It’s time to register for the North American Raspberry & Blackberry Conference!

We hope to see you at our annual conference in Sandusky, Ohio, January 16-18! See pages 6-7 for conference details and a registration form; also visit www.raspberryblackberry.com – the link at the top of the page will take you to a page with additional information and links to key files and online registration.

**December 16** is the deadline to make your reservations at the Kalahari Resort at special conference rates. Call 877-525-2427 to make reservations. Be sure to mention OPGMA to get the group rate. **January 6** is the deadline for lower earlybird conference registration rates.

Later and at-the-door registration fees are higher. If you register online you can take advantage of a $25/person discount for additional NARBA registrants.

**Flying in to Cleveland?** NARBA is working to coordinate transportation for members from the Cleveland airport to Sandusky by carpooling. If you would like a ride or are renting a car and willing to take additional riders to/from the conference, please use the form at www.surveymonkey.com/s/NARBAcarpool to give us the information we will need, or call the NARBA office at 919-542-4037 by January 8.

Blackberry breeder John R. Clark with his primocane-fruiting variety Prime-Ark 45 in Watsonville, California in October 2011. Photo by Ellen Thompson.

Notes John, “There are more berries there than one will ever pick, and hard to believe. This same variety in Arkansas last Wednesday [October 5] had NO berries on it. The impact of heat and other factors is about as great as I have seen on any crop.”

John Clark will be a featured speaker at the North American Raspberry & Blackberry Conference in January, where he will give two talks: “How to Grow the Fresh Market Blackberry Industry: A Blackberry Breeder’s View” and “Trends & Progress in Blackberry Breeding.” He is also speaking in bramble sessions at the Southeast Regional Fruit and Vegetable Conference in Savannah (see page 5).

**USDA Funds Two Bramble Projects**

Funding for two exciting projects was recently announced by USDA; though the scientists involved have known for some time, we had to wait until the formal announcement to spread the word.

One project is a planning grant for red raspberries. A team of scientists from across the US and part of Canada have been funded by USDA-NIFA’s Specialty Crop Research Initiative to plan a “breeding roadmap” for U.S. red raspberry cultivars. The roadmap will include developing a ranking system for existing and future cultivars in public breeding programs and identifying coordinated research steps to develop usable markers for resistance to certain pests, important horticultural traits and flavor characteristics sought by consumers. This team will identify methods to address stumbling blocks existing within publically funded red raspberry breeding programs that are holding back increases in industry productivity and profitability.

The workshop “New Paths for Red Raspberry Genetics” being held at our upcoming conference is part of this project, and attendees will have an opportunity to help shape further research. See page 6 for more information; please note that preregistration is requested for this workshop and that attendance is limited in the evening Working Group session.

The other project, “Developing the Genomic Infrastructure for Breeding Improved Black Raspberries,” is a multi-year project involving research personnel in Oregon, Arkansas, Idaho, New York, and Ohio.

The overall goal of this project is to develop and make available genomic tools for the improvement of black raspberries and begin applying these tools in using wild black raspberry germplasm for crop improvement and development of new cultivars to support the industry. The project will examine consumer

Continued on page 5
**The BRAMBLE** is a quarterly publication of the North American Raspberry & Blackberry Association (NARBA), formerly the North American Bramble Growers Association (NABGA), and is a benefit of membership in the association. For sample copy, reprint permission, membership information, and advertising rates, contact NARBA 1138 Rock Rest Road Pittsboro, NC 27312 USA Phone: 919-542-4037 Fax: 866-511-6660 (toll-free) E-mail: info@raspberryblackberry.com Web: www.raspberryblackberry.com

**EVENTS**

**January 6, 2012 – Southeast Regional Fruit & Vegetable Conference** bramble sessions, organized by NARBA. This is where we had our annual conference last year. For more information, see page 5 or visit www.seregionalconference.com.


**January 25, 2012 – Oregon Horticulture Society Raspberry & Blackberry Seminar** at the Portland Expo Center (held in conjunction with the Northwest Ag Show). Agenda not yet available.

**June 3-7, 2012 – International Raspberry Organization Conference** in Abbotsford, BC. Plans are being made for the one-day 8th IRO conference and for raspberry tours in the Fraser Valley and in NW Washington. For more information, contact the Washington Red Raspberry Commission, info@red-raspberry.org or 360-354-8767.

**January 2013 – North American Raspberry & Blackberry Conference**, Portland, OR. We are considering doing this as a joint conference with the North American Strawberry Growers Association. If you are interested in helping plan this conference, please contact the NARBA office.

**2015 – 11th International Rubus & Ribes Symposium**, in North Carolina. A long time off, more info to come.

Contact NARBA to have bramble-related events included here and posted on our web calendar.

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**Briefly Speaking**

Many of you have seen my request for members to contact their Congressional Representatives in support of the 2012 Farm Bill, in particular the Specialty Crop Programs. While writing this article, I received an email asking for the most important headline of 2012 for the fruit industry. I thought the coincidence was remarkable and thought I would give you my Industry Christmas wish list for 2012: “Congress takes responsibility for immigration reform and drops the idea of E-verify while fully funding ARS, APHIS, NIFA and University Extension programs.”

