



# New York Berry News

CORNELL UNIVERSITY



Volume 08, Number 1

January 15, 2009

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**Feb. 10-12, 2009.** *Empire State Fruit and Vegetable EXPO and Becker Forum*, Liverpool Holiday Inn and OnCenter, Syracuse, NY. **Berry session Thursday, February 12, 2009.** More information follows.

**February 17-18, 2009.** *Ontario Berry Growers Annual Meeting*, St. Catharines, Ontario, Canada.

**February 18-19, 2009.** *Ontario Fruit and Vegetable Convention*, St. Catharines, Ontario, Canada.

*For more information or to register for these events contact: Kevin Schooley, 30 Harmony Way, Kemptville, ON K0G 1J0 Canada. Phone: 613 258-4587; fax 613 258-9129, e-mail: [kconsult@allstream.net](mailto:kconsult@allstream.net).*

**February 16, 2009:** *Small Fruit IPM Scout Training – Session I.* Wyoming County CCE. See flyer below for details.

**February 24-27, 2009:** *Hudson Valley Commercial Fruit Growers' School and Trade Show* Kingston Holiday Inn, Kingston, NY. **Berry session Feb 26.** For more information go to: <http://hudsonvf.cce.cornell.edu/calendar.html> or contact Jenny at (845) 340-3990 for further information.

**March 4, 2009:** *Berry Pest Management Update.* Erie County CCE, with polycom site at Chautauqua County CCE. *Mark your calendars now - details in February issue.* DEC pesticide recertification credits available.

**March 5-7, 2009:** *Professional Farmers' Market Managers Training Workshop.* Stockade Inn, Schenectady, NY. For more information: <http://www.nyfarmersmarket.com/workshops.html> or E-mail Diane at [info@nyfarmersmarket.com](mailto:info@nyfarmersmarket.com). (315) 637-4690.

**March 12, 2009:** *Regional Berry Pruning Work shop.* Columbia County CCE. See flyer below.

**March 14, 2009:** *Small Fruit IPM Scout Training – Session II.* Wyoming County CCE. See flyer below for details.

**March 16, 2009:** *Introduction to Berry Pest Management.* Ontario County CCE. *Mark your calendars now- more details in the next issue.*

**March 19, 2009:** *Regional Berry Pruning Work shop.* Grisamore Farms, Locke, NY. See flyer below.

**March 25, 2009:** *Regional Berry Pruning Work shop* Jefferson County CCE. See flyer below.

**March 26, 2009:** *Regional Berry Pruning Work shop* Livingston County CCE. See flyer below.

**April 6, 2009:** *Regional Berry Pruning Work shop* Delaware County CCE. See flyer below.

**April 20, 2009:** *Small Fruit IPM Scout Training – Session III.* Green Acres Farm, Rochester, NY. See flyer below for details.

**May 12, 2009:** *Small Fruit IPM Scout Training – Session IV.* Green Acres Farm, Rochester, NY. See flyer below for details.

**June 22-26, 2009:** *The 10th International Rubus and Ribes Symposium.* Zlatibor, Serbia. Save the date!

**H**ere it is as we promised – a myriad of berry nice opportunities to take in a meeting, attend a workshop, hear a talk on the latest research, visit a trade show, network with other growers and extension folks - something for every member of your berry operation!

## CURRENT EVENTS

**Feb. 3-5, 2009.** *Mid-Atlantic Fruit and Vegetable Convention*, Hershey Lodge and Convention Center, Hershey, PA. For more information contact William Troxell at 717-694-3596 or visit [www.mafvc.org](http://www.mafvc.org).

