



Worldwide Production of Blackberries

By Bernadine Strik, Department of Horticulture, Oregon State University; Chad Finn, USDA-ARS, Hort Crops Research Lab, Corvallis; John R. Clark, Department of Horticulture, University of Arkansas, Fayetteville; M. Pilar Bañados, Universidad Católica de Chile, Santiago

In 2005, I (B. Strik) was invited to make a presentation on worldwide blackberry production at the International Society for Horticultural Science *Rubus* Symposium, held in Chile in December, 2005. I developed a survey, with the help of my colleagues listed above, and sent it to key extension/research colleagues and industry members worldwide. I could not have done this without their assistance.

Introduction

Blackberries are often classified according to their cane architecture into three types: erect, semi-erect, and trailing (Strik, 1992). Erect-caned cultivars include the thorny 'Brazos', 'Tupy', 'Cherokee' and the thornless 'Navaho' and 'Arapaho'. Semi-erect types include 'Chester Thornless', 'Thornfree', 'Loch Ness', and 'Èaèanska Bestrna'. Trailing types include 'Marion', 'Silvan' and 'Thornless Evergreen' and the blackberry, raspberry hybrids 'Boysen' and 'Logan'. The new primocane-fruiting cultivars Prime-Jan and Prime-Jim are erect, thorny types.

In 1990, results of survey reported 7,860 acres of blackberries in the northwestern region (Strik, 1992) and 2,975 acres in the eastern USA (Clark, 1992) for a total of 10,835 acres. In 1990, most of the blackberry production in the eastern USA was pick-your-own or pre-picked for on-farm or local sales and less than 2% was processed (Clark, 1992). In contrast, over 90% and 50% of

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Plan to Attend NABGA's 2007 Conference

Our conference this year, the **National Bramble Conference**, will be held on January 15-17, 2007 in Columbus, Ohio, in association with the Ohio Fruit and Vegetable Congress. The Congress also includes sessions on tree fruit, other small fruit, vegetables, direct marketing, and a large trade show, all of which are also open to bramble growers who register for the conference. **Registration is being handled by the Ohio organization, and complete information will be sent to you later this fall.** Here's the bramble schedule as it stands; it's still somewhat subject to change as all the different tracks come together in the next few weeks for the final program.

Monday, January 15

1:30-4:30 Bramble ABCs Workshop. Led by Dick Funt, retired OSU Extension specialist—and an experienced commercial bramble grower himself—with Ohio grower Tom Althausser and NABGA Vice President Tom Walters, NW Washington Research & Education Center

Evening: NABGA Executive Council meeting

Tuesday, January 16

9:00 **Raspberry Varieties** - Courtney Weber, Cornell University
Primocane Black Raspberry Breeding - Peter Tallman, independent breeder, Longmont, CO

10:00 **Bramble Diseases** - Mike Ellis, Ohio State University

11:00 **GAPS for Bramble Growers** - Betsy Bihn, National GAPS Coordinator, Cornell University

1:30 **Roundtable Discussion: Organic Bramble Possibilities**

3:00 **Grower Spotlight:** Dean Henry, The Berry Patch Farm, Nevada, IA, and a second grower (still being confirmed)

Evening: NABGA Dinner – an informal opportunity to talk and socialize with others in the bramble community

Wednesday, January 17

8:30 **NABGA Annual Meeting**

Reports on Research- Gina Fernandez, NC State University, Annemiek Schilder, Michigan State University, and Fumio Takeda, USDA-ARS

10:00 **Building Demand: Bramble Industry Promotion-** Henry Bierlink, Washington Red Raspberry Commission

11:00 **Health Benefits of Brambles-** Gary Stoner, OSU Medical Center

12:00 **Post-Harvest Handling for Quality Berries-** presenters TBA

We are also planning a bramble research poster session. Contact Kim Lewers at lewersk@ba.ars.usda.gov if you'd like to submit a poster.

The conference will be at the Greater Columbus Convention Center in downtown Columbus. The Hampton Inn and Suites, the headquarters hotel for the 2007 Growers Congress, is located directly across the street from the conference. A block of rooms has been reserved for participants at a special room rate of \$99/night + tax (standard king or double bed for one person). Call 614-559-2000 or visit their website at www.hamptoninn.com. The Drury Inn and Suites (614-221-7008) and Crowne Plaza (614-461-4100) will also be offering special conference rates.

Information is at www.ohiofruit.org, with more to come – we will also be posting information on our own website. To find out about the Columbus area, visit www.columbusconventions.com. Mark your calendar and plan to register soon!✱

Briefly Speaking..

Ervin Lineberger has give me the opportunity to use this "Briefly Speaking" space this issue, and I welcome the chance to draw your attention to several topics. Recently, I attended the first of four sessions sponsored by NC State University to provide leadership and professional development for the heads of commodity organizations, and it's made me think even more than usual about the effectiveness of the organizations I work with and my role within them.

NABGA faces a big challenge trying to serve a membership and an industry scattered all across the continent. This newsletter is one way we try to connect our members, but I am also very excited about our new Bramble Growers E-Forum on Yahoo.com (see page 5). If you read the discussions on pages 4-5, you'll see how a forum like this can facilitate communication. I encourage all of you to join it and use it.

Membership itself is a challenge. First of all, of course, we need to keep the members we have. NABGA's membership year officially runs October 1 through September 30. (If you join late in the year, I run the membership through the following year.) You can make my life easier, save NABGA postage, and avoid being hounded by me over the next few months, if you fill out the membership renewal form in this newsletter. And you'll see there's a handy place on it where you can give suggestions for what NABGA should be doing. If you don't renew now, I'll send another reminder in your December newsletter, then a couple of increasingly strident notices early next year before I give up on you.

You can also help our membership grow by talking NABGA up to other growers you know or work with –

including those who were members in the past but haven't been in a few years. I'm always glad to send out sample newsletters. And I'm looking into purchasing a tabletop display unit we can ship to members who want something about NABGA to set up at their local meetings. For example, a recent workshop at NABGA president Ervin Lineberger's farm attracted several dozen growers considering commercial blackberry production– a great opportunity for new members.

But it's also exciting being part of a national organization. NABGA leaders and members are very active in the Steering Committee of the National Berry Crops Initiative and we are building some strong coalitions. We have some real opportunities to make a difference in the coming year in issues such as the Farm Bill and immigration reform. The larger and more active our grassroots base, the stronger we are. And we need *more* leaders – consider volunteering, for example, to serve on the Executive Council for your region (representatives for regions 1, 3, 5, and 7 will be voted on in January).

You'll be hearing a lot more about our conference in Columbus – I've been impressed by how many *other* great sessions there will be that our members can attend! And the leadership of the Southeast Regional Fruit and Vegetable Conference, noting the strong response to our meeting there last January, has decided to include bramble sessions again in January, 2007 (see page 3), and has invited us to help plan and participate in the sessions.

I look forward to seeing many of you in Columbus – and Savannah.

—Debby Wechsler, NABGA Executive Secretary

EVENTS

October 20— Cornell University Raspberry High Tunnel Open House, Ithaca, NY, 1-4 pm. For more information contact Cathy Heidenreich at 315-787-2367 or mcm4@cornell.edu.

November 9-11 — Southeast Strawberry Expo, Sunset Beach, NC (near Wilmington, NC). For more information, email ncstrawberry@mindspring.com, visit www.ncstrawberry.com, or call the NC Strawberry Association at 919-542-3687.

December 11-13 —New England Vegetable and Berry Conference. For more information: www.nevbc.org.

January 4-7, 2007 — Southeast Regional Fruit & Vegetable Conference, Savannah, GA. Includes bramble sessions and Blackberry ABCs workshop. This is where our annual meeting was last year;



At Cornell University's Raspberry High Tunnel Open House on Oct. 20, observe raspberries growing and fruiting well past the time when they are normally in season. Meet with researchers, taste fruit, study this new technology and market opportunity, and hear results from this research and demonstration trial.

