New York Berry News

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This issue is jam packed (no pun intended!) with the latest information on NY Berry production, meetings, books, research updates and more.

Don't miss the Empire State Hort Expo Feb 14-17, in Syracuse NY, featuring the berry program on Thursday, Feb.17. Another not-to-be-missed event is the NY Berry Industry Sustainability meeting in Hudson, NY on March 29, See the article on this meeting below for more information and the program agenda.

The 2005 Pest Management Guide for Berry Crops is now available both in hard copy and online. Other great resources, such as the new "Pocket Guide to IPM Scouting in Highbush Blueberries" from Michigan State University, and the newly revised "Midwest Small Fruit Handbook" are musts for your small fruit library. Another interesting reference is "Production of Vegetables, Strawberries, and Cut Flowers Using Plasticulture". See features on all of these for more details.

Jump into spring with the Early Season Berry Calendar, and get those berry plantings ready to go. Learn about soil compaction in strawberry plantings and how to minimize it. Catch the latest in fungicide test results for control of strawberry fruit rots and white pine blister rust. Read about new technology for controlling postharvest strawberry rots being developed at Perdue, and work on turning minor fruits into major crops from the germplasm repository in Corvallis, Oregon. And last, but not least, review the latest on Ribes research for New York. See you at the Expo!

UPCOMING MEETINGS

February 14-17, 2005. *Empire State Fruit and Vegetable Expo*, On Center, Syracuse, New York. **Call:** 315-687-5734 or e-mail mailto:nysvga@twcny.rr.com

February 16-19, 2005. *North American Berry Conference- a joint conference with the North American Bramble Growers Association*, in Nashville, Tennessee. **For more information**: http://www.nasga.org/meetings/2005/berry_conference/announcement.htm

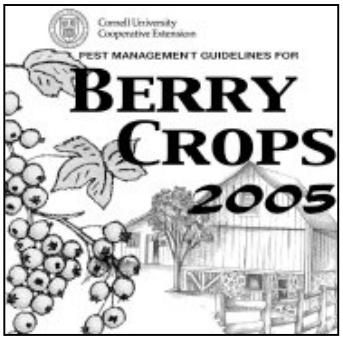
February 24, 2005. *Growing Visitors at Your Farm: Increasing Farm Profitability Through Agritourism*, Owego, NY. Co-sponsored by Cornell Cooperative Extension South Central NY Agriculture Program, Tioga County Tourism and NY Farms! And is funded in part by a grant from Cornell Small Farms Program. **For more information/registration**: (800) 671-7772.

March 5-8, 2005. *National Agricultural Plastics Congress*, Francis Marion Hotel, Charleston, SC. **For more information**: http://www.plasticulture.org/conginfo2005.htm .

March 3-13, 2005. *Annual Florida Strawberry Festival*, in Tampa, Fla. **For more information**: (813) 752-9194 or http://www.flstrawberryfestival.com .

March 29, 2005. *New York Berry Industry Sustainability Meeting*, in Hudson, NY. **For more information**: see article below.

2005 Pest Management Guide for Berry Crops Now Available



The 2005 Pest Management Guidelines for Berry Crops is authored by Marvin P. Pritts, Lori J. Bushway, Gregory English-Loeb, Juliet Carroll, Wayne F. Wilcox, and William Turechek. The Guideline aids berry growers with general nutrient guidelines, general site selection and preparation information, as well as insect, mite, disease, and weed management decisions. Detailed cultural and chemical management practices are provided for blueberry, raspberry, blackberry, strawberry, currant, and gooseberry production.

Insect pests and diseases are associated with stages of plant development in table form to aid in timeliness of identification and treatment. Harvesting, handling, transportation guidelines, and post harvest considerations, as well as useful web sites and contact information for berry specialists lend balance to this valuable text. General pesticide safety information, tips for laundering pesticide-contaminated clothing, and pesticide emergency numbers are included. Chemicals regulated in New York State include brand name/formulation, EPA registration numbers, and restrictions.

Information for the integrated production and maintenance of berry crops is drawn directly from Cornell University research, extension demonstrations, and on-site experience. Commercial growers, those who advise, sell, or provide services to these professionals, as well as small-scale growers can use this text as a guide to choosing safe and effective weed, insect, wildlife, and disease management programs for berry crops.

The updated version of **2005 Pest Management Guidelines for Berry Crops** is now online at http://www.fruit.cornell.edu/Berries/pestman/index.html. Or purchase a hard copy from Cornell Cooperative Extension Resource Center.

New York Berry Industry Sustainability Meeting Scheduled for March 29, 2005

A meeting is being planned in the Hudson Valley to take a look at the berry industry as a whole in New York, and to look at some options for expanding and optimizing the industry. We will examine some processing, storage, and business strategies that have potential in improving industry sustainability in a world market.

Proposed Schedule:

10:00-10:20 am *Opportunity with Berries in the Hudson Valley: An overview*
Steven McKay, CCE Extension Educator

10:20-10:45 am *New Concepts in Packaging Fresh Fruit: A short slide presentation and round table discussion.*
Moderators~ Steven McKay, CCE Extension Educator and Paul Kang, Berry Marketer, Hunt's Point Market

10:45-11:15 am *CA Storage Opportunities for Fresh Berries*
Moderators: Palletized Storage, Industry Specialist

11:15- 12:00 am *New or Expanded Marketing Channels*
Moderators: Mike Biltonen, Manager Stone Ridge Orchard

12:00- 1:00 pm Catered Lunch

1:00- 1:15 pm *Commercial Freezing of Berries*
Moderator: Bob Weybright, CCE Extension Educator

1:15- 1:45 pm *Value Added Options for Berries*
Moderator: Mike Biltonen, Manager Stone Ridge Orchard and
Anna Dawson, Owner Hometown Foods

1:45-2:05 pm *Opportunities with Black Currants*
Moderator: Greg Quinn, Owner Au Currant

2:05- 2:30 *How Can The Berry Growers Work Together*?

Moderators: Mike Biltonen, Steve Hadcock, CCE Extension Educator, and Bob Weybright, CCE Extension Educator.

2:30- 3:00 pm *Where Will We Go from Here? Formation of an Action Committee*
Moderators: Steven McKay, CCE Extension Educator, Mike Biltonen, Manager, Stone Ridge Orchard, and Steve Hadcock, CCE Extension Educator.

The meeting is proposed for March 29, 2005 at the Cornell Cooperative Extension of Columbia County meeting hall in Hudson, NY. Registration cost including lunch is $25. ***Registration deadline is March 25. If you plan to attend, please contact Peggy at 518-828-3346 to leave your name, address, and phone number.***

Value of New York Fruit Production Increases

The value of New York's 2004 tree fruit and grape production totaled $219 million, up 6 percent from the 2003 value, according to the New York Agricultural Statistics Service. The value of utilized production was above the previous year for all fruits except pears, grapes, and blueberries.

- The 2004 apple crop in New York was up 11 percent to 1.10 billion pounds. This year's value of utilized apple production, based on packinghouse door equivalent returns, and totaled $160 million. New York ranks second in apple production behind Washington.
- Grape production in New York decreased 27 percent from 2003 to 145,000 tons. Fresh grapes totaled 2,000 tons while wineries and processors crushed 143,000 tons. Grapes utilized for juice accounted for 72 percent of the total grapes processed with the remaining 28 percent going for wine
- The value of the 2004 grape crop is estimated at $31.2 million, 13 percent below the 2003 crop value. New York ranked third in grape production behind California and Washington.
- New York's tart cherry crop is estimated at 10.7 million pounds, up 49 percent from the 2003 crop of 7.2 million pounds. The value of utilized production is estimated at $4.38 million.
- New York sweet cherry production, at 900 tons, is up 50 percent from the 600 tons produced in 2003. The 2004 crop is valued at $1.25 million compared to $1.05 million a year ago.
- Peach production for the Empire State is placed at 6,000 tons, down 8 percent from the 2003 level. The value of the 2004 crop, at $4.23 million, is up less than 1 percent from 2003.
- Production of pears in New York is estimated at 16,500 tons, up 6 percent from the 2003 output of 15,500 tons. The 2004 crop is valued at $5.37 million, down 3 percent from 2003. New York ranks fourth nationally in pear production.

For more information, contact Erika White at (518) 457-5570 or go to www.nass.usda.gov/ny.
(Reprinted from the NY State Agricultural Statistic Service, press release 01/26/05)

New York Strawberry Production Up, Blueberries Down

Strawberry production in New York was up 30 percent from 2003 to 6.50 million pounds, according to the New York Agricultural Statistics Service. The value of utilized production is estimated at $10.4 million, up 34 percent from the $7.75 million in 2003. New York ranks seventh in strawberry production. Nationally, the strawberry crop for 2004 was placed at 2.21 billion pounds, up 2 percent from 2003.

Production of blueberries for the Empire State was at 2.00 million pounds. The 2004 crop is valued at $2.32 million, a 10 percent decrease from $2.58 million in 2003. The U.S. estimate for blueberries is 229 million pounds, up 21 percent from the 190 million pounds produced in 2004.

The combined value of New York's berry crops totaled $12.7 million. This is 6 percent of the $219 million value of all New York's fruit. This compares with the $10.3 million in 2003 that was 5 percent of the total value.

For more information, contact Erika White at (518) 457-5570 or go to www.nass.usda.gov/ny.
(Reprinted from the NY State Agricultural Statistic Service, press release 01/26/05)

USDA Survey To Measure 2005 Crop Acreages

New York farmers will be asked to participate in a nationwide survey during March to measure 2005 crop acreages to be planted and the quantity of grains in storage. The New York Agricultural Statistics Service will conduct the State survey.

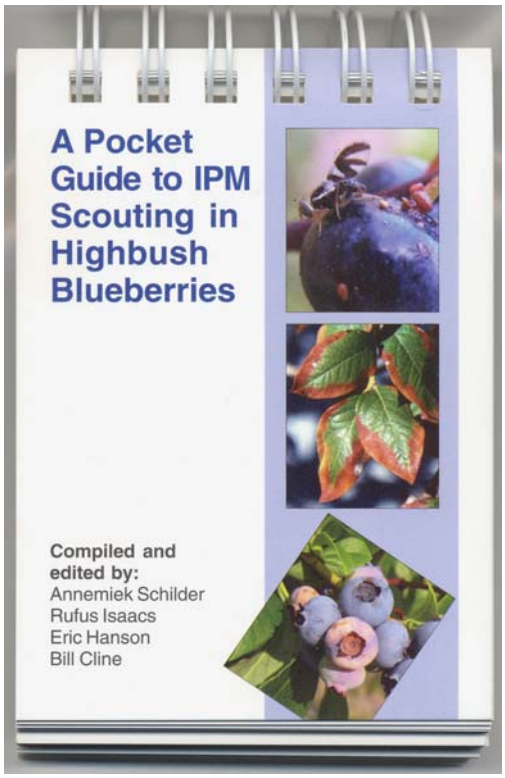
Steve Ropel, State Statistician, noted that continued market uncertainties highlight the need for information producers can rely on. Farmer cooperation on the survey is the key to developing accurate estimates. Starting on March 1 a sample of over 1,000 New York farm operators will be asked to report crop acreages planted or to be planted and grains in storage. Only a fraction of the state's farms are included in the survey. Each selected farm represents other farms of similar type and category. Therefore, a completed report for every farm selected is important to show a true picture of New York agriculture in 2005.

Information from this survey will be made available to the state's farmers for their use in making production and marketing decisions in 2005. Planted acres of major crops and grains in storage will be published on March 31. State releases showing New York and U.S. estimates are available free to anyone requesting them or at www.nass.usda.gov/ny.

For more information, contact Lisa Jackson at (518) 457-5570 or go to www.nass.usda.gov/ny.
(Reprinted from the NY State Agricultural Statistic Service, press release 01/26/05)

New Guide Available For Scouting Highbush Blueberries

Rebecca Lamb, Michigan State University, Integrated Pest Management Program



A new resource for highbush blueberry growers is now available in a pocket-sized form. *A Pocket Guide to IPM Scouting in Highbush Blueberries* has plastic-coated pages in a convenient size of 3.5" X 5.0" that allows growers to carry the scouting information with them into the field.

The scouting guide has a range of information that offers helpful identification for most common insect and disease pests, as well as abiotic injury, beneficial organisms, growth stages and scouting calendars. Each disease section has symptoms, disease cycle and management advice, as well as colorful pictures to help growers identify the correct disease. The insect sections explain the biology of the pest, with color pictures of the insect and the damage it might do to blueberries.

With the aid of the pictures, growers can use the scouting guide to help determine what problems they have in their field and return to larger sources to supplement the information.

Here are some examples from major category of the guide:

Insects

- Blueberry bud mite
- Blueberry maggot
- Cranberry fruitworm
- Cutworms
- Japanese beetles

Diseases

- Anthracnose fruit rot
- Botrytis blight and fruit rot
- Mummy berry
- Nematodes
- Shoestring

Beneficial organisms

- Lacewings
- Ladybeetles
- Parasitic wasp

Abiotic injury

- Nutrient deficiencies
- Herbicide injury
- Fruit defects

The guide is published by Michigan State University Extension and written by MSU's Annemiek Schilder, Rufus Isaacs and Eric Hanson along with Bill Cline from North Carolina State University. It was written to serve growers throughout the Eastern U.S. and was reviewed by experts at five universities, the USDA/Mississippi and MBG Marketing. The authors kept in mind the short amount of time growers have while in the field and made the guide clear and easy to understand. The guide may be purchased for $14 plus $4 shipping and handling from the MSU Extension Bulletin Office at 517-353-6740 or on line at http://web2.msue.msu.edu/bulletins/mainsearch.cfm, then type in the key word "blueberries" or "blueberry" (not "blueberry") to pull up MSU's blueberry publications.

(Editor's note: I bought a copy of this for myself. It just arrived today. This is a little gem, at a great price, and does indeed fit in your pocket!)

Early Season Berry Calendar

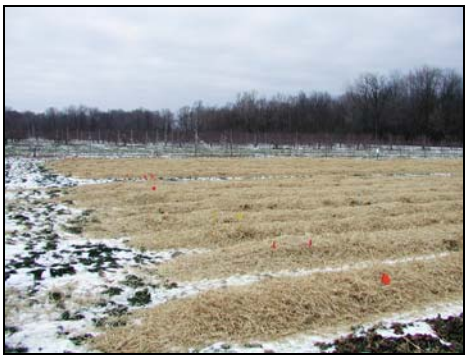
Cathy Heidenreich, Department of Plant Pathology, NYSAES Cornell University, Geneva

In spite of the continued cold temperatures, spring is on its way! Now is the time to get out your calendar and pencil in those things that need to be done early in the season to get your established berry crops off to a good start. Remember that some of the activities are phenology and/or weather dependent. e.g., removing the straw mulch. Where applicable, links are provided to previous NYBN issues. Check "Pest Management Guidelines for Berry Crops, 2005" for specific details on pest and weed management, and fertilization.

Raspberries- summer bearing, Raspberries-fall bearing, Blackberries

February	March
Finished pruning? (NYBN Vol2 No2) "Delayed" dormant sprays for control of Anthracnose, Spur and Cane blights. (NYBN Vol2 No3) "Delayed" dormant sprays may not be needed here if previous year's canes were removed from the planting or thoroughly shredded. "Delayed" dormant sprays	Bud Break: Scout for Anthracnose, Spur and Cane blights for both types of raspberries.  Consider making early season weed control applications.(NYBN Vol3 No4)

Strawberries

February	March
Nothing yet! 	Remove straw mulch as weather conditions dictate. Apply row covers for earlier cropping, if desired, after straw removal.(NYBN Vol3 NO2)  Set up overhead irrigation prior to bloom for frost protection as needed. (NYBN Vol3 No4)  

Blueberries

February	March
Finished pruning? (NYBN Vol3 No2)	"Delayed dormant" sprays if you had Phomopsis canker or scale insect problems last season. If both sulfur and oil sprays are used, do not apply in the same 14-day period.
	
Mulch renewal every 2-3 years for weed control, moisture retention, and reduction of mummyberry ascocarps. Don't forget to add a little extra nitrogen later on after mulching.	If additional mulch was not applied, lightly rake or disk soil beneath bushes just prior to bud break to disturb production of mummyberry spores.(NYBN Vol3 No3)

Soil Compaction in Strawberry Fields

Lori Bushway, Senior Extension Associate in Berry Crops, Department of Horticulture, CALS, Ithaca, NY

Anything that presses soil particles together (e.g. wheel or foot traffic, tillage) reduces pore space and creates a denser soil. This compaction causes a reorientation of soil particles and reduces the volume of air. Subsequently, reducing water infiltration, internal drainage and aeration of soils as well as increasing wetness, runoff and drying time of soil surface. Wet fields may cause a delay in spraying, planting or harvesting, an increase risk of crop disease and decreases in yields.

Soil compaction is also associated with less plant root production. Because of the root restriction the amount of water and nutrients available to the crop is often decreased. Without timely rains and well-placed fertilizers, yield reductions can occur. Increased compaction also adds to the energy consumption by tractors for subsequent tillage.

Certain cultivation practices common in berry fields have been noted to cause significant compaction problems. Cornell University researchers, under the leadership of Dr. Marvin Pritts, are leading the first effort to document the impacts of soil compaction on berry crops. They aim to:

- Develop a soil compaction profile for a typical strawberry field.
- Quantify the relationship between soil compaction and root health, soil compaction and pathogen populations and soil compaction and fruit productivity.
- Identify cultural practices that affect soil compaction.

Site preparation and planting is completed in the strawberry compaction research field at Cornell and cooperating farms. The first fruit will ripen this spring. Subsequent analysis will help researchers better understand the impacts of soil compaction in berry fields and help growers learn what cultural practices can minimize and ameliorate soil compaction.

Fuzz-Free Strawberries Forecast With New Food Safety Treatment

Jennifer Cutraro, Purdue University News

WEST LAFAYETTE, Ind. - Open up a pint of strawberries from the grocery store, and more often than not you'll find a fuzzy berry or two in the mix. A blast of chlorine dioxide gas, however, promises to not only keep those berries fuzz-free, but also to kill off harmful bacteria living on their surface more efficiently than methods currently used by the food industry, say Purdue University researchers.

"Strawberries are tricky," said Rich Linton, professor of food science and one of the leaders of the current study on decontaminating strawberries. "They're notoriously difficult to clean, and their surface composition actually encourages bugs to grow."

Those bugs can include potentially lethal bacteria, such as *E. coli*, as well as viruses including hepatitis A, which caused an outbreak linked to frozen strawberries in 1996.

"The issue with strawberries is that they're easily contaminated," Linton said. "They're grown in close association with soil, where they may pick up pathogens such as E. coil from manure-based fertilizers, and they're hand-picked, providing another avenue for contamination."

Linton and his colleagues at Purdue's Center for Food Safety Engineering, who already have demonstrated the efficacy of using chlorine dioxide gas to kill pathogens on the surface of apples and green peppers, have shown the treatment also removes significantly higher levels of pathogens than the current industry-standard chlorinated water rinse.

Linton's study, published in the current issue of the Journal of Food Protection, compares two different chlorine dioxide treatments, called "batch processing" and "continuous processing." Both treatments provide greater than a 5-log, or 99.999 percent, reduction in the numbers of *E. coli* and *Listeria monocytogenes* on strawberry surfaces.

Food safety experts assess decontamination efficiency with a measurement called "log reduction," which indicates how much contamination can be reduced after a decontamination treatment. A log, or logarithm, is a power of ten; thus a 1-log reduction is a 90 percent reduction; a 2-log reduction is a 99 percent reduction, and a 5-log reduction is a 99.999 percent reduction.

While current methods for removing pathogens on strawberries yield about a 2.5 log reduction in bacteria levels, the Food and Drug Administration has stated produce treatments should achieve a 5-log reduction in pathogens.

Not only does Linton's treatment significantly reduce the number of potentially harmful pathogens growing on strawberries, it also extends their shelf life without sacrificing quality attributes such as color and taste.

"The berries last a lot longer after this treatment-in fact, we've had strawberries in the refrigerator for more than six weeks with no mold growth," Linton said.
"If this process can give consumers even one or two more days before the strawberries they buy get fuzzy, that's huge. Think about it - how many strawberries do you have to throw away in a pint? If we could reduce that number, it would be a great advantage for consumers and the industry."

The two methods Linton used differ in the way the berries are exposed to the chlorine dioxide. In a batch system, the strawberries are placed in a sealed container, and a set amount of chlorine dioxide gas is applied once and then allowed to remain in the chamber for a period of time. Continuous treatment involves constant delivery of gas into the chamber over time.

Batch treatment required higher concentrations of chlorine dioxide treatment for longer amounts of time than continuous treatment, but both methods achieved more than a 5-log reduction in pathogens, Linton said.

He found that either 30 minutes of batch treatment, or 10 minutes of continuous treatment, produced effective levels of decontamination.

Linton's team currently has funding through the United States Department of Agriculture to scale up this technology and further develop it for use by the food industry.

"We see this technology as a potential intervention for security applied to our food system," Linton said. "It may be possible to develop this technology so that we can begin decontaminating produce while it's in transit.

"Much of our produce comes from other countries where we may have less control over sanitary practices in the field. If we could use technology like this to seal up produce and treat it as it travels from point A to point B, it's a great application for protection of our nation's food supply."

Also participating in this research were Yingchan Han, post-doctoral research associate; Travis Selby and Krista Schultze, graduate students in the Department of Food Science; and Phil Nelson, professor of food science. The U.S. Department of Agriculture Cooperative State Research, Education, and Extension Service and the Food and Drug Administration provided funding for this work.

(Reprinted from: CREES Cooperative State Research, Education and Extension Service Newsroom)

Evaluation of Fungicides for Control of Botrytis and Anthracnose Fruit Rots on Strawberry, 2004

Bill Turechek and Cathy Heidenreich, USDA BARC Fruit Lab, Beltsville, MD, and Department of Plant Pathology, New York State Agricultural Experiment Station, Cornell University, Geneva, NY.

Trials were performed in a 4-year-old strawberry planting on a Cornell research farm at the Geneva Experiment Station. Plants were grown in a matted-row system, with fruiting rows approximately 1.5 ft wide on 4 ft centers. Individual plots consisted of 12 ft sections of row with 3 ft buffer zones on both ends of each treatment plot. Treatments were replicated 4 times in a randomized complete block design. Fungicides were applied with a 2 gal hand sprayer (approx. 30 PSI) during bloom on 15, 19, and 25 May, and to green and ripe fruit on 7 and 14 Jun; these represent timings A thru E in the table, respectively. To provide anthracnose disease pressure, berries were inoculated with a 2.5 x 10^4 conidia/ml suspension of *C. acutatum* using a hand-held garden sprayer 5 hr after fungicide treatments were applied on 7 Jun. Fruit were harvested on 8, 11, 15, and 22 Jun. The number of berries with and without anthracnose and gray mold symptoms was recorded the same day they were harvested and the percent of berries infected was calculated. Subsamples of unblemished, symptom-less berries from each plot were placed on individual deep-well plastic trays. The number of fruit sampled per replication per harvest date was typically 25, unless the number of berries available for screening was less than 25, in which case all berries were subjected to the post harvest treatment. The berries were incubated 4 days at 68 F and 95-97% relative humidity. After incubation the proportion of diseased fruit was recorded. Data were arcsin square root transformed and analyzed in an ANOVA using SAS PROC MIXED. Treatment means were separated using the pairwise difference option (PDIFF) in PROC MIXED ($P<0.05$).

The 2004 season was not conducive for the development of gray mold. The most favorable conditions occurred towards the end of bloom when approximately 2 inches rain fell over a 5 day period (May 23-28) with an average daily temperature of 16.5 C. Apparently, this had little impact on disease development as the control plots had less than 0.5 % disease at harvest. Consequently, this year's data provides very little information on the performance of these fungicides against grey mold. In contrast, the temperatures just prior to and during harvest were exceptionally favorable for the development of anthracnose. The average temperature on the day of inoculation and the 2 days that followed was 24 C. Because the plots were artificially inoculated, the "D"-timing application was largely responsible for control of anthracnose as it was applied approximately 8 hr before inoculation. Also, the increased incidence of anthracnose recorded at post-harvest was not due to the development of latent infections but a result of the berries having an additional 4 days under conditions highly conducive to disease development. All treatments that included Captan, CaptEvate, and Pristine at the "D" timing provided very effective control of anthracnose. Switch also provided reasonably good control of anthracnose. The "softer" chemical treatments Citrex, Serenade, Messenger, Elexa 4, Kumulus, and Kaligreen provided no control of anthracnose. Oxidate, a commercial formulation of hydrogen dioxide, appeared to have good control at harvest, but then failed to maintain control during post-harvest evaluation. As expected, Elevate provided no control of anthracnose.

Treatment, rate/A	Timing	Anthracnose Fruit Rot (%)		Botrytis Fruit Rot (%)	
		Harvest*	Post harvest*	Harvest*	Post harvest*
Switch 62.5 WG 11 oz	A,C,E				
CaptEvate 68WDG 3.5 lb	B,D	0.4 a	10.4 a	0.04 a	1.0 ab
Captan 80WDG 3.5 lb	A-E	0.7 a	15.9 a	0.00 a	2.4 abc
Captan 80WDG 2.35 lb	A-E	0.9 a	15.5 a	0.09 ab	1.9 abc
CaptEvate 68WDG 3.5 lb	A,C,E				
Pristine 38WG 18.5 oz.....	B,D	1.1 a	11.3 a	0.05 ab	0.3 ab
Pristine 38WG 18.5 oz	A,C,E				
CaptEvate 68WDG 3.5 lb	B,D	1.4 a	9.7 a	0.08 ab	1.5 abc
CaptEvate 68WDG 3.5 lb	A-E	1.7 a	12.6 a	0.00 a	0.8 abc
CaptEvate 68WDG 5.25 lb	A,C,D	2.2 ab	15.9 a	0.00 a	0.3 ab
Oxidate 27 128 fl oz	A-E	3.0 abc	62.2 bcd	0.44 ab	6.1 abc
CaptEvate 68WDG 3.5 lb	A,C,E				
Switch 62.5 WG 11 oz	B,D	3.2 abcd	18.2 a	0.09 ab	0.5 ab
Captan 80WDG 3.75 lb	A-E	5.3 bcd	16.1 a	0.06 ab	1.0 ab
Citrex 100L 30 fl oz	A-E	10.4 cde	61.7 bcd	1.10 b	8.8 c
Serenade WP 6 lb	A-E	10.5 cde	53.3 b	0.28 ab	4.6 abc
Messenger WDG 13.35 oz.....	A-E	10.7 cde	57.7 bcd	0.61 ab	7.5 bc
Elexa 4 PDB 5 gal	A-E	10.8 cde	53.8 b	0.00 a	3.4 abc
Elevate 50WG 1.5 lb	A-E	11.3 cde	61.4 bcd	0.03 a	1.5 abc
Kumulus DF 5 lb.....	A-E	11.9 cde	63.4 bcd	0.90 ab	2.9 abc
Elevate 50WG 1.0 lb	A-E	13.4 e	63.1 bcd	0.08 ab	1.0 ab
Elevate 50WG 1.5 lb	A,C,D	14.8 e	54.7 bc	0.03 a	1.1 abc
Kaligreen 3 lb	A-E	15.0 e	71.0 d	0.26 ab	2.2 abc
Untreated check		12.2 de	68.1 cd	0.46 ab	2.9 abc

* Values are actual means of 4 replications per treatment. Treatment means within a column followed by the same letter are not significantly different using the PDIFF option in PROC MIXED ($P \leq 0.05$).

TURNING MINOR FRUITS INTO MAJOR CROPS

ARS Repository in Oregon Working To Introduce New Fruits in the United States

Article by David Elstein, Photos by Stephen Ausmus

Elderberry. Lingonberry. Aroniaberry. Funny names, but these are three of the dozens of small fruits that researchers at the National Clonal Germplasm Repository in Corvallis, Oregon, are studying.

The Agricultural Research Service (ARS) repository stores genetic material of better-known crops such as strawberries, blueberries, mint, and hops, but their work on minor fruits may be the most challenging.

Descriptively, "minor" does not mean unimportant. The term defines crops grown on 300,000 acres or less in the United States. There are more than 600 such crops, many of them fruit. Combined, minor crops have a value of $40 billion, which equals 40 percent of all U.S. crop values. And in half the states, the value of minor crops is more than half the value of all crops.

Evaluating hardy kiwifruit at the Corvallis Repository collection, geneticists Chad Finn and Kim Hummer are pleased with the excellent fruiting on these 3-year-old vines

"The small fruits we're studying have unusual flavors and qualities, and many are rich with antioxidants," explains Kim Hummer, research leader and curator for the repository. An example is the black raspberry, which has the highest anthocyanin level of any temperate fruit.

Anthocyanin is a flavonoid, one of the components that give fruits and vegetables their color. Antioxidants—such as vitamins C and E as well as flavonoids—are found in many fruits and vegetables in various concentrations. Antioxidants are believed to lessen one's risk of getting heart disease and high blood pressure. The compounds may also slow or even prevent formation of cancer.

Hummer and her staff collect and maintain plants and seeds of many minor fruit crops and collect the germplasm of many others. The repository distributes cuttings and seeds to breeders across the country to see which types of plants grow best in which region. They are also growing some in Corvallis.

An example of successful minor-fruit introduction is the kiwifruit, which originally came from China. Before 1970, it was an obscure fruit. Now it can be found in most grocery stores throughout the United States and the world. The repository is now studying a new species of hardy kiwifruit. It has smooth skin and is the size of a grape, but it has green flesh and black seeds similar to its larger, fuzzy-skinned cousin. Even though there are only a few hundred acres of the crop in Oregon, Hummer believes that may increase.

Geneticist Chad E. Finn, who works across town from Hummer at ARS's Horticultural Crops Research Laboratory, is evaluating some of Hummer's crops. The main cultivar of hardy kiwifruit has two major problems: its small size and a 2-month marketing window. It ripens in mid-September and can be stored for only a few weeks. "We're trying to identify genotypes that are the size of large cherries and ripen earlier in the summer, thereby extending the fresh-market season," says Finn.

Another fruit being researched is the edible-fruited honeysuckle. Even though few acres are grown in the United States, the fruit may become popular in the future, since it is eaten in several Asian countries. Many people say that honeysuckle fruit tastes and looks like cylindrical blueberries. This species is quite different from the native American ornamental honeysuckles.

Some minor crops are popular in certain areas of the country, and the Corvallis scientists are trying to help test them in other locations. A good example is elderberry. Its juice is used in jams and some Midwest wines, but this fruit may grow well in the western United States. Various ethnic groups throughout history have thought that elderberry had medicinal or even supernatural powers.

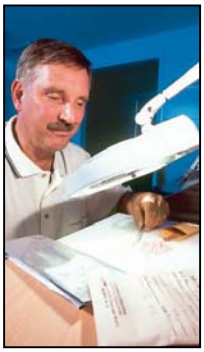
There are also unconventional uses for minor fruits. “Many homeowners are searching for ‘edible landscapes,’ and these fruit crops are ideal candidates,” Hummer says. Aroniaberry is one such plant with good ornamental value. It can be grown in many environments, whether next to a pond or alongside a highway. And several commercial sources now make and sell aroniaberry juice.

This research is part of Plant, Microbial, and Insect Genetic Resources, Genomics, and Genetic Improvement, an ARS National Program (#301) described on the World Wide Web at www.nps.ars.usda.gov.

Kim E. Hummer is with the USDA-ARS National Clonal Germplasm Repository, 33447 Peoria Road, Corvallis, OR 97333; phone (541) 738-4201, fax (541) 738-4205, *hummerk@science.oregonstate.edu*.

Work of the Repository

The National Clonal Germplasm Repository at Corvallis is one of about 30 sites that make up the U.S. National Plant Germplasm System. These sites are managed by ARS and in many cases cooperate with land-grant universities.



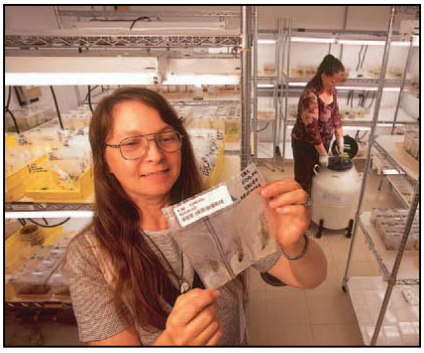
The Corvallis repository preserves and stores genetic resources of thousands of varieties of crops such as pears, strawberries, blueberries, mint, and hops.

Seed physiologist Jack Peters cleans and counts seeds for preservation at NCGR.

Not only does the repository try to collect every significant variety of the crops that they are responsible for, but they also distribute cuttings and seeds to researchers around the world.

Some of their crops are grown in orchards. Corvallis is home to the more than 1,000 varieties of pears from all over the world. While they’re all the same genus and the fruit grows on trees, that’s where their similarities end. The pears appear in all shapes and colors, and each has a unique taste.

In the tissue culture growth room at NCGR, plant physiologist Barbara Reed studies lignonberry plantlets as technician Janine De Paz immerses germplasm samples in liquid nitrogen for long-term storage.



To preserve this material, the repository has tissue cultures for backup and plant distributions, cryogenic preservation for very long-term storage, a genetics laboratory for identifying the fruit, and a plant pathology laboratory to test plants for viruses and to develop clean material.

Plant pathologist Joseph Postman evaluates virus results using an ELISA test as Oregon State University Student Meghan Oaks crushes leaf samples using a roller press.

They acquire varieties of fruits and nuts from around the world to keep the diversity of the various species alive. This treasure trove of genetic diversity is a valuable resource to researchers and breeders. It could be used to regenerate crops in case something disastrous harms the current supply. Over time, certain varieties are used more than others in commercial plantings. This results in less genetic diversity, which could leave large portions of crops vulnerable to newly emerging pests and diseases. Keeping diverse collections makes sure species will live on.

(Reprinted with permission from Agricultural Research, January 2005 Issue)

Ribes Research Update 2004

Steven McKay, Extension Educator, Columbia Country Cooperative Extension, Hudson, NY

Northeast SARE and Grow NY grants have enabled a working group to develop some resources and knowledge that is useful for potential growers of ribes, elderberry, and aronia. Following is a progress report on the project, and a list of some resources available at this time.

The development of the Ribes industry is progressing at a pace faster than originally planned, while the aronia and elderberry industries are a bit slower to take hold. Availability of plant material has been a limiting factor for all crops since widespread publicity in the popular press has spurred plantings and interest in producing value-added products. The impact of the article in the NY Times last fall is still being felt as inquiries are still being received where the article is referenced. Fresh markets for Ribes including gooseberries, red currants, and black currants were expanded this year, and the demand for gooseberries far exceeds production. One wholesaler in NY has expressed interest in CA stored red currants, and another wholesaler in Boston is meeting with growers in February, 2005 to plan purchase of berries and their distribution. The health benefits study had its first phase completed and a national press release went out in November showing black currants and elderberry to be high in antioxidant capacity, with aronia even higher. (These purple berries were shown to be among the fruits and vegetables with the highest antioxidant capacity.) Commercial production of black currants for processing continues to expand while two commercial products, a yogurt, and a beverage are becoming widely distributed in the Northeast. An aronia beverage is now under development by a group in New York City. Fungal disease control in black currant has been achieved with a handful of commonly used and new-generation fungicides.

The following reports/information are available by email for anyone who would requests them:

1. The article about health benefits of the berries,
2. Results of fungicide trials,
3. A brief production guide for ribes, elderberry, or aronia,
4. A feasibility study for these berry groups.

Project Outcomes:

a. Processed over 60,000 pounds of northeast black currant fruit commercially, and selling and developing new local beverages made from the syrup.

b. Over 40 acres of additional Ribes plantings have been planted during the year. A farm in Massachusetts is still planning to plant Aronia, and one in New York, elderberry, both for processing quantities.

c. At least four enterprises are being developed to produce commercial retail black currant beverages. Connecticut Currant, Au Currant, Rhoades Farm, and

d. The feasibility studies have found the Ribes industry to be one of the most promising seen many years.

e. A Ribes cookbook has been published with over 800 recipes. It is suitable for selling at farmers' markets, and other retail sites.

f. A comprehensive production guide for Ribes has been published and will be released by Haworth Press this spring, 2005 (see www.HaworthPress.com).

g. The International Ribes Association will become active again in 2005. This will be an excellent resource for growers and processors at all levels.

h. A series of list serves exists for the Ribes industry.

i. A new pruning and training system for fresh Ribes production was uncovered while in Europe working on the gooseberry standards project. This system simplifies pruning and results in a higher quality crop. It has been adapted by at least 5 farms in the NE.

j. CA storage for gooseberries and currants can result in holding time of up to 8 months. This is a useful marketing tool for the new crop. We have gathered the initial information on the procedures, but would like to improve with additional cooperative research this summer.

k. Clinton Vineyards continues to increase their production of cassis, and two additional producers have begun production in 2004.

l. The Ribes list serves and web sites are resources of Cornell and the International Ribes Association that have been made available for the SARE project for discussion and posting information.

m. Ribes crops have been legalized in NY.

n. A commercial nursery is now offering the European elderberry varieties imported under this project.

o. The first health benefits article was published in the *American Chemical Society Journal*, and released to the national press.

p. Significant quantities of black currant concentrate have been imported into the US to "jump start" the processed black currant industry and prove demand.

q. A company in New York City is working on developing an Aronia drink, and using the health benefits study in their marketing.

Evaluation of Fungicides for Control of White Pine Blister Rust, 2004

Bill Turechek, Steven McKay, Cathy Heidenreich and Gregg Heidenreich. USDA BARC Fruit Lab, Beltsville, MD, Columbia County Cooperative Extension, Hudson, NY, and Department of Plant Pathology, New York State Agricultural Experiment Station, Cornell University, Geneva, NY.

Trials were conducted in a 3-year-old mixed planting of black currant, red currant and gooseberry in Geneva, NY. Bushes were planted in alternation within rows such that individual plots consisted of three plants, one black currant, one red currant, and one gooseberry. Treatments were arranged in a randomized complete block design with four replications. All treatments were applied to drip using a 2 gal garden sprayer at approximately 30 PSI. Application timings were as follows: 28 Apr (grape) 7 May (bloom), 19 May (early fruit), 27 May and 3 Jun (green fruit), 9, 16, 24 Jun (ripening fruit), 1, 9 Jul (harvest). The incidence of white pine blister rust (WPBR) was evaluated by examining all leaves on 3 canes per plant on 14 Jul on black currant bushes only. Canes were tagged on the same date just below the five youngest fully expanded leaves and data was taken again on 15 Sep. Percent defoliation was determined by tallying the number of leaves that had abscised from the total number of leaves (or leaf scars) present above the portion of the cane tagged on 14 Jul. Data were arcsin square root transformed before statistical analysis and analyzed in an ANOVA using SAS PROC MIXED. Treatment means were separated using the pairwise difference option (PDIFF) in PROC MIXED ($P<0.05$).

The season was very conducive for the development of WPBR. All treatments significantly reduced WPBR incidence with the exception of Oxidate at the Jul evaluation. However, programs including the sterol-inhibiting fungicides Nova and Indar, Dithane, and Kocide provided the best control. The increase in disease incidence and subsequent defoliation recorded at the 15 Sept reading was due to infections initiated after we stopped treatment on 14 Jul. Defoliation was much more severe on treatments not receiving Indar, Nova, Kocide or Dithane. Although a more timely disease management schedule beginning at prebloom greatly improved WPBR control over 2003 results, further investigation is clearly needed to improve spray timings for disease control after harvest. Organic products, including Serenade, Citrex 100L, Elexa 4 PDB and JMS Stylet oil, while providing significant levels of disease reduction in Jul, did not perform well as other conventional products. Copper-based compounds still appear to be the best organic alternative for disease control. As projected, Switch and Elevate gave little reduction in WPBR incidence.

Treatment, rate/Acre	% WPBR [% control]* 14 Jul			% WPBR [% control]* 15 Sept			% Defoliation* 15 Sept	
Indar 75WP 2 oz	0.00	a	[100]	80.0	a	[20]	0.0	a
Dithane RSNT 4 lb	0.00	a	[100]	100.0	c	[0]	6.3	abc
Kocide 2000 7.5 lb *alt w/* Nova 40W 5 oz	0.00	a	[100]	100.0	c	[0]	13.5	abc
Nova 40W 5 oz (*21 day schedule after bloom* [5/7])	0.00	a	[100]	95.0	abc	[5]	26.3	bc
Kocide 2000 7.5 lb (*21 day schedule after bloom* [5/7])	0.00	a	[100]	100.0	c	[0]	2.5	ab
Kocide 2000 7.5 lb	1.19	a	[99]	100.0	c	[0]	3.3	ab
Nova 40W 5 oz	1.25	a	[98]	83.5	ab	[16]	0.0	a
CaptEvate 68WDG 5.25 lb	2.94	a	[96]	100.0	c	[0]	20.5	abc
Switch 62.5WG 0.875 lb	5.56	ab	[93]	100.0	c	[0]	83.8	de
Captan 80WDG 3.75 lb	5.88	ab	[92]	100.0	c	[0]	31.0	c
Cabrio EG 0.875 lb	8.33	ab	[89]	96.8	bc	[3]	11.8	abc
Citrex 100L 30 fl oz	10.66	abc	[84]	100.0	c	[0]	85.0	de
Serenade 8 lb	19.44	bc	[74]	91.8	abc	[8]	71.3	c
Citrex 100L 30 fl oz *alt w/* Serenade 8 lb	26.50	cd	[64]	100.0	c	[0]	82.5	de
Elexa 4 PDB 7.5 gal	30.32	cd	[59]	100.0	c	[0]	93.0	de
JMS Stylet Oil 0.8 gal	41.42	de	[44]	90.0	abc	[10]	99.5	e
Oxidate 128 fl oz	58.27	f	[21]	98.3	bc	[2]	100.0	e
Untreated check	73.78	f		100.0	c		100.0	e

*Mean disease incidence and defoliation from 4 replicate plots per treatment are shown. Means within a column not followed by a common letter are significantly different.

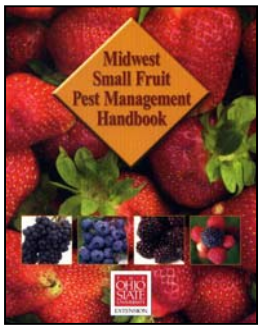
SMALL FRUIT REFERENCE LIBRARY REVIEWS

Cathy Heidenreich, Plant Pathology, NYSAES Cornell University, Geneva, NY

Here is the latest in a series on building your small fruit library. (See full article in the October 2004 Issue of NYBN). Careful planning and selection of materials for your reference library can provide you with a broad knowledge base that is timely and in some respects, timeless.

This month we have two new items hot off the press for your viewing pleasure. The first is the newly revised (2004) version of the popular "Midwest Small Fruit Handbook". The second is a new publication from NRAES entitled "Production of Vegetables, Strawberries and Cut Flowers in Plasticulture".

Book Review: Midwest Small fruit Pest Management Handbook



This publication, edited by Richard C. Funt, Michael A. Ellis, Celeste Welty, is an excellent resource for small fruit pest management. Chapter1 details general concepts of integrated pest management: definitions, strategies, biological control, pest monitoring, making control decisions. The following chapters on strawberries, brambles, highbush blueberries, and grapes include sections on integrated disease management, identifying and understanding major diseases, pests, weeds and their management for each crop. Chapter 6 is devoted to weed management: weed ID and scouting, cultural, mechanical and chemical control, herbicide applications, fumigation, cover crops. Chapter 7 deals with reducing bird and wildlife damage. Chapter 8 covers all aspects of pesticide use in small fruit production: application, labels, formulations, sprayer calibration, calculations, equipment cleaning and maintenance, pesticide safety, record-keeping, worker protection, environmental concerns, pesticide storage. The final chapter deals with plant tissue analysis and fertilizer recommendations.

From the Preface: "This handbook contains information on pests, production methods, and pest management practices that should not change on an annual basis. It is intended to remain current for several years between revisions. Your state's fruit pest management guide, which is a publication listing pesticides for specific crops and specific problems, is published separately and updated each year. To make the best possible decisions about small fruit pest management, this handbook should be used in conjunction with an up-to-date state spray guide."
Full color pictures and illustrations round out a publication that gives you a lot of bang for your buck at $9.75/copy plus shipping and handling! This book may be viewed online at the Ohio State Extension Bulletin Service or purchase a hard copy by contacting:

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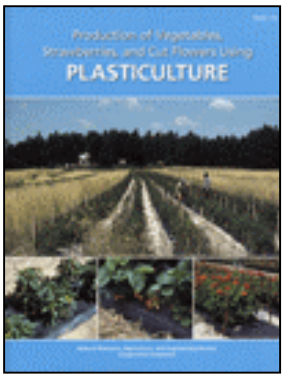
Book Review: Production of Vegetables, Strawberries, and Cut Flowers Using Plasticulture (Thanks to Lori Bushway for this review)



William J. Lamont, John W. Bartok, Jr., Robert D. Berghage, A. Richard Bonanno, Joseph A. Fiola, Stephen A. Garrison, James W. Garthe, George J. Hochmuth, Laurie Hodges, Steve Olsen, Michael D. Orzolek, James W. Paterson, David S. Ross, Robert Rouse, James Sellmer, Otho S. Wells

Plasticulture is a crop-growing system - using products derived from plastic polymers - that frequently achieves greater returns per unit of land than conventional growing methods. Though growers can implement individual components of a plasticulture system, the greatest benefits are derived by integrating various components into a complete system.

Beginning with an overview of plasticulture history, technology, applications, and benefits, the text then quickly immerses the reader into detailed information and guidance for implementing the various components of a complete and successful plasticulture program. The "Plastic Mulches" chapter compares various types of mulches, including response of specific crops to mulch color, as well as application and installation techniques. A section titled "Drip Irrigation and Water Management" focuses on plant-soil-water relationships as a means for system planning considerations, and component installation, operation and maintenance. The "Fertigation" segment offers system design considerations, as well as fertilizer injection management approaches. Chapter 5 concentrates on "Season-Extension Technologies" such as row covers, high tunnels, and heating and ventilation alternatives, while chapter 6 titled "Windbreaks" discusses wind damage problems, and how various windbreak solutions can offer protection. "Plant Establishment (including transplanting and direct-seeding), Machinery, and Spacing" within a plasticulture system is addressed in chapter 7, and includes a section that identifies common plant establishment mistakes. Separate chapters on "Weed Management" and "Soil Sanitation – Managing Soilborne Pests", concludes the general information portion of this useful publication.

"Production of Strawberries Using Plasticulture" in chapter 10, and "Specialty Cut Flower Plasticulture" in chapter 11, itemizes and expands the general components of a plasticulture system to the unique requirements of strawberry production and specialty cut flower enterprises respectively.

25 tables, 86 photos and 16 figures/diagrams supplement the practical and informative text of *Production of Vegetables, Strawberries, and Cut Flowers Using Plasticulture.* A chapter on "Managing Used Agricultural Plastics", a glossary of important terms, an appendix with plasticulture equipment and material sources, and a handy measurement conversion table rounds out this benchmark publication.

(2004) 146 pages. Paperback. ISBN: 0-935817-87-5. Item code: 123NRAES133

List Price: **$23.95**

You may fax your orders to, (607) 255-9946, or e-mail your orders to resctr@cornell.edu .

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

Questions or Comments about the New York Berry News?

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