New York Berry News

CORNELL UNIVERSITY

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What's Inside

Welcome to the October/November issue of New York Berry News. A lot has been happening in the world of small fruit production here in New York the past few weeks. This issue brings you all the latest to help keep you up to date.

We start with two reports on national berry meetings held in Geneva late last month, along with high lights of Cornell's raspberry high tunnel tour. Other news brief provide information on new and/or improved websites of interest to berry growers, what's new from government, berry good health benefits, and details on upcoming events you may not want to miss.

Our in-depth articles were both written by new NYBN authors/contributors. The first is a report on an Organic Berry Production Workforce Training workshop by Janet Aldrich, from Delaware County CCE; the second is a report on elderberry research and production in Missouri by Patrick Byers and Andrew Thomas. Other in-depth articles include information on control of Phomopsis canker and cane blight of blueberry by Annemiek Schilder, and a guide to understanding the value chain, by Brent Gloy.

UPCOMING MEETINGS

December 1-7, 2005. *International Society for Horticultural Science 9th International Rubus and Ribes Symposium*, Pulcon, Chile. **For more information contact**: Pilar Banados, Facultad de Agronomia Ingenieria Forestal, Universidad Catolica de Chile, Casilla 306-22, Santiago, CHILE; fax: 56-2-55334130, E-mail: pbanados@puc.cl or online: http://www.faif.puc.cl/rubus-ribeschile.html

December 6-8, 2005. *Great Lakes Fruit, Vegetable, and Farm Market Expo*. DeVos Place Convention Center, Grand Rapids, Mich. www.glexpo.com.

December 13-15, 2005. *New England Vegetable and Fruit Conference*. Radisson Hotel, Manchester, NH. See news brief below for more information or go to http://www.nevbc.com/.

January 4–6, 2006. *North American Berry Conference and Southeast Regional Fruit and Vegetable Conference*; Savannah International Trade and Convention Center, Savannah, GA. For more information see news brief below or contact Georgene Thompson, 717-243-1349, georgenethompson@comcast.net or visit http://www.nasga.org.

January 31 – February 2, 2006. *Mid-Atlantic Fruit and Vegetable Convention*. For more information contact the Pennsylvania Vegetable Growers Association at pvga@pvga.org or visit http://www.pvga.org/.

February 15-16, 2005. *NABGA Regional Meeting*, at the *Empire State Fruit and Vegetable Expo*. See news brief below formore info.

NATIONAL BERRY CROPS INITIATIVE STRATEGIC PLANNING WORKSHOP HELD IN GENEVA.

Courtney Weber, Associate Professor, Department of Horticultural Sciences, Cornell University's New York State Agricultural Experiment Station at Geneva, NY

Leading academic, government and industry experts in berry production, breeding, pest control and marketing met in Geneva on October 24-26, 2005 to begin the process of developing a National Strategic Plan for Berry Crops, which includes but is not limited to strawberries, brambles (raspberry, blackberry and others), blueberries, cranberries (including lingonberry), and Ribes (gooseberry and currant). The USDA and other federal agencies have taken notice as specialty crops (fruits, vegetables, nuts, ornamentals ect.) have exceeded program crops (corn, soybeans, cotton, ect.) in value in the U.S. in recent years. In order to take advantage of this attention, specialty crop industries must have a clear and concise message that can be communicated to policy makers.

Dr. Tom Bewick, National Program Leader for Horticulture, USDA-CSREES organized the meeting in collaboration with Dr. Courtney Weber and Dr. Marvin Pritts of Cornell University as part of an ongoing effort to organize specialty crop industries. University and USDA researchers from 23 states, industry representatives from Driscoll Strawberry Associates, Ocean Spray Cranberries, the Oregon Raspberry and Blackberry Commission, the Washington Red Raspberry Commission, the California Strawberry Commission, the North American Strawberry Growers Association, the North American Bramble Growers Association, the North American Highbush Blueberry Council, the Wild Blueberry Council and the New York State Berry Growers Association, along with individual growers, met to begin the process of developing a common message from these diverse industries. (I was especially pleased to have four past and present board members of the NYSBGA involved in the workshop.)

The overall goal of this workshop and other initiatives is to have a unified voice across the wide range of crops grown by horticulture producers. Efforts in the tree fruit and grape industries have yielded promising results. Jim McFerson of the Northwest Tree Fruit Technology Group, Jerry Lohr of J. Lohr Winery, and Bill Nelson of Wine America provided insights into the efforts in their industries to work together and highlighted their success with recent funding initiatives in the USDA National Research Initiative (NRI) and the Viticulture Consortium. In these cases, a unified message from the tree fruit industry resulted in a concentrated effort for the family Rosaceae (apples, stonefruits, strawberries, brambles ect.) in the Plant Genome Section of NRI's 2004 grant program. The Viticulture Consortium provides funding for grape research annually to help the grape and wine industries.

Significant progress was made during the event towards common goals for berry crops. Core values pertaining to integrity, cooperation, sustainability, and leadership were outlined along with a vision statement and core purpose. Issues facing the industry were clarified and categorized into social and cultural aspects, political climate, economic factors, technological factors, and production challenges. A series of goals for the overall industry to maintain and strengthen the industry were proposed for discussion in future committee meetings. A governance structure including an executive committee with an executive director was developed that includes regional representation through commodity committees and liaisons with academic and USDA personnel. Overall, it was an excellent and large first step in developing a plan for the future of the industry. Additional workshops will be held at future commodity conferences starting with the Southeast Fruit and Vegetable Conference in Savannah, GA on January 6-8, 2006. For more information about the initiative and future meetings, contact Dr. Tom Bewick at tbewick@csrees.usda.gov.

NORTH CENTRAL COORDINATING COMMITTEE FOR SMALL FRUITS AND VITICULTURE (NCCC-22) MEETS IN GENEVA

Courtney Weber, Associate Professor, Department of Horticultural Sciences, Cornell University's New York State Agricultural Experiment Station at Geneva, NY

Academic, industry and government experts on small fruits and viticulture from 23 states and Ontario, Canada participated in the annual NCCC-22 meeting held in Geneva on October 28-30, 2005. This committee is dedicated to the exchange of information among research and extension personnel to better coordinate our efforts. Reports of the activities at 9 USDA stations and 19 university experiment stations were given on topics ranging from berry breeding and production research, viticulture trials, native bee pollinators, and nutritional analysis and health benefits potential of berries, grapes and wine. As federal and state support for our research is reduced, it is increasingly important for the research community and industry to prioritize research needs and reduce duplication of effort. This committee has facilitated hundreds of collaborative projects and continues to enable researchers to remain up to date on the problems the industry faces and the solutions that researchers have developed.

(**Editor's note**: The 2-day meeting, hosted by Dr. Courtney Weber, was held in Jordan Hall auditorium. Many attendees of the NBCI meeting earlier in the week stayed on to attend this important meeting as well. We wish to thank Dr. Weber for his efforts in hosting the 2 meetings here in Geneva and also those industry members and growers from our state who voluntered to participate in the NBCI strategic planning meeting.)

HIGHLIGHTS FROM THE CORNELL RASPBERRY HIGH TUNNEL OPEN HOUSE

Cathy Heidenreich, Small Fruit Extension Support Specialist, Department of Horticulture, Cornell University's College of Agriculture and Life Sciences, Ithaca, NY 14853

Fifty people turned out for Cornell University's Raspberry High Tunnel Tour on October 20, 2005. Growers, extension personnel, and homeowners traveled from around the state to see the new season-extension production system and ask questions about high tunnel raspberries. Questions ranged from high tunnel construction and materials, to soil management, plant nutrition, disease and pest problems, weed control, variety selection and economics of high tunnel production.

The weather was picture perfect for the event, with warm temperatures (for October) and bright sun. Many were surprised to find harvest in full swing, with some varieties being harvested for the first time that afternoon. Fall bearing raspberry plantings under normal production had already experienced their first hard frost and were all but finished for the season, as was demonstrated by the bucket of canes on display from Dr. Pritts's home 'Heritage' planting.

Participants were amazed at the size and quality of berries being harvested from the tunnel. Others marveled to see a myriad of native bumble bees traveling to and fro in the tunnel, pollinating flowers of some late varieties included in the variety trial.

Five varieties were on display for sampling at the tasting table: 'Josephine', 'Heritage', 'Caroline', 'Autumn Britten', and a numbered variety from the Geneva breeding program. Josephine appeared to be the favorite, followed closely by Caroline. These varieties are not usually grown in our area, as they were bred for more southern growing regions. All agreed the berries were delicious, regardless of variety sampled.

The purpose of this project is 3-fold: 1) to identify varieties suitable for high tunnel production under NY conditions, 2), to document how best to manipulate plants to achieve delayed fall flowering and fruiting, and 3) to determine if the use of season extension technology is economically viable on the farm.

Planting establishment and high tunnel construction
Fall-bearing raspberries were planted in April of 2004. The prepared planting bed was mulched with 4" compost, which was then incorporated into the soil. No commercial fertilizer was applied. All canes were mowed to the ground in the fall. In spring of 2005, the tunnel framework was installed over the planting. Plastic was put on September 13, 2005, just prior to harvest. No disease or pest management was needed. Beds were hand weeded as needed.

Evaluation of varieties under high tunnel production
The study is divided into two parts. The first experiment involves monitoring the growth and productivity of several promising late varieties that typically fruit too late for the New York climate. The varieties included in this experiment are 'Heritage', 'Caroline', 'Josephine', 'Autumn Britten', NY01.63, NY01.64, and NY01.65. The numbered selections were made by fruit breeder Courtney Weber who suspects that they may have traits that allow them to perform well in high tunnels.

Delaying fall fruiting and flowering
The second set experiment focuses on treatments to manipulate 'Heritage' into fruiting later than the normal September season. Typically, one would prefer that these fall-bearing types fruit early to avoid frost. The objective of this part of the project was to delay fruiting until late in the fall when the availability of fresh raspberries is low and the price is high. During the summer, plants were treated in various ways to delay flowering and fruiting. The five treatments included an unmanipulated control, applying straw over plots in late February at the rate of 6 tons/acre after a period of cold weather, mowing canes to the ground in early June shortly after they emerge, pinching primocanes (removing the top 4 – 6 inches) when they reach a height of about 2½ ft., and pinching when canes were 3 ½ ft. tall.

Preliminary results
At the time of the open house, the projects were in the 9th week of harvest. The mowing treatment and NY64 had yet to fruit significantly. Fruit appearance was excellent although sugar content was low. Yields were extremely high; averaging nearly 2 lbs. per ft. of row in control plots of 'Heritage'. Berries were being sold at the Cornell orchard store for $5 per pint; there were never any left at the end of the day to be stored over night. Observational evidence indicates high tunnel harvested berries had a much better shelf life and are relatively disease and pest free.

Variety trial
'Heritage' and 'Autumn Britten' peaked in production during weeks 5 and were beginning to decline by week 9. 'Caroline' also peaked at during week 5 and had the greatest yield that week with more than 3500 g fruit/18 foot plot (170 g per ½ pint; 6 plants per plot). 'Josephine', and NY 63 were still increasing in production at week 9, and the first fruit from NY65 was harvested the day of the open house. NY 64 had not yet begun to fruit.

Plant manipulation trial
Each of the 4 treatments delayed flowering, and data is now being collected on how they affect the time of harvest and yield. As in the variety trial above, 'Heritage' control plants peaked around week 5 and had started to gradually decline by week 9. Pinch-early, pinch-late, and mulch treatments were still increasing in production. The mowing treatment (very popular with the bumble bees) was in full bloom and had yet to fruit.

More results will be forthcoming as the final data is collected and analyzed. Many thanks to all those who attended the open house and especially to those involved in the project: Mary Jo Kelly, Steve McKay, Jennie Conrad, Hans Spalholtz, and Katie Miner.

GRAND OPENING OF REDESIGNED NYIPM WEBSITE!

Juliet Carroll, Fruit IPM Coordinator, New York Integrated Pest Management Program, Geneva, NY 14456

We've redesigned the New York State Integrated Pest Management Program website to serve you better. It's at the same location (http://www.nysipm.cornell.edu/), but we have dressed it up with a new graphic look and behind-the-scenes technology to deliver pages even more quickly.

New Features:

- Specialized search function for each commodity to help you find any document: now you can search our database by pest, crop, setting or management technique
- Expanding left menu allows for easy viewing and navigation to all our sections
- Top navigational bar gives quick access to the most popular pages: fact sheets, Cornell guidelines, brochures, and more
- New breadcrumb trail shows the path back home

Look for New Content:

- Fruit: Trac software, CCE commercial fruit programs, and IPM Elements for apples
- Field Crops: weekly pest reports in a new, easier-to-read format
- Vegetables: pheromone trap network and IPM Elements for peppers
- About the Program: an updated IPM catalog and our latest annual report
- new sections: Buildings, Teaching IPM, and Landscapes, Parks & Golf Courses

Coming Soon

We're not done yet. We'll be revamping much of our content for easier on-screen readability, adding a consumer section, and more.

BLUEBERRY PRODUCTION, CROP MANAGEMENT TOPIC OF NEW MSU WEBSITE

Sarah Long, Project Greeen Communications Manager

EAST LANSING, Mich. — Blueberry growers can get the answers to many of their crop-related questions by visiting a new Web site developed by researchers at Michigan State University (MSU).

A team of MSU blueberry researchers and Extension specialists developed the Web site as a one-stop resource on blueberry production and crop management. The site, http://www.blueberries.msu.edu, includes information on blueberry cultivation, blueberry varieties, insect pests, diseases, nutritional disorders, weeds, pest management, weather, and crop scouting. The site also includes links to other blueberry-related Web sites.

"The Web site was created as a comprehensive resource for people interested in blueberry production," says Annemiek Schilder, MSU assistant professor of plant pathology. "Because Michigan is the largest highbush blueberry-producing state, it seemed logical that MSU would create this site."

Schilder says the Web site is useful for anyone who works with blueberries, including growers, nursery owners, researchers, Extension staff members and specialists, teachers, crop consultants, government employees and home gardeners who want to get more information on all aspects of growing blueberries.

Development of the Web site was funded by Project GREEEN (Generating Research and Extension to meet Economic and Environmental Needs), Michigan's plant agriculture initiative at MSU, and the Michigan Blueberry Growers Association.

Project GREEEN is a cooperative effort between plant-based commodities and businesses together with the Michigan Agricultural Experiment Station, MSU Extension, and the Michigan Department of Agriculture to advance Michigan's economy through its plant-based agriculture. Its mission is to develop research and educational programs in response to industry needs, ensure and improve food safety, and protect and preserve the quality of the environment.

To learn more about Michigan's plant agriculture initiative at MSU, visit <www.greeen.msu.edu>.

FOUR REPORTS DOCUMENT PERCEPTIONS OF THE U.S. FOOD SYSTEM

Four reports commissioned from FrameWorks by the W.K. Kellogg Foundation explore how people think about food and the food system. Published collectively as **Perceptions of the U.S. Food System: What and How Americans Think about their Food**, the reports conclude the first phase of a comprehensive strategic frame analysis on the food system to be completed in 2006. The four reports are:

- Not While I'm Eating: How and Why Americans Don't Think about Food Systems,
- All Trees and No Forest: How Advocacy Paradigms Obscure Public Understanding of the Food System,
- Digesting Public Opinion: A Meta-analysis of Attitudes toward Food, Health, and Farms, and
- Harmful and Productive Patterns in Newspaper Representations of Food Systems.

All four reports are available online, individually or as one document (PDF / 540 kb).

(**Reprinted from**: ATTRA Weekly Harvest Newsletter, October 5, 2005)

SOME BERRY GOOD HEALTH NEWS

The next time you're shopping at a local supermarket or a roadside produce stand, you may want to pay closer attention to the raspberries, blackberries and other brightly colored fruits and vegetables on display. Research by cancer specialists and food scientists nationwide has shown that anthocyanins—the antioxidant compound that produces the dark red, purple and blue colorings in many varieties of berries and vegetables—can help in the prevention of certain types of cancer, particularly colon cancer. Colon cancer is the second leading cause of all cancer deaths in the United States.

The health benefit of eating berries has certainly drawn the attention of Bernadene Magnuson, an assistant professor in the Department of Nutrition and Food Science. Magnuson recently completed two years of research that was supported by the Cancer Research and Prevention Foundation, a nonprofit organization interested in funding new ideas for cancer research. "We are trying to make people aware of the multiple health benefits of berries. This is a commodity that we can easily grow and that can have some proven cancer inhibiting qualities," Magnuson says.

Her research was done in three stages: First, anthocyanins were introduced to colon cancer cells in a culture dish to observe their effect. "It was fairly striking how [anthocyanins] inhibited the growth of colon cancer cells," Magnuson says. Next, the berry extracts were tested on normal colon cells, to make sure they didn't destroy healthy cells. The final stage involved inducing cancer in rats, and then observing whether the size or rate of growth of their cancer lesions diminished after anthocyanins were introduced to their diet.

Magnuson believes that the highly colored berries are the best choices for consumers, and adds that blackberries, raspberries (both black and red) and grapes are not only excellent sources of anthocyanin, but contain lots of healthy fiber as well. "Ultimately, if we can try and find an answer [for cancer prevention] that is naturally occurring in the foods we eat, it is always better than looking for synthetic cancer inhibitors that will just put another new pill on the shelves." —

What You Can Do

Most cancer experts agree that colon cancer is the easiest cancer to prevent or arrest in the early stages. "You can start by changing your diet, and that is always a good thing," Magnuson explains, "But the most important thing is an annual exam that includes testing for colon cancer if you are over the age of 50."

Here are a few healthy eating tips from the American Institute for Cancer Research that can go a long way in helping to prevent colon cancer:

Eat mostly fiber-rich vegetables, fruits, whole grains and beans

Vegetable and fruits have plenty of cancer-fighting nutrients, protective compounds and dietary fiber. Dieticians recommend 20–30 grams of fiber daily. Whole grains and beans are particularly rich in fiber: one slice of whole wheat bread has 2 grams of fiber and 1/2 cup of beans contains 7 grams. Also, eat fruit for dessert to boost your dietary fiber intake. Frozen is just as good as fresh for anthocyanin levels in berries.

Eat less fat

Red meats, processed meats, whole milk, butter, oil, margarine, fried foods, most chips and processed foods are high in fat, and often, saturated fat. Eat smaller amounts, or choos to eat them less often. And, make cooked meat portions less than 3 ounces (the size of a deck of cards) per day.

*(**Reprinted from**: .TERP MAGAZINE, published by the University of Maryland Division of University Relations.*

PROPOSED BERRY SESSIONS FOR THE 2006 EMPIRE STATE FRUIT AND VEGETABLE EXPO

Dena Fiacchino, Tree Fruit and Small Fruit Extension Specialist, Oswego County Coorperative Extension, Mexico, NY

The Empire State Fruit and Vegetable Conference is a collaboration of industry professionals, growers and producers, university professionals, researchers, processors, and general public. This is the 3rd year the conference has joined forces to address needs and concerns of the fruit and vegetable industries in New York State, as well as New England states and the Mid-Atlantic region.

This year the berry program is expanding. A full day and a half of sessions has been arranged for berry producers attending the conference. The North American Bramble Growers Assoc. (NABGA), an association comprised of raspberry and blackberry growers and professionals will be holding a regional meeting on Wednesday Feb. 15, 2006. The Wednesday afternoon session (2:00 – 5:00 pm) will focus on the ABC's of Raspberry Production. This session will serve a two-fold purpose: it will provide an opportunity for novice growersto review the basics that can easily escape the mind,as well as provide an introduction to bramble production forboth new, potential fruit farmers and interested growers who would like to diversify their farming operations. A regional board meeting will also take place for those interested in bramble production and becoming part of NABGA.

Thursday Feb 16, 2005 will be a full day of berry information!
Discussion topics include: bramble production in NYS, economic benefits of raspberry high tunnel production, new developments in pesticide application, new age fruit products created to maximize profits, and economics in high tunnels. There will also be detailed information on persistent strawberry and blueberry diseases, along control options and new production strategies. More information will be available at a later date.

NORTH AMERICAN BRAMBLE GROWERS ASSOCIATION REGIONAL MEETING PLANNED

On February 15-16, the North American Bramble Growers Association (NABGA) will hold a Regional Meeting for bramble growers in association with the NY State Berry Growers Association at the Empire State Fruit and Vegetable Expo in Syracuse, NY. NABGA's participation brings to the Expo an expanded program of bramble educational sessions and opportunities for discussion among bramble growers.

Wednesday, February 15
9:00-11:00 Bramble Grower Issues Sessions

- Getting and keeping good labor on the bramble farm. Presenters TBA
- Weed management in established bramble plantings. Presenters TBA
- National and regional issues for bramble growers: How do we build and support the bramble industry? NABGA officers and staff

2:00-5:00 pm - ABCs of Raspberry Production
An introductory course for novice growers and a refresher for more experienced producers. Topics will include: What you need to do before you plant; Plant types and recommended varieties; Crop and pest management; and Experiences from the field. Led by Marvin Pritts, Courtney Weber, Dena Fiacchino, Cathy Heidenreich, and Nate Nourse (Nourse Farms). Sponsored by the North American Bramble Growers Association.

North American Bramble Growers Open House *(evening, at hotel)*

Join leadership and staff of the North American Bramble Growers Association and other growers of raspberries and blackberries for informal discussion and refreshments. Learn about the association, discuss issues for the bramble industry and the needs of your farm, and visit with growers and suppliers.

Thursday, February 16

Participate in the sessions of the NY Berry Growers Association annual meeting, which includes sessions on black raspberry breeding, high tunnel bramble research, the role of NABGA, and a grower profile, as well as other small fruit topics.

There is no separate registration for this meeting; simply register for the Empire State Fruit & Vegetable Expo. For more information, about the NABGA meeting, contact Debby Wechsler at nabga@mindspring.com. For info on the Expo contact ???

REGISTER NOW FOR THE 2006 NORTH AMERICAN BERRY CONFERENCE

You Can't Wait Until After the Holidays to Register!!

The annual North American Berry Conference is being held January 4-6 at the Savannah International Trade and Convention Center in Savannah , GA. The conference date has been moved from its normal February date to make it easier for growers, researchers, educators, and suppliers to also participate in the Southeast Regional Fruit and Vegetable Growers Conference being held January 6-8, immediately following the Berry Conference. Scheduling the conferences side-by-side offers greatly enhanced educational and networking opportunities.

NASGA is emphasizing the importance of registering now for the 2006 conference. Registration materials are available on the NASGA website, www.nasga.org . Many people are accustomed to making plans for the Conference after the holidays. **However, the deadline for making reservations in our block at the Garden Hotel Historic Savannah is Wednesday, November 30.**

Wednesday's sessions will offer two concurrent tracks, one on production and one on making your business profitable. Thursday will feature a tour for attendees of both the Berry Conference and the Regional Fruit and Vegetable Growers Conference. Friday's morning's general sessions will highlight pest management, a local grower, and marketing information.

Because exhibits will be available to attendees from both conferences, the Southeast Trade Show will also offer exhibitors greater opportunities to showcase their products and services.

Although registration for the two Conferences is separate, those attending the Berry Conference will receive free admission to the Southeast Trade Show.For information on the Southeast Regional Fruit and Vegetable conference, visit their website, http://www.gfvga.org/.

NASGA is a multi-country organization of approximately 300 members, primarily small production growers that specialize in pick your own or farm market sales, along with the research community and suppliers that support them.

NASGA'S GEORGIA BERRY TOUR COINCIDES WITH NORTH AMERICAN BERRY CONFERENCE IN SAVANNAH, GEORGIA

A tour of Georgia farms and farm markets is scheduled for Thursday, January 5, in conjunction with the annual North American Berry Conference being held January 4-6 at the Savannah International Trade and Convention Center in Savannah , GA. While the tour is part of the conference, it is ticketed separately, so that attendees do not need to attend the conference to register for the tour.

The Southeast Regional Fruit and Vegetable Growers Conference is being held January 6-8, immediately following the Berry Conference, so the tour is conveniently timed for attendees at both conferences.

Tour day is filled with educational opportunities from farm visits to information on Georgia 's small fruit industry and an overview of the Savannah Area green Industry and Agriculture. Scheduled stops include:

- Ottawa Farms, Pooler, hosted by owner Pete Waller. Waller is the third generation to carry on the tradition of "old time farming." They specialize in PYO strawberries and blueberries, and also have onions, corn and other produce.

- Clark Farm and Produce, Twin City, hosted by Al Clark. Clark Farm offers outstanding customer service, including shelling your peas and butter beans, boiling the peanuts freshly picked out of their fields, and, for a small fee, delivering the produce to your door. They also offer school tours, gift baskets, and hayrides.

- Wilbanks Apiary, Claxton, hosted by Reg Wilbanks. Now in its fifth generation of family ownership, Wilbanks is among the largest commercial beekeeping operations in Georgia, with 6,000 honeybee colonies.

- Two farms in one of the largest and most diversified agricultural counties in Georgia, Tattnall County. Both farms are part of Farm Fresh Tattnall, Inc., a new farmers' cooperative – D. C. Durrence Farm, Reidsville, hosted by Danny Durrence, and W. A. Rogers and Sons Farm Market, Glennville, Alex Rogers.

Registration and information on the conferences and the tour are available at www.nasga.org . Because the January dates are earlier than usual, it is important to register early. Registration is separate for both conferences, as well as the tour. For information on the Southeast Regional Fruit and Vegetable conference, visit their website, http://www.gfvga.org/.

NEW ENGLAND VEGETABLE AND FRUIT CONFERENCE

Vern Grubinger, University of Vermont Cooperative Extension

The New England Vegetable & Berry Conference and the New England Fruit Meeting have officially merged into the **New England Vegetable and Fruit Conference**, which will be held every two years. The conference will be held this December 13, 14, 15 at the Radisson Hotel in Manchester, NH and will include 24 educational sessions over 3 days, covering major vegetable, berry and tree fruit crops as well as various special topics.

A Farmer to Farmer meeting after each morning and afternoon session will bring speakers and farmers together for informal, in-depth discussion on certain issues.

This conference is put together with close collaboration between growers and Extension from across the region. The steering committee gathers the best speakers from within our region and across the country to let you know about the latest innovations and advances in the fruit and vegetable industry.

Twenty-five educational sessions over three days will mix the best theory and practice regarding major fruit, berry and vegetable crops. Virtually every session from Strawberry I on Tuesday morning to Sweet Corn School on Thursday afternoon will include the perspective of both farmers and Extension staff and researchers.

There will also be an extensive **Trade Show** with over 100 exhibitors that sell books, equipment, fencing, fertilizers, greenhouses, instruments, insurance, packaging, pesticides, seeds, and more!

The event is sponsored by the New England Vegetable & Berry Growers Association and the Massachusetts Fruit Growers Association in conjunction with the Universities of Connecticut, Massachusetts, New Hampshire, Rhode Island, Vermont and Maine, as well Cornell University and the Connecticut Agricultural Experiment Station in cooperation with the U.S. Department of Agriculture.

The 3-day educational program offers 4 concurrent sessions each morning and afternoon. On Tuesday, December 13 the sessions are on: strawberries, tomatoes, biorational and biological pest control, potatoes, leafy greens, root crops, and tree fruit. On Wednesday, December 14 sessions are on: tree fruit, pumpkins, blueberries, soil health, greenhouse tomatoes, and organic. The sessions on Thursday, December 15 are on: viticulture, sweet corn, cucurbits, brambles, winter growing, sweet corn, peppers and eggplant, and cut flowers.

The Annual Banquet of the New England Vegetable and Berry Growers Association will be held during the conference, on Wednesday evening. The speaker will be Roger Swain from People, Places, and Plants. Roger also hosted Victory Garden for many years.

The pre-registration fee to attend any part or all of the conference or trade show is $60 for the first member of a farm business and $30 for each additional member (family or employee) when pre-registered with first member. The pre-registration fee for students (high school or college) is $20 each when pre-registered by the instructor. There is an additional fee of $10 per person, in each category, for late registration or walk-ins. Pre-registration must be received by November 30, 2005. (There has been some confusion about registration fees but the fees listed above are accurate.)

You must make your own room reservations with the Radisson Hotel Manchester! I suggest you call early, as they are likely to sell out before the deadline of November 30. Room rates are $93 per night, single or double occupancy. call (603) 625-1000 and mention the conference by name to get the above rate, or book on-line at: www.radisson.com/manchesternh with promotional code VEGBER.

Additional information on the New England Vegetable and Berry Conference and the New England Fruit Meeting, including the complete program with speakers and topics, as well as downloadable registration material, may be found at http://www.newenglandvfc.org/

BERRY INTERESTING-WORKFORCE TRAINING ON ORGANIC BERRY PRODUCTION

Janet L. Aldrich, Senior Extension Educator, Cornell Cooperative Extension of Delaware County

I admit, by day three of Delaware County Cooperative Extension's Workforce Training, Steven McKay had me wanting to plow down some of my dairy farm's alfalfa fields and immediately start in on gooseberry production. I wasn't alone. For three days, twenty-six growers from a three county area in the Catskills met with three dynamic Cornell fruit specialists to learn about organic production systems for growing berries. Many were already growing berries, many wanted to diversify into berry production, and others wanted to start a berry business. Workforce training, sponsored by New York State Agriculture and Markets, is designed to reach both the experienced and inexperienced – farm owners and farm employees. For our instructors we had what I consider to be a "Dream Team" of this state's fruit specialists: Marvin Pritts, Professor of Horticulture and Berry Specialist, Cornell University, Catherine Heidenreich, Small Fruit Extension Support Specialist, Cornell University; and Steven A. McKay, Extension Educator, Cornell Cooperative Extension of Columbia County and Small Fruit Specialist on the Hudson Valley Fruit Team. Who could ask for anything more?

Berry School participants at Poverty Hollow Blueberries in Treadwell – John and Bette Braymer (first on left) hosted two afternoon labs at the farm.

WHAT IS AG WORKFORCE TRAINING?

Workforce trainings are held across New York State in all fields of agriculture, usually through Cornell Cooperative Extension. They consist of classroom lectures followed by afternoon in-the-field, training sessions. Participants need to complete a certain number of hours of this instruction before they can receive a certificate of completion. Farm owners, landscape operation owners, greenhouse/nursery owners – many attend themselves or send their workers, recognizing the need to increase skills and knowledge in the agricultural workplace. At the training held at Delaware County Cornell Cooperative Extension on September 26-28, the concentration was on organic berry production. Recognizing the growing

consumer trend for local farm products, especially those grown organically, naturally or using integrated pest management practices, we felt that berry production offered Delaware County growers an opportunity to produce crops and value added products that can command decent farm gate prices. Although this county has a short growing season and falls within the USDA's hardiness zone 4,with season extension techniques they can produce berries throughout the growing season, offering the freshest berries locally. The class was filled immediately. Participants not only learned from the instructors, but they met each other and some solid farmer friendships were made.

TWO LOCAL FARMS OFFER LEARNING LABS

When I first stepped foot on Poverty Hollow Blueberries in Treadwell, New York, I was confronted with over ten acres of blueberry bushes laden with lush, large, delicious blueberries and met John and Bette Braymer, co-owners with their daughter Sylvia Rowlands. The Braymers were quickly picking the blueberries that would then be taken fresh to downtown Delhi to be sold at a small roadside stand. The Braymers do this both for fun and profit and enjoy the fact that their daughter is part of this farm venture. But they admit...they have been planting new sections of fields every year for the past twenty-five years, and the plantation of over 1500 plants is starting to be more than they can handle. They were considering establishing a U-Pick operation and were very excited to learn about the berry production school. All three signed up to attend. They are not certified organic but have never used pesticides of any kind, nor chemical fertilizers, so they felt the certification process would not be too difficult to complete. Their fields provided two days of labs for the school – the first with Marvin Pritts to discuss production systems and the second with Catherine Heidenreich to scout for diseases and insects. Even though it rained heavily the first afternoon (after a whole summer of drought), participants tromped through the fields happily while Marvin demonstrated pruning and discussed planting systems on this hillside terrain.

During the scouting with Catherine, students were given their own hand lenses and searched the fields for diseases and insects. It was a picture perfect day and although the plantation had very few insects, we were able to discover some powdery mildew, rust, leaf spot, leaf miner, chewing caterpillars, beetle damage on leaves, and canker. What a great day!

Chewing caterpillar on blueberry leaf

Blueberry leaf rust

Blueberry powdery mildew

Hand-In-Hand Farm of Hobart is owned by Nancy Haycock and Elizabeth Hand. It is a certified organic vegetable operation that specializes in heirloom vegetables and herbs. It also has a charming Farm Store that offers value added products such as soups, baked goods, chutneys, relishes and berry or fruit jams. This hillside farm is dazzling to visit, with its rows of flowers, colorful vegetables, and surrounding vistas. Nancy Haycock also attended the Workforce Training – by day three when the school came to her farm with Steven McKay, she felt like she was bringing in a group of friends to show off the fruits of this farm's labor. She served a tomato vegetable curry soup that warmed our bodies despite the farm's almost constant winds. At Hand-In-Hand Farm, we were able to taste red currants fresh off the bush, even though they were at the end of their season. All week at the training, we sampled this farm's preserves: tart cherry, blueberry, currant-blackberry, blackberry, and peach-rhubarb. At the farm, Steven McKay demonstrated pruning techniques that were similar to those used on blueberries. During classroom lecture, he had covered the concept of "cordon training system" where one to three trunks per plant are grown and tied to stakes vertically. We got out our hand lenses and were able to

find a little white pine blister rust on the underside of some leaves – a common occurrence when you live in the country and white pines co-exist.

Ribes expert Steven McKay examines a red currant plantation at Hand-In-Hand Farm in Hobart and shows the group a bit of white pine blister rust.

A Ribes (gooseberry and currant) expert, Steven left the group with ideas on growing and marketing, as he noted that in the 1930s, New York State ranked number one in the country for red currant production. He encouraged the group to join the International Ribes Association (www.internationalribesassociation.com) that publishes a quarterly newsletter on the culture, processing and marketing of these beautiful and tasty fruits – the red currants are considered the "jewels" of Ribes as they can be found in shades of dark red to pink, yellow, white and beige. Together with black currants and the extensive color range of plump gooseberries (ranging from green to yellow/green, to yellow, white, pink, red, dark red or purple) these berries lend themselves to artistic presentation and gourmet specialty markets.

GROWING BERRIES – WHAT DOES IT TAKE?

What is the toughest part of *organic* berry production? According to Marvin Pritts, it is weed control. Organic growers need to study their soils and put their production fields into cover crops ***before*** initial planting. Steep slopes (greater than 5%) should be avoided as they will erode easily and are hard to cultivate and irrigate consistently. Moderate slopes (3-5%), on the other hand, allow air to drain and reduce the high humidity around the plants – this is highly favorable for berries as it reduces diseases as well as the risk of frost injury. Says Pritts, "Steep, south-facing slopes tend to increase the risk of frost injury in the spring because plants generally bloom earlier. However, west-facing slopes present the greatest risk for winter injury because plants are exposed to persistent, desiccating winds in winter."

A major step in site preparation is getting rid of perennial weeds – for both organic and conventional growers. "Weeds cause more economic loss in berry production than diseases and insects combined." Pritts notes***. "Eliminating weeds the year before planting is much easier than controlling them after planting. Starting site preparation two or three years in advance to eliminate existing weeds will be rewarded in future years and is especially important if the berries are going to be grown organically."*** Cover cropping the site, repeated cultivation or covering the site with black plastic for several months are also effective.

Before planting a cover crop, the soil needs to be tested for pH, potassium, phosphorus, magnesium, calcium, and boron. A composite sample from ten or more locations in the field, to a depth of 10-12 inches is recommended. It takes a year for either lime or sulfur to affect the pH, so these should be added one year before planting. Animal manures and legumes offer a good source of slowly released nitrogen; however, animal manures can contain weed seeds. Also, manures need to be well composted and worked into the soil prior to planting to minimize the risk of fruit contamination with pathogenic bacteria.

COVER CROPS ARE KEY

All three of the teachers advocate the use of cover crops on the planting site the year before planting - not only to improve soil structure, but to suppress weeds. The choice of cover crops will depend but the soil – its pH, drainage, soil moisture, and time of year for establishment. Pre-plant cover crops are usually plowed under in the late fall or early spring prior to planting. Unless the soil and site are prone to erosion, crops with low nitrogen contents such as grains and grasses should

be plowed under early in the fall to allow time for decomposition. Legumes contain more nitrogen and decompose quickly so they can be turned under within a month of planting. Following are a few cover crops covered in the class handouts: alfalfa, brassicas (mustards are increasingly popular as a pre-plant cover crop because they contain certain chemicals that suppress weeds, nematodes and other soilborne pathogens and they have an extensive root system); buckwheat on sites with a low soil pH; clovers; fescues (used both as a pre-plant and a permanent cover crop in fruit plantings, often in combination with white and red clover; alfalfa (plantings are made in the fall); annual field brome grass; hairy vetch (not to be confused with crown vetch); and marigolds! Pritts' literature notes that marigolds are a relatively new cover crop that has generated much interest among growers for its ability to suppress weed and nematode populations. The seeds will germinate only when soil temps exceed 65 degrees F – they do not have to flower to provide benefits and can be plowed under after growing for three months or more. Others choices include: Japanese millet; spring oats; winter rye, annual ryegrass; Sudan grass; and Sorghum-Sudan grass hybrids. Each of these has a different planting time, soil requirement, seeding rate and purpose as a cover crop. Growers need to do their homework to decide what will work best on their farm.

GETTING STARTED IN BERRIES – T'AINT EASY

While all three instructors are enthusiastic about berry growing, they advise that it is not easy and to succeed (make a profit) you need to be a good horticulturist, labor manager, pest manager, and marketer. Pritts' handout outlines some questions farmers need to ask themselves before investing time and money into berry production: *(See also the January/February 2005 issue of Part Time Farmer for an overview of berry production considerations developed by Lori Bushway at Cornell.)*

- How do you plan to market the berries?
- Are your facilities adequate for the type of marketing you plan to do?
- Is the soil on your farm appropriate for growing berries?
- Is the soil sufficiently drained?
- Do you have a large enough water supply for irrigation?
- Does your land slope enough to allow for air drainage, but not so much that it is difficult to work?
- Do you have sufficient capital resources to invest in berries? (about $3,000 for strawberries; $5,000 per acre for fall raspberries; and $7,000 per acre for summer raspberries? ***Keep in mind that a return on investment will be many years away.***
- Do you have the personal skills necessary to manage laborers and greet customers?
- Where will you obtain labor during the busy picking season?
- Do you have land for future expansion and crop rotation?
- Is your family willing to commit to berry production? (Growing berries may entail foregoing a summer vacation, working during harvest, and if retailing, tolerating the public on the farm.)
- Have you checked local ordinances regarding zoning, parking, signs, noise, riparian rights, etc., to see if they might conflict with your plans for berry production?
- Are you set up to keep track of input expenses, payroll, pesticide applications (even organic operations use pesticides and should keep records) employee records, yield records and perhaps customer mailing lists?
- Have you started a library of resources?
- Are you certified or trained to apply pesticides (this applies to organic growers too)?

A SCHOOL FOR ALL SEASONS

It is not possible to cover the entire school. Marvin Pritts covered the essentials of strawberry, brambles (raspberries and blackberries) and blueberry production. Catherine Heidenreich covered pest management and scouting methods for berry crops. Steven McKay covered production methods for Ribes (gooseberries and currants), and their marketing potentials. There were extensive handouts and references to more resources, such as Cornell's excellent fruit website: www.fruit.cornell.edu. Participants definitely got a good start on their "library of resources". As these workforce training schools are held throughout the state, we would like to urge all farmers and growers to take advantage of them – find the time to go or send workers. The information received, the networking among farm

ELDERBERRY RESEARCH AND PRODUCTION IN MISSOURI

Patrick Byers, Department of Fruit Science, Missouri State University and Andrew Thomas, Southwest Research and Education Center, University of Missouri

(**Editor's note:** I was privileged to meet Patrick Byers while driving an airport shuttle van for the recent national berry meetings last month. He kindly agreed to share this information on the work he and other researchers have been doing with elderberry production in Missoouri. Elderberries are a native species for New York and may provide apotential marketing opportunity for New York growers.)

Introduction

The Elderberry (*Sambucus nigra* L. ssp. *canadensis* (L.) R. Boll*)* is native to much of North America. The plant is a medium to large shrub or small tree. Foliage is pinnately compound, and the stems are noted for large, raised lenticels. Flowers are borne in flattened panicles, usually in May, and fruit ripens in July, August, and September. Flowers and fruit are produced on both current season's shoots and on older wood.

Elderberries were undoubtedly utilized by Native Americans, and were harvested from the wild by European settlers. Organized efforts to improve the native elderberry, however, began in the 20th century. The cultivars Adams 1 and Adams 2 were selected from the wild by William W. Adams in New York in 1926. Ezyoff, of unknown parentage, was introduced by Samuel H. Graham of Ithaca, New York, in 1938. More recent breeding efforts at the Kentville, Nova Scotia experiment station have resulted in Johns (1954), and Nova, Scotia, Kent, and Victoria, all released in 1960. The Nova Scotia releases are all seedlings of either Adams 1 or Adams 2. The latest release, York (1964), is a cross of Ezyoff and Adams 2 and was developed by the New York Agricultural Experiment Station.

A review of the elderberry literature reveals studies at Pennsylvania State University on elderberry culture, and at the University of Illinois on fertilization and cultivar evaluation. Recent work has focused on elderberry juice composition and the use of elderberry juice as a colorant. Reported elderberry investigations in Missouri prior to 1997 were limited to cultivar testing at the State Fruit Experiment Station of Southwest Missouri State University.

The elderberry is a native, adapted plant in Missouri, and there is a demonstrated, growing demand for elderberry fruit and flowers from winemakers, jelly processors, and producers of various nutraceutical preparations. Commercially available cultivars were developed elsewhere, in New York and Canada, and native midwestern germplasm has not been utilized to any extent in the development of adapted cultivars. Research-based information on suitable cultural practices is lacking; numerous possibilities for cultural studies are available.

The Elderberry Improvement Project

The Elderberry Improvement Project was initiated in 1997 from discussions among Patrick Byers of the SMSU State Fruit Experiment Station (SMSU-SFES), Andrew Thomas of the University of Missouri Southwest Research and Education Center (UMC-SWREC), and Alan Erb, formerly of Kansas State University (KSU). The project also received initial and ongoing support from John Brewer of Wyldwood Cellars, Mulvane, Kansas. Chad Finn, with the USDA-ARS laboratory in Corvallis, OR, joined the project in 2000.

The Elderberry Improvement Project has evolved into three components:

1. Collection of native elderberry germplasm
2. Replicated evaluation of superior native germplasm
3. Cultural studies

Collection of Native Germplasm

The collection of native germplasm was initiated in 1997 and is ongoing. The plantings are maintained at the SMSU-SFES, UMC-SWREC, and at Corvallis. Available commercial cultivars were obtained from KSU and commercial nurseries. John Brewer donated selections from his elderberry project. Superior elderberries were solicited from elderberry enthusiasts among the public. Other superior elderberries were gathered during collection trips. At present (2005) the collection consists of 6 named cultivars, 31 selections from Missouri, 2 selections from Kansas, 3 selections from Oklahoma, 5 selections from Arkansas, 1 selection from Tennessee, 3 selections from North Carolina, and 4 selections of

the European Elder. The collection includes 55 selections and cultivars. Information collected includes phenology and plant growth, harvest date, yield, panicle size, berry size, fruit quality, and ratings of disease and insect problems.

Replicated Evaluation Of Superior Native Germplasm

The replicated evaluation of superior native germplasm began in 2003 and is ongoing. Replicated plantings were established at the SMSU-FES in Mountain Grove and UMC-SWREC in Mount Vernon which include 10 advanced selections and 2 commercial cultivars (Johns and Adams 2). Our hope is to identify elderberry cultivars with sufficient merit for release and commercial planting. This component of the project was expanded in 2004 with the establishment of a study to investigate the effects of environment on the expression of genetic traits in elderberry; Chad Finn with the USDA-ARS is a cooperator on this study. Data collected in these studies include phenology and plant growth, insect and disease ratings, panicle yield, panicle size, berry yield, berry size, and juice parameters. We are particularly excited about our collaboration with Dr. Penelope Perkins-Veazie at the Lane, Oklahoma, USDA experiment station. Dr. Perkins-Veazie and her lab will measure antioxidant levels in fruit samples from each of the selections and cultivars in the replicated study.

Cultural Studies

A study was initiated in 2000 to investigate 4 pruning strategies: annual removal of all shoots, removal of all shoots every 2 years, training to a tree form, and no pruning. Data collected in this study includes phenology and plant growth, insect and disease ratings, panicle yield, panicle size, berry yield, berry size, juice parameters, and antioxidant levels.

Future directions in the Elderberry Improvement Project include the following:

- Continued collection of superior native germplasm
- Naming and release of superior selections
- Entering superior selections into the germplasm repository system
- Additional cultural studies in such areas as fertility management, insect and disease management, and harvest management

The Elderberry Improvement Project would not have been possible without the support of Southwest Missouri State University, the University of Missouri, Kansas State University, the USDA National Plant Germplasm System, the Northwest Center for Small Fruit Research, and John Brewer and Margaret Tidwell. In particular we appreciate the contributions of the administrations and staff of the SMSU State Fruit Experiment Station and the UMC Southwest Research and Education Center.

Elderberry Culture

The information presented here is gathered from several sources (see references), including our experiences with the Elderberry Improvement Project.

Cultivars

Several elderberry cultivars are available commercially, including Adams 1, Adams 2, York, Nova, Scotia, Kent, and Johns. Of these, in our trials Adams 2 has consistently outperformed all others. Recommendations from other regions include all these cultivars. A large portion of the commercial fruit crop, especially in the Midwest, is harvested from wild plants. Among the native selections in our trials are several that outperform Adams 2.

Propagation

Elderberries are easy to propagate. Root cuttings (pencil diameter or slightly smaller, 4-6 inches long) may be dug in early March before growth begins. The cuttings are placed horizontally in a flat or pot, covered with .75 to 1 inch of a light soil or soiless medium, and kept warm and moist. Often a single root cutting will produce 2-3 plants. Dormant hardwood cuttings root easily. Collect 3-4 node cuttings before growth begins in the spring, and place the basal 2 nodes below the surface of a well-drained soil or medium. Be sure that the cutting wood is not cold damaged. A dip of the basal end of the cutting in an IBA rooting powder may increase rooting. Sprouted hardwood cuttings and softwood cuttings are also easily rooted, provided provision is made to maintain high humidity around the cuttings until rooted. An intermittent mist system works well. A rooting hormone dip may be beneficial. Cuttings of 2-3 nodes root well. Remove a portion of the foliage from softwood cuttings (we usually leave only the 2 basal leaflets of each leaf). Softwood cuttings typically root well until about July 1; rooting percentage drops as the summer progresses.

Establishment

Bare root 1-year plants dug from a nursery work well for planting establishment. Recently propagated container-grown plants may be used to establish plantings during the same season. Our plantings are on raised ridges (berms) that are spaced 12 feet apart. Plants are spaced 4 feet apart in the planting row.

Pruning

Elderberries produce fruit on shoots older than one year, and produce suckers from the crown or root system that will bear fruit the first year. Several references recommend a selective removal of older shoots when pruning. Initial results from the Mountain Grove pruning study suggest little difference among the four pruning treatments in either panicle yield or berry yield. We have learned that the average size of treatment 1 (the annual removal of all shoots) panicles is significantly larger, suggesting that current season suckers produce larger though fewer panicles. Most of the panicles on treatment 1 plants were harvested in two harvests, over a period of two weeks.

Fertilization and Irrigation

We apply nitrogen annually to the elderberry plantings. Mature plantings receive 60-80 pounds of nitrogen, applied at bud break in late March – early April. We apply other nutrients every second year, using a complete fertilizer as the nitrogen source. Elderberries are not drought tolerant, and we irrigate the plantings during dry periods. We use trickle irrigation. The plantings are also mulched, to help conserve soil moisture.

Elderberry Pests

While elderberries are relatively pest resistant, we have noted several potential problems in our plantings. An unidentified stem borer causes wilting and dieback of new shoots in April and May in the Mountain Grove plantings. Larvae of a sawfly have defoliated plants at the Mount Vernon site. The adult elder borer, also known as the elderberry longhorned beetle, has been collected at both the Mount Vernon and Mountain Grove sites. The larva of this spectacular beetle bores into the woody parts of the plant. Stink bugs are routinely noted on ripe panicles, but the amount of damage is unknown. A potentially damaging pest is the eriophyid mite, present at both the Mountain Grove and the Mount Vernon sites. This mite causes cupping and crinkling of the foliage, and can cause abortion of florets and young fruit. The economic impact of this pest is unknown. Fall webworms were also noted in the Mount Vernon planting. An unidentified leaf spot disease, which usually is noted in midsummer, can cause premature leaf drop and occasionally defoliation. Birds of several species will feed on elderberry fruit; those selections with pendulous panicles appear to be less attractive to birds.

Elderberry Harvest, Yields, and Juice Parameters

Elderberry harvest takes place in late July, August, and early September. Entire panicles are clipped and harvested when all berries are fully colored. The panicles on current season's shoots ripen later than panicles on older wood. A bush with shoots of mixed age will ripen fruit over a 3-week period. We harvest plants at weekly intervals. Berries may be removed from the panicle by freezing the entire panicle and shaking off the fruit. The berries may be refrozen and processed as needed.

In the early 1970's, Dr. Skirvin of the University of Illinois reported on yields from an elderberry trial that included Adams 1 and Adams 2. Average yields over the two cultivars were 1214 lb/acre in the first year, 8677 lb/acre in the second year, and 8582 lb/acre in year 3. Maximum yields (for Adams 2) were 3735 lb/acre in the first year, 13495 lb/acre in year 2, and 13846 lb/acre in year 3. The average yields for Adams 2 and the selection Gordon B from the pruning trial at Mountain Grove were 1226 lb/acre in the first year, 3338 lb/acre in year 2, and 5621 lb/acre in year 3. Gordon B had the highest yields in this trial - 1842 lb/acre in the first year, 4868 lb/acre in year 2, and 7572 lb/acre in year 3. In the first harvest year (2004) of the replicated selection/cultivar trial at Mountain Grove, the highest yield, 11352 lb/acre, was reported for the selection Wyldwood 1. The following table includes juice parameters from the 2002 harvest:

Table 1: Means of juice characteristics from 2002 elderberry harvest at two locations:

Site	# Samples	°Brix	pH	TA (ml)
Mt. Vernon	34	11.44	4.72	0.85
Mtn. Grove	26	12.59	4.56	0.92
Combined	60	11.94	4.65	0.88

Uses for Elderberry Fruit and Flowers

At present, most of the elderberries grown in the Midwest are harvested for processing markets. Several wineries produce elderberry wines from the fruit, and the flower panicles are used to flavor wines. Jelly and jam are produced from elderberry juice or blends of elderberry and other fruits. Elderberries contain high levels of antioxidants, and elderberry juice and concentrate are marketed as nutraceuticals. The pigments in elderberry juice are suitable for colorant use.

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CONTROL OF PHOMOPSIS TWIG BLIGHT AND CANKER IN BLUEBERRIES

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Throughout the 2005 season, cane dieback was observed in numerous blueberry fields, including in Bluecrop, Duke and Jersey. Isolations done showed that the fungus Phomopsis vaccinii caused the majority of the dieback, although *Colletotrichum acutatum* (the cause of anthracnose fruit rot in blueberries) was also found. In addition, there were some other symptoms that I call “leopard spot,” a bleached area with large black spots. The fungus causing these symptoms had yet to be identified. The severity of cane dieback, especially of one-year-old canes, can be traced to the very wet summer of 2004, when many of these canes got infected. The interaction of the disease with cold injury is not well understood, however, infected canes are likely more prone to winter injury, which could have contributed to the problem. Likewise, infected canes may be more sensitive to drought stress. Since the summer has been very dry, the risk of new infections would have been slight, unless overhead irrigation was applied, which would have provided the water splash for dispersal of spores and the wetness required for infection.

The Phomopsis cane canker and twig blight fungus can infect young canes and twigs directly if they are wet for a long period and also enters the canes through wounds caused by harvesting equipment or pruning activities. The fungus overwinters in infected canes and twigs and produced spores from April to September, with a peak in May to June. An aggressive program to combat Phomopsis would look something like this:

1) Prune out dead and diseased canes and twigs, including green canes with lesions. If the bushes look very bad, mow off everything, and let new canes come up. Use fungicides to protect new canes from infection.

2) Destroy diseased canes. Ideally, they should be removed from the field and burned. However, because of the labor involved, most growers just bushhog the canes and leave the remnants lying in the row middle. This is probably not a big concern, because *Phomopsis* spores are dispersed by rain splash and consequently won't go very far (usually within a few feet of the source). It may only be a problem if the canes are lying close to or are left in the bush. While the canes are a potential source of spores, if they break down quickly, the *Phomopsis* fungus will also be destroyed. So the better they are chopped up and in contact with the soil, the quicker *Phomopsis* will be gone.

3) Prevent canes from getting herbicide burns or other wounds (e.g., from a harvester or other equipment) which may predispose them to infection. Irrigate during dry periods (including in the fall) to reduce plant stress.

4) Protect canes and twigs with Topsin M+ Captan or Topsin M+ Ziram on a regular schedule (e.g., a spray every two weeks) from early pink bud through pea-size fruit. Indar (fenbuconazole) is also very good against Phomopsis, so if you are spraying Indar for mummy berry anyway, you are also covered for Phomopsis. Bravo will also work, but can't be sprayed after bloom. Other effective products are Pristine and Cabrio. In years with a warm and wet early fall, a post-harvest spray may be useful to protect newly developed buds and young canes as well as older canes wounded by harvesting from infection. Previous research has shown spore activity to cease in early September, so sprays should not be needed after mid September.

5) Lime sulfur can be put on in the fall after leaf drop and/or as a delayed dormant application in the spring. This will reduce inoculum and fewer fungicide sprays may be needed the following season. We are currently investigating liquid sulfur and copper as dormant sprays. These products are much less expensive than lime sulfur.

6) Don't feel discouraged if you do not start seeing results immediately. One needs to keep up this program for at least two years, because it may take a year for existing infections to show. A hard winter with lots of winter injury may also make the bushes appear in worse shape.

7) There are other canker diseases out there, including Fusicoccum canker (in northern Michigan and the Upper Peninsula) and possibly cane anthracnose (found recently in Michigan). The control methods mentioned above should also be effective against these diseases. However, if you are not sure what is going on in your field, send in a sample to the MSU diagnostic lab for a proper diagnosis.

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A GUIDE TO UNDERSTANDING THE VALUE CHAIN

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The value chain can be a very useful conceptual tool when trying to understand the factors that impact the long-term profitability of your business and when developing a successful strategic plan for your business. The value chain can be thought of as a set of activities, services, and products that lead to a product or service that reaches the final consumer.

The value chain can help you answer questions regarding:

1) How the products you produce reach the final consumer.

2) The structure (economic relationships) between players in the chain.

3) How this structure is likely to change over time.

4) The key threats to the entire value chain.

5) The key determinants of your share of the profits created by your chain.

Agribusinesses that focus only on the firms nearest to them in the value chain are not likely to anticipate major structural changes that can dramatically impact their profitability. In order to understand your value chain, begin by drawing a simple diagram that shows the key processes and inputs that contribute to the final product. In general, the value chain of most agribusinesses looks like Figure 1. Your job is to replace the generic boxes with more detail where appropriate.

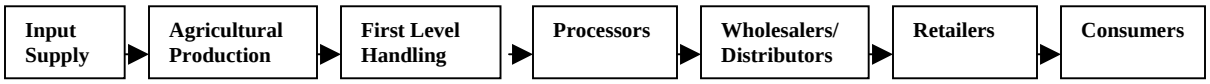

Figure 1. A typical value chain for agricultural products.

The amount of detail that you include in your value chain depends in part upon the final product that you most identify with. For many producers, this is a difficult question. Just identifying where the product goes after it leaves your business is an important first step. Ask yourself, how and in what ways your production finally reaches the consumer. This question can have very different answers depending where you are located in the value chain. Grain producers will likely have many different ways in which the product reaches the final consumer and may have little control over where or how their product reaches the consumer. For these producers, the key is to identify the major channels or classes of products that reach the consumer. For instance, grains are often converted to manufactured cereal products, feed, and feed products, ethanol, etc. On the other hand, fresh fruit or vegetable growers may have a great deal of control over how their product reaches the consumer. These growers will likely want to be much more explicit with respect to the final product that they produce, i.e., fresh apples sold at roadside stand, apples picked by consumers in the orchard, apples put in storage and sold in a retail outlet, and apples processed for juice.

The key is to identify the various ways in which your product reaches the consumer. The amount of detail that you use in constructing the value chain will depend in large part upon the degree of **differentiation** that exists between you and your competitors. By simply considering the alternative ways in which your product reaches the final consumer, you can begin looking for ways to differentiate yourself from your direct competitors and making your product more attractive to members of certain value chains. For instance, look for ways to add value not only to the businesses you directly supply but to their customers as well. Also, you may begin to see opportunities for end markets that play to your strengths.

The next key factor to consider is the **economic relationship** between the various parties in your value chain. The **number and size** of the competitors at a particular stage of the value chain can have important consequences for other members of the chain. A dominant player at one stage in the chain can place many demands on smaller players with many competitors. Often, stages near the dominant player will react by trying to match the dominators size and influence. Sometimes this involves consolidation or forming cooperatives.

Another factor to look for at any stage is the importance of **economies of scale**. These are typically important in the processing stages. Economies of scale can dictate how processors want to interact with other players. Often, they will want to insure that product continues to flow through their plants. Food safety and contamination risk are even more important when a player has large economies of scale. A contamination can be very costly for any player, but one with large economies of scale and thus volume is especially at risk. Look for these firms to be very sensitive to the quality and origin of the product coming into their plants.

Biological production risk and perishability are frequently important characteristics of agricultural value chains. Biological production uncertainty can have important implications for the consistency of supply-to-supply chain members. This is especially important when there are economies of scale present. Perishability can have important impacts on the logistics and handling of food products. It will also influence the responsiveness of supply and will limit the amount of substitution that can take place when a weather event reduces production.

You will often want to examine the **economic relationships that govern the transactions** taking place at each stage of the value chain. These factors can be especially important because they can make price discovery difficult and can limit access to a value chain. For instance, many retailers and branded product manufacturers are moving toward networks of preferred suppliers. These networks do not operate like traditional agricultural markets that are open to everyone. In order to participate, the supplier must typically qualify or meet certain production standards. In many cases, the manufacturers and retailers are looking to reduce rather than expand their supplier networks.

Finally, you want to be aware of key **consumer trends and key technological advances**. In agriculture, the development of biotechnology has the potential to dramatically change value chains because the technology has important implications at both ends of the value chain. Consumer attitudes toward biotechnology will create new niche markets for value chains that either do or do not use biotechnology. Likewise, new products will be developed and potentially create new value chains. Further, biotechnology will impact the role of food processors in the food system, as food products are refined at the genetic rather than the plant level.

Understanding these factors will enable you to understand where the pressures that are likely to influence your profitability will likely come from. It will also allow you to understand how you can add additional value to your specific value chain. Ask yourself, what chain are you most suited to participate in, how can you deliver the most value to that chain, what relationships are necessary to successfully compete in your chosen value chain, what key factors can destabilize or adversely affect the value chain.

The structure of the value chain will have a direct impact on you and your direct competitors' profitability. Remember, to a large extent, the amount of profit that can be obtained by you is dependent upon the final value that your entire value chain delivers to the consumer. It is also important to realize that your value chain also competes against other value chains that may be delivering products and services to the same customers that your chain delivers to.

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