NABGA is helping plan these sessions. For more information, contact NABGA, visit www.gfvga.org, or call 877-994-3842.

January 16-17, 2007— NABGA's National Bramble Conference, at the Ohio Fruit and Vegetable Congress in

Columbus, OH. See page 1.

February 9-12, 2007 — North American Strawberry Growers Association Annual Conference, Ventura, CA. Contact 613-258-4587, info@nasga.org, or visit www.nasga.org.



Fall Bramble Chores

This list was developed by Dr. Gina Fernandez, Small Fruit Specialist at NC State University and reviewed and revised with the assistance of Dr. Marvin Pritts at Cornell. Chores and timing may be somewhat different in your area or for your cropping system.

Plant growth and development

- Primocanes continue to grow but slow down.
- Flower buds start to form in leaf axils on summer-fruiting types.
- Carbohydrates and nutrients in canes begin to move into the roots.
- Primocane leaves senesce late fall.
- Primocane fruiting types begin to flower in late summer/early fall and fruit matures until frost in fall.

Harvest

- Harvest primocane fruiting raspberries.

Pruning and trellising

- Spent floricanes should be removed as soon as possible.
- Optimal time to prune is after the coldest part of the winter is over. However pruning can start in late fall if plantings are large (late winter for smaller plantings).
- Start trellis repairs after plants have defoliated.

Weed management

Many spring and summer weed problems can be best managed with fall- and winter-applied preemergent herbicides. Determine what weeds have been or could be a problem in your area. Check with your state's agricultural chemical manual and local extension agent for the best labeled chemicals to control these weeds.

Insect and disease scouting

- Continue scouting for insects and diseases and treat with pesticides if necessary (follow recommendations in your state).
- Remove damaged canes from field as soon as possible to lessen the impact of the pest.

Planting

- Growers in southern areas can plant in the fall.
- In cooler areas, prepare list of cultivars for next spring's new plantings. Find the commercial small fruit nursery list at www.smallfruits.org

Nutrient management

- Take soil tests to determine fertility needs for spring plantings.
- If soil is bare, plant an overwintering cover crop (e.g. rye) to build organic matter and slow soil erosion.

Marketing and miscellaneous

- Order containers for next season.
- Make contacts for selling fruit next season.

Request for Proposals

The North American Bramble Growers Research Foundation (NABGRF) is seeking proposals for bramble research for the year 2007. Since 1999, NABGRF has funded a total of 30 proposals, totaling \$58,360.

All bramble proposals will be considered; however, preference will be given to proposals related to:

- cultivar development and testing
- pest management strategies
- cultural management strategies to improve yield, quality and profitability
- identification of beneficial compounds in bramble fruit and their effects on human health

Funding for individual projects is expected to range from \$1,500 to \$3,000. In 2006, NABGRF funded two proposals, for a total of \$5,714 and two through a cooperative arrangement with the IR-4 program, which supplemented NABGA's contribution to provide full funding.

Guidelines and procedures for proposals will soon be posted at www.raspberrylblackberry.com. New this year, NABG-RF request that all proposals be submitted **electronically** through this website. For more information, contact Gina Fernandez, Research Committee chair, at gina_fernandez@ncsu.edu.

Proposals will be reviewed by NABGA's Research Committee at the Association's meeting in Columbus, Ohio in January 2007. Awards will be sent out shortly after the meeting. Deadline for proposals is December 1, 2006. ❖

Savannah Conference Plans Bramble Sessions

Here's how the sessions are shaping up for the bramble track at the Southeast Regional Fruit and Vegetable Conference – it is essentially a NABGA regional meeting. More info will be forthcoming. You can also contact NABGA, visit www.gfvga.org, or call 877-994-3842.

Thursday, January 4-1-4 pm

• **Blackberry ABCs workshop**– the basics for new and novice growers. Presenters will include Dave Lockwood, University of Tennessee; Phil Brannen – UGA; Arlie Powell, Auburn U; Mike Bruorton, SunnyRidge Farm. In the evening there will be a **Bramble**

Grower's Dinner (Dutch Treat).

Friday, January 5, 8-11 am

• **Production Updates**- Double Blossom, Raspberry Crown Borer, Viruses, etc.

• **Building a Dynamic and High Quality Bramble Industry in the Southeast.** *Panelists will include NABGA president Ervin Lineberger.*

• **Post Harvest Handling**

• **Q & A with all speakers**

Participants in a late-August field day for potential bramble growers visit the packing facilities at Ervin Lineberger's farm in Kings Mountain, NC.



Q & A & F

NABGA occasionally gets questions from growers and consumers, sometimes via phone but more often by email. Consumer questions are often entertaining and sometimes very difficult to answer! "Where can I get berries?" "Are moldy berries dangerous?" "What's the difference between the berries in the store and the blackberries I find wild?"

For growers' questions, I usually forward the query to extension specialists in the grower's state, if I know of any, and to others in our network who I think may be able to answer them. I always ask if they are willing for me to share their correspondence with others – the discussions you see here are the result of a "yes" answer. NABGA very much appreciates the help of these and many other experts who take the time to respond to queries, often from growers outside their own state.

—*Debby Wechsler, NABGA Exec. Sec.*

Question from grower Howard Thompson, Thompson Orchard, Joplin, Missouri, in April, 2006:

I could use the help of a more experienced raspberry grower. I am in SW Missouri, which is fungal alley. We are in drought conditions. I irrigated in January and February. My two 240-foot test rows are now three years old. In the rows are Prelude, Brandywine, Estate, Nova, Encore, Dinkin, and Heritage. They were planted on a slight berm. I use lime/sulfur for a dormant spray. I use captan very 2-3 weeks once I get leaves. I have pruned them after fruiting last year and then in late Feb.

I lost all of 60 one-year-old cherry trees last year from what the Fruit Advisor from Missouri State said was likely phytophthora. They know the other fruits well. He has been out to my place for the peach trees and blueberries, but seem to have less experience with brambles or belief that you can grow raspberries in Missouri, which is why I am asking you.

When I initially planted them, I mulched them light with wood chips. Now for various reasons there is some bare soil showing through. What I have

read is to mulch just the first year. Am I crazy to consider remulching these rows with an inch or two of 5-year-old sawdust mixed with a little white rock?

Answer from Mike Ellis, Ohio State University Extension Plant Pathologist:

On red raspberries, Phytophthora root rot is a very serious problem. It results largely from the ground being saturated with water. Thus site selection and anything to improve drainage is very important for control. On red raspberries, Mulch can keep the ground wet and this can lead to root rot. In dry years and maybe in the first year of establishment, it is beneficial for maintaining a good level of water, in wet years it may be the kiss of death. Dr. Wayne Wilcox has done a great deal of work with this disease. He has used straw mulch to help induce root rot in some of his trials. In general I do not recommend it on established raspberries for this reason.

The best situation is planting on a ridge with trickle irrigation. In this case you do not need mulch. If you are in a drought, it may be helpful to retain water, but when the rains come, it may be a problem. A two inch layer of saw dust sounds like a bit much for brambles. On black raspberries and blackberries, Phytophthora is not as serious as on reds, but I still question the need for mulch unless you are in a drought.

Answer from Phillip Brannen, Extension Plant Pathologist, University of Georgia:

I would easily defer to others, since the mulching area is not my area of expertise, especially relative to raspberries. However, I would be a little concerned about using sawdust; I think I would prefer a mulch which would drain better. I would also be concerned about a two inch layer of sawdust, since this might act as a barrier to oxygen exchange etc. when wet. I guess it really depends on whether you mean true, fine sawdust or wood chips?