The story following the headline would include tales of hope from growers who took the initiative to persuade Congress to change the way they do business. Specialty crop programs in USDA like the National Clean Plant Network are intended to help Clean Plant Centers become self supporting and sustainable, and they should be the poster child for all other USDA programs. You can read how at the following web site. http://nationalcleanplantnetwork.org

This organization was started with the premise that grassroots efforts by members are an integral part of maintaining a healthy berry industry. While people have suggested that we conserve our ammunition and wait to see what happens, I think regular and frequent conversations with our representatives will deliver a stronger message. Members must be involved in stakeholder discussions with State and Federal Extension and Research planning committees. While these efforts might not be in your comfort zone, your participation will be rewarding for the industry. Both our representative and extension personnel make it very easy to participate and will help you and welcome your participation. They just need to know you want to get involved and can show you the way.

I look forward to our conference in Ohio and hope to see your there. Wishing you all the best for the New Year!

Nate Nourse, NARBA President

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**Thank You to our Conference Sponsors**

These companies have signed on to be sponsors of the North American Raspberry & Blackberry Conference as of December 2.

- Sunnyridge Farm, Inc.
- Sun Belle, Inc.
- Nourse Farms
- Norcal Nursery
- Berries Unlimited
- Trellis Growing Systems
- Giumarra/VBM
- Reiter Affiliated Companies

We welcome additional sponsors. If your company might like to support the conference, please contact the NARBA office.
USDA Funds Bramble Projects continued from front page

interests and marketing strategies that will promote consumer demand, product availability, increased consumption and profitability of this health-beneficial commodity. This project will work to streamline the development of cultivars with high consumer acceptability through molecular breeding.

The outreach plan of the project includes presentation of regular progress reports to caneberry grower groups such as NARBA and several workshops.

Perspectives on Black Raspberries

The article below is drawn from the proposal for the recently funded project.

Despite numerous studies showing the potential for dramatic health benefits from black raspberry consumption and great interest in developing products from this native specialty crop, it is underplanted and underutilized because current cultivars lack the disease resistance and adaptability needed to support a larger industry.

Black raspberry is a high value crop native to North America, with a long history of production in the U.S. In the early 1900s, production was centered in and around western New York with a large market for fresh and processed (dried) fruit. At that time, black raspberry acreage in North America exceeded that of red raspberry, however by the 1940s, increasing disease problems led to a shift in production, with increasing acreage in Oregon and decreasing production in New York and the Ohio River Valley. Since the 1960s, production has continued to decline across the U.S. This decline has been largely attributed to disease and a lack of adapted and disease resistant cultivars. In Oregon, the largest production region, black raspberry growers typically see a decline in yield after the first or second harvest and replace their fields, at great expense, after an average of only 3-4 years because of severe disease pressure. This is half of what it was 60 years ago, and less than a quarter of what is expected from a healthy field. The bulk of decline in black raspberry production has been attributed to two major disease problems: Aphid-vectored viruses, particularly Black raspberry necrosis virus (BRNV), are a leading reason for the short life of plantings. At present, commercial fields in the Pacific Northwest become nearly 100% infected with BRNV after just two seasons and subsequently experience serious decline. There are no cultivars with resistance to this virus or its vector, the large raspberry aphid. Wilt, caused by Verticillium is also a serious problem in black raspberry production. Because neither of these diseases can be easily controlled through chemical or cultural practices, the best means for control and long-term disease management is through genetic resistance and breeding.

Public breeding for improved black raspberry cultivars began in 1893. At first, many improved cultivars were developed, but breeding progress has slowed dramatically in the last 60 years, and most of these old cultivars have since been lost. Since 1975, only four cultivars have been developed and released. The vast majority of acreage today is based on one cultivar, ‘Munger’, developed and released in the 1890s. The lack of progress in breeding new black raspberry cultivars has been attributed to a lack of variability in available elite germplasm and lack of disease resistance.

In 2006, Chad Finn and Michael Dossett began an effort to systematically collect and evaluate wild black raspberry germplasm from across the species entire range of the species range and another to the western edge of the species range, to help fill in gaps from underrepresented areas. These efforts have resulted in the collection of a wide range of wild germplasm from more than 130 locations across 27 states and two Canadian provinces. This collection is the largest ever of wild black raspberry germplasm, representing the entire range of the species. It is currently being evaluated for a number of traits of commercial interest in the Willamette Valley of Oregon, the largest production region for black raspberry.

This work has already led to the identification of four sources of strong aphid resistance as well as additional sources of weaker resistance. Evaluation of this germplasm is providing critical information for decisions about which wild plants to use as parents in the breeding program. The use of these wild parents in the breeding program will have important long term consequences for breeding progress and the development of improved cultivars to support the industry; the development and use of molecular markers will expedite and streamline the process of identifying and integrating traits of interest, particularly adaptability and disease resistance, from wild germplasm into new elite cultivars while maintaining or improving fruit quality and other traits critical to processors and consumers.

The molecular tools developed by this project will also enable the effective use and long-term management of new sources of aphid resistance found in wild black raspberry germplasm.

Most black raspberry acreage today is the cultivar Munger, developed in the 1890s.
Winter Bramble Chores
This list was developed by Dr. Gina Fernandez, Small Fruit Specialist at NC State University and reviewed by Dr. Marvin Pritts at Cornell. Chores and timing may be somewhat different in your area or for your cropping system. For recommendations for the Pacific Northwest, we encourage you to subscribe to the email “Small Fruit Update” by emailing info@peerbolt.com.

Plant growth and development
- Plant is “dormant” and accumulating chilling hours.
- Some differentiation may be occurring in the flower buds.

Pruning and trellising
- Pruning should occur in late winter or early spring. Ice storms can do tremendous damage to plants and trellis systems. If you produce blackberries in areas where ice storms are common, pruning can take place early winter to help avoid severe damage. Wait until early spring to prune floricanes so winter injured wood can be removed.
- Make trellis repairs after plants have defoliated but before pruning and training.

Primocane fruiting raspberries
- Prune (mow) primocane fruiting types to the ground
- Floricanes fruiting raspberries
- Prune out the spent floricanes
- Tie canes to wires so they are spread out
- Cut any lateral branches back to 6"
- Thin canes to 6-8’’/hill (3’’ spacing) or 3-4 canes per linear ft. of row
- Erect blackberry types
- Prune out the spent floricanes
- Tie canes to wires in a fan shape
- Cut lateral branches back to 8-12”
- Thin canes to 6-8 canes/hill (4’’ spacing)
- Trailing blackberry types
- Prune out spent floricanes
- Tie or weave canes to wire so they do not overlap
- Prune side laterals to 12-18”
- Thin canes to 6-8/’’ hill (6-8’’ spacing)

Call For Nominations
Elections for seats on the Executive Council, NARBA’s board of directors, will be held at NARBA’s annual meeting on January 16, 2012. The seats for Regional Representatives for Region 2, Region 4, Region 6, Region 8 and one at-large seat are open for election. See the make-up of each region on the back page of this newsletter. Executive Council members serve two-year terms. They hold a face-to-face meeting at the annual conference and conduct other meetings and discussions via conference call and email. To make a nomination please contact any member of the current Executive Council or the NARBA office. Volunteers for Regional Representatives are welcome!

Weed control
- Many summer weed problems can best be managed in the fall and winter using preemergent herbicides. Determine what weeds have been or could be a problem in your area. Check with local extension agent for cultural or chemical means to control these weeds.
- Establishing new blackberry or black raspberry plants into rows of black plastic or landscape cloth can reduce weed problems significantly. For red raspberries, straw mulch works best since new canes will emerge within the row, and must be able to push through the mulch.

Insect and disease scouting
- Scout fields for insect and disease damage and remove those canes.
- If possible, remove any wild brambles by the roots that are within 600 ft of your planting during the winter, or treat them with glyphosphate in autumn.
- Apply liquid lime sulfur to dormant canes, just prior to bud break, for disease control.

Planting
- Growers in warmer areas can plant in December. In northern areas, set dormant plants in spring when the soil thaws.
- Take soil tests to determine fertility needs one year before planting. Amend the soil in the fall prior to spring planting.
- Prepare list of cultivars for next year’s new plantings. A commercial small fruit nursery list can be found at www.smallfruit.org or www.hort.cornell.edu/nursery.

Water management
- Make repairs to irrigation system (check pumps, lines, etc).
- Plants generally do not need supplemental water in winter.

Marketing and miscellaneous
- Order containers for next season.
- Make contacts for selling fruit next season.
- Attend grower meetings.

Thinking ahead to the 2012 harvest...
How can NARBA help you promote your berries? Currently, on our website, we have ready-to-print recipe cards and health benefit brochures in the Members-Only section, plus many recipes that you or consumers can access. We also still have some inventory (and can print more) of the full-color recipe brochures (pictured to right) that we created this year. Contact the NARBA office to order.

What new tools would benefit you that we might offer? Should NARBA put more effort into PR to media on a national basis? Should we work to inform and educate wholesale buyers? Should we create a consumer-focused Facebook page? Please talk to an Executive Council member, call 919-542-4037, or email info@raspberryblackberry.com with your thoughts.
Dole Food Company Acquires SunnyRidge

In mid October, Dole Food Company announced that it had acquired SunnyRidge Farm, Inc., one of the major fresh-market blackberry and blueberry companies in the United States. SunnyRidge also sources and sells strawberries and raspberries. SunnyRidge Farm is a member of NARBA and has been a strong sponsor of our annual conference. A number of Southeastern growers who sell blackberries through SunnyRidge are also NARBA members.

Keith Mixon, president and chief executive officer of the family-owned SunnyRidge Farm, said “We at SunnyRidge Farm, including the Mixon family, are proud and delighted to be joining one of the world’s great food companies. We share Dole’s passion for improving consumer health and nutrition, and look forward to building the business further, within the Dole family of companies.”

Mixon said that all of his company’s employees would be retained, including the 100 or so in the offices in the Southeast U.S. “Our common vision is to create a worldwide, all-berry company. We are very, very excited. The negotiations have been going on for a while.

“The goal is to continue with the same group of people we have put together, and that Dole already has, to create a new, complete, full line of berries under the Dole banner.”

SunnyRidge Farm has growers and company-owned acreage throughout Florida, Georgia, North Carolina and Mexico. The company also works with growers in various other regions in North and South America to provide blueberries, raspberries, blackberries and strawberries year-round.

In a news release, Dole officials said the acquisition would provide a “strategic complement to our existing fresh and frozen berry operations, both of which have previously focused on strawberries.” According to the release from Dole, blueberries and blackberries are some of the fastest growing commodities in the produce category.

Mixon said he expects the new full line of berries to put Dole in the No. 2 or No. 3 spot in every traditional berry category. The SunnyRidge brand will be retained, Mixon said.

“We will also be able to offer our berries to Dole’s frozen and value-added lines of products,” Mixon said.

Said David A. DeLorenzo, President and Chief Executive Officer of Dole Food Company. “We are very pleased with our acquisition of SunnyRidge Farm and welcome their management team, employees and growers into the Dole family. Their premium blueberry and blackberry operations are an excellent strategic complement to our existing fresh and frozen berry operations, both of which have previously focused on strawberries. The SunnyRidge acquisition lets us advance our commitment to providing the consumer with an ever-growing array of healthful, nutritious fruits and vegetables.”

Bramble Sessions in Savannah

A full day of blackberry/raspberry educational sessions will be held on Friday, January 7, 2012 at the Southeast Regional Fruit and Vegetable Conference in Savannah, GA, the site of NARBA’s most recent annual conference in January 2011. NARBA is assisting with organizing these sessions. Southeastern growers who are not able to come to our annual conference this year will want to take advantage of this regional meeting. The full conference runs January 5-8 and includes sessions on many other crops and topics as well as a large trade show. The blackberry/raspberry sessions run from 8:00 am to 5 pm on Friday, Jan. 6 and include:

• Grower Spotlight: Success with Direct Market Blackberry Production – Walker Miller, Happy Berry Farm (SC)
• Raising Healthy Plants for Quality Fruit: Blackberry Physiology & Nutrition – David Lockwood, University of Tennessee
• Trends in the Blackberry Market – John R. Clark, University of Arkansas
• Update on University of Arkansas Blackberry Breeding – John R. Clark
• Spotted Wing Drosophila & Caneberrys – Hannah Burrack, NCSU
• Options for Natural Pest & Disease Control
• Fruit Quality: My Biggest Problem and How I Deal with It – Grower Panel with Ervin Lineberge (NC) Michelle Patten (GA) and Danny Shelton (TN)
• Developing a Model for Crop Forecasting – Barry Goodwin, NCSU
• An update on the proposal for a Blackberry Research & Promotion Program

Registration information and full schedule details are online at www.seregionalconference.com.

Dole, with 2010 net revenues of $6.9 billion, is the world’s largest producer and marketer of high-quality fresh fruit and fresh vegetables, and is the leading producer of organic bananas. Dole markets a growing line of packaged and frozen fruit and is a produce industry leader in nutrition education and research.

NARBA Membership

It’s time to renew your NARBA membership for 2012 – please see the renewal form sent out with your newsletter and renew today! Anyone who registered for the annual conference based on 2011 membership will be requested to renew at the conference – you can save distraction and paperwork there by renewing in advance.

If you know growers who are not members, this is a good time to encourage them to join, so they can be sure to get get a full year of benefits.
The North American Raspberry & Blackberry Conference

OPGMA Educational Sessions At-A-Glance

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<tr>
<th>Day</th>
<th>Time</th>
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<tr>
<td>Monday, January 16</td>
<td>9-9:45 AM</td>
<td>Registration is Open 7:30 AM-4:30 PM Trade Show is Not Open Today</td>
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<tr>
<td>Monday, January 16</td>
<td>11:30 AM-12:30 PM</td>
<td>Mechanics of Your Way to Success (Mangrove)</td>
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<td>Monday, January 16</td>
<td>1-5 PM</td>
<td>1:45-2:45 PM Workshop: New Paths for Red Raspberry Production Workshop</td>
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<td>Tuesday, January 17</td>
<td>9-9:45 AM</td>
<td>Registration is Open 7:30 AM-5:30 PM</td>
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<td>Tuesday, January 17</td>
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<td>Wednesday, January 18</td>
<td>8-9:30 AM</td>
<td>Small Fruit Disease, Insect &amp; Weed Problems &amp; Control Update (Mangrove)</td>
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<td>Wednesday, January 18</td>
<td>10-11 AM</td>
<td>Tree Fruit Diseases, Insect &amp; Weed Problems &amp; Control Update (Mangrove)</td>
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<td>Wednesday, January 18</td>
<td>12-1:30 PM</td>
<td>Tree Fruit Diseases, Insect &amp; Weed Problems &amp; Control Update (Mangrove)</td>
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<td>Wednesday, January 18</td>
<td>1:45-2:45 PM</td>
<td>Vegetable Diseases, Insect &amp; Weed Problems &amp; Control Update (Mangrove)</td>
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Registration includes the Raspberry & Blackberry Conference sessions and lunch on Monday, Tuesday Bramble sessions, all OPGMA sessions, and the OPGMA Congress Reception on Tuesday.

If you register online (rather than on a paper form), there is a discount of $25/person for additional persons from the same family or farm.

Register online at: https://opga.wufoc.com/forms/opgma-congress-registration/ (there is a link at www.raspberryblackberry.com)

Location & Hotel

The OPGMA Congress and North American Raspberry & Blackberry Conference will be held at the Kalahari Convention Center, 7000 Kalahari Drive, Sandusky, Ohio 44870; www.kalahariresort.com. A special rate of $112 for a Standard King or 2 Queens ($144 value). To take advantage of this special rate, reservations must be made by calling 877-252-2427 on or before Friday, December 16, 2011. Please ask for the Ohio Produce Growers & Marketers Association room block. Reservations made after this date will be accepted based on availability and may be at a higher rate.

EDUCATIONAL SESSIONS

OPGMA sessions are concurrent with the Raspberry & Blackberry Conference and are open to NARBA conference registrants. See chart. To see details on all sessions, visit www.opgma.org.

SPECIAL EVENTS

NARBA Hospitality Room

Sunday 7:30 PM Open to all North American Raspberry & Blackberry Conference registrants for informal networking and light refreshments.

NARBA Annual Meeting & Luncheon

Monday 11:30 AM – 1:30 PM Before the luncheon, leading blackberry breeder John R. Clark, University of Arkansas, will share his insights on blackberry production and marketing. NARBA conference registrants. See chart. To see details on all sessions, visit www.opgma.org.

Bramble Growers Dutch Treat Dinner

Monday 7 PM at The Reserve Restaurant A NARBA tradition! The Reserve Restaurant is in the Kalahari; you don’t even need to step outside. Sign up ahead of time (info@raspberryblackberry.com) or on-site at the NARBA table by noon on Monday, January 16. Then join the group, in a special reserved area of the restaurant for dinner and informal fellowship and conversation. Order from the menu and pay your own bill.

OPGMA Congress Reception

Tuesday 5 – 6:30 PM Connect with other produce growers, marketers, and exhibitors during this networking reception. Complimentary hors d’oeuvres will be served.

TUESDAY WORKSHOPS

Fundamentals of Raspberry & Blackberry Production Workshop

8 AM – 12 PM For new growers, prospective growers, or more experienced growers who want a refresher in the basics. Participants will receive a copy of the Raspberry & Blackberry Production Guide for the Northeast, Midwest, and Eastern Canada. The workshop is limited to 40 participants. Advance registration is required.

Workshop: New Paths for Red Raspberry Genetics

1 – 5 PM This workshop is funded through the grant reported on page 1. It will cover current and future activities related to red raspberry cultivar development with a focus on flavor, field vigor, heat tolerance, and pest resistance traits. Perspectives from breeding programs and the nursery industry will be shared. A major topic of discussion will be use of molecular markers in early screening of new and existing raspberry cultivars. Which traits are most valuable to growers and consumers? Which activities would allow faster development of cultivars? Advance registration is requested.

Red Raspberry Workshop Working Group

630 – 8 PM This dinner/meeting is a follow-up work planning session based on discussions in the afternoon workshop. There is no cost to participate in this session. Advance registration is required. Limited to 30 participants. If you would like more information about this session contact Catherine Daniels at cdaniels@wsu.edu.

Trade Show

The exhibit hall is located in the Kalahari Convention Center. Visit www.opgma.org for a current list of exhibitors. Trade show hours: Tuesday, January 17 a.m. – 5 p.m. Wednesday, January 18 a.m. – 12 p.m.
**OPGMA Congress**

**and North American Raspberry & Blackberry Conference**

**January 16-18, 2012**

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**COMPANY INFORMATION**

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Are you a first-time attendee at OPGMA Congress?  
☐ Yes  ☐ No

Primary business interest you want to appear on badge. **Mark only one.**

- Fruit Grower  
- Raspberry/Blackberry  
- Student  
- Vegetable Grower  
- Ag Marketer  
- Exhibitor  
- Fruit & Vegetable Grower  
- Educator  
- Other  

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**Register via online, fax, or mail.**

Online: www.opgma.org  
Fax: 614-487-1216  
Mail: OPGMA  
2130 Stella Ct  
Columbus, OH 43215

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**Use this form or register online. There is a $25/person discount on the NARBA conference for additional persons from the same family/farm if you register online rather than from a printed form.**

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**PAYMENT INFORMATION**  
Registration will not be processed without full payment.

☐ U.S. check made payable to OPGMA  
☐ VISA/MC/AmEx

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Authorized Signature - I hereby agree to the terms and conditions of my card issuer agreement.

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Join our close-knit family of the best growers in the world.

Giumarra Vital Berry offers world class logistics, transportation, and marketing services to a select group of very special growers from around the globe.

To find out more about how to join the Giumarra Vital Berry family, please contact Stan Crafton at (720) 922-1330 or scrafton@giumarra.com

The Nature’s Partner brand is trusted worldwide for premium quality and consistency.
Packaging for Red Raspberries

A few months back, the Washington Red Raspberries Commission received the query below from Kelsey Hite, a student in the Toledo, OH area, which it forwarded to NARBA. It is great to have students asking these questions and brainstorming solutions, and NARBA asked several people if they would send responses to Kelsey. We also posted the query on the NARBA E-Forum, where it generated some very interesting comments. Edited excerpts of those comments are below. The full discussion may be found at http://groups.google.com/group/raspberryblackberryassociation.

Original query: I am doing a science project with a group of other students. We have been researching raspberries and discovered that they can be crushed and consequently contaminated on their way to and at the grocery store. We investigated the problem and realized that the clamshell containers currently used do not protect the fruit enough.

We came up with a new idea: thin sheets of biodegradable paper could be placed in between layers of raspberries in the clamshell. This would keep them from packing into the gaps and crushing each other. The biodegradable potato starch paper would cause no waste at all, because they dissolve when placed in water. Obviously, the increased cost is an issue to consider. However, in the United States alone, wasted raspberries from poor packaging cost $52 million per year in losses. We calculated the expense of the layers and discovered that it would only cost one-tenth of a cent extra per container of raspberries, creating a profitable trade-off.

Another way to reduce raspberry waste and contamination would be to design the boxes to be the same on the top and the bottom. We spoke to a produce manager who said that gravity pulls the berries into each other. This inspired us to find this way to protect the boxes: flipping the container over each day.

Are these feasible ideas? Do you know of similar innovations? Do you have other feedback that would help us?

Anthony Boutard, Ayers Creek Farm, Gaston, OR: We tried clamshells a few years ago and ran into constant problems. Field packing is difficult and it was time consuming to get a good fill. By the time we delivered the fruit, they had settled further. The plastic showed finger prints which added another complication. There was also consumer resistance: people don’t like the plastic, and this is especially true for consumers who buy certified organic fruit. Our sales took a dive with the clamshells. Even with our label on them, people assumed they were industrially produced, and never paused to look at the lid. Also, produce staff like to stack the clamshells in a big display which is detrimental to fruit quality.

The paper maché hallock [also known by other names, e.g. pulp cup] remains the best package for field-ripened berries. It wicks moisture generated by normal respiration away from the berries. They are easy to handle in the field. Even though they hold more, they take about two-thirds of the time to fill in the field. We put a big, bright label on the side and people can see them from across the store. Our berries in paper hallocks are clearly visible and sell much better. In our area, others growers have adopted our practice of labeling the hallocks.

Many years ago, Sambraillo Plastics had a plastic lid for hallocks, and it worked well. We tried the clamshells when they dropped the lid, and it was a mistake. If the lid were reintroduced, though, I am not sure I would use it, given the feedback we have received from consumers and produce managers. In our area, at least, consumers are fed up with the plasticizing of our food. For small farms such as ours, the paper maché hallock is the best option.

Because raspberries detach from the receptacle, they will always pose a greater packing challenge, regardless of the packaging. The moisture from respiration collects in the cup shaped fruit providing an ideal environment for mold growth. The berries will hold a bit longer if they are packed open end down. That way, the heavy moist air drops away from inside of the fruit. Unfortunately, it requires a skilled crew to understand the problem and pack the berries receptacle opening down. The way our hands work, most end up in the container receptacle-opening up.

We have also found that getting staff to harvest on the sunny side of the trellis improves fruit quality because incipient mold problems are easier to see in good light. Our trellises run north-south so they pick the east side first.

Susan Lynn, Sandhill Berries, Mt. Pleasant, PA: This is a complicated question. It is not merely the time on the shelves that affect the packaging. Settling during transportation is perhaps a bigger issue. I feel that a liner that absorbs shock in the bottom of the master might be helpful. Between the clamshells? Our clamshells fit our masters so well (this year) that there would have been no space for an absorption layer between the clamshells. All the masters also used to be a single layer and that might have been better for packaging. Terminal markets seem to want the more compact double layer master. The biggest problem we have is that when we pack in a 1/2 pint, large berries (both blackberries and red raspberries) almost have to be “arranged” in the clamshell.

Probably some places they are still picking into clamshells. I was surprised to see in CA that the berries were being transferred from coffee cans to clamshells with little concern. We do not usually have enough pickers, so we do continued on next page
Raspberry Packaging
Continued from previous page

not have the luxury of making pickers do time-consuming selective picking. We pay them to pick fast and then sort on a conveyor belt after picking. This is okay because of our varied uses for berries – we do not just do wholesale.

I think that flipping the clamshells would only cause additional bruising. We see this even on our conveyor belt – we have to dump the berries VERY gently on the belt without bouncing. If a berry is handled more than that, many of the varieties are hopelessly leaking. That is fine for same-day farm markets but not terminal markets. The CA varieties I see are much firmer than most of our eastern varieties, and also appear to be able to be picked less ripe. And where the climate is warmer, the raspberries will come off the receptacle sooner, perhaps negating the need for additional absorptive packaging. There could be many different responses to this question depending on geography and producer’s end market.

Dick Funt, Carobeth Farm, Columbus, OH: At Carobeth Berry Farm I have selected one of my workers to ‘arrange’ the berries in either pint or quart clamshell to fill the corners and to the top without squeezing the berries when the clamshell is closed. All our hand-picked berries are chilled for about one hour before they are sold or they are frozen in the clamshell at the end of the day. However, over 80% of our raspberries are U-pick and therefore few are placed in clamshells. The cardboard master is a very reasonable way to stack and move quantities of pints or quarts. With a full clamshell and chilled berries, it appears there is little settling, with fresh morning-picked berries moved on modern roads.

My father and grandfather prided themselves in giving ‘a full measure’ of berries in wooden, open-topped boxes which were packed into a 24-quart wooden crate in the 1950s. They were quite concerned that Cumberland black raspberries would settle as they traveled down a rough road. They also sold the ‘wet’ (early morning-picked berries in the humid eastern US) before noon so to move the berries quickly and reduce moldy berries. Their motto was “never sell a dirty berry or a moldy berry.” We never handled a black raspberry twice. Certainly the wooden quart box in the middle of a deep wide container had a high field heat. Clamshells allow a shallow depth and have vents to increase cooling in a short period of time.

Mark Hurst, Hurst Berry Farm, Sheridan, OR: I think the idea of paper between layers has some merit but I worry about leaking raspberries dissolving the

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Cornell Raspberry Variety Extends Harvest into November
By Amanda Garris/Cornell News Service
Cornell’s new raspberry variety, Crimson Giant, is fashionably late. Developed by Cornell berry breeder and associate professor of horticulture Courtney Weber, Crimson Giant was bred specifically for the New York climate and can extend the harvest window for fresh, local raspberries to the beginning of November.

“Consumer disbelief is the real challenge for Crimson Giant,” said Weber, who works at Cornell’s New York State Agricultural Experiment Station in Geneva, N.Y. “They are not accustomed to seeing locally produced raspberries that late in the fall, and they might assume the seller has put a ‘local foods’ sticker on berries from California.”

The berry has all the attributes of high-quality commercial fruit: true raspberry flavor and firm, bright red berries that don’t darken quickly in storage. The fruit is large, averaging 4.5 grams in its New York trial, a significant increase over the 2-3 gram berries in other varieties.

In local trials, Crimson Giant begins ripening in late September or early October, three weeks later than the widely grown Cornell variety Heritage. Weber reports that during the traditional fall raspberry harvest, Crimson Giant is still flowering.

The late harvest requires a protected production system such as high tunnels to shield the flowers and fruit from fall frost. Already widely used for summer tomato production in New York state, high tunnels are structures composed of hoops of metal or plastic covered by plastic sheeting. Unlike greenhouses, they do not have a foundation and are generally not heated. Drip irrigation supplies the necessary moisture to support plant growth.

“Raspberry yield in high tunnel systems can be many times higher than field-grown plants, due in part to the lower incidence of diseases like gray mold, the ability to grow plants at a higher density and the mitigation of wind that can damage plants,” said Marvin Pritts, chair and professor of horticulture. “The berries are often larger, and the need to manage most pests, diseases and weeds is lower than in the field.”

Crimson Giant is expected to be a boon for growers seeking to enlarge their market share and command premium prices for berries in the late season, when apples outnumber them at the farm stands and farmers’ markets.

Growers interested in planting a trial to evaluate the variety can contact the Cornell Center for Technology Enterprise and Commercialization (CCTEC) for a list of licensed nurseries.

“Sourcing through licensing helps to ensure growers are testing disease-free, high-quality plants,” said Jessica Lyga, CCTEC’s plant variety and germplasm licensing liaison. “The royalty revenue, in turn, supports breeding of the next varieties.”

Licensing is now a common way for Cornell varieties to enter the marketplace. Wheat, cucumbers, strawberries, squash, potatoes, plums, peppers, melons, grapes, cherries, corn, apples and apple rootstocks, and ornamentals such as Alstroemeria are also available for trials and production through licensing.

“Funding for plant breeding has been cut at the state level, and much plant breeding has become privatized,” said Lyga. “Cornell is committed to continue breeding crops adapted to local growing conditions, expanding the availability of local foods and increasing the market share for regional growers.”

The Cornell small fruits breeding program was established at the Agricultural Experiment Station in 1882. Since then, breeders have produced more than 80 red and black raspberry, blackberry and strawberry varieties for production in New York and abroad. Notable varieties include the Heritage raspberry and Jewel strawberry, which have become industry standards in the Northeast. Two new strawberries are slated for release for the 2012 season.

Amanda Garris is a freelance writer in Geneva, N.Y.
Measuring Bioactivity in NC Red Raspberries
By Christine Bradish, Graduate Student, NC State University,

Small fruits are a very healthy food option, and increased consumer health awareness has helped drive their domestic and international demand in recent years. The most important bioactive compounds in small fruits are flavonoids, which are very small molecules commonly occurring in plants, with over 4000 known in nature. Regular consumption of flavonoids can help prevent cancer and chronic disease through their antioxidant activities.

Within the plant, flavonoids function as secondary metabolites, meaning they are produced during times of stress, e.g. drought, heat, disease, insect feeding. Because raspberries prefer cooler climates, we hypothesized that the warmer summer temperatures found in the Southern growing region, especially extended periods of time over 85°F during fruit ripening (when the plant has reached above-optimal growth temperatures and is in a stressed condition), would cause an increase in these levels of health-beneficial flavonoids and antioxidant activities. We were also interested to see if different cultivars had varying flavonoid profiles.

Funded by an USDA Transdisciplinary Training Program in Functional Foods Grant, we were able to test this hypothesis through a collaborative study between the NCSU Plants for Human Health Institute and UNC-Greensboro Center for Research Excellence in Bioactive Food Components.

Fruit from the primocane-fruiting cultivars Autumn Britten, Caroline, and Nantahala was collected from high tunnel replicated trials at Piedmont, Lower Mountain, and Upper Mountain Research Stations in North Carolina during the 2010 growing season. (More information on these trials can be found at http://ncsu.edu/enterprises/blackberries-raspberries/production/latest-research/). Autumn Britten and Caroline have been shown to be successful varieties in other climates, and are being trialed in the warmer climate in NC; and Nantahala is a recent release by Drs. Gina Fernandez and Jim Ballington from NC State University, bred specifically for the NC mountains and surrounding states.

For each fruit sample taken, quantities of ten flavonoids and antioxidant capacity were measured and compared among the different cultivars and locations. We found that the three cultivars had very different flavonoid profiles. Each cultivar had the same ten flavonoid compounds, but in varying levels. Autumn Britten was highest in cyanidin-3-rutinoside, Caroline was highest in cyanidin-3-sophoroside, and Nantahala was highest in cyanidin-3-sambubioside. These findings can be important to health researchers, breeders, and growers. For example, health researchers find that cyanidin-3-sambubioside in particular is a very effective anti-cancer agent. To develop cyanidin-3-sambubioside enhanced fruits, breeders would use cultivars such as Nantahala with naturally high levels of the compound to make crosses develop better lines. As the public becomes aware of the health benefits of eating fruits with this anti-cancer compound, growers can market that they are growing cultivars, such as Nantahala, with exceptional levels of that compound.

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Autumn Britten planting used in this research. Photo by Christine Bradish.

Autumn Britten planting used in this research.

Total Anthocyanins (mg/L)

<table>
<thead>
<tr>
<th>Cultivar</th>
<th>Amount (mg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autumn Britten</td>
<td>690.285</td>
</tr>
<tr>
<td>Caroline</td>
<td>690.488</td>
</tr>
<tr>
<td>Nantahala</td>
<td>470.713</td>
</tr>
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Antioxidant Capacity (mmol TE/g FW)

<table>
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<tr>
<th>Cultivar</th>
<th>Capacity (mmol TE/g FW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autumn Britten</td>
<td>12.761</td>
</tr>
<tr>
<td>Caroline</td>
<td>13.766</td>
</tr>
<tr>
<td>Nantahala</td>
<td>11.973</td>
</tr>
</tbody>
</table>
The three cultivars also had varying antioxidant capacities; Caroline had the highest, followed by Autumn Britten and Nantahala. This data could be very useful for marketing to health-savvy consumers, as the benefits of antioxidant consumption are an increasingly popular trend. Comparing the antioxidant capacity of raspberries against other fruits, or of different raspberry cultivars against one another can be an effective way of showing and selling the ‘healthfulness’ of your products.

Warm temperature and location were shown to affect levels of quercetin-3-glucoside and antioxidant capacity. Measurements for both of these were highest at the two warmest locations (Piedmont and Lower Mountain Research Stations), and increased linearly as average night temperature and hours of exposure to temperatures over 85°F increased during the fruit ripening period. Warm temperatures and high humidity in the Southern region may provide a challenge to growing small fruit such as raspberries; however, these results show that these conditions may also contribute to a more healthful product. More research is needed, but there may be a marketing edge or niche available to grow fruit with higher levels of these bioactive compounds in the future for health research or interested groups of consumers.

With the increased consumer interest in health, it is important to consider how the different flavonoid and antioxidant content of small fruit can differ by cultivar and growing region, among other things. By understanding the differences in bioactive content among different types and varieties of small fruit, we can better understand their effects on human disease, how to breed nutritious and health-beneficial cultivars, and how to market these advantages to consumers.

Christine Bradish may be contacted at cmbradis@ncsu.edu.

**Raspberry Packaging**

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paper, which would be a big mess! Other issues are the extra space this would require in the clamshell (larger clamshell), fewer units per pallet, which translates into higher freight costs.

Nate Nourse, Nourse Farms, South Deerfield, MA: Raspberries are the hardest berry to grow and ship to market profitably. As a shipper I know once the berries leave my hands they need to be ready for however someone else will treat them, usually badly.

The paper idea is okay, but will have too many problems. Fruit taken out of cold storage sweats, then you know what happens to the paper.

Berries need to be handled as little as possible, 95% of damage happens during transport. Berries need to be harvested almost ripe and kept at 32-33 degrees. Most of the damage occurs because the grocery stores think they can never run out of any produce. Raspberries may be 7-14 days old before you buy them. We have no losses from our berries when they are sold before they are five days old.

I think the best solution involves inventory management to reduce losses. I don’t believe it is the packaging; it is the way produce is handled and kept around too long. ✴
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Available from NARBA
Recipe brochures for raspberries and blackberries. Contact NARBA for prices.

Proceedings of the North American Raspberry & Blackberry Conference, for 2010 and 2011, on CD. Sent to members that year; additional copies available for $10/each, postage included. Proceedings of other years, on paper, also available. List of contents available on request.

Raspberry & Blackberry Production Guide for the Northeast, Midwest, and Eastern Canada, NRAES Cooperative Extension. The best book available, no matter where you are. Lots of color pictures, well organized, and full of good information. $35 to members, $40 to non-members, shipping included (a few dollars more outside the U.S.). Those prices are a discount below ordering direct from NRAES.