**This is a great place to network, ask your questions, and get**

## All-star Cast of Speakers



### Cathy Heidenreich

Berry Extension Support Specialist, Western New York  
Department of Horticulture  
Cornell University CALS, Ithaca, NY

### Dr. Marvin Pritts

Professor and Chair  
Berry Crop Specialist  
Department of Horticulture  
Cornell University CALS, Ithaca, NY

### Dr. Juliet Carroll

Fruit IPM Coordinator  
NYS IPM Program  
Geneva, NY 14456



### Dr. Kerik Cox

Assistant Professor  
Tree Fruit and Berry Pathology  
Department of Plant Pathology and Plant-Microbe Biology  
NYSAES, Geneva, NY 14456

### Dr. Greg Loeb

Professor  
Grape and Small Fruit Entomology  
Department of Entomology  
NYSAES, Geneva, NY 14456



### Jim Ochterski

Agriculture Economic Development Specialist  
Cornell Cooperative Extension, Ontario County



### Craig Michaloski

Owner/Grower: Green Acres Farm  
Rochester, NY

### Laura McDermott

Berry Extension Support Specialist, Eastern New York  
Department of Horticulture  
Cornell University CALS, Ithaca, NY



### Betsy Bihn

GAPS Program Coordinator  
Department of Food Science  
Cornell University CALS, Ithaca, NY



### James Carrabba

Agricultural Safety Specialist  
NY Center for Agricultural Medicine and Health (NYCAMH)  
Cooperstown, NY

**This training program has been partially funded through a grant from the Agricultural Workforce Certification Program. Those successfully completing the entire training program will receive a:**

- Certificate of Achievement
- Small Fruit IPM Scout Resource Kit (\$50 value)

### Sponsored by:

Cornell Cooperative Extension of Wyoming County in collaboration with Cooperative Extension offices of Allegany, Cattaraugus, Chautauqua, Livingston, and Ontario counties ,  
New York Farm Viability Institute,  
Cornell University's College of Agriculture and Life Sciences Department of Horticulture



Cornell University  
Cooperative Extension  
Wyoming County



## SMALL FRUIT IPM SCOUT TRAINING

**Cornell Cooperative Extension**  
401 North Main Street  
Warsaw, NY 14569

**585-786-2251**

<http://counties.cce.cornell.edu/wyoming>

## Dates and Locations:

### Central NY, hosted by Cayuga Co. CCE

**Thursday, March 12th, 1-4 PM**  
**Grisamore Farms, Locke, NY**

Registration: Peggy Lillie, Cayuga County CCE, 248 Grant Avenue, Auburn, NY 13021. Phone: 315-255-1183  
More information: Dan Welch, Cayuga County CCE, 315-255-1183;  
[dlw56@cornell.edu](mailto:dlw56@cornell.edu).

Directions: Grisamore Farms is located in New York State between Ithaca and Auburn, and is just off NYS Rte. 34 and NYS Rte. 90. From Ithaca take Rte. 34 North and watch for our signs for the turn off. From Auburn/ take Rte. 34 South and watch for our signs for the turn off.

### Hudson Valley, hosted by Columbia Co CCE Thursday, March 19th, 1-4 PM

**Columbia Co. CCE Hudson, NY**

Registration: Peggy Storti, Columbia County CCE, 479 Route 66, Hudson, NY 12534. Phone: 518-828-3346  
More information: Steven McKay, Columbia County CCE, 518-828-3346,  
[sam44@cornell.edu](mailto:sam44@cornell.edu).

Directions: From the north— follow Rt. 9H to the junction with Rt. 66. Turn right on Rt. 66 and go 2 miles towards Hudson. The office is located on the left.  
From the south—Take Rt. 9H North through Claverack. 2 miles past Claverack, turn left at the flashing light onto Fish and Game Rd. At the end of Fish and Game Rd. turn left onto Rt. 66. The CCE office is on the left 1/10th of a mile from that turn.

### Northern NY, hosted by Jefferson Co. CCE

**Wednesday, March 25th, 1-4 PM**  
**Jefferson County CCE, Watertown, NY**

Registration: Jefferson County CCE, 203 North Hamilton Street, Watertown, NY 13601. Phone: 315-788-8450  
More information: Sue Gwise, Jefferson County CCE, 315-788-8450;  
[sjg42@cornell.edu](mailto:sjg42@cornell.edu). (Directions on next panel)

Directions to Jefferson County CCE: From I-81 N, take the Rt-3 Exit, EXIT 45, toward Arsenal St/Sacketts Harbor/Downtown. Turn right onto NY-3N and go 2.7 miles. Turn left onto N. Hamilton Street in 2 miles and end at 203 N. Hamilton St.

