New York Berry News

CORNELL UNIVERSITY

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What's Inside

Computers are wonderful things- when they work! So if you are wondering what happened to the November issue, in short, the computer died! In any event, with the arrival of a new computer we are back in business and ready to bring you an action packed double feature this month!

In the line up are educational opportunities galore for the winter months including national, regional, and state conferences, meetings, and fruit schools. Find information on tap here for meeting programs, schedules, registration information and accommodation.

Also on tap, the latest in research results, new and noteworthy news briefs, and in depth articles. Welcome to our two new feature authors this month, Bernadine Strik and Molly Shaw.

Wishing all of you a happy and healthy Holiday season and a prosperous New Year!

CURRANT EVENTS

January 11, 2007**. 175th Annual Forum of NYS Agricultural Society- "Exploring Challenges, Cultivating Opportunities",** Holiday Inn, Liverpool, NY. For more information: www.nysagsociety.org or contact Penny Heritage, 518-384-1715.

January 16-17, 2007**. NABGA National Bramble Conference,** Columbus, Ohio, in association with the Ohio Fruit & Vegetable Congress. For more information: http://www.raspberryblackberry.com.

January 18-20: **NYS Farmers' Direct Marketing Conference,** "The Food Less Traveled: How Local Food Contributes to Healthy People and Healthy Communities", Owego Treadway Inn, Owego, NY. For more information: http://www.nysfdma.com/

January 27-28: **NOFA-NY 25th Annual Conference**, "Building the Farm Economy Around Local Foods". For more information: http://nofany.org/index.html.

February 9-12: **NASGA/NASS Joint Conference**, Crowne Plaza Ventura Beach Hotel, Ventura, California. For more information: http://www.nasga.org.

February 13-15: **Empire State Fruit and Vegetable Expo**, Onondaga Convention Center, Syracuse, NY. For more information: http://www.nysaes.cornell.edu/hort/expo/

February 26-28: **The Hudson Valley Commercial Fruit Growers' School**, Holiday Inn in Kingston, Ulster County. Berry Session Feb. 26th with emphasis on raspberries. For more information: Steven McKay, sam44@cornell.edu.

March 1: **NENY Fruit School** in Lake George. Contact: Kevin Iungerman, kai3@cornell.edu.

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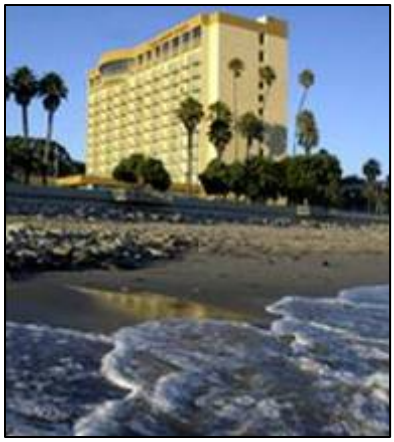
2007 NORTH AMERICAN BERRY CONFERENCE ALONG WITH THE 6TH NORTH AMERICAN STRAWBERRY SYMPOSIUM (NASS)

For Advance Registration and Free Tour, You Must Register by Nov. 30th!

Location - Ventura, CA **Dates - Feb. 9-12, 2007**

Join us in the #1 Strawberry region of the world to see and explore the ever-changing face of strawberry research and development across North America.



This year's conference will be held at the beautiful Crown Plaza Ventura Beach Hotel, convenient to the beach, the Oxnard growing areas, and the magic of Los Angeles.

See hundreds of acres of strawberries! This year's conference is only a short distance from the 12,000 acre Oxnard strawberry district , and early registrants will receive a free tour of the region led by none other than University of California breeder Kirk Larson.

This is a world-class research conference for growers and scientists being conducted jointly with the North American Strawberry Symposium. The program covers a broad range of topics, with several tracts, panel discussions, and a great variety of pre and post conference tours.

For Agenda

For Pre and Post Conference Tours

Registration Fees

To Register Online

Crown Plaza Ventura Beach Hotel,
or call 1-800-842-0800

Student Poster Competition- $500 First Prize

There will be a very special banquet in honor of the remarkable strawberry breeding careers of Dr. Royce Bringhurst, Victor Voth and Dr. Gene Galletta.

As an added bonus the World Ag Expo in Tulare, California will take place Feb 13-15. So it will be possible for you to attend both events.

For more information:

See the agenda, hotel information, information about Hollywood tours, registration form and more in the November Issue of the NASGA Newsletter.

* Hotel - Crown Plaza Ventura Beach - http://www.cpventura.com/ 1-800-842-0800 You can make your reservation any time. Please make sure to mention that you are registering with the NASGA block to receive our discounted rate.

YOU'RE INVITED TO THE 175TH ANNUAL FORUM OF THE NYS AGRICULTURAL SOCIETY

The New York State Agricultural Society

"EXPLORING CHALLENGES, CULTIVATING OPPORTUNITIES"

SYRACUSE, NY—A record crowd of over 500 people is expected at the Holiday Inn, Liverpool on Thursday, Jan. 11, 2007, for the 175th Annual Meeting & Forum of the New York State Agricultural Society. The program is co-sponsored by the New York State Department of Agriculture and Markets.

This year, the New York State Agricultural Society takes a bold new step in its leadership role in representing the state's broad agricultural interests. Instead of the usual format of listening to policymakers and experts tell us what they think we should know, the Society reverses the tables—literally – at its 175th meeting. Agricultural Forum attendees will tell policymakers and experts what the agricultural community thinks they need to know.

Policy, research, teaching, extension and support service programs are all formed based on understanding the needs of the agricultural community. Often the interpretation of those needs gets filtered through many levels before they make their way into implementation. At the annual forum, participants have an opportunity for face-to-face, unfiltered discussions about the critical issues of our industry and our times and those which will shape our futures.

The Society has identified 25 primary issue areas around which small group discussions will answer the questions:

What are the challenges surrounding this issue?
What are some solutions?

Group discussions will be structured and facilitated. Each group will have "listeners" from relevant agencies and organizations to hear firsthand what participants in the 2007 New York State Agricultural Society Forum have to say. The contents of the discussions will be recorded, briefly discussed at the full session and summarized in writing after the forum.

When you want to know what is going on in your fields, orchards and processing plants, you go out and scout them. The Society 175th Annual Meeting and Forum will be the biggest day of scouting the needs of New York agriculture the state has ever seen.

Other highlights include the premiere of a new PBS documentary, "The Producers: taking center stage for New York Agriculture". This educational film, produced by WCNY-TV, is a significant project suggested by the Society to mark its 175th anniversary. Also, there will be a pre-Forum kickoff on Wednesday, Jan. 10, celebrating the 125th Anniversary of the NYS Agricultural Experiment Station, and a reception honoring Ezra Cornell's 200th birthday on Thursday, Jan. 11, the day of the Society Annual Meeting and Forum.

All are invited to join in the discussion and the celebration of 175 years honoring New York Agriculture's past, present and future. Early registration is strongly encouraged. Forum Registration: $25 per person by Dec. 15; $30 per person to register between Dec. 16-Jan. 2; and $40 per person at the door. Meals are additional.

For meeting details and registration information, visit www.nysagsociety.org or contact Penny Heritage, NYS Agricultural Society Executive Secretary at 518-384-1715

NATIONAL BRAMBLE CONFERENCE

The National Bramble Conference is **January 15-17, 2006.** It will be part of the Ohio Fruit and Vegetable Congress, which also includes programs for the Ohio Fruit Growers Society, the Ohio Vegetable and Potato Growers Association, and the Direct Agricultural Marketing Association of Ohio, and Mid-American Ag and Hort Services. At any one time, there are as many as eight tracks of concurrent sessions, as well as a large trade show! Bramble Conference attendees sign up for the conference as a whole and may attend any of these other sessions, except a few workshops that must be pre-registered. On Monday, January 15, we are offering one special workshop of our own--Bramble ABCs (see article below for more details)--which is by pre-registration only.

Registration

All registration is through the Ohio Fruit/Vegetable Association. Your registration will allow you to attend other sessions at the conference, not just the Bramble sessions. Note that the registration, except for special workshops, is a ***family*** registration and includes all members of your family. Workshop registrations are separate and are per-person. There is a discount for members of NABGA (or of the other participating organizations). If you are not currently a member, or need to renew, download a membership form from the "membership" section of this website, and join/renew by January 4.

Hotel Information

The Hampton Inn and Suites is the Headquarters Hotel for the 2007 Growers Congress. The Hampton is located directly across the street from the conference at 501 North High Street, Columbus, Ohio 43215. A block of rooms has been reserved for participants and registrants at the special room rate of $99/night + 16.75 % tax for a Standard King or Double bed for ONE person. Call (614) 559-2000 or visit their website at www.hamptoninn.com
Two other hotels will be offering special rates for Congress participants and registrants.

The Drury Inn and Suites will be offering special conference rates. Call (614) 221-7008 or visit their website at www.druryhotels.com

The Crowne Plaza will also offer special rates for the Congress. Call (614) 461-4100 or visit their website at www.crowneplaza.com

For more information, visit the the Ohio Growers Congress on the web or contact NABGA via email.

INTENSIVE BRAMBLE PRODUCTION WORKSHOP TO BE OFFERED AT NABGA 2007 CONFERENCE

Dick Funt, Professor Emeritus, Ohio State University

Bramble ABCs is a three-hour workshop for potential and novice fruit growers and experienced growers who want a refresher. Raspberry and blackberry production management and marketing are the major topics. The workshop will be held during the Ohio Fruit and Vegetable Congress from 1:30 to 4:30 PM on Monday, January 15, 2007 in Columbus, Ohio, at the Greater Columbus Convention Center. This workshop will be interactive between growers and the presenters: Richard Funt, Professor Emeritus, Ohio State University; Tom Althauser, an Ohio raspberry grower: and Tom Walters, NW Washington Research and Extension Center and the North American Bramble Growers Association's vice-president.

The workshop will ask three questions: Where are you now? Where do you want to be in five years? And how will you get there? It will cover the planning process, financial risk, profits, the supply chain, current industry trends, soil/water management, cultivar selection, pest control, marketing, and other key aspects of a bramble operation.

The Bramble ABCs workshop has limited registration and preregistration is required. Cost for the workshop is $50, with a lower charge for a spouse or second farm/family member attending. This workshop is part of the three-day National Bramble Conference sponsored by the North American Bramble Growers Association (NABGA). Additional bramble sessions and NABGA's annual meeting will be held on Tuesday, January 16 and Wednesday, January 17.

For more information, contact NABGA at nabga@mindspring.com or 919-542-3687 or visit www.rasperryblackberry.com. Information on the full Ohio Fruit and Vegetable Congress and registration forms are available at www.ohiofruit.org or by calling (614) 246-8235.

(Reprinted from: Penn State Vegetable and Small Fruit Gazette, Vol. 10, No. 12, December 2006)

EVALUATION OF NEW CULTIVATION TOOLS TO REDUCE LABOR REQUIREMENTS IN MATTED ROW STRAWBERRY CULTURE

Mary Jo Kelly, Marvin P. Pritts and Robin R. Bellinder, Department of Horticulture, Cornell University, Ithaca, NY 14853

Three new cultivation tools were compared with a traditional between-row cultivator, an herbicide control, and the conventional herbicide-plus-cultivator weed management program used in a first-year strawberry (*Fragaria xananassa* Duch.) planting. The new implements were 1) a Rabe Werk flex-tine harrow, 2) a Buddingh finger weeder, and 3) a Bärtschi brush hoe, and the traditional implement was a double-headed multivator.

The flex-tine harrow performed poorly. Its use appeared to stimulate germination of weed seeds as end-of-season weed biomass was high and yield the following year was low. It was also the most labor-intensive treatment to maintain.

The finger weeder reduced in-row weed growth dramatically, and productivity of this treatment was high, but its use required additional between-row cultivation with another implement.

The brush hoe, while classified as a between-row weeder, reduced in-row weed growth as well, and yields for brushed plots were also high.

Cultivation with a multivator resulted in good weed control between rows and high yields, but hand weeding requirements within the row were high. Weed growth and yields were unacceptable when the herbicide was used alone, but an early-season pre-emergent herbicide application, followed by a single late-season hand weeding and cultivation, resulted in a dramatic reduction in weeds at the end of the year and a notable increase in yield the following year.

The conventional herbicide-plus-cultivation weed management program, used in the establishment year by growers who plant in the perennial matted row system, continues to be a good choice if labor is both plentiful and affordable; however, the finger weeder and brush hoe are viable alternatives for situations in which labor is scarce. Organic growers, and growers who plant in non-traditional annual systems, may benefit from their use as well.

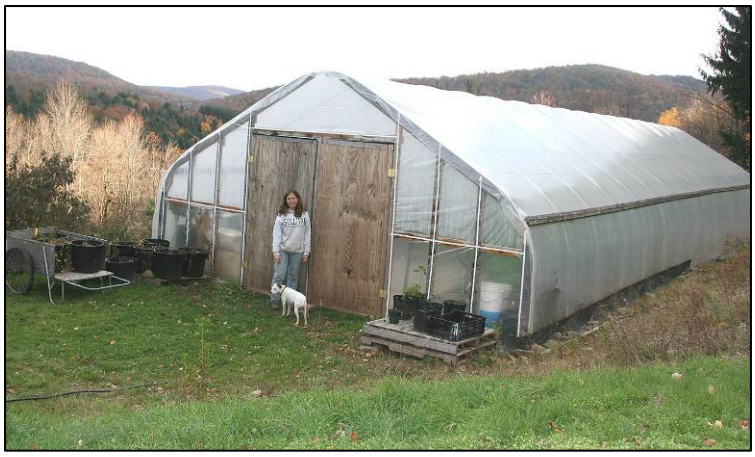
To read the full research article, see HortTechnology January-March 2007 17(1).

FEBRUARY 2007 AMERICAN AGRICULTURALIST TO FEATURE INDIGO HILL HIGH TUNNEL RASPBERRY PRODUCTION

The February 2007 issue of American Agriculturist magazine will have a feature on the New York Farm Viability Institute (NYFVI)-funded high tunnel project at Indigo Hill Farm.

Kathryn Scullion and Ed McGee were still harvesting their first crop of tunnel-grown raspberries into November 2007 at the DeLancey, NY, farm.

Cornell University and Extension researchers are studying raspberry high tunnel production and economics and compared production with field-grown raspberries at Indigo Hill. The farm's story is the second article in a new NYFVI series in American Agriculturist.



The high tunnel at Indigo Hill Farm was built over hardpan on one of the few spots of level ground on the farm. Kathryn Scullion is pleased with the first harvest of raspberries from the tunnel and expects production to increase in 2007. (*Photo by Marjorie Struckl*)

PROBLEM INSECTS IN BLUEBERRY FRUIT

Molly Shaw, South Central NY Agriculture Team fruit and vegetable program, Cornell Cooperative Extension

Blueberries are relatively easy when it comes to pest management (especially compared to apples!), but they do have a few persistent pests that can be a major issue in some locations and in some years.

This past year (2006) Cornell Cooperative Extension's South Central NY agriculture team along with 10 blueberry farms set up traps to monitor for cranberry fruitworm, cherry fruitworm, and blueberry maggot. The goal of our project was to see how wide spread and problematic these pests were for the region, and to learn first hand how to keep an eye on them using insect traps.

The pests:
The first thing we did was learn a little background on these insects. Cranberry fruitworm seemed to be the major problem, with cherry fruitworm as a minor contributor. Both of these pests are moths as adults that emerge in the spring and lay eggs on the fruit right around petal-fall. Those eggs hatch and the caterpillars burrow into the green fruit. Cranberry fruitworm makes a mess while it eats, tunneling between berries in a cluster, webbing them together, and leaving sawdust-like frass (poop) in globs outside the berries. **See figures 1 and 2.** Cherry fruitworm is much more subtle, living in one or two berries and not leaving much evidence of its whereabouts on the outside of the fruit. However, when a berry is infested with either caterpillar, it will turn blue earlier than all the neighboring berries, and growers can see pretty easily how much damage they have by scouting the planting for early blue berries just before the first healthy berries are starting to ripen. Michigan State Extension has a very nice website with fact sheets containing much more life cycle details on these any many other blueberry pests. See http://www.blueberries.msu.edu/.

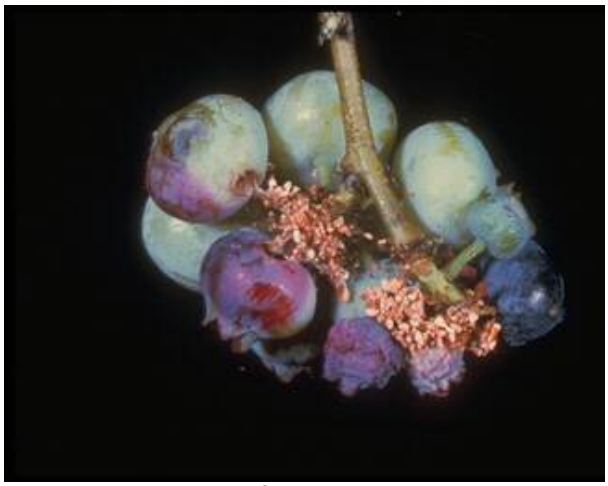


Figure 1. Cranberry fruitworm damage on a blueberry cluster. Photo credit from NRAES Blueberry Production Guide. permission.

Figure 2. Cranberry fruitworm moth stuck to a sticky trap. Photo credit Queen's Printer for Ontario, 2005. Reproduced with

Blueberry maggot is a fly as an adult. These flies overwinter as pupae and they start to emerge as adults when the fruit is turning blue. Adults will mate and lay eggs over a period of a month or so, starting in July. They also lay their eggs right on the berries, and the tiny maggots burrow straight into the fruit and gorge there until they're full grown (about 3 weeks, **see figures 3 and 4**), at which time they exit the berry, drop to the ground, pupate, and wait until next summer to emerge as adults. A berry with a maggot in it looks just about identical to a healthy berry, and therein likes the problem. When the berries are picked and used the maggots have a nasty habit of floating to the top of jams and crawling out into breakfast cereal. Again, see Michigan's excellent fact sheet on the blueberry maggot life cycle at http://www.blueberries.msu.edu/.

Figure 3. Blueberry maggot damage. Photo credit from NRAES Blueberry Production Guide.

Figure 4. Blueberry maggot adult and some look-alikes that you may find on the traps but that are not blueberry maggots.

Variable insect populations:
We set out traps on 10 farms located in Tioga, Tompkins, Cortland, Chemung and Schuyler counties. Each farm got at least one cranberry fruitworm trap, one for cherry fruitworm, and at least two for blueberry maggot. **See figures 5, 6, and 7** for pictures of the traps we used.

We found that in the Southern Tier of NY the populations of these insects were spotty. Only one farm had cherry fruitworm present. Six of the ten farms had cranberry fruitworm, with the highest trap count for the season being 447 at a location in the Finger Lakes, while several regional farms had zero moths caught. Two of the ten had blueberry maggot. Population distributions didn't seem to follow a recognizable pattern. Sometimes one farm happened to have them while the farm down the road did not. And farmers have had variable insect pressure over the years—one year they may be bad at a certain location, while the next year they could be almost non-existent.

Since these pests aren't present at every farm and since they show up at slightly different times each year because of weather variations, monitoring for their presence makes sense. Knowing what's going on with the insects can save you insecticide sprays and can improve spray effectiveness by allowing the timing to be more precise.

Figure 5. Wing traps baited with a synthetic version of the female sex attractant were used to monitor both cranberry and cherry fruitworms (each species had a separate trap and lure)

Figure 6. The Pherocon AM trap comes already baited with an ammonium acetate smell. Flies are lured by both the smell of food and the color yellow.

Figure 7. This 6"x12" sticky strip baited with an ammonium supercharger (hanging at top) was another type of trap we used to catch blueberry maggot flies.

Who the traps would help:
We found that three types of farms in particular would benefit from setting out traps to monitor for these insects:

1. *Growers who spray every year assuming they'll have a problem, but who never see insect damage in the harvest.* The two growers in this group realized that they could use the traps to decrease their insecticide applications, and maybe cut out insecticides all together when adults were not present in the traps.
2. *Growers who have variable levels of damage, and would spray if in a particular year a high number of moths showed up in traps.* There were three growers in the study in this group. They have had enough damage from cranberry fruitworm in the past that if the adults showed up in high numbers in their traps (this "high number" is arbitrarily set by the grower, there is not established threshold to go by), then they will spray an insecticide for control. But if few moths are in the traps, they will not spray and they'll tolerate a low level of damage in the harvest.
3. *Growers who do not spray insecticides at all, no matter what the damage.* Whether for personal safety reasons or philosophical convictions, they will not apply insecticides. There were 5 growers in the study in this group, and while it was useful for them to monitor for the insects one year to learn their life cycle, it wouldn't be worth their while to trap for years to come because the results don't affect their management decisions.

Learning how to use the traps:
There are two fact sheets developed to help you learn how to use the traps to make management decisions. First, read about the life cycles of the pests from the Michigan State Extension website (http://www.blueberries.msu.edu/). It's important to understand the pests before trying to control them. Second, you can get the trapping instructions and tips by downloading them from our Tioga county extension website (http://counties.cce.cornell.edu/tioga/tcag.php) or you can ask for a copy to be mailed to you by calling Molly Shaw at 607-687-4020 x 319 or e-mailing her at meh39@cornell.edu. Make sure you leave your name and address if you have to leave a message. The fact sheets give you details about where to buy supplies, how to set the traps in the field, and what to look for in the traps. If you choose to spray for insect control, the fact sheets also help you figure out when to spray.

Using the traps to make spray decisions:
The recommendation from Michigan State is to use the traps for the cranberry and cherry fruitworms to determine when to start scouting for eggs laid on the fruit, and to *scout for eggs* to determine the optimal spray time. The egg scouting gives a more reliable spray timing than trap counts alone. At one farm that had a history of high cranberry fruitworm damage we did scout for eggs and found that nearly 30% of the clusters had eggs on them. With a little practice you can even tell which eggs are just about ready to hatch, since they change color as they mature. Determining when the eggs are ready to hatch pinpoints the optimal first spray coverage timing. However, this same grower had been using the traps for the past few years to help time his sprays without ever scouting for eggs, and he still got satisfactory control. In a u-pick

situation (like we have for the most part in NY but unlike the wholesale markets in Michigan where berries are mechanically harvested), using the traps alone may be good enough, because growers generally tolerate some level of damage at harvest. By just using the traps this grower found out that he could start his sprays later than his usual late bloom timing (and therefore spray one less spray that season) and still get satisfactory control of the fruitworms.

Blueberry maggot is no fun to deal with. Since flies emerge over a two-month period and lay eggs on ripening fruit, spraying for maggot control involves multiple sprays with a low residual/short days-to-harvest product (refer to the Cornell Guidelines for registered materials). The recommendation is to apply the first spray within a week after the first sustained catch of flies on the traps ("sustained" means several flies per week, not just one or two lone flies), and to continue spraying according to the label directions. The sprays target the female fly as she tries to lay an egg in a berry, so the insecticide has to be present on the berry surface to work.

Many growers do not want to spray insecticides on blue fruit, so they tolerate the maggots in the late season pickings rather than spray. We checked the percent infestation at two farms late this summer and the results showed that from 1.6% to 4.5% of the berries contained a blueberry maggot.

There is some rumor that it may be possible to "trap out" blueberry maggots from a blueberry planting, to put enough traps out that over several years the population declines and eventually disappears. We are going to try this next year on one blueberry farm in South Central NY, if we get promising results, we'll make sure to get the word out!

WORLDWIDE PRODUCTION OF BLACKBERRIES

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

Foreword

In 2005, I (B. Strik) was invited to make a presentation on worldwide blackberry production at the International Society for Horticultural Science *Rubus* Symposium, held in Chile in December, 2005. I developed a survey, with the help of my colleagues listed above, and sent it to key extension/research colleagues and industry members worldwide. I could not have done this without their assistance (see "acknowledgements"). No industry funding, was solicited for this work/paper. However, we felt it would be of interest to the blackberry industry in the Pacific Northwest and thus are providing this summary.

Introduction

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

In 1990, results of survey reported 7,860 acres of blackberries in the northwestern region (Strik, 1992) and 2,975 acres in the eastern USA (Clark, 1992) for a total of 10,835 acres. In 1990, most of the blackberry production in the eastern USA was pick-your-own or pre-picked for on-farm or local sales and less than 2% was processed (Clark, 1992). In contrast, over 90% and 50% of the trailing blackberry crop in Oregon and California, respectively, was processed in 1990. Over 80% of the production from the 135 acres of erect and semi-erect blackberries in northwestern USA was marketed fresh in 1990 (Strik, 1992).

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

In the mid to late 1990s, the shipping of blackberries from Chile, Guatemala, and Mexico into the USA provided fresh blackberries during the "off-season" autumn, winter, and spring months and increased consumer awareness of this berry crop and consequently increased sales of USA produced fruit in the "on" season also. Production of blackberries was apparently on the increase worldwide; however, there was relatively little factual information on area planted, cultivars grown, and most common production systems.

Our findings

In 2005, there were an estimated 49,507 acres of blackberries planted and commercially cultivated worldwide (Table 1), a 45% increase from estimated area in 1995 (Fig. 1). Wild blackberries still make a significant contribution to worldwide production and although accurate data are hard to obtain, survey respondents estimated that 8,895 acres of wild blackberry (*R. glaucus* Benth.) in Ecuador, 5,930 acres in Romania (*R. armeniacus Focke*, *R. laciniatus* Willd), 4,942 acres in Chile (derived from introduced *R. ulmifolius* Schott), a small area of unknown size in Mexico, and 245 acres of planted *R. glaucus* in Venezuela were harvested in 2005. The 19,770 acres of wild blackberries harvested in 2005 had a total reported production of 14,837 tons. In some regions like the Pacific Northwest, the fruit harvested from wild blackberries, even though for personal use, may negatively impact sales of commercially grown fruit.

Worldwide blackberry production was 154,603 tons in 2005, not including the wild production mentioned above (Table 1). In the following sections, we will provide more information on blackberry area and cultivars grown in the major producing regions of the world. We will include little information on production in countries with less than 250 acres planted (Table 2).

Europe

There were 19,007 acres of commercially cultivated blackberries in Europe in 2005 (Table 1). Serbia accounted for 69% (13,096 a) of the blackberry area in Europe and had the greatest area in the world (Fig. 1). Serbia produced 27,557 tons, the fourth highest production in the world (Fig. 2), with 90% of their production processed and exported. Only semi-erect blackberry types were grown in Serbia with the predominant cultivars being 'Thornfree', 'Dirksen Thornless', and 'Smoothstem' that produce in July and August. 'Čačanska Bestrna', a new cultivar from the Investigation, Production, and Trade Center of Horticulture, Cacak that produces as high as 20 tons/acre and 22 g fruit is being widely planted. Plants are generally established at an in-row spacing of 3 to 4.5' with 8 to 10' between rows. Winter cold injury is considered one of the biggest production issues.

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

North America

There were 17,690 acres of commercially cultivated blackberries in North America in 2005 (Table 1).

United States

The USA accounted for 67% of the area planted to blackberries in North America in 2005 with 11,905 acres, the second highest in the world (Fig. 1). Area planted in the USA increased 28% from 1995 to 2005. The USA had the highest production, 35,099 tons, in the world in 2005 (Fig. 2).

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

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

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

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

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

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

Area in Georgia has tripled in the last 10 years to 315 acres. However, growth projections for the next ten years were cautious as Mexico may be a large competitor for their fresh market season. Mainly erect types are grown in Georgia with 'Arapaho' and 'Navaho' accounting for 60% of the area planted.

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

Mexico

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

Central America

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

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

Of note, is that the blackberry area in Guatemala declined 63% from 1995 to 222 acres in 2005, but is expected to increase 33% in the next ten years (Table 2), provided this country can compete with Mexican production. Guatemala is the main country in Central America that ships fresh blackberries to the USA. There were no research programs on blackberry reported in Central America.

South America

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

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

Chile had 1,111 acres of commercial blackberries in 2005 with a total production of 4,275 tons not including the 6,393 tons harvested from wild plantings and exported as a processed product. Area planted increased 50% from 1995 to 2005 and is projected to be 1,975 acres in 2015, provided competition from Mexico in the fresh market does not adversely affect cost of production and competitiveness in the processed portion of the industry. In 2004, Chile exported 10,670 tons of processed fruit (55 to 65% was harvested from introduced wild species) and 210 tons of fresh fruit. Their fruiting season is

from November to March using trailing, erect, and semi-erect cultivars. Production systems are similar to those in the USA.

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

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

Asia

China accounted for all of the production in Asia with 3,830 acres in 2005 (Table 1). Over 90% of the area was planted to semi-erect blackberry, mainly seedlings of 'Hull Thornless' and 'Chester Thornless'. The remaining area was planted to 'Shawnee' and the trailing 'Boysen', 'Marion', and 'Siskiyou'. Most of China's production is in the Jiangsu Province, but the newest regions, in the Liaoning, Shandong, and Hebai Provinces, are projected to grow most in the next ten years when China is expected to have 5,436 acres. In most fields, the planting density is very high with 1' between plants and 3' between rows. Fields are commonly flood irrigated. Average yield is 3 to 17 tons/acre with all fruit hand picked at a cost of about $0.10 per pound. In all production regions, except Nanjing Province, canes are buried in winter to avoid cold injury. Most of the production in China is processed with 70% of processed fruit and 10% of their fresh production exported.

Oceania

Most of the blackberry area in Oceania (Table 1) is planted in New Zealand which had 640 acres and 3,690 tons in 2005. Area in Oceania is projected to grow by about 35% in 10 years. The fruiting season in New Zealand is from November through April with almost all of their blackberry production consisting of trailing types, mainly 'Boysen'. Almost all of their production is processed with 55% of that exported. There is a strong, active breeding program along with supporting pathology and horticulture research programs conducted by New Zealand HortResearch Inc.

Africa

South Africa was the only country in 2005 reporting commercial blackberry production with 247 acres (Table 1). About 60% of their area was planted to 'Young' trailing blackberry that was all processed and 60% exported. 'Hull Thornless', 'Loch Ness', 'Choctaw' and 'Arapaho' were grown also with 50% of their production being marketed fresh. However, no fresh fruit were exported due to distance to major markets of Europe. They report problems with plant importation due to phytosanitary restrictions and the need for cultivars that are firmer for long-distance shipping. They will try to produce the new primocane-fruiting types in South Africa.

Organic production

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

Tunnels

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

Cultivars

Respondents reported the cultivars grown on 38,083 acres of the 49,507 acres of blackberries grown worldwide. On this reported area, 50% of the cultivars were semi-erect, 25% erect, and 25% trailing types in 2005. 'Thornfree', 'Loch Ness', and 'Chester Thornless' accounted for 58% of the semi-erect blackberry area and 'Dirksen Thornless', 'Hull Thornless', and 'Smoothstem' for 28%. The only other cultivar grown on more than 5% of the worldwide semi-erect area was 'Čačanska Bestrna'.

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

Conclusions

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

Table 1. Worldwide area and production of blackberries, 2005.

Region	Area planted (acres)	Production (tons)
Europe	19,007	47,386
North America	17,690	65,154
Central America	4,053	1,752
South America	3,946	7,031
Asia	3,830	29,038
Oceania	734	4,022
Africa	247	220
World Total	**49,507**	**154,603**

Table 2. Countries, by region, that reported from 1 to 250 acres of planted blackberries in 2005.

Region/country	Area planted (a)	1995-2005 (%)	2005-2010 (%)
Europe			
Austria	49	0	0
Belgium	12	0	0
France	74	200	0
Ireland	25	20	100
Italy	64	28	92
Spain	136	450	0
Switzerland	86	0	0
The Netherlands	52	5	0
North America			
Canada	102	36	67
Central America			
Guatemala	222	-63	33
South America			
Argentina	86	106	49
Peru	5	1900	650
Uruguay	22	100	0
Venezuela	2	0	200
Oceania			
Australia	94	90	32

Figure 1. Worldwide cultivated blackberry area, 1995, 2005, and 2015 (projected)

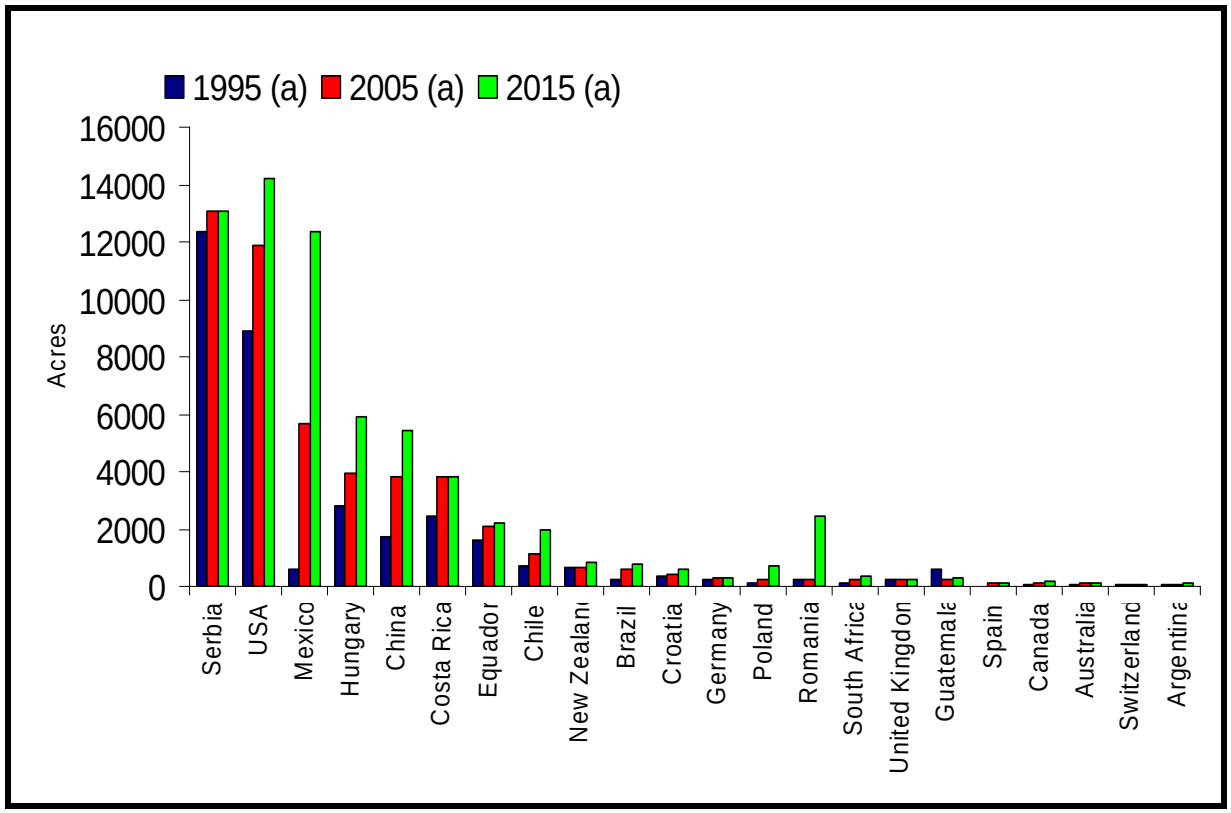
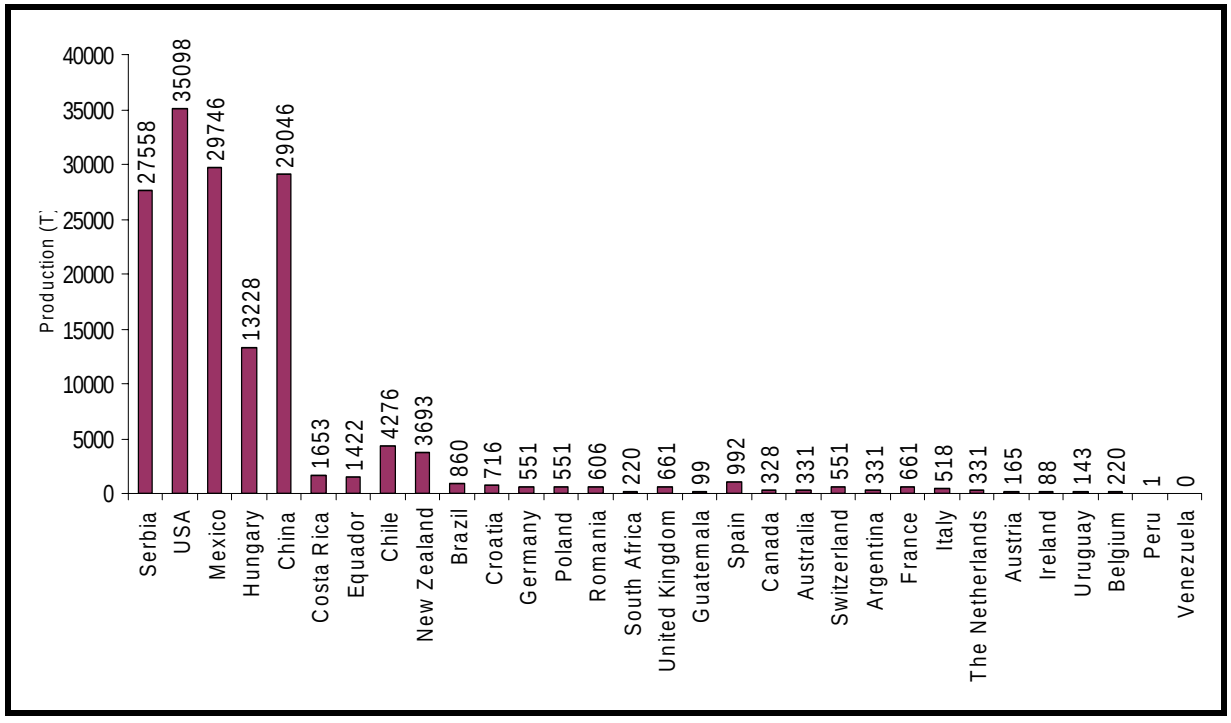


Figure 2. Worldwide cultivated blackberry production (tons), 2005



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PTEROSTILBENE'S HEALTHY POTENTIAL - BERRY COMPOUND MAY INHIBIT BREAST CANCER AND HEART DISEASE.

Luis Pons, *USDA Agricultural Research Service Information Staff*

You may not have heard of pterostilbene (pronounced "tero-STILL-bean") yet. But this berry compound's prospects for inhibiting breast cancer, diabetes, and LDL cholesterol in humans may soon make it as well known as other health-enhancing natural substances.

Standing to reap benefits from pterostilbene's renown are producers of blueberries and

grapes, two fruits known to contain this compound.

"The more we study pterostilbene, the more we see its huge potential in the human health field," says chemist Agnes Rimando of ARS's Natural Products Utilization Research Laboratory in Oxford, Mississippi. Her animal studies on the compound have led to several groundbreaking discoveries.

Fig. 1. Blueberries are packed with healthful phytochemicals such as pterostilbene, which has been shown to lower cholesterol in some lab animals

Pterostilbene is one of many aromatic hydrocarbons called "stilbenes." It's a derivative of resveratrol, a compound found in large quantities in the skins of red grapes. Resveratrol burst on the health scene more than a decade ago, when it was found to have cardiovascular and cancer-fighting benefits.

Studies at the time examined resveratrol's role in an apparent phenomenon in which people in France live long lives despite diets very high in saturated fat and cholesterol. It has been theorized, though not yet proven, that red wine's prevalence in the French diet lowers incidence of cardiovascular disease.

Originally isolated from red sandalwood *(Pterocarpus santalinus),* pterostilbene had already been touted for its fungicidal and antidiabetic properties—and showed potential for lowering blood glucose—when Rimando started experimenting with it in the early 1990s.

"Actually, I isolated pterostilbene from a plant from Thailand back when I was a graduate student at the University of Illinois at Chicago (UIC)," says Rimando. "At that time, I found it to be toxic to a few cancer cell lines, especiallly breast cancer cells. Later, I had a renewed interest in whether pterostilbene might inhibit cancer when resveratrol was reported to have cancer-preventive activity."

Figure 2. Technician Gloria Hervey collects blueberry extracts for analysis of pterostilbene and other phytochemicals.

Through experiments using mice, rats, and hamsters, Rimando and collaborators have since helped add chapters to what's known about pterostilbene and what it can do.

Major Findings

Rimando and UIC collaborators made a huge discovery in 2002, when—in tests using rat mammary glands—they found that pterostilbene possessed cancer-fighting properties at similar effective concentrations as resveratrol.Also in that study, Rimando, Oxford plant physiologist Stephen Duke, and scientists at the University of Buenos Aires in Argentina found that pterostilbene is a powerful antioxidant.

Then, in 2004, Rimando solidified pterostilbene's standing with two major announcements to the American Chemical Society. First was the finding—with colleagues in Agriculture and AgriFood in Canada, Oregon Freeze Dry Inc., and North Carolina State and Idaho State universities—that pterostilbene had been detected for the first time in some berries of *Vaccinium,* a genus of shrubs that includes many types of berries. The research revealed that blueberries are a ready source of the compound. Pterostilbene was already known to exist in very small amounts in red-skinned grapes.

Heartening Results

Then, Rimando announced that pterostilbene can help lower cholesterol and prevent heart disease.

This conclusion was the result of animal studies Rimando did with colleagues at the University of Mississippi and with chemist Wallace H. Yokoyama of ARS's Processed Foods Research Unit in Albany, California.

They found that pterostilbene was similar in activity to ciprofibrate, a commercial drug that lowers LDL cholesterol and triglycerides. "But ciprofibrate can have side effects such as muscle pain and nausea," says

Rimando. “Pterostilbene targets the same specific receptor as ciprofibrate, but it’s likely to have fewer side effects.”

Figure 3. Using gas chromatography/mass spectrometry, chemist Agnes Rimando analyzes pterostilbene content in blueberries.

The focus of this work was to determine the ability of pterostilbene and related compoundsto activate the peroxisome proliferator activated receptor alpha, or PPARa, a protein in the cell nucleus associated with metabolism that modulates blood lipid levels.

Triglycerides, the chemical form in which fats occur in plants and animals, are a combination of three fatty acids with glycerol. As with cholesterol, elevated levels of triglycerides in the blood have been linked to cardiovascular diseases. Rimando and her colleagues found that the triglyceride-lowering ability of pterostilbene rivals that of ciprofibrate.

The announcements generated a wave of attention for pterostilbene, not only in the United States but in other countries as well. At least two news organizations in Great Britain directly attributed a boom in British blueberry sales to Rimando’s findings. And the Oxford lab’s results have since been cited by companies marketing products ranging from blueberry extract to juice concentrate to commercially available pterostilbene itself.

Latest Revelations

In her latest studies, Rimando and scientists at the University of Medical Science in Poznañ, Poland, led by Renata Mikstacka, showed pterostilbene’s potential as a cancer-inhibiting compound with regard to inhibiting enzymes that activate chemical carcinogens. Using mice cells, they demonstrated that pterostilbene, as well as other analogs of resveratrol, potently inhibits an enzyme called “cytochrome P450.”

Cytochromes are found within the cells of animals, plants, bacteria, and other microorganisms that transport electrons. They’re also a factor in people’s varying response to drugs and toxins entering their bodies. Cytochrome P450 enzymes activate a variety of compounds known as “procarcinogens,” which can turn substances such as cigarette smoke and pesticides into carcinogens.

“Pterostilbene showed strong inhibitory activity—much more than resveratrol—against a particular form of cytochrome P450,” Rimando says. “This may explain the cancer-preventive property it demonstrated in a mouse mammary gland culture assay.” But she warns that more studies are needed to explain this process as well as those of other *trans*-resveratrol compounds.

As for where pterostilbene research goes from here, Rimando says, “I hope that some clinical studies can be conducted, either within ARS or by outside scientists, that will verify lab-animal results that allude to pterostilbene’s health benefits for humans.”

This work is part of Plant Biological and Molecular Processes (#302) and Quality and Utilization of Agricultural Products (#306), two ARS National Programs described on the World Wide Web at www.nps.ars.usda.gov.

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FINDING MARKETING INFORMATION FOR AGRICULTURAL PRODUCTS - WHERE DO YOU GO?

Kirsten Park, Extension Support Specialist, Food Industry Management Program, Cornell University

I recently worked on a project investigating the market potential of an item that, frankly, had such low consumption, no one bothers to report on it. I tried to be as creative as I could and investigated some very interesting chat rooms and blogs as well as a lot of black holes. So I can sympathize with all of you trying to investigate the market for a new crop or enterprise.

I thought I would share some of the more accessible websites which cater to producers and other entrepreneurs interested in value-added agriculture. I urge everyone who is interested in developing, expanding, or investigating a new business "opportunity" to either (1) own a computer which is linked to the internet, or (2) be prepared to go to your local library—a lot.(You could also consider hiring a poor college student to do the web research for you).

Below is a bibliography of some of the websites that I have bookmarked in my browser.
Even though some are much better than others, there is something about every one of them that Iappreciate, although not every one will be of use to you.

Bibliography of Websites Devoted to Value-Added Markets
Internet Resources

Agriculture Market Resource Center—AgMRC
http://www.agmrc.org/homepage.html

If there is one national information resource for value-added agriculture, this is probably it. Top notch resource. Sometimes contains too much information without a filtering mechanism. The website flow is good, however. Once you find some good sources, follow the links. These also lead to great information. The following categories contain articles,references, and research bulletins useful in obtaining information on agricultural businesses:

- • Investigate Value-Added Products (Commodities & Products)
- • Explore Market and Industry Trends (Explore Market & Industry Trends)
- • Create and Operate a Business (Create & Operate a Business)
- • Locate Consultants and Businesses (Locate Consultants & Businesses)

Agriculture Utilization Research Council—State of Minnesota
http://www.auri.org/research/research.htm

AURI was created and is supported by the Minnesota state legislature, and its purpose is to help develop new uses and new markets for the state's agricultural products. Contains reports and studies of alternative agriculture, energy sources, and more. Do some digging around on this site. It is not as logically laid out as AgMRC's (above), but there is a lot of very interesting information hidden in the newsletters and research reports. A lot of their grant projects offer confidentiality; however, they do offer a lot of useful information about what, how, and where on many agricultural projects. Some initiatives include:

- • AURI Fuels
- • Biodiesel
- • Community Manure Food Waste Digestion System
- • Growing Hybrid Poplar Trees as a Crop
- • Manure Digester
- • Meat Goat Initiative
- • Meat Goat Enterprise Budget
- • Meat Industry Impact Study
- • Multi Species Report
- • Oilseed Executive Summary

Appropriate Technology Transfer for Rural Areas (ATTRA)
http://www.attra.org

This is a super resource about sustainable agriculture which I almost left off the list until prompted by a user. The publications are excellent, and they provide additional information about grants, breaking news, ask the expert, a "question of the week" and highlights of local, regional, USDA and other federal sustainable ag activities.

Center for Profitable Agriculture—State of Tennessee
http://cpa.utk.edu/level2/educmaterials/default.htm

This partnership between Tennessee Farm Bureau and The University of Tennessee Institute of Agriculture provides assistance for producer projects by Extension specialists. This site lists all the projects undertaken with a useful 2-3 paragraph description of each project. In addition, the site hosts some nice Extension-type educational materials. Pages of interest on this site include:

- • Value-Added Projects
- • Educational Materials
- Extension Publications
- Information Sheets
- Presentations and Slide Shows
- Other

Illinois Value-Added Rural Development Center (IVARDC)
http://www.value-added.org/

The website provides some online handbooks, research reports, presentations of value-added projects, primarily of commodities and projects targeted to Midwest agriculture. If you are a cooperative or are interested in forming a coop, you might want to review some of the research case studies provided. Does have 2 pre-feasibility evaluators for biodiesel and ethanol. Otherwise not much "how-to" information provided on the site.

Keystone Agricultural Innovation Center—Penn State University
http://kaic.psu.edu/resources.htm

This site hosts a new look. The focus is to serve Pennsylvania businesses, but contains information useful especially to those in the Northeast. Hosts a page devoted to mail order/internet marketing accessed via <Business Management/Marketing Options>. You might also want to click on through the <Related Links> to the Farm Management site at Penn State:
http://farmmanagement.aers.psu.edu/Default.asp

Michigan State University Product Center for Agriculture and Natural Resources

This is a link to **The Strategic Marketing Institute** at Michigan State University, which has a number of opportunity assessment papers and white papers pertaining to market development for agricultural, food and natural resource industries. The papers are excellent information resources.

New Ventures for Food and Agriculture in Indiana—Purdue University
http://www.agecon.purdue.edu/newventures/

A focused website listing practical resources for those looking to add or develop a new business venture.

- • Purdue Value-Added Resources
- • Value-Added Business Basics
- • Value-Added Processing/Products
- • New Ventures Team
- • Upcoming Programs

Ag Innovation & Commercialization Center—Purdue University
http://www.agecon.purdue.edu/aicc/Educational_Materials.asp

This page is also from Purdue and can be accessed from the New Ventures website. This site contains a web-based business plan workbook. All you need to do is register (for free) and you can run through the tutorial and workbook planner. This does require sitting in front of the computer, so if you want something that you can pick up and put down on a moments notice, you
might want to use a workbook on hard copy (you can find an excellent pre-planning guide at: http://www.nyfarmviability.org/aic/pre-planning_guide.htm)

Government sites

Economic Research Service
http://www.ers.usda.gov/
Truly a wealth of information provided on their website. It provides more technical data about consumption and markets than the websites above, but is the best place to go for historical databases. You might want to go directly to their Food Sector page at: http://www.ers.usda.gov/Browse/FoodSector/ for more information directly applicable to the ag sector. Don't ignore, however, their Food and Nutrition Assistance and Diet, Health, and Safety sites if you have a business proposition which would involve these issues.

National Agricultural Statistics Service
http://www.nass.usda.gov
Again a wealth of databases at your finger tips. NASS provides production-level, or farmgate, information.

New York Ag Statistics Service
http://www.nass.usda.gov/ny/
This site is the NY NASS and therefore provides farm-gate, production-level information for New York State.

Other web sites to visit if you have the time and need the statistics:

Site Name	Web Address
Fedstats: One Stop Shopping for Federal Statistics	http://www.fedstats.gov/
STAT-USA/ Internet Home Page	http://www.stat-usa.gov/
U.S. Department of Agriculture Homepage	http://www.usda.gov/
Economic Research Service	http://www.ers.usda.gov/
ERS/USDA Outlook and Yearbook Reports	http://www.ers.usda.gov/publications/OutlookReports.htm
Food Markets Briefing Room, USDA/ERS	http://www.ers.usda.gov/briefing/
ERS/USDA Data - Organic Production	http://www.ers.usda.gov/data/organic/
Food and Nutrition Surveys—Food &Nutrition Information Center-USDA	http://www.nal.usda.gov/fnic/etext/000056.html
Foreign Agricultural Service Home Page	http://www.fas.usda.gov/
Direct Marketing Home Page	http://www.ams.usda.gov/directmarketing/
Bureau of Labor Statistics Home Page	http://www.bls.gov

*"**Smart Marketing**" is a monthly marketing newsletter for extension publication in local newsletters and for placement in local media. It reviews the elements critical to successful marketing in the food and agricultural industry. Articles are written by faculty members in the Department of Applied Economics and Management at Cornell University."*

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Check out the NYSAES Tree Fruit and Berry Pathology web site at:
www.nysaes.cornell.edu/pp/extension/tfabp

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