Polar Vortex

The Possible Good and Bad of Winter 2014

By Marvin Pritts, Cornell University Department of Horticulture (Reprinted from NY Berry News, Vol. 13, No. 2 February 19, 2014)

Frequent visits from the polar vortex this winter have caused many fruit growers to be concerned about this year’s crop potential. Berry crops enter a time of dormancy when the water exits the plant cells and they become relatively resistant to cold temperatures. So long as temperatures drop slowly in fall, plants acclimate, go dormant and then can tolerate quite cold temperatures. This past fall was a relatively good year for acclimation, so there is not likely injury due to a sudden drop in temperature before acclimation occurred. Most injury to berry crops happens when water re-enters the tissues when weather warms in spring and then this is followed by another period of intense cold. This water freezes and expands, injuring vascular tissues and buds. The good news is that temperatures this winter (in the Northeast at least) have stayed relatively cold. This is far better for the plant than winters in which the temperatures fluctuate dramatically. These fluctuations could still come, but so far they have been few.

Has the absolute temperature been too cold for berry crops? Strawberries should be covered with straw mulch, and if not, they will likely have been covered with snow during the cold weather. This protects the plants from injury, so most strawberry should be fine this year. Blueberries can be injured when the temperature begins to fall below -10º F, but significant damage doesn’t occur in most varieties until -20ºF. I have seen blueberries killed back to the snow line at -30ºF. We flirted with -20ºF at many locations, so the possibility exists for some bud damage. The good news is that blueberries and Ouachita; originally there was also a third row of Chester, but it was too tight in the tunnel and was also a late variety more susceptible to SWD. They like Natchez and Ouachita because they are tasty, thornless, and have enormous berries. Harvest starts in mid-June with Natchez, Ouachita starts a couple weeks later, and they finish in late July. John figures they get about 700 pints per row.

2014 North American Raspberry & Blackberry Conference Tour

By Debby Wechsler, NARBA Executive Secretary

A busload of hardy souls braved the 6-degree weather and brisk winds for the NARBA Annual Conference Farm tour. Our first stop was Cramers’ Posie Patch, in Mount Joy, PA. The bus was met by John Thomas, production manager, and Keith Cramer. Cramers’ raises cut flow- ers, heirloom tomatoes, asparagus, wine grapes, and blackberries in tunnels. As Keith explained, Cramers and Haygrove Tunnels have a long-standing relationship. The Cramers were the first U.S. customers for Haygrove and now have a total of five acres of their tunnels on the farm. Haygrove’s operations are also housed on the farm.

In 2010, the farm was moved here from another location, and the blackberries we saw were planted then. They are in a 230 x 24 ft. Series 4 Haygrove tunnel, with plants 5.5 feet apart in the row. The tunnel has a row each of Natchez and Ouachita; originally there was also a third row of Chester, but it was too tight in the tunnel and was also a late variety more susceptible to SWD. They like Natchez and Ouachita because they are tasty, thornless, and have enormous berries. Harvest starts in mid-June with Natchez, Ouachita starts a couple weeks later, and they finish in late July. John figures they get about 700 pints per row. We bundled up and trudged out to see the plants, which are on a rotating cross-arm trellis and were laying flat on the ground, covered with two layers of row covers which had been laid over the plants in December.

Plants are thinned to three strong, early canes. At one foot, they are trained horizontally, and then cut off when they reach the next plant, and laterals are trained up the short arm of the trellis. The long arm supports the previous year’s growth, where the harvest will take place.

continued on page 8
NARBA Annual Meeting and Board Changes

Bylaws change approved

NARBA’s Annual Meeting was held on January 27 at our conference in Hershey. The proposal for NARBA bylaws changes to make the term of office of Executive Council members (NARBA’s board of directors) three years rather than two years was approved and went into effect immediately. Current EC members terms were adjusted to serve three-year terms.

New Executive Council members

Fred Finney, who farms in Wooster, OH, was re-elected for Region 4 (MD, OH, WV).

Blake Smith of Two Farmers Produce in Greenville, Iowa, will be representing Region 6 (AR, IA, IN, IL, KS, MN, MO, ND, OK, SD, NE & WI) will be Blake is relatively new as a grower, but he’s made it to NARBA conference in both Portland and Hershey, and brings good questions and lots of enthusiasm to his new role.

Julie Schedeen, of Schedeen’s Farm in Boring, OR, is the new representative for Region 8 (AK, AZ, CA, CO, ID, HA, MT, NM, OR, UT, WA, WY, Mexico & Central/South America). Julie was a grower spotlight speaker at our conference in Oregon; the Schedeens have been raising berries since 1977. In a state where most caneberry growers raise for processing, their farm concentrates on selling direct to the public, with two roadside stands and lots of processed products.

Many thanks to Randy Honcoop and Lee Mattison, who both leave the board after serving two-year terms.

New Officers Elected

In its conference call meeting on March 12, the Executive Council elected officers for 2014-2015. They are:

President: Fred Koenigshof
Vice President: Fred Finney
Treasurer: Rudy Heeman

Committees

Several committees of the board are actively seeking participation from NARBA members. One is the conference planning committee for the 2015 conference in Arkansas. Another is a “Strategic Planning” committee that will look at what NARBA could and should be doing to build the...
Nate Nourse, for their contributions specifically to the North American Raspberry & Blackberry Association and the raspberry and blackberry industry….Their commitment to our industry and support of our organization are unrivaled."