### Western NY, hosted by Livingston Co. CCE

**Thursday, March 26th, 1-4 PM**  
**Livingston Co. CCE Office, Mt Morris, NY**

Registration: Jennifer, Livingston County CCE, 2158 Main St, Mt Morris, NY 14510, phone 585-658-3250.  
More information: David Thorp, Livingston County CCE, 585-658-3250 ext 109, [dlt8@cornell.edu](mailto:dlt8@cornell.edu).

Directions: NYS Thruway Exit 46 to 390 South. Exit 7 Left off ramp onto Route 408. Turn right on Main St (NY 36). Building is on the right-hand side of the street.

### Southern Tier, hosted by Delaware Co. CCE

**Monday, April 6th**  
**Delaware Co. CCE Office, Hamden, NY**

Registration: Delaware County CCE, P. O. Box 184 34570 State Highway 10, Hamden, NY 13782-0184  
More information: Janet Aldrich, Delaware County CCE, 607-865-6531,  
[jla14@cornell.edu](mailto:jla14@cornell.edu).

Directions: The office is located 1 mile south of Hamden on Route 10, make a left at the Resource Center, drive around to the back of the building - our entrance is in the rear.



*Cornell Cooperative Extension provides equal program and employment opportunities.*



2009 REGIONAL BERRY WORKSHOP

# Pruning and It's Impact on Pest Management

Sponsored by:



Cornell University  
Cooperative Extension



N.Y. State Berry  
Growers Association



Cornell University  
Department of Horticulture



Berry growers often overlook the benefits obtained by consistent attention to the basics—like regular pruning and annual sprayer calibration.

The information presented in these workshops is a return to the fundamentals of berry growing. Understanding fundamentals can mean a huge savings in pest control expenses while also seeing more consistent and increased yield and vigor of plants.

Bring your employees and focus on the fundamentals!

NYS DEC pesticide applicator re-certification credits will be available for categories 1A, 10, and 22.

*Accommodations for persons with disabilities may be requested by calling the county CCE office listed in this brochure one week prior to the class to ensure sufficient time to make arrangements. Requests received after this date will be met when possible.*

## Agenda

### Pruning Blueberries and Brambles

Dr. Marvin Pritts, Cornell.

Pruning encourages yield and reduces disease and insect pressure and impacts pest control product distribution in the canopy. Pruning techniques will be described in detail and demonstrated in field or video.

### Pruning and Pests—A Closer Look

Cathy Heidenreich, Western NY Berry Ext. Support Specialist, Cornell

Understand the life cycles of pests deterred and eliminated by pruning. Cathy will focus on selected pests of brambles and blueberries.

### Sprayer Calibration—It's easier to do and more important than you think!

Laura McDermott, Berry Ext. Support Specialist, Eastern NY, Cornell

Maximize the effect of pest control materials in those newly pruned plantings by making sure sprayers are appropriately calibrated. A discussion of nozzles, material handling and safety will be included. Each site will have a tractor and boom sprayer present and attendees will follow along using their own worksheet and working through the figures as we do the calibration.



## Pruning/Pest Mgmt. Workshop Registration Form

\_\_\_\_\_  
Name(s) of those attending

\_\_\_\_\_  
Name(s) of those attending

\_\_\_\_\_  
Name(s) of those attending

\_\_\_\_\_  
Company/Farm

\_\_\_\_\_  
Address

\_\_\_\_\_  
Phone

\_\_\_\_\_  
E-mail address

\_\_\_\_\_  
Total # attending      X \$10/person      = Total enclosed

Registration fee is \$10.00 per person which includes handouts and refreshments. Checks should be made payable to:  
**Cornell Cooperative Extension**  
in the county where you will attend.

Mail Registration form with payment to the Cooperative Extension office where you will be attending no less than 1 week prior to the workshop date.

### Questions?

Contact the hosting CCE Educator listed on this brochure

or  
Cathy Heidenreich  
Phone: 315-787-2367  
E-mail: mcm4@cornell.edu

or  
Laura McDermott  
Phone: 518-746-2562  
E-mail: lgm4@cornell.edu



Each day begins at 10:00 am and ends at 3:30 pm.  
Lunch will be provided.

## Classroom Sessions

### Held at:

Cornell Cooperative Extension  
of Wyoming County  
401 North Main Street  
Warsaw, NY 14569



### Session 1:

**Mon., February 16, 2009**

- Site Selection and Preparation
- Berry Weed Management
- Berry Nutrient Management
- GAPS for Small Fruit
- Marketing Small Fruits



### Session 2:

**Mon., March 16, 2009**

- Berry Pest Management: Diseases
- Berry Pest Management: Insects
- IPM Tactics for Berry Crops
- General Farm Safety Considerations for Small Fruit Workers

## Field Sessions

### Held at:

Green Acre Farm  
3460 Latta Road,  
Rochester, NY 14612



### Session 3:

**Mon., April 20, 2009**

- Production Practices
  - Pruning bushberries and cane berries
  - Trellis construction
  - Strawberry mulch application/removal
  - Irrigation systems

### Session 4:

**Mon., May 11, 2009**

- Production Practices
  - Cultivation equipment demonstration
  - Scouting for berry pests
  - Sprayer calibration demonstration
  - Weed identification practicum
- Closing Comments
- Distribution of Certificates/Resource Kits

**This is a great opportunity to attend sessions on a variety of relevant small fruit production practices.**

**Please join us for a valuable learning experience.**

## Registration Form

### Small Fruit IPM Scout Training

Register by completing the form below and mailing along with a check (payable to *Cornell Cooperative Extension*).

~OR~

Stop by the Extension office located at 401 North Main Street in Warsaw to register and pay by cash, credit or check.

**Registration Deadline**  
**February 6, 2009**

Name(s): \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

County of Residence: \_\_\_\_\_

Phone: (\_\_\_\_\_) \_\_\_\_\_ daytime

(\_\_\_\_\_) \_\_\_\_\_ evening

E-mail: \_\_\_\_\_

Number of attendees \_\_\_\_\_

x \$75 = \$ \_\_\_\_\_

Please mail this registration form and check to:  
Cornell Cooperative Extension of Wyoming County  
Attn: Lutie Batt  
401 North Main Street  
Warsaw, New York 14569  
585-786-2251

# THE EMPIRE STATE FRUIT AND VEGETABLE EXPO: PREPARING YOU AND YOUR BUSINESS FOR THE FUTURE!

*The Expo Continues to Grow and Expand as Your Operation's Needs Change and Grow!*

The 2009 Empire State Fruit and Vegetable Expo and Becker Forum will be held at the Holiday Inn Liverpool and the Oncenter Convention Center in Syracuse, New York on February 10, 11 and 12, 2009. The Expo continues to offer growers the information and innovations that are needed in this time of economic and technological change. As always, commodity sessions will feature specialists from all over the country, who will speak and teach about the latest research and innovations regarding growing and production techniques, harvesting and storage options, and more! This information is specifically planned and prepared in order to help growers continue to grow and improve their farm businesses. Large, small and every size in-between businesses can benefit from the content of the sessions at the Expo. The large trade show will feature a variety of businesses specifically devoted to the fruit and vegetable industry, with equipment for all sizes of growing operations. The trade show will also feature special sessions specifically geared to growers and their employees throughout the two days as well.

*Proactive Approaches to Immigration and Work Force Issues* is the title for the popular Becker Forum, which will be held on Tuesday, February 10. For the past two years, this intensive day-long session has been sold out so mark your calendars now to set aside the date. This workshop will continue its informative record by focusing on the ever-changing challenges that farmers face with regards to agricultural labor, and will provide strategies you can use in your agricultural business. This session is fast becoming a premier event focusