released. As it has in past years, the list contains several fruits, including apples (1), strawberries (3), peaches (4), imported nectarines (6), imported grapes (7), and blueberries (10).

The Dirty Dozen list often receives significant media attention, and most balanced articles typically point out that pesticide residues measured and regulated by the Environmental Protection Agency and that fruits and vegetables are important part of our diet which should not be eliminated or reduced because of pesticide concerns.

Pesticides, as their name makes clear, are used to manage (kill) crop pests, but the meaning of lists like the Dirty Dozen in the context of pest management is rarely, if ever, discussed. To understand what the Dirty Dozen might mean for integrated pest management (IPM), it's important to understand what is meant by the pesticide use and pesticide residues.

Methods for measuring pesticides

The EWG used several factors when considering pesticide usage on crops. These included the percentage of samples testing positive for any pesticide residue, the percentage of samples with more than one pesticide residue, the average number & quantity (ppm) of pesticide residues, and the maximum & total number of pesticides found in samples. Data compared were from routine United States Department of Agriculture (USDA) testing. Residues measured are of materials registered for use on the crops, and residues of registered materials are regulated by EPA. In other words, legally allowable residues of pesticides registered and legally used on crops were measured, and these legally allowable residues have been determined by EPA to be safe.

The Dirty Dozen & IPM

While the number of pesticide residues present can certainly be an indication of heavy pesticide usage, it may also be related to a sound pesticide rotation as part of a resistance management program. It is actually worse for the environment and the farmer to use a single pesticide against all pests for two reasons:

1. Pesticides that are effective against many pests are called "broad spectrum" and are also often toxic to non target and beneficial organisms. In other words, broad spectrum materials can kill things we don't want to kill. When narrower spectrum or species specific pesticides are available, these are a better choice.

2. A single pesticide used against a species that has more than one generations per growing season (like SWD)

For these reasons, samples with more than one pesticide residue or relatively large numbers of different pesticides present are not necessarily troubling in the context of IPM.

Where I think IPM practitioners can learn from lists like the Dirty Dozen, however, is with respect to residue quantity and maximum residue levels. It is important to stress, again, that the materials detected are legally registered and used on fruits and vegetables. Produce with detectable levels of unregistered pesticides would not be allowed to be sold.

However, my goal as an applied entomologist is to develop integrated insect management strategies, of which pesticides may one, but not the only, tool. Fruit crops where relatively high levels of pesticides are detected suggest that few non pesticide options exist. This is a challenge and an opportunity for applied research. This is a call to arms to develop management tools which reduce our reliance on pesticides in strawberries, blueberries, and the rest of the Dirty Dozen. Just as consumers should not be afraid to eat the produce on this list, growers and scientists should not be afraid of the information it contains and should take this as an opportunity to improve our production systems.

Sound applied research takes time, but one project already underway was highlight in South Carolina at an agent-training tour I participated in. Spearheaded by Dr. Natalia Peres, University of Florida, with cooperators in the Carolinas, this project uses weather data to predict when strawberry fungal disease can infect fruit and only recommends pesticide applications if conditions are right for infection. In test locations, this has resulted in a significant reduction in pesticide usage when compared to a standard, weekly spray schedule. This type of pesticide reduction is exciting but is the result of years of previous research. It is important that the need for meaningful, applied research is not lost in discussions of food choice and food security.

It is important to be conscious in our food choices, but it is just as important to be conscious of the infrastructure needed to support the ability to choose. The importance of applied agricultural research has not diminished in the current era of budget tightening, but it is being pushed to the edge of priorities. This decreased support directly limits our ability to respond to public concerns like the Dirty Dozen and its list cousins.

Hannah Burrack is Assistant Professor of Entomology and Pest Management in Field and Horticultural Crops at NCSU, keep up at ncsmallfruitipm.blogspot.com

NCDA and CS is offering two cost-share grants to assist farmers with on-farm food safety efforts.

RALEIGH—Fruit and vegetable farmers can apply for two cost-share grants offered through the North Carolina Department of Agriculture and Consumer Services to assist with the costs for water analysis and independent certification of an operation's good agricultural practices.

“Both of these grants help farmers with their on-farm food safety efforts, which are critical to marketing their farm products,” said Agriculture Commissioner Steve Troxler. “I am glad we were able to secure these USDA funds to assist our growers. Farmers can apply for both grants, which will be available on a first-come, first-served basis.”

This is the third year for the Water Analysis Cost Share grant program, which will reimburse growers up to \$200 for certified laboratory analysis of irrigation and/or packing house wash water for the presence of generic E.coli bacteria. Growers can be reimbursed for one water test or multiple tests throughout the year.

For more information or to obtain an application for the Water Analysis Cost Share program, go to www.ncgradingservice.org, or contact Kevin Hardison at (919) 707-3123, or kevin.hardison@ncagr.gov.

The department has previously offered the Good Agricultural Practices Certification Assistance Program, which covers up to \$600 for independent audits of a farm's GAP or good handling practices.

To be eligible, growers must have a third-party audit from an approved government agency or company that verifies GAP or GHP efforts, the audit must be conducted in 2011 and the grower must submit an application to participate in the program prior to the audit. The audit can be for farm review, field harvest and field packing activities, packing house facility, storage and transportation, and traceback.

For more information or to obtain an application for the GAP Certification Assistance Program, go to www.ncgradingservice.org, or contact Shirley Nicholson at (919) 707-3126, or shirley.nicholson@ncagr.gov.

“Food safety is important at every level of the food chain,” Troxler said. “Produce buyers are demanding assurances from growers that their produce is safe. It's going to become more difficult for farmers to market their fruits and vegetables if they don't have a program in place to make sure their produce is free of contamination.”

Funding for both NCDA&CS-managed grants comes from the U.S. Department of Agriculture.

Source: Laurie Wood, Marketing Specialist, NCDA & CS.

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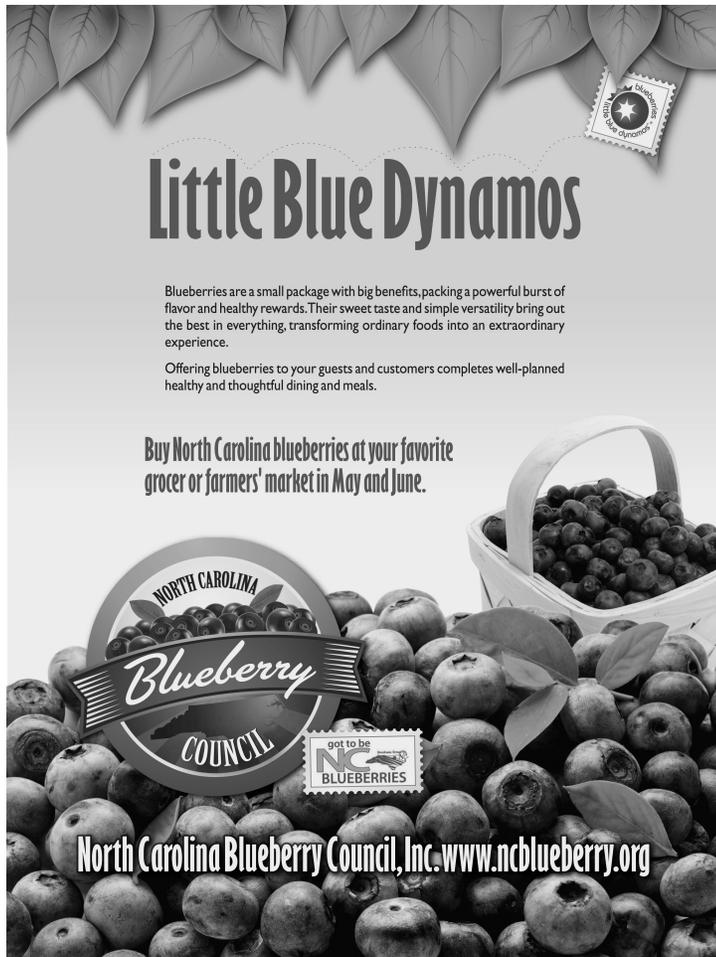
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MARKETING UPDATE

Beginning in late May, advertisements looking similar to the one at left started publishing in *Sunbelt Food Service Magazine*, *Farm Bureau* magazine, *Our State Magazine*, and *Western North Carolina* magazine in addition to a special NCDA supplement in the *Fayetteville Observer*—each ad was tailored to the market and reader of the individual publication.

This theme carried over to billboards and displays in six large North Carolina malls.

The ad appeared on rotating food websites with a link back to the website for the Council, and also in the two largest broadcast markets in North Carolina on public radio.

Lots more on this soon!



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Is Your NC Blueberry Council Membership Current?

During the next month we'll be cross referencing our records to make sure our membership list and dues are current. Don't miss out this newsletter and the other benefits of being a Council member. You can mail the following information to: NCBC, Inc., P O Box 244, Atkinson, NC 28421 or call Julie Woodcock, 910-471-3193 to put on a credit card.

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Hannah Burrack honored by IPM Center

The Southern Region IPM Center has honored Dr. Hannah Burrack, assistant professor of entomology at North Carolina State University, with its Friends of IPM Future Leader Award.

The Friends of IPM Future Leader Award recognizes an individual early in his or her career who has shown leadership in integrated pest management, or IPM. The Southern Region IPM Center is located on the N.C. State University campus.

Burrack received the award for her successful monitoring networks of serious pests such as the spotted wing drosophila, and for her early adoption of a blog to communicate news to growers.

Burrack began her career at NC State University in 2007, after graduating with a Ph.D. in entomology from the University of California at Davis. Burrack specializes in small fruits and tobacco.

Burrack also developed a monitoring network for spotted wing drosophila, an invasive pest that has devastated fruit and vegetable crops on the U.S. west coast. The network led to the first discoveries of the pest in

South Carolina in early July 2010, and in North Carolina a few weeks later

Since then, the network has confirmed spotted wing drosophila in 13 locations in the Carolinas.

Burrack is also establishing monitoring networks for blueberry maggot and grape root borer. She posts findings from the networks, in addition to information about workshops, on her blog, NC Small Fruit, Specialty Crop and Tobacco IPM, located at

<http://ncsmallfruitsipm.blogspot.com/>.

Written by: Rosemary Hallberg, communications specialist, Southern Region IPM Center, 919.513.8182 or rhallberg@sripmc.org. Media Contact: Dr. Hannah Burrack, assistant professor, N.C. State University, 919-513-4344 or hannah_burrack@ncsu.edu



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The May/June issue of *Agricultural Research* features blueberries on the cover as well as important editorial content. The PDF version can be read easily online, or print for feature reference.

The location is <http://tinyurl.com/42e6vua>.

Some of the highlights are:

The Delightful Domesticated American Blueberry:
Some Research Challenges for Its Next 100 Years

Blueberries: Making a Superb Fruit Even Better

Blueberry Growing Comes to the National Agricultural Library.

Agricultural Research is published 10 times a year by the Agricultural Research Service, U.S. Department of Agriculture..

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