A list of previous winners of the Distinguished Service award may be found in the “About NARBA” section of our website. *

**Research Foundation Makes 2014 Grants**

The North American Bramble Growers Research Foundation has approved six projects for funding in 2014. The Foundation’s Research Committee reviewed online proposals and then met on January 26 in Hershey, PA, to make their recommendations. The recommendations were subsequently approved by the Foundation’s Board of Trustees.

For 2014, eleven project proposals requesting a total of $43,914 were received. With $21,612 in available funds, which included both funds in hand and pledges by nursery contributors, the Committee recommended funding these six projects for a total of $17,219. They also recommended allocating $1,000 for legal assistance in revising and updating the Foundation’s bylaws. The fund balance of about $3,400 is a reserve for possible emergency needs and a base for future funding. Projects funded are:

- Evaluation of algicides for management of orange felt and fungicides for control of cane blight diseases of blackberry – Phil Brannen, University of Georgia, $2,632
- Identification of effective toxicants for inclusion in attracticidal spheres for management of Drosophila suzukii – Tracy Leskey, USDA -ARS Appalachian Fruit Research Station (WV), $5,000
- Developing the genomic infrastructure for breeding improved black raspberries – Chad Finn, Nahia B Assil, Jungmin Lee, Jill Bushakra, USDA -ARS (OR), $1,500
- Effects of non-crop habitat and patterns of movement by Drosophila suzukii on fruit infestation in commercial blackberry fields – Hannah Burrack, NC State University, $3,273
- Innovative packaging technologies to enhance the safety and the quality of fresh raspberry – Thomas Gianfagna and KiYam, Rutgers University, $3,814
- Electronic data collection/labeling for the USDA rubus genebank – Kim Hummer and Joseph Postman, USDA -ARS Germplasm Repository (OR), $1,000. *

An article based on the progress report from one NABGRF-funded project is on pages 14-15 of this newsletter. To see previously funded projects and reports from projects, visit the “Research Foundation” section of www.raspberryblackberry.com.

**NARBA Distinguished Service Award 2014**

At the annual meeting on January 27, NARBA President Nathan Milburn presented Nate and Tim Nourse of Nourse Farms with NARBA’s 2014 Distinguished Service Award.

The award especially honors their leadership in developing the North American Bramble Growers Research Foundation’s Nursery Contribution program and their strong support of this program, which since its inception in 2007 has more than doubled the funds available to the Foundation for making grants to research. Nate Nourse, who was there to receive the award, served as NARBA president in 2010 and 2011; both Nate and his father, Tim Nourse, have held many positions of leadership within the berry industry.

Said Nathan, “Most of us know Nourse Farms as a leading supplier of plants to the berry industry, but we recognize here the father and son, Tim and Nate Nourse, for their contributions specifically to the North American Raspberry & Blackberry Association and the raspberry and blackberry industry….Their commitment to our industry and support of our organization are unrivaled.”

A list of previous winners of the Distinguished Service award may be found in the “About NARBA” section of our website. *
Spring Caneberry Chores

This list was developed by Dr. Gina Fernandez, Small Fruit Specialist at NC State University and is reviewed by Dr. Fernandez and Dr. Marvin Pritts at Cornell each issue. Chores and timing may be somewhat different in your area or for your cropping system. A good source of information for the Pacific Northwest is the Small Fruit Update; sign up at www.berriesnw.com/SFU.asp.

Plant growth and development
- Plants deacclimate quickly
- Bud differentiation (additional flowers formed)
- Bud break
- Flowering
- Primocane emergence

Pruning and trellising
- Check buds and canes for damage (see articles on pages 5-6)
- Finish pruning and make sure all floricanes are tied to the trellis before budbreak.
- Rotate shift trellises to horizontal position before budbreak; rotate to upright position immediately after flowering.

Insect and disease scouting
- Growers with a history of cane diseases and/or mites often find that certain fungi-cides and oils are most effective just prior to bud break. The period of time in the spring when the plant is flowering is the most important season for control of insects and diseases. Know what your pests are and how to control them.

Water management
- Bramble plants need about 1-2 inches of water/week. This amount will be especially critical during harvest.

Nutrient management
- Apply second half of nutrients if doing split application.

Marketing and miscellaneous
- Service and clean coolers.
- Make sure you have enough containers for fruit in the coming season.
- Prepare advertising and signage for your stand.
- Contact buyers to finalize orders.
- Hire pickers.
- Prepare signage for field orientation; it is easier to tell pickers where to go if rows are numbered.

EVENTS


April 7-9 - Global Berry Congress, Amsterdam, The Netherlands. For more info, visit www.berrycongress.com.

July 12 - NC Blackberry Festival. In Lenoir, NC, World's largest Blackberry Patchwork Cobbler, parade, blackberry eating contest, arts and crafts, music, etc. For info call 828-726-0616 or visit http://ncblackberryfestival.com.

May 11-13 - International Raspberry Organization in Chuzhou, China. For more information, contact henry@red BlackBerry.org.


June 18-25, 2015 - 11th International Rubus & Ribes Symposium, in Asheville, NC, June 21-25, with preconference tour to farms and research sites June 18-20. Sign on now to become a sponsor. For more info about the Symposium, visit www.rubusribes2015.com or contact gina_fernandez@ncsu.edu.

Several other festivals this summer are also on our website; Those listed here are ones we know NARBA members are involved in. Let us know of meetings, events, or festivals of interest to our members or the caneberry-loving public for posting here and on our website.

NARBA Conference Proceedings

The Proceedings of NARBA’s 2014 Conference in Hershey, PA, are now posted in the “Members Only” section of www.raspberryblackberry.com. There are 23 pdf files of articles, PowerPoint presentations, and handouts. Check them out!

They are posted online rather than in a CD this year, as the Executive Council felt the information would be easier to keep track of – CDs can easily get misplaced. Some files are large (3-8 MB); if you have no internet or a very slow internet connection, you may contact the NARBA office to receive the files on CD or request a print-out of a specific article.

Plan to come to Arkansas ... for NARBA's 2015 conference

In Fayetteville, Arkansas, date TBD, probably late February, 2015. Like to be involved in planning or have suggestions? Contact the NARBA office.

Grower Dale Stokes of Wilmington, Ohio, talked at the conference about his farm and about using black raspberries to prevent and treat disease.
Polar Vortex
Continued from page 1
were at their hardest point when the cold weather hit.

The hardiness of summer raspberries depends a great deal on the variety. Some varieties will be fine, but other may have suffered damage on the tops of the floricanes. It is relatively easy to cut some canes and place them in water in a warm area to determine if damage has occurred. The good news with raspberries is that, even with some damage, the remaining buds can compensate for bud loss by producing more and larger berries - although they will be lower down on the canes. Fall raspberries that are cut to the ground should be unaffected by the cold weather.

Thornless blackberries grown outdoors are likely to have suffered the greatest loss. They are marginally hardy in our region under the mildest of winters, but in an open winter like 2014, they are very vulnerable to injury. I am most interested in seeing how our tunneled blackberries perform, given that a single sheet of plastic does not protect from cold temperatures that much.

The big unknown factor this year was wind. We had strong winds on some of our coldest nights. Although plants don’t suffer from “wind chill” like human skin (since there is little water to evaporate from woody tissue), wind can contribute to drying out of plant tissue. We may see injury that might be attributed to cold temperatures, but could have been caused by high, desiccating winds. Because this winter was so unusual, it is unclear how much the combination of cold temperatures and wind will have contributed to any observed injury.

The other hope is that this coldest winter in a century may have damaged overwintering populations of spotted winged drosophila. If that occurs, berry growers may be wishing for a winter like 2014 every year. But regardless of how cold it was here, the rest of the world seems to be warmer than ever. Australia and Argentina had record heat, Alaska was warm this winter, the Southwest was having record temperatures, and the Sochi Olympics was barely cold enough to have snow. The only thing that is certain is that we will have to learn to live with more fluctuations in our weather patterns in the years to come.

Assessing Cold Damage on Blackberries
Member Charlie O’Dell in Virginia asked Dr. John Clark in February about his thoughts on fruit bud survival of his Arkansas blackberry varieties blackberries from this unrelentingly cold winter. Charlie wrote, “Weather here this winter has been very cold, twice down to 7-8 below 0º F. I want to check our Arkansas blackberries for fruit bud possible winter damage, but am not sure how to do this. It has been steadily cold all winter, no false spring warm spells, so berries are still at full dormant state. Any suggestions on how to check blackberry buds for winter damage will be most helpful!”

Reply from John Clark: The temperatures you mention are sure dangerous as far as damage potential, but you hit the nail on the head that the sustained cold may have kept the plants dormant. Back in 2012, I think we had the same thing and little to no damage though it got cold enough to hurt many crops.

There is no absolute good way on blackberries to really know what has happened. I usually look at two things. First I scrape along laterals or main canes to look for browning just under the bark, not as deep as the inner area of the cane. One can often see browning in the cambium area, and if it is there, likely the cane is damaged. How bad? Hard to tell. But I would try a few, see if you find anything other than green under the outer layer.

Critical Temperatures for Cold Damage (courtesy of Gina Fernandez, NCSU)

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<th>Variety</th>
<th>Winter</th>
<th>Spring (estimates)</th>
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<tbody>
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<td>28 – 30F</td>
</tr>
<tr>
<td>Raspberry</td>
<td>-20 to -30 F</td>
<td>28 – 30F</td>
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<tr>
<td>Black raspberry</td>
<td>-5 to -10 F</td>
<td>28 – 30F</td>
</tr>
<tr>
<td>Purple raspberry</td>
<td>-15 to -20 F</td>
<td>28 – 30F</td>
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</tbody>
</table>

See instructions on sampling to assess damage and a video on how to dissect caneberry buds at http://teamrubus.blogspot.com/ in the posts for February 13 and January 23.

Above: An injured flower bud. The secondary bud above it is not imaged and will produce a crop. Photo courtesy John Clark. Below, cold damage on a cane. Photo by Fumi Takeda, USDA-ARS.

A s for bud damage, see the photo [above]. One can see the black area where the flower bud or primordia are, and also the brown area in the bud base where it hooks to the main stem. This is cold damage, and likely this bud is dead. The secondary up above is still green. I don’t think Arkansas varieties usually have as many secondaries as, say, maybe Chester, and this concerns me as to second or backup crop potential. But, if the canes are dead, buds don’t matter.

Later comments from John Clark:
In looking at Arkansas blackberries on March 7, 2014 at the primary research site near Clarksville, Arkansas, following a low of 9º F earlier in the week, I found a range in bud damage from little to no damage to quite extensive damage. I did not see substantial damage to canes or laterals, although complete confidence in lack of cane damage is not attained until growth begins successfully.
Assessing Cold Damage on Blackberries
continued from previous page

The blackberries at this site ranged from budbreak with 1/4-inch of green leaves to fully dormant buds; the most advanced tended to be primocane-fruiting genotypes, as they usually break buds earlier. In general the more developed the bud, the more damage seen, though there was variation within these general groups also. My estimate is that most of the damage seen was from the early March 9º F temperature exposure and is likely due to some bud development and loss of hardiness (even on buds that appear dormant) in recent days or weeks. With similar or possibly lower temperatures and no days providing de-hardening temperatures, then damage may not been seen or be less. The overall low this winter at this site was 5º F, but this temperature or near this was experienced several times during the winter. Based on this rather limited examination, I expect to see the following:

1) Reduced crop on some varieties, particularly with more advanced bud development, with crop reduction potentially significant.

2) Where partial damage occurred, reduced berry cluster size both in berry number and cluster elongation on primary buds. This is a result of some flowers in the bud being killed, others not, altering the fruiting structure.

3) Secondary bud development, usually resulting in later bud breaking and being less fruitful, often more leafy and longer in length than normal primary buds.

4) Some cane damage or possible cane collapse after the season begins, water demands increase, and damaged vascular systems are not able to maintain cane health.

I learned years ago to never say for sure on winter injury; time will tell as to how much (or little) damage is present. I am hoping for the best and that there is no additional damage from spring frosts!

Winter Injury in Caneberries

By Gina Fernandez, NC State University.

Extracted from a presentation to the NC Commercial Blackberry and Raspberry Growers Association on February 6, 2014

“Winter” injury, caused by cold temperatures has different symptoms depending on the time of year it occurs. The plant’s ability to withstand cold also varies through the year.

- In fall, early frost damages terminate fruiting on primocane fruiting cultivars
- In winter, very cold temperatures kill canes, damage roots
- In the late dormant season, fluctuating temperatures cause cane and/or bud damage
- In spring, late frosts cause death of flower buds

Winter injury may kill floricanes but not new primocanes. Damage is not always apparent until fruiting laterals begin to grow.

This year, our primary concern (at this date) is injury that may have occurred in the winter and early spring. We have seen temperatures fall below 0º F in the mountains of NC twice (1/7 and 1/30/14) at the Mountain Horticultural Crops Research Station in Mills River, NC. At the Piedmont Research Station in Salisbury, NC, temperatures were in the single digits on those same dates. These temperatures are below what has been determined as critical temperatures for injury in blackberry cultivars (see chart on previous page).

In early February, we collected canes from our research sites across the state. In general, we found damage to blackberry buds collected from the mountains but not many from than in those grown in the piedmont region. This past week (mid March), I was in the coastal plain region of the state and did not see any damage to blackberry buds.

Practices for Reducing Freeze Damage

Plant on north-facing slopes to avoid fluctuating winter temperature effects

Delay pruning as long as possible; extremities are usually more susceptible to damage.

Place row covers over RCA trellises berries to protect western caneberry varieties in the Midwest.

Avoid cultivation. Cultivation in late winter and early spring tends to increase freeze damage. Soil temperature on a radiation-frost night will be much warmer than air temperature, and if the soil has been cultivated, the surface layer will contain more air and less water. With less water, the surface layer will hold less heat. Also, the increased soil air will cause the surface layer to be a better insulator, which will decrease the amount of heat released from deeper in the soil. Bushes will probably stay 1 to 2º F warmer on uncultivated soil than on cultivated soil.

Maintain soil moisture. By increasing the amount of water in the soil, the soil will absorb more heat during the day and conduct more heat to the surface for plant
**SWD Survivability and Cold Weather**

In the PA Vegetable and Small Fruit Gazette, Feb. 28: Can we expect reduced SWD pressure this season due to our extremely cold weather?

From Dr. Greg Loeb, grape and small fruit entomologist at Cornell: We really do not know. I am aware of a few papers out of Japan looking at cold tolerance of SWD and also a paper out of Oregon. Both of these studies worked with non-adapted or poorly adapted SWD and found that adults were not able to handle temps much below freezing. Several groups are now looking at this question more carefully. We and others are showing that SWD does go into a non-reproductive phase (diapause) later in the fall and it's likely the adults have improved capacity to tolerate cold temps, at least to some extent. Probably not enough to handle the kinds of temperatures we have seen this winter in unprotected places. Of course, we would expect adults to seek out protected places such as in the soil litter or in rotting wood, etc. But we really don’t have any data on this yet. We did set up some cages without bottoms outdoors this winter (with leaf litter and with or without logs) and released flies reared from late season fruit. A round January 1 we pulled the cages off and allowed snow, etc. to accumulate. The plan is to put cages back on in March and monitor for emergence. I would guess survival will not be very good but we shall see.

From Rufus Isaacs, Michigan State University entomologist: My expectation is for a later start of SWD activity in 2014 than last year based on our longer and much colder winter, plus the slower spring in the Midwest and Northeastern region of the country. However, we have also had significant snowfall this winter, and so under the snow any overwintering flies will have been protected from the extreme low temperatures. Some new research from Oregon shows that there is a winter form of the fly that is adapted to winter survival, effectively reducing the level of winter mortality. At this point, I would not be surprised if SWD populations build a bit later this summer, but I do not expect them to be absent and I would advise growers of susceptible crops to be prepared for this pest whenever it arrives.

Cold Winter and Brown Marmorated Stink Bugs

A recent story in many media outlets reported a finding by Virginia Tech entomology professor Thomas Kuhar of a 95% kill rate of BM SB they were overwintering for research. Edited from a story the Washington Post Capital Weather Gang blog:

Each fall, Kuhar his team gather stink bugs that congregate on the outside of buildings in the Blacksburg, VA area. The stink bugs are put into ventilated 5-gallon buckets filled with foam insulation tubes and then the buckets are stored outside for the winter, under a shelter. The insulated buckets simulated the overwintering locations of stink bugs. The bucket arrangements also help to keep the bugs in a dormant state of diapause while they await experiments in Kuhar’s lab. When Kuhar and his staff pulled out his first set of insulated buckets in early February for stink bug experiments they found a 95% kill rate from the sustained cold weather that occurred in January in Blacksburg.

However... a follow-up: Other experts expect to find no more than a 50 percent death rate over the winter. That is more than the normal 25 percent rate, but it won’t rid the Mid-Atlantic of these annoying and destructive pests. As everyone knows, these bugs are experts at finding warm, snug places to sleep through winter, like inside your attic.
Blackberry canes on rotating cross-arm trellis at Cramers, with row cover pulled back.

At Daniel Stoltzfus's farm: Braving the cold to inspect horse-drawn machinery; a mobile chicken house is in the background. At right: Pete Waller poses by the Stolzfus family's horse-drawn buggy. The farm uses no electricity, tractors, or motored vehicles.
family farm, in 2004. For four years, he farmed conventionally, and now for four years has been organic and a member of the Lancaster Farm Fresh Co-operative. There are 55 tillable acres on the farm, with 13 acres of produce, the rest in hay and grain. They also have a small dairy with 13 cows and about 1500 chickens. They used to have blackberries in a tunnel, but no longer raise them; labor was one of the biggest challenges. Six horses are used to work the farm. Walking around the farmyard, we were able to see a number of horse-drawn implements, as well as a planting of plasticulture strawberries in a tunnel (currently with the cover off). While the farm has no electricity, they have a diesel powered motor and are able to run hydraulic equipment and chill a reefer unit trailer.

The Lancaster Farm Fresh Co-operative is his sole market outlet. This co-op, he explained, had 20 farms when it first started; it now has 85. They have a staff of 8-15 people in the office, have 10-12 trucks on the road that pick up at the farms and deliver to customers, and a warehouse. The members decide together in advance who grows what, the amount, and when, and the crops are sold before they are harvested.

Our final stop was Four Seasons Produce, a major regional produce distributor. For many this was a truly impressive experience. General manager Jason Hollinger explained that his grandfather was a produce farmer who had a small retail market that grew into a grocery store business. His father managed the produce department and also sold from that department to restaurants. In 1976, he went out on his own as a produce distributor. They had four or five warehouses scattered around and in 2004, consolidated into this one location – an impressive, state-of-the-art facility. About 80% of the produce they carry comes from Florida and California, but they do buy what they can locally in season, especially in summer - including from the Lancaster Farm Fresh Cooperative. Organic is a sizeable and growing part of their business. They ship from Boston to Washington DC, with over 100 trucks on the road, and their main customers are independent grocers with 1 to 9 stores, ranging from those seeking high end organic produce to discounters. We walked through the cavernous warehouse, with over 200,000 square feet of refrigerated storage, The aisles were stacked high with shelves of boxed produce, each aisle devoted to specific types of produce - this one for apples, this for berries, this for potatoes, this for leafy greens - and you could pick out the smells: strawberries, apples, peppers.... Bananas have a special area all their own, with tall, narrow ripening chambers in which pallets of bananas can be stacked and then exposed to ethylene gas.

What does it take to become a supplier to Four Seasons? GAPs certification, a commitment to grow wholesale, and some experience selling wholesale, e.g. to demanding stores, and the development of trust that the grower will deliver as promised with the necessary quality, size, weight, and color.

What are they seeing as trends? Organic is growing, and organic raspberries are especially in demand and hard to find. There is also increasing consumer interest in juicing and smoothies.

Many thanks to Kathy Demchak of Penn State Extension for her hard work organizing this tour, leading the development of the program, and working on many other parts of the conference.
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Retail Demand for Fresh Berries

By Michael R. Thomsen, Associate Professor, Dept. of Agricultural Economics and Agribusiness, University of Arkansas, Fayetteville, AR USA

Agricultural economists at the University of Arkansas have examined retail demand for fresh berries. The goal is to improve understanding of consumer sensitivity to prices and retail competition among different types of berries. Results show that the demand for each berry is highly responsive to changes in its own price.

Supermarkets offer many fresh fruits, most of which can serve as substitutes for berries to one degree or another. The easy access to substitute fruits is the main reason why fresh market demand for each type of berry is price responsive. There are, however, important differences among the different berries. Strawberries and blueberries are the least price responsive, with demand falling by 1.26% and for every 1.49%, respectively, for each 1% increase in the retail price. Consumers can reasonably expect to find fresh strawberries all year and so strawberries are likely to be a planned purchase item on consumer shopping lists. Blackberries and raspberries, on the other hand, are the most responsive. Blackberry demand falls by 1.88% for every 1% increase in retail price. Relative to strawberries and blueberries, year-round access to fresh blackberries is more recent and so blackberry demand is likely to still be tied to impulse purchases, which are sensitive to perceptions of a good deal. Blackberry demand is also the most responsive to the prices of competing berries. For example, if the price of strawberries increases by 1% blackberry demand increases by 0.52 percent indicating that consumers that may have been planning to buy strawberries switch to blackberries when confronted with higher strawberry prices.

Promotion of health benefits is sensible given these findings because it reduces price sensitivity by making other fruits less appealing substitutes. Because berries are substitutes, promotional efforts that raise the price of one type of berry are likely to create positive spillovers to competing berries.

Dr. Thomsen spoke about this topic at the 2013 Berry Health Benefits Symposium. See www.berryhealth.org.

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</tbody>
</table>

Numbers in the table indicate the percentage change in volume demanded resulting from a one percent change in price. Numbers that are larger in absolute value indicate a higher degree of price sensitivity.

responsiveness of retail berry demands to price
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AG POLICY UPDATES

EPA Proposes New Safety Measures to Protect Farm Workers from Pesticide Exposure

On February 20 EPA announced proposed revisions to the Worker Protection Standard. The agency is seeking comments. The proposed changes to the Agricultural Worker Protection Standard (WPS) include:

- Increased frequency of mandatory trainings (from once every five years to annually) to inform farm workers about the protections they are afforded under the law, including restrictions on entering pesticide-treated fields and surrounding areas, decontamination supplies, access to information and use of personal protective equipment. Expanded trainings will include instructions to reduce take-home exposure from pesticides on work clothing and other safety topics.
- Expanded mandatory posting of no-entry signs for the most hazardous pesticides; the signs prohibit entry into pesticide-treated fields until residues decline to a safe level.
- First time-ever minimum age requirement: Children under 16 will be prohibited from handling pesticides, with an exemption for family farms.
- No-entry buffer areas surrounding pesticide-treated fields will protect workers and others from exposure from pesticide overspray and fumes.
- Measures to improve the states’ ability to enforce compliance including requiring employers to keep records of application-specific pesticide information as well as farmworker training and early-entry notification for two years.
- Personal Protection Equipment (respirator use) must be consistent with the Occupational Safety & Health Administration standards for ensuring respirators are providing protection, including fit test, medical evaluation, and training.
- Making available to farm workers or their advocates (including medical personnel) information specific to the pesticide application, including the pesticide label and Safety Data Sheets.
- Additional changes to make the rule more practical and easier to comply with for farmers.
- The exemptions for family farms are continued.
- For more information on the EPA’s Proposed Worker Protection Standard and how to comment, visit www.epa.gov/oppead1/safety/workers/proposed/index.html

FSMA Gets New Deadlines for Final Rules

The U.S. Food and Drug Administration (FDA) has reached a settlement with the Center for Food Safety (CFS) and the Center for Environmental Health regarding the deadlines for publishing final rules implementing the Food Safety Modernization Act (FSMA).

The agreement extends and staggered the final rule deadlines beyond the June 2015 deadline set by the U.S. District Court of Northern California last year. In exchange, the agency will drop its Ninth Circuit appeal in the dispute with the two consumer groups.

The new deadline for produce safety is October 31, 2015. This is the main section of concern to most members. Other deadlines are August 30, 2015, for preventive controls for human food and preventive controls for animal food; October 31, 2015 for the foreign supplier verification program and third-party accreditation; March 1, 2016, for sanitary transport, and May 31, 2016, for intentional adulteration.

The settlement also removes any prior deadlines for public comment periods. To comment, visit www.fda.gov/Food/GuidanceRegulation/FSMA/ucm261689.htm.

Farm Bill Passes

The Agricultural Act of 2014 (commonly known as the Farm Bill) was signed into law by President Obama on February 7.

This new Farm Bill is good for specialty crops like caneberrries. The Farm Bill conference report includes an overall increase in investment of 55 percent over 2008 Farm Bill funding levels in key produce industry initiatives and programs, including the State Block Grant Program, Specialty Crops Research Initiative, a new fruit and vegetable incentive grant program for SNAP recipients, and pest and disease prevention.

An article by Jennifer Steinhauer in the NY Times on March 8 noted that fruit and vegetable farmers, who have been largely shut out of the crop insurance programs that grain and other farmers have enjoyed for decades, now have far greater access, and funds to help growers transition from conventional to organic farming rose to $57.5 million from $22 million. The article also reported that programs that help food stamp recipients pay for fruits and vegetables – to get healthy food into neighborhoods that have few grocery stores and to get schools to grow their own food – all received large increases. The new attention and government money devoted to healthy foods stem from the growing market power of those segments of the food business, as well as profound shifts in nutrition policy and eating habits across the country. ✪

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Find us on Facebook

Reaching out – NARBA’s Facebook page and website are key methods of reaching out to consumers – be sure to like us (www.facebook.com/-RaspberryBlackberry) and share a link to our website. There are lots and lots of recipes there, and lots more information will be added this spring!

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RESEARCH REPORT

Postharvest Kits For Fruit Quality Testing
By Penelope Perkins-Veazie, NC State University

One of the activities of this NABG Research Foundation-funded project, “Postharvest Kit, Produce Cooling, and Training for Small Acreage Raspberry and Blackberry Growers,” was development of a post-harvest kit for growers.

Postharvest experts generally follow fruit and vegetables from field to consumer. The general guidelines are cleanliness, cold chain management, adherence to packaging guidelines and weights, and reduced mold/decay of the product. Extensive postharvest research, along with the boom in technology and relatively cheap tools, has made it possible for small-acreage growers to better monitor their commodities for quality control.

I developed this kit with the idea that extension specialists and county extension agents could use the kits for on farm visits and grower demonstrations at meetings. After putting several together, it was also clear that anyone could do this themselves, if a short list of items and how they are used, was put together. The key to the kit is that most items can be found at Walmart, Harbor Freight, or Amazon. Some items can be purchased directly from the source vendor, and some items can be obtained on sale. Outlined below are the list of items, what their uses are, sources, and relative costs. NCSU will sell the kits for $300 if you don’t want to be bothered to put your own together (contact Penelope_perkins@ncsu.edu for details). Or, you may want to tailor a kit to your specific needs.

Weight and diameter

Scale (600 g or 1.3 lb): used to check individual weights of clamshells to make sure the proper weight is met. Can be used as a training device for new pickers. Also good for the “biggest berry” competition.

Calipers give a quick gauge of diameter or thickness, depending on the fruit. It may be that you want to call attention to your large berries or determine if standards will be met for berry size. Also can be used to size onions, apples, peaches.

Sweetness

Refractometers are used as a quick means to determine the sugar level of fruits. This model uses infrared light beamed through a sample and reads out the result digitally (easier on the eyes than the stick model). Refractometer readings (in brix or % soluble solids) are capturing sugars, acids, and other water soluble components. For some fruit, the reading will reflect the sugars to 90%. For other types, the sugars may only represent 60 to 70% of the brix reading. It is a good instrument to check fruit quality, especially after heavy rain or irrigation, to see if those blackberries are really ripe enough, or to see if your fertilizer regime (more potassium for sweetness) is working for strawberries. Note: if you just want the refractometer and aren’t assembling the full kit, Milwaukee (milwaukeeinstruments.com) sells the refractometer plus a box (an extra $12 or so). I recommend getting the box – it won’t fit in the insulated bag we use but if you just want the refractometer, the box protects it nicely.

Slurpee straws are added to transfer puree to the refractometer sampling dimple (or you can squeeze the fruit directly onto the sampling stage). Lens wipes are added to clean the surface. Avoid paper towels as these will scratch the lens coating of the refractometer.

Temperature management

This is the heart of maintaining shelf life for fruits and vegetables. Usually it’s a matter of keeping fruit cold enough; sometimes some commodities want to be warmer (like tomatoes).

Anemometer: Thanks to balloonists, these units now come in handy pocket sizes. Anemometers measure wind speed, and can be used to check your cooler fans to see how much movement you’re getting, and if the air movement is uniform.

Thermometers:

Digital Shelf thermometer. Gives a quick glance when you open the cooler door as to the status of the cooler. The humidity measurement is not very accurate but will distinguish 10% from 60%.

Digital Stick-in thermometer. This is needed to comply with food standards where an actual destructive measurement is taken of produce (stick it into the fruit and read the temperature)

1. INSULATED BAG (HOLDS AND PROTECTS CONTENTS)
2. REFRACROMETER (MEASURES SUGARS)
3. SCALE (MEASURE CLAMSHELL OR FRUIT TO 1.5 LB)
4. ANEMOMETER (MEASURE WIND SPEED)
5. CALIPERS (MEASURE DIAMETER, LENGTH, THICKNESS)
6. LASER THERMOMETER (NON CONTACT TO CHECK FRUIT TEMPERATURES IN STORAGE)
7. pH PAPER (CHECK ACID LEVEL OF FRUIT)
8. SHELF THERMOMETER (QUICK LOOK IN COOLER TO SEE IF TEMPERATURE AND HUMIDITY ARE IN RANGE)
9. CHLORINE WIPES TO CLEAN HANDS, SURFACES WHEN TESTING
10. COLD PACK (CAN REFREEZE IF NEED TO KEEP SAMPLES COLD)
11. STICK THERMOMETER (TO CHECK INTERNAL FRUIT TEMPERATURE)
12. LENS WIPES FOR REFRACTOMETER LENS
13. WATER AND SUGAR (SUCROSE) TO CALIBRATE REFRACROMETER
Non contact thermometer. My personal favorite. The beauty of this little thermometer is that you can aim it at the center pack of fruit and get an idea of what the temperature is relative to the cooler temperature, without having to stick a fruit or even walk inside. It’s also great way to find hot spots in your truck or cooler – check corners, floor, roof areas for relative temperatures of solid surfaces.

While not included in this kit, check out ibutton loggers at www.QA supplies.com. These temperature or temperature plus humidity buttons ($28 to $85 plus $15 software) can be placed anywhere in your cooler or produce load. Changes in temperature can be followed by computer in increments of minutes or hours. You can follow the cooling curve from anywhere using this system.

Other kit items:
- pH paper: useful for checking acidity of fruits and also for pH where cleaning of produce is being done. If chlorine is used as a wash step, check the pH of wash water to make sure it is 6 to 7 so chlorine will remain active. A useful hint: fruit pH is usually between 3 and 6. So if you want to check fruit pH, get pH paper that covers these ranges and has 1/2-point increments (3, 3.5 etc). If you want to check chlorine levels, use pH paper that covers 0 to 14 range in 1 unit intervals.
- Chlorine test strips: used to see if free chlorine levels are correct. Usually not done with small fruits, but chlorination of wash water is done with peach, apple.

Free chlorine should be 100-200 ppm. The chlorine level of tap water should be 1-2 ppm if city chlorinated.

Container: this is a 9-can insulated cooler bag. The idea is to offer insulation and protection to the instruments inside without adding excessive bulk or weight.

### Description of item | Source | cost in $
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Digital refractometer (Milwaukee) | Amazon | 120.00
Laser (no contact) thermometer | Harbor Freight | 30.00
Digital penetrating (stick) thermometer | Walmart | 10.00
pH strips (0 to 14 units by 1 or 0.5 units) | Amazon | 3.00-10.00
Anemometer | Amazon | 36.00
Digital shelf thermometer | Amazon | 12.00
Digital calipers | Harbor Freight | 4.00
Scale (600 g) | Amazon | 10.00
Scale weight 500 g | Amazon | 10.00
Wet wipes | Walmart | 1.00
Small insulated cooler/9 can size | Amazon | 20.00
Lens cloths to clean refractometer (bulk) | Walmart | 10.00
Slurpy straws (disposable) (bulk) | Amazon | 24.00

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**Chad Finn Receives Wilder Medal Award**

Congratulations to NARBA member Chad Finn, who has received the American Pomological Society’s 2013 Wilder Medal. This medal has been awarded since 1873, and previous award winners include many well-known and distinguished names in the horticultural world – as well as some distinguished actual fruit varieties (see www.americanpomological.org/wilder2.html).

The paragraphs below are from the article in the October issue of the Journal of the American Pomological Society, by John Clark and Robert Martin (see the full article at www.pubhort.org/aps/67/v67_n4_a8.htm).

Chad Finn took over the leadership of the USDA-ARS small fruit breeding program in Corvallis, Oregon in 1993 ... and has developed what is probably the most diverse berry breeding program in the world with significant efforts in all of the major small fruit crops. Initially, he developed very active programs in germplasm and cultivar development for strawberries, blackberries and red raspberries. More recently, in response to grower input, he has added blueberries and black raspberries to his portfolio. Dr. Finn’s germplasm development program is the largest and most productive of its kind in the world, extending from collection and evaluation of traits in wild species through to incorporation of desirable traits into new cultivars. He has developed cooperative research with other breeders, other scientists for trait evaluations, commodity groups, and growers in the Pacific Northwest and throughout the world.

Dr. Finn ... has provided outstanding service to the horticultural industries and to professional societies in the area of pomology, at the local, national and international levels. ★

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**A New Voice for Raspberries**

The new National Processed Raspberry Council recently launched its website and social media programs as the first steps in building awareness of and demand for processed (frozen) raspberries. Council staff are actively creating more content, including film short cooking demos which will soon find their way onto the site. Next up is a raspberry harvest video, showcasing the industry’s sustainability story, planned for this summer. Find the Council’s website at [www.redazz.org](http://www.redazz.org). The NPRC was formed to fund nutrition research and conduct wellness messaging campaigns targeting health care professionals, consumers, manufacturers, and end users of frozen raspberries. For more information on its activities call 360-354-0948.

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**The Bramble: Newsletter of the North American Raspberry & Blackberry Association, Spring 2014**
NARBA 2014 Officers and Executive Council

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