Followup from Howard Thompson, in September, 2006:

Earlier this year I contacted the group about remulching my red raspberry test rows in light of the drought which now

down to dirt. I got back several responses back including one from Dr Ellis at Ohio State. I followed the general consensus of not remulching. We got good rain in the spring which stopped around 4 July as usual. The spring berries (Prelude and Nova) were fine. Even with weekly irrigation (drip irrigations) once a week, my late summer berries (Prelude, Dinkin, Heritage) were smaller than peas. They were not worth picking. The Dinkin essential failed to fruit. About two weeks ago we got 1.3" of rain over 2-3 days. About a week later the quality of the berries was up. I now had nickel to quarter sized berries. It is now two weeks from the rain and the quality is still acceptable but getting smaller. I have read that drip irrigation cannot make-up for a loss. This uncontrolled experiment confirms that statement. According to the pressures and flow rated, I only needed to irrigated 8-10 hours to get an inch of water. I was running the system for 12-24 hours once a week. The observation here would suggest: 1) additional mulch just like the blueberries, 2) change to twice weekly watering during the bearing season and 3) there is a one-week delay between water and fruit production. You can share this with the group. Any feedback would be appreciated.

Question from Cal Blake, Caludi's Fields, Lexington, KY, in August, 2006:

I need to find a source for V/Y trellises for blackberries/ raspberries before it's too late for next year. It's somewhat difficult learning as you go, particularly in Kentucky, where the current emphasis seems to be on growing crops that need at least 40-50 acres or on agritourism or vineyards, or a combination thereof. If there are any vendors close to Lexington, KY, they would obviously be my first choice as Judi and I would prefer to pick them up to avoid the shipping costs. The *The Strawberry Grower* [newsletter of the NC Strawberry Association] and *The Bramble* have been our primary sources of reference for our berry crops. We had 400 row feet of Apache blackberries this year and picked a little over 700 pints and sold them all for \$4 a pint. I'd be interested in any statistics you have with regard to prices

Join the Conversation! NABGA's New E-Forum

By Debby Wechsler, NABGA Executive Secretary

It's clear to me, from emails like these and discussions with growers, that many bramble growers are eager for information and the chance to learn from each others' experiences. So, to take advantage of modern technology to make this really easy to do, I've just set up a Yahoo e-mail forum for members of NABGA. I recently joined one of these myself to get information and support for a health issue in our family, and it's been extremely helpful. I think ours will be, too.

This e-mail forum is different from the occasional email alerts and reminders I send out from the NABGA office to all members for whom I have emails. **You have to actively join.** It takes just a few minutes of your time. Only NABGA members will be able to join.

Here's how:

1. Go to the website <http://tech.groups.yahoo.com/group/NorthAmericanBrambleGrowers/>
2. If you do not already have a Yahoo account, follow the steps to create one. You can use your own name or create an alias. You do not have to fill out any info except to create an email address and a password. If you have a different email address already that you check regularly, list it as your primary alternate address.
3. Then, to join the group, you will be asked to:
 - A. Verify contact information—your Yahoo name and email preference. Click on your other email address if you don't want to bother with the Yahoo one.
 - B. Write a brief comment telling me about yourself and why you want to join the group. All I need is your name/farm name/address—enough so I can tell who you are and determine whether you are a member.
 - C. Decide how you want messages delivered. You have the choice of getting each individual email that is sent, a daily digest of all messages that day, special notices only, or just checking the website for messages. I recommend choosing either the first or second option (I do the daily digest with my other group). You can change these preferences at any time.
 - D. Select a display preference. Unless your computer system is very old or your internet connection is horribly slow, choose the "enhanced" option. Works for me.

Once this is done, I will get a message you've applied to join, and if you are a member, your membership will be approved and you'll get a notice via email.

It's a bit hard for me to re-create the steps, since I'm group administrator, so let me know if you have problems. While navigating the group website is a bit confusing, I assure you that reading and responding to the emails themselves is easy – and I think you that you will find it both interesting and useful.

in other areas. The berries were huge and the taste was great. If we'd put up trellises last year we'd have had another 200 pints. Thanks for your help.

Answer from Charlie O'Dell, grower and retired Virginia Tech extension horticulture specialist:

I too started from scratch on Arkansas type blackberries a few years ago, having spent so many years zeroed in on strawberries. I first visited some other good

growers to see how they trellised theirs. I learned so much from a visit to Ervin Lineberger's blackberries, I adopted his trellis system: I used 7' steel T posts set on a slight V angle on each side of each row about 2.5 feet apart, placed every 25 feet going down each row. At every other set of posts in each row, I ran a brace wire across from the top of one post to its mate on the other side of that row. I used Tractor Supply Co. #9 galvanized wire to

run the top two horizontal wires, one at about 5.5' ht. and one about 3' ht down each line of posts, then heavy plastic orange baler twine on a bottom line about 1.5' above ground. I used vineyard ground screw anchors, one at each end of the rows, running #9 wire from the eye bolt to the top of the posts to keep lines taut and help prevent sag when loaded with canes loaded up with fruit. On some rows I used all heavy plastic orange twine (Southern States brand), and like it better than the wires, as I can take it down to prune out old canes! The ground or earth anchors were ordered from a Vineyard Supply Company, sorry I don't remember their address, this was several years ago.

Debby, you might consider publishing our replies in NABGA, it would be helpful to many other new growers. I give much credit to Ervin Lineberger for sharing his good info with me and helping me get started off on the right foot. Hey, I like that \$4/ pint price! Makes my 1.74/pint U-Pick look too cheap. I think I should definitely go to \$2/pint next year!

Followup from Debby Wechsler, NABGA: Here are results of a quick web search for "vineyard supply company":

- Oregon Vineyard Supply Co., 2700 St. Joseph Road, McMinnville, OR 97128, (503) 435-2700

- Midwest Vineyard Supply, Inc., 2300 S Twin Bridge Road, Decatur, IL 62521, (217) 864-9896, sales@midwestvineyardsupply.com, www.midwestvineyardsupply.com/

- Jim's Supply Co., PO Box 668, Bakersfield, CA 93302, 800-423-8016 www.jimssupply.com/vineyardhome.htm

Once the email forum gets going, I'll continue to pull interesting topics for publishing in the newsletter for the benefit of those who don't do email (and there are many such folks, including my own husband), if I can figure out who they are from and obtain permission.



GROWER PROFILE

Larriland Farm

Larriland Farm is a large and thriving PYO operation in the Baltimore-Washington area—and the home of NABGA members Lynn, Guy, and Fenby Moore. Guy serves on the NABGA Executive Council and Lynn serves on the NABG RF Research Committee.

Their parents, Larry and Polly Moore, started the farm. Before 1963, Larry had a dairy farm at another location. (The farm's name comes from the dairy: Each dairy herd required a prefix to the cow's name to identify the herd and its bloodlines. The prefix that he chose was Larri-, hence, the name Larriland Farm (pronounced Larry land). In 1963, Larry sold the dairy farm, moved to this Howard County location, and began growing agronomic crops such as soybeans, alfalfa, and wheat. He then grew turf, but after several years in the turf business, he began looking for other options because he felt that turf depleted the soil too much. About this time, his children expressed an interest in farming (according to their website, "having been brainwashed for the prior 15 years to consider this option").

In 1973, the Moores harvested their first acre of strawberries. In that same year, they planted peach and apple trees. Today Larriland grows 14 acres of strawberries, 2 acres of tart cherries, ½ acre of sweet cherries, 1½ acres of black raspberries, 3 acres of red raspberries, ¼ acre of purple raspberries, 5 acres of blueberries, 1½ acres of thornless blackberries, 14 acres of peaches, ½ acre of nectarines, 16 acres of apples and 15-20 acres of vegetables including spinach, beets, tomatoes, broccoli, and pumpkins.

Three of Larry and Polly Moore's four children work on the farm. Lynn, the second oldest daughter, is the president of Larriland Farm and overall manager. Guy is responsible for production. Fenby, says Guy, "is the finance guru, but we all do some of everything." Their older sister, Nancy, lives on the farm but is not involved in the operation. Their parents, now in their early 80s, are both still active in the farm.



The Moore family works together to make Larriland Farm a success. From left: Lynn, Guy, Polly, Larry, Fenby, and Nancy Moore.

Located about 30 miles west of Baltimore and about 40 miles northwest of Washington, DC, Larriland draws customers from both metropolitan areas, mostly well-off suburbanites. "It's a fairly mobile community with lots of new families and new developments for potential customers," says Lynn Moore. "Typical customers are young families with children." Though another large direct-market farm, Butlers' Orchard, is only 7 or 8 miles away, the area supports them both comfortably. Larriland does some advertising in local newspapers and family magazines and started an email newsletter a couple of years ago. "I've done some radio ads, the last ones two years ago, but we are only on TV if we make the news," comments Lynn.

Almost all the crops are sold PYO. An on-farm retail market in a converted barn sells some ready-picked crops, mostly to an older clientele, and carries a range of pickles, jams, crafts, and similar products not produced at the farm. The farm opens with strawberries in late May and runs through October, with October by far the most profitable month. On October weekends, the farm offers a hayride, which is a 20-minute excursion circling the farm, and a straw maze, built with over 1,000 straw bales. Part of the market barn also gets decked out as a scary "Boo Barn" in October. During the week, they

schedule school groups, mostly kindergarten, first grade, and daycares. These pay around \$6/child for a hayride and the opportunity to pick "as large a pumpkin as they can carry out of the field."

An average of 30 employees work on the farm. The farm hires mostly local high school and college students, but labor can be a big problem in the fall when these workers go back to school. "We're usually desperate for help at this time of year," says Guy in mid-September, "but we've been blessed: four adults just came up and applied to work!"

Bramble crops at Larriland begin with a spring crop of the florican variety Estes in early June. Primocane varieties start mid-August and pick until mid October. Guy notes, "The primocane varieties—especially Caroline—are very popular. Chester blackberries are also popular. We plant the tomatoes next to the blackberries so the customers can pick them at the same time." Raspberries sell for \$3.99/lb. PYO, discounted to \$2.99/lb. for over 5 pounds. When picking is good it's not unusual for customers to pick more than 5 pounds. Blackberries sell for \$2.25/lb.; over 10 pounds, they are \$1.99/lb.

"The University of Maryland has been instrumental in helping select varieties for our new bramble plantings," says Guy. "We just made a new 2-acre

planting last spring of Jaclyn, Caroline, and Ann (yellow raspberry).” For this planting, he used dormant, nursery-matured root cuttings rather than tissue-cultured plugs, and has been pleased with the results. “They were more trouble to put in, since we had to do it by hand and couldn’t use a planter, but they sent out suckers right away. They have a small crop already this fall, and should bear heavily next year. I figure I’ve gained a year or year and a half of production. We’ll be planting a block of Josephine this spring—I couldn’t get the plants when I got the others.”

Development has mostly been kind to Larriland, providing customers and workers, but it does create some problems as well. While the farmland itself is protected by an agricultural easement, taxes on their individual homes have gone up by 250 percent in the last five years. Lynn is also very concerned about the two-lane road that passes through the farm. Officially a 45 mph highway, it’s now being used by commuters racing by at 60 mph or more. “People pull out and go around tractors without even looking,” says Lynn, “and I’ve got customers who have to travel on it to get from one part of the farm to another. They’re on vacation, they’re relaxed, and they’re only going a short ways, so they may be only going 30 mph. I can see it becoming a big concern, and I don’t know what to do about it.”

Another big concern of Lynn’s is soil compaction. “I think PYO is extremely hard on the soil. It takes a lot of custom-



Though the resolution of this photo isn’t very good, it gives a good idea of the Larriland Farm market barn.

ers to sell PYO. If it rains on Friday and is sunny on Saturday, they still come, even though the ground is wet. We have a fairly heavy soil, and the worst thing we can do is to be on it when it is wet. We can mulch, and we do mulch the strawberries, but mulching is expensive and really just keeps the ground wet longer. The compaction makes it hard to keep using some fields; the productivity goes down. We put in cover crops for 2-3 years, but the soil doesn’t come back. It takes decades to correct the problem. We’ve been working on this for 10-15 years, but we’re not making headway.” Lynn has put a lot of effort into trying to find answers to this question, but is still looking.

And what is the future? The current managing generation, Lynn, Guy, and Fenby, now in their 40s and 50s, hope

that their children, now ages 9 to 15, will want to continue this family tradition, but they don’t expect the kids to know what they want to do until they are in their mid 20s. In the meantime, they work to keep the farm profitable, to keep the land together, to keep the land healthy, to keep the crops growing and the customers coming. ✨

For more information about Larriland Farm, visit www.pickyourown.com.

A Recipe from Larriland – Blackberry Flummery

Guy Moore says he grew up eating this dish, which he calls “blackberry mush.” It can be made with either fresh or frozen blackberries.

- 1 quart blackberries
- 1/2 cup hot water
- 3 Tbsps. cold water
- Dash of salt
- Dash of cinnamon
- 2 Tbsps. cornstarch
- 1 to 1-1/2 cups sugar (adjust sugar to taste)

Wash and pick over berries, discarding any imperfect ones. Combine berries, water, sugar, salt and cinnamon in a saucepan. Bring to a boil, stirring well. Reduce heat and simmer gently about 5 to 8 minutes. Add 3 tablespoons cold water to cornstarch to make a smooth paste. Blend into hot cooking berries. Stir constantly until slightly thick and translucent in color, about 2 to 3 minutes. Serve cold with milk for breakfast or with whipped cream for dessert.



Worldwide Production of Blackberries

Continued from front page

the trailing blackberry crop in Oregon and California, respectively, was processed in 1990. Over 80% of the production from the 135 acres of erect and semi-erect blackberries in northwestern USA was marketed fresh in 1990 (Strik, 1992).

In the 1990s, blackberries were not found on grocery store shelves in the eastern USA, and only rarely in the western USA (Clark, 2005). Late in the 1990s, 'Chester Thornless' became a major shipping blackberry, as it was found to have good fruit firmness. 'Navaho', from the University of Arkansas, was found to have excellent shelf-life and could be shipped. These and other cultivars contributed to a major shift in the production outlook for shipping of blackberries from that of a local-marketed crop to one shipped for retail marketing (Clark, 2005).

In the mid to late 1990s, the shipping of blackberries from Chile, Guatemala, and Mexico into the USA provided fresh

blackberries during the "off-season" autumn, winter, and spring months and increased consumer awareness of this berry crop and consequently increased sales of USA produced fruit in the "on" season also. Production of blackberries was apparently on the increase worldwide; however, there was relatively little factual information on area planted, cultivars grown, and most common production systems.

Our findings

In 2005, there were an estimated 49,507 acres of blackberries planted and commercially cultivated worldwide, a 45% increase from estimated area in 1995 (Figure 1, page 8). Wild blackberries still make a significant contribution to worldwide production and although accurate data are hard to obtain, survey respondents estimated that 8,895 acres of wild blackberry (*R. glaucus* Benth.) in Ecuador, 5,930 acres in Romania (*R. armeniacus* Focke, *R. laciniatus* Willd), 4,942 acres in Chile (derived from introduced *R. ulmifolius* Schott), a small area of unknown size in Mexico, and 245 acres of planted *R.*

glaucus in Venezuela were harvested in 2005. The 19,770 acres of wild blackberries harvested in 2005 had a total reported production of 14,837 tons. In some regions like the Pacific Northwest, the fruit harvested from wild blackberries, even though for personal use, may negatively impact sales of commercially grown fruit.

Worldwide blackberry production was 154,603 tons in 2005, not including the wild production mentioned above. In the following sections, we will provide more information on blackberry area and cultivars grown in the major producing regions of the world. We will include little information on production in countries with less than 250 acres planted.

Europe

There were 19,007 acres of commercially cultivated blackberries in Europe in 2005. Serbia accounted for 69% (13,096 a) of the blackberry area in Europe and had the greatest area in the world. Serbia produced 27,557 tons, the fourth highest production in the world (Figure 2, page 9), with 90% of their production pro-

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cessed and exported. Only semi-erect blackberry types were grown in Serbia with the predominant cultivars being 'Thornfree', 'Dirksen Thornless', and 'Smoothstem' that produce in July and August. 'Eaèanska Bestrna', a new cultivar from the Investigation, Production, and Trade Center of Horticulture, Cacak that produces as high as 20 tons/acre and 22 g fruit is being widely planted. Plants are generally established at an in-row spacing of 3 to 4.5' with 8 to 10' between rows. Winter cold injury is considered one of the biggest production issues.

Hungary was the next largest producer in Europe with 3,950 acres or 21% of the total area and 13,227 tons. 'Loch Ness' accounted for 75% of the blackberry area and 90% of the total production was processed and exported. Countries in Europe with 250 acres or more were the United Kingdom, Romania, Poland, (250 a each), Germany (270 a), and Croatia (445 a). In the United Kingdom and Germany, most of their production is for fresh, domestic use. In Germany and Romania, 'Loch Ness' is the main cultivar. Area in Poland has doubled in the last ten years. There were 550 tons produced in 2005 with 80% processed. Most of this was exported as was most of their fresh production. 'Gazda', from the Institute of Pomology and Floriculture in Skierniewice, Poland, accounted for 80% of the area planted in Poland. Typical yields are 2 to 3.5 tons/a.

North America

There were 17,690 acres of commercially

cultivated blackberries in North America in 2005.

USA: The USA accounted for 67% of the area planted to blackberries in North America in 2005 with 11,905 acres, the second highest in the world (Fig. 1). Area planted in the USA increased 28% from 1995 to 2005. The USA had the highest production, 35,099 tons, in the world in 2005.

Sixty-five percent of the blackberries cultivated in the USA were planted in Oregon in 2005, 7,755 acres. Area in this state increased 25% from 1995 to 2005. Over 95% of the total production of 25,185 tons was processed with the remaining marketed fresh, all for domestic use.

Most (95%) of the blackberries in Oregon are trailing types, particularly the cultivars Marion (61%), Boysen (15%), Thornless Evergreen (11%), and Silvan (7%). However, in 2004 and 2005, plant sales of the new thornless 'Black Diamond' were greater than all other cultivars. An estimated 310 acres of semi-erect types were present in Oregon in 2005, mainly 'Chester Thornless' (82%). Only 1% of the blackberries in Oregon are erect types, mainly 'Cherokee' (63%) and 'Navaho' (30%).

The next largest blackberry producing state in the USA is California with 700 acres and 2,600 tons in 2005. The fruiting season is from mid-May through August. Over half of the area is planted to semi-erect cultivar, 'Chester Thornless' and proprietary cultivars. The production of 'Boysen' for processing in the central valley of California has declined steadily, as predicted (Strik,

1992), to only 100 acres. Most of the blackberry production in California is now located on the north-central coast and has a fresh market focus. There is no public breeding program for blackberries in California and little public research. Two private breeding companies, Driscoll Strawberry Associates Inc. and Plant Sciences International, have blackberry breeding programs. In California, a continued decline is expected in area of 'Boysen' planted in the Central Valley in contrast to a 33% increase in area planted in the coastal area in the next 10 years.

Texas reported 680 acres and 800 tons in 2005. Only erect blackberries are planted with 'Kiowa', 'Brazos', and 'Roseborough' accounting for 85% of the area. Only 10% of the production is processed with 40% sold on-farm and 50% marketed to domestic, USA markets in the months of May-July.

Arkansas had 600 acres and about 1,543 tons of production, a 60% increase in planted area from 1995. A broad range of erect types are being grown including 'Arapaho', 'Navaho', 'Ouachita', 'Apache', 'Chickasaw', and 'Kiowa'. Eighty percent of their production is marketed fresh and the rest is sold on-farm from 20 May to 20 July. Area in Arkansas is projected to grow to 1000 acres by 2015.

Area in Georgia has tripled in the last 10 years to 315 acres. However, growth projections for the next ten years were cautious as Mexico may be a large competitor for their fresh market season. Mainly erect types are grown in Georgia with 'Arapaho' and 'Navaho' accounting

Continued on next page

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Worldwide Production of Blackberries

Continued from previous page for 60% of the area planted.

In the USA, other than the aforementioned five states, four states reported from 125 to 250 acres planted in 2005 (North Carolina, Ohio, Virginia, Washington). An additional 26 states reported from 5 to 125 acres of blackberries. Of note is Washington State which had less than 125 acres in 1995, but has doubled in area presently and is projected to grow to 345 acres by 2015.

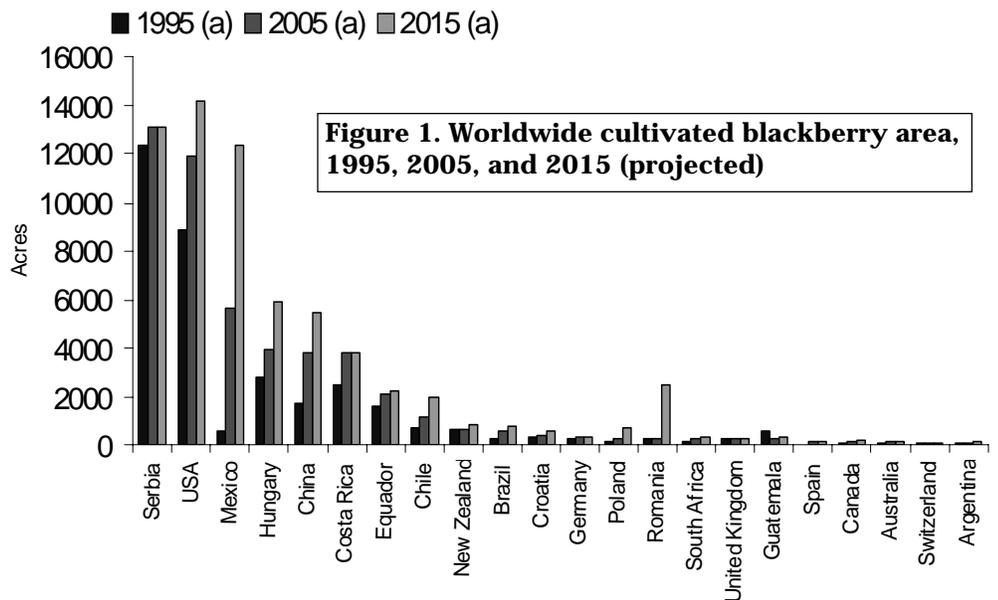
Mexico: Mexico accounted for 32% of the planted area in North America in 2005 with 5,683 acres. Blackberry production in this country increased from 568 acres in 1995 and is projected to grow to at least 12,355 acres by 2015. About 93% of the area was planted in the State of Michoacan in 2005. There was also some production in the State of Jalisco and a new planting of semi-erect types in Chihuahua. The predominant type of blackberry grown was erect, particularly ‘Brazos’ and ‘Tupy’ (from Brazil) with relatively little (5%) semi-erect types, mainly proprietary cultivars, grown. Most of the Mexican production targets fresh export markets to the USA. In 2004, Mexico exported 8,245 tons to the USA, more than double their export volume in 2002.

Central America

There were 4,053 acres of commercially cultivated blackberries in Central America in 2005 with 1,752 tons produced (Table 1). The two countries that reported commercial production were Costa Rica and Guatemala.

There were 3,830 acres of blackberries (mainly ‘Brazos’ and *R. glaucus*) in Costa Rica located predominantly in the provinces of Cartago and San José. Most grow *R. glaucus* like a shrub without a trellis in organic production systems. Of the 1,653 tons produced in 2005 less than 15% was exported. Presently most is used for local processed and fresh consumption.

Of note, is that the blackberry area in Guatemala declined 63% from 1995 to 222 acres in 2005, but is expected to increase 33% in the next ten years (Table



2), provided this country can compete with Mexican production. Guatemala is the main country in Central America that ships fresh blackberries to the USA. There were no research programs on blackberry reported in Central America.

South America

There were 3,946 acres of commercially cultivated blackberries in South America in 2005 (Table 1).

Ecuador accounted for 53% of the planted area in South America with 2,100 acres. ‘Brazos’ and *R. glaucus* are the main types planted in organic production systems with an average yield of 7 and 1 ton/acre, respectively. There was an estimated 30% growth in planted area from 1995 to 2005, but little growth is projected for the next ten years. Only 15% of their estimated 1,421 tons of production are exported for fresh market, mainly due to the soft fruit of *R. glaucus* and the Mediterranean fruit fly (*Ceratitis capitata* Wiedemann).

Chile had 1,111 acres of commercial blackberries in 2005 with a total production of 4,275 tons not including the 6,393 tons harvested from wild plantings and exported as a processed product. Area planted increased 50% from 1995 to 2005 and is projected to be 1,975 acres in 2015, provided competition from Mexico in the fresh market does not adversely affect cost of production and competitiveness in the processed portion of the industry. In 2004, Chile exported 10,670 tons of

processed fruit (55 to 65% was harvested from introduced wild species) and 210 tons of fresh fruit. Their fruiting season is from November to March using trailing, erect, and semi-erect cultivars. Production systems are similar to those in the USA.

Brazil had 617 acres and 860 tons of production in 2005 with only 15% exported. All of their area is planted to erect blackberries, mainly ‘Tupy’ and ‘Guarani’ from the Embrapa Clima Temperado Research Center, Pelotas. Most of the production is processed for domestic use.

No other countries in South America reported more than 250 acres of area planted (Table 2). There was very little blackberry research reported other than the breeding program in Brazil and cultivar trials in Chile in 2005.

Asia

China accounted for all of the production in Asia with 3,830 acres in 2005 (Table 1). Over 90% of the area was planted to semi-erect blackberry, mainly seedlings of ‘Hull Thornless’ and ‘Chester Thornless’. The remaining area was planted to ‘Shawnee’ and the trailing ‘Boysen’, ‘Marion’, and ‘Siskiyou’. Most of China’s production is in the Jiangsu Province, but the newest regions, in the Liaoning, Shandong, and Hebei Provinces, are projected to grow most in the next ten years when China is expected to have 5,436 acres. In most fields, the planting density is very high with 1’

between plants and 3' between rows. Fields are commonly flood irrigated. Average yield is 3 to 17 tons/acre with all fruit hand picked at a cost of about \$0.10 per pound. In all production regions, except Nanjing Province, canes are buried in winter to avoid cold injury. Most of the production in China is processed with 70% of processed fruit and 10% of their fresh production exported.

Oceania

Most of the blackberry area in Oceania is planted in New Zealand which had 640 acres and 3,690 tons in 2005. Area in Oceania is projected to grow by about 35% in 10 years. The fruiting season in New Zealand is from November through April with almost all of their blackberry production consisting of trailing types, mainly 'Boysen'. Almost all of their production is processed with 55% of that exported. There is a strong, active breeding program along with supporting pathology and horticulture research programs conducted by New Zealand HortResearch Inc.

Africa

South Africa was the only country in 2005 reporting commercial blackberry production with 247 acres. About 60% of their area was planted to 'Young' trailing blackberry that was all processed and 60% exported. 'Hull Thornless', 'Loch Ness', 'Choctaw' and 'Arapaho' were grown also with 50% of their production being marketed fresh. However, no fresh fruit were exported due to distance to

major markets of Europe. They report problems with plant importation due to phytosanitary restrictions and the need for cultivars that are firmer for long-distance shipping. They will try to produce the new primocane-fruiting types in South Africa.

Organic production

There were 6,246 acres of organic blackberry production reported in the world in 2005: 3,830 acres in Costa Rica, 2,206 acres in South America (most in Ecuador), 180 acres in North America (most in the USA), and 27 acres in Europe.

Tunnels

Use of tunnel production was reported on 778 acres worldwide with tunnels mostly being used to protect against adverse weather (370 a in Mexico; 50 a in Oregon and 30 a in Washington, USA). Tunnels or greenhouses to advance or delay the fruiting season in addition to protection against the elements were used in Spain (123 a), The Netherlands and Italy (50 a each), Romania (25 a), and South Africa (25 a). The use of tunnels is expected to increase, particularly in Mexico and Oregon and Washington, USA.

Cultivars

Respondents reported the cultivars grown on 38,083 acres of the 49,507 acres of blackberries grown worldwide. On this reported area, 50% of the cultivars were semi-erect, 25% erect, and 25% trailing types in 2005. 'Thornfree', 'Loch Ness', and 'Chester Thornless' accounted for

58% of the semi-erect blackberry area and 'Dirksen Thornless', 'Hull Thornless', and 'Smoothstem' for 28%. The only other cultivar grown on more than 5% of the worldwide semi-erect area was 'Eaèanska Bestrna'.

'Brazos' was by far the most common erect blackberry grown worldwide accounting for 46% of the erect area. However, 'Brazos' is being rapidly being replaced by 'Tupy' in Mexico. Other cultivars accounting for 5% or more of the erect area planted were 'Tupy' (18%), 'Navaho' (9%), 'Kiowa' (5%), and 'Cherokee' (5%). 'Marion' is the most important trailing blackberry grown accounting for 51% of the worldwide area of trailing types; more than 90% of the worldwide 'Marion' area is located in Oregon, USA. 'Boysen' accounted for 24%, 'Thornless Evergreen' 9%, and 'Silvan' 5% of the worldwide area of trailing blackberry.

Conclusions

Worldwide blackberry area increased from 34,490 acres in 1995 to 49,507 acres in 2005, a 44% increase. Most of growth in the last ten years occurred in Mexico, the USA, China, and Costa Rica (Fig. 1). Projections for the greatest growth in the next ten years are in Romania (900%), Poland (200%), Mexico (117%), Chile (76%), Hungary (50%), China (42%), and the USA (20%). Based on this survey, there may be 66,797 acres of commercial blackberries worldwide, not including production from harvested wild plants, in 2015.✪

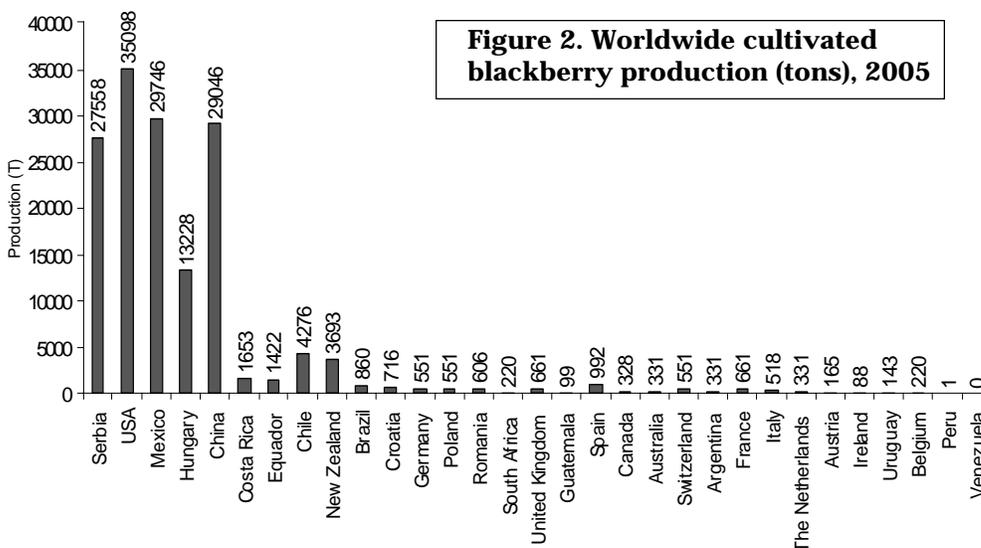
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Many thanks to the Small Fruit Update (see www.nwipm.com) for bringing our attention to this article and to Bernadette Strik for providing it. To see a version of this article with all charts, figures, and acknowledgements, visit <http://berrygrape.oregonstate.edu/fruitgrowing/berrycrops/blackberryworldwide.pdf>.



Welcome, New Members!

Please welcome the members listed below, who have joined NABGA since the last newsletter. You may want to clip or photocopy the list and fasten it into your membership directory. A complete and up-to-date membership list can also be found in the Members Only section of our website.

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Interest in berries grows in California

June 29, 2006 9:50 AM

Excerpted from an article published in the online edition of Western Fruit Grower on June 29, 2006.

Despite their healthfulness, the cost of berries, relative to other fruits and vegetables, may deter some consumers.

"The average person won't pay \$3.50 for a small box of berries," said University of Arkansas fruit breeder John Clark at a recent California blueberry meeting.

However, he noted, many people seem to be willing to spend \$3.50 on a pack of cigarettes or a box of cookies.

"The percentage of people with low incomes who eat berries will increase when they become more educated about the product," Clark said.

California growers are counting on consumers to buy an even more, pricy product. They are aiming to harvest their berries when fruit from other parts of the country – where the bulk of U.S. berries are grown – are not available. Through the winter months, 4.4-ounce containers

of berries grown at mild Central Coast and Southern California farms fetch \$6 or \$7 at supermarkets and \$4 to \$5 at farmers' markets, according to Santa Barbara small-farm advisor Mark Gaskell.

"Wholesale prices for organic blueberries have not been below \$30 since October and are now \$47 (for a 3.5-pound flat)," Gaskell said. "And the buyers just say 'more.'"

In 1980, Americans on average ate less than a fifth of a pound of blueberries each. By 2004, their consumption had grown to half a pound, according to the USDA Economic Research Service. Strawberry consumption has skyrocketed from less than two pounds per person per year in 1980 to nearly five and a half pounds in 2004. (Berry consumption is still very low compared to many fruits, such as apples at 43 pounds per person per year, and oranges at 90 pounds per person per year.)*

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Insect Visitors to Late Season Berries

By Doug Pfeiffer, Dept. of Entomology, Virginia Tech

Now is the time of the season when primocane-bearing raspberries and blackberries are yielding their fruit. As we collect our fruit at Kentland Farm in support of our Southern Region Small Fruit Consortium project on fall bearing brambles, we encounter a wide range of insects visiting these berries, some of which I'll review here.

Japanese beetle and green June beetle Japanese beetle and green June beetle have mostly tapered off, though there are still a few of each on our plants. Early in the primocane fruiting cycle, these two scarabs were the most common fruit feeders, and have been the cause for most grower concern because of the relatively long Preharvest Intervals (PHIs) of insecticides that are effective (and the main targets of our project). Both species were more common on raspberries than blackberries, possibly because of an inherent preference for one over the other, but possibly also because raspberry fruit developed before the blackberries. These species feed on foliage of brambles, but the economic impact comes from the adult beetles feeding on ripe berries. The 2006 season was a serious one for Japanese beetle, not only on brambles but on other crops as well, such as grapevines. In 1972, a USDA entomologist published an excellent monograph on the Japanese beetle. In this manual, he



Green June beetle

proposed a rule of thumb concerning the requirements for adequate rainfall. Japanese beetle, like many scarabs, lays eggs that are poor at maintaining moisture levels. Consequently, if soils are too dry, many eggs desiccate, and lower populations of adult Japanese beetles are present in the following year. The rule of thumb was a total of 10 inches of rain during June, July and August. This rule apparently needs some adjusting at least for some locales. In 2005, the total rainfall for this period around Winchester was about 6 inches; nevertheless, there were plenty of Japanese beetles to go around! This may be partly influenced by terrain, since low areas will always tend to have more soil moisture, and ovipositing females will tend to seek out areas with adequate moisture.

Wasps As the two fruit-feeding scarabs have declined, wasps have replaced them as the more common insects on berries (except for flies). One of the more common is the European hornet, *Vespa crabro*. This large wasp was introduced years ago and has spread so that it is established in many of the eastern states. It can be recognized by its large size, brown coloration, and the characteristic patterning in the yellow stripes on the abdomen. Despite their imposing appearance, European hornets are less aggressive than yellowjackets, and normally sting only when the nest is threatened. However, if grabbed along with a ripe berry, a sting may be likely. Hornets nest in tree cavities and, like yellowjackets, predatory.

Paper wasps create the open-faced paper nests commonly seen under the eaves of houses and other structures. While predatory for most of the season, they are also commonly seen feeding on ripe caneberries. The European hornet, paper wasps and yellowjackets all are social insects, creating colonies that last for a single season. Fertilized females overwinter.

Lady beetles are widely recognized as beneficial insects, feeding on a wide variety of soft-bodied insects in both their adult and larval forms. The newest member of the coccinellid community is the Multicolored Asian lady beetle, *Harmonia axyridis*. An introduced species, it



European hornet

has become abundant and widespread, sometimes the most common lady beetle found. It has aroused concern for two reasons. In the fall, it may aggregate by the hundreds or thousands in houses as it seeks protected places in which to overwinter. This is compounded by their tendency to leak orange blood (hemolymph) when threatened, possibly staining walls if brushed off the surface. More central to this article, however, are the reports of this species also feeding on soft-bodied fruits, like raspberries and caneberries. While this will bear watching in the future, in our caneberry planting near Blacksburg, MALB numbers do not seem very common this season. Other lady beetles, apparently more strictly predatory, such as the convergent lady beetle, are also commonly seen at Kentland Farm.

Scorpionflies have been seen visiting the brambles at Kentland, occasionally on berries. Their net role is uncertain; these insects (not really flies, despite the name) have a mixed diet, feeding on other insects, as well as fruit material and decaying animal matter. The insect shown on page 15 is a male, indicated by the tail resembling the sting of a scorpion. These are completely harmless. Females have a tapering abdomen.

continued on page 15



Multicolored Asian lady beetle

Development of a simple system for blackberry shelf life evaluation

By Penelope Perkins-Veazie, USDA, ARS, SCARL, Lane, OK and John Clark, U. of Arkansas, Fayetteville, AR

This is the second year of a study to evaluate storage methods for quick evaluation of relative shelf life of blackberry selections. The harvest season of 2005 was unusually dry in Clarksville, AR, so overall scores were high for all selections.

Blackberries of named selections, selections with observed attributes (firmness), and new selections from Dr. Clark's breeding program were harvested at weekly intervals from June 8 to June 27 (a total of 4 harvests). Fruit were harvested directly into 1/2 pint polystyrene clamshells and held on ice (at 5 to 10C) until arrival at Lane by car. Fruit were placed at 41 F for 7 days or at 68 F for 1 day then rated for the presence/absence of decay, leak, red drupelets, and degree of softness (1=firm; 5=mush). Additionally, subsamples of berries free of injury or decay and firm were placed on paper towels in surface-sterilized egg cartons and held at 100% RH at 72 F for 2 days to stimulate fungal growth. Fungi were identified by Dr. Vince Russo, a plant pathologist at Lane, OK.

Comparison of storage temperatures

Humidity at 68 F was increased to 90% in 2005 by using a room sized humidifier. By reducing storage time and increasing humidity, berries held at 68 vs 41 F were more similar in ratings than in 2004 (Table 1). So, if it is simpler to hold fruit at in a highly humidified closed room overnight than for a week at 41 F, this system may work well for grower evaluation of fruit quality.

We had hoped to hold berries at 41 F under high (95+) relative humidity in 2005 to further test shelf life. While humidity could be increased to 90% effectively at 68 F by using an inexpen-

Table 1. Comparison of berry shelf life at 68 F (90% RH) vs 41 F (90% RH) (all selections).

	Storage temperature										
	41		68		41		68		41		68
Year	% marketable		%Decayed		% Leaky		% Soft		Weight loss		
2004	69	56	35	56	40	57	18	18	1.5	3.9	
2005	87	81	35	20	11	21	14	15	2.1	1.1	
Significance between temperatures for both years, P<0.05, except for % soft in 2004 and 2005											

Table 2. Performance of some selections at 90% relative humidity, held 7 days at 41 or 1 day at 68 F, 2005.

Selection	41 F	68 F	41 F	68 F	41 F	68 F	41 F	68 F
	% marketable		% decay		% leaky		% soft	
Arapaho	84	82	25	25	13	13	9	15
Navaho	92	86	5	6	2	15*	18	16
Kiowa	88	84	4	5	10	18*	22	23
Shawnee	84	71*	10	24*	19	32*	19	30*
A2190	88	73*	16	32*	9	32*	10	16
A2355	82	62*	17	26*	19	43*	20	45*
APF 12	84	68*	14	21	12	33*	23	42*
APF 53	89	66*	6	32*	12	39*	14	30*

*Means significantly different within row and category, P<0.05

sive room humidifier, this did not work at the lower temperature of 41 F. Fortunately, the relative humidity of both storage rooms reached the same level (90%). Under these conditions, the selections ranked for local/home use, such as 'Shawnee', 'APF 53' or 'APF 12' (Prime Jim) had lower amounts of % marketable berries, due to decay, leaky, and soft fruits (Table 2). In contrast, for blackberries ranked for national use, such as 'Navaho', had similar numbers of soft berries at both temperatures. stored at 68 F, the number of soft berries did not change significantly. Percent decayed berries did not change significantly between 41 and 68 F storage for 'Navaho', 'Kiowa', or 'Arapaho'. These results indicate the possibility that two mechanisms for shelf life may be involved, such as firmness, and decay resistance.

A number of fungi were identified on samples held in sterilized egg cartons. These included Botrytis cinerea, Colletotrichum gloeosporides, Rhizopus, Chladosporium, and Fusarium.

Comparison of selections

A total of 31 selections were held at 68 or 41 F in the 2004 season, and 43 selections in the 2005 season. These included eight named varieties of well-character-

ized shelf life, and 12 primocane-fruiting selections. Those harvested in both years are presented in Table 3. Clearly, a year with rainfall, such as the 2004 season, is needed to best differentiate outstanding selections. It is also clear that at least two seasons are needed for adequate evaluation of shelf life. A few selections, such as 'A2195', had such disparate rankings in 2004 and 2005 as to warrant additional evaluation.

Shipping rank is based on the average % marketable fruit for 2004 and 2005 and indicates the best outlet for the selection. Less than 70 is best suited for home use, 70-75 for local use; 75-80 for regional use, and >80 has national shipping potential (can stand up to cross country shipment). % marketable fruit represents an average of the variables decay, leak, and softness where $M = 100 - [\text{sum}(\% \text{ decay} + \% \text{ leaky} + \% \text{ soft}) / 3]$

Conclusions

Holding blackberries at 68 F for a short time interval (less than 2 days) helps with determining a selection's ability to withstand decay or leak during shipment, and can be done without special holding chambers. Judging softness of the fruit was useful for the poor holding varieties, but did not show differences in firmer

Table 3. Shelf life of blackberries held for 2 days at 68 F (2004), 1 day at 68 F (2005) or 7 days at 41 F (fruit of each selection were held at both temperatures) in 2004

Selection	Ranking	% marketable fruit		mean (marketable)	% decay		% leaky		% firm	
		2004	2005		2004	2005	2004	2005	2004	2005
A2315	home	44	83	64	69	18	87	15	70	82
APF53	home	47	80	64	57	17	84	24	63	70
A2195	home	42	90	66	66	13	97	14	73	99
APF40	local	55	85	70	55	9	71	18	71	83
Shawnee	local	62	78	70	47	16	54	25	74	76
APF12	local	62	77	70	46	17	54	21	68	68
Choctaw	local	63	77	70	50	22	56	27	75	80
APF44	local	54	87	71	62	16	64	16	78	92
APF8	local	63	85	74	49	15	56	20	87	90
A2252	regional	62	88	75	51	9	48	12	70	85
A2190	regional	68	81	74	45	24	43	20	85	87
A2214	regional	66	85	76	41	17	50	17	82	89
Arapaho	regional	71	83	77	42	25	40	13	87	88
A2255	regional	58	97	78	54	7	63	2	81	100
Apache	regional	65	90	78	54	11	50	18	99	97
Kiowa	regional	70	86	78	30	5	49	14	84	77
A2215	regional	71	88	80	37	9	47	15	83	87
A2218	national	75	88	82	39	21	34	10	96	96
A2222	national	75	89	82	73	18	26	12	92	99
Ouachita	national	75	92	84	36	8	31	4	92	88
A2035	national	78	93	86	22	8	32	10	87	97

berries. During the two year evaluation period, four selections were found that had excellent shelf life, and another five selections were found that may prove to be equally good after an additional season of evaluation. ✱

Insect Visitors to Late Season Berries

Continued from page 13

Soldier beetles

(sometimes known as leatherwings, owing to the leathery front wings or elytra) are often seen in caneberry plantings, often associated with blooms. They probably pose no problem, feeding on pollen and possibly some insects.

Stink bugs are common feeders on a wide range of fruiting structures. Their numbers have been high in diverse cropping systems in recent years, from fruit systems to cotton. The image shows a green stink bug; brown and dusky stink bugs are also present. Their feeding may cause a loss of individual drupelets, but they are considered minor pests. ✱



Soldier beetle



Scorpion fly

For more information and some fine color pictures, visit the Virginia Fruit Web Site www.ento.vt.edu/Fruit-files/VAFS.html.

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Nominations Sought

Executive Council seats for Regions 1, 3, 5, and 7 will come open for election at the NABGA annual meetin in January. To make a nomination – volunteers welcome – contact Ervin Lineberger, NABGA president, or the NABGA office.

info@noursefarms.com.

***Region 3** (Represents MI, NJ, NY, PA, Europe, and South Africa), **Open.**

***Region 4** (Represents DE, MD, OH, & WV) **Guy Moore**, 2415 Woodbine Rd., Woodbine, MD 21797, phone 410-489-7034, e-mail guymoore@verizon.net.

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Region 6 (Represents AR, IA, IN, IL, KS, KY, MN, MO, ND, OK, SD, NE, TN & WI) **Dean Henry**, The Berry Patch Farm, 62785 280th St., Nevada, IA 50201, phone 515-382-5138, e-mail berry.patch@midiaowa.net.

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Region 8 (Represents AK, AZ, CA, CO,

See you in
Columbus, Ohio
January 15-17, 2007
for NABGA's National
Bramble Conference

Watch for the complete conference schedule and registration packet in the mail later this fall.

ID, HA, MT, NM, OR, UT, WA, WY, Mexico, Central & South America) **Henry Bierlink**, Washington Red Raspberry Commission, 1796 Front St., Lynden, WA 98264, phone 360-354-8767, e-mail henry@red-raspberry.org.

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It's Membership Renewal Time

A membership renewal form is tucked into this issue of your newsletter. Please renew today!

NABGA's membership year runs October 1 through September 30. (If you joined in the last few months, yours is a 2007 membership, and you do not need to renew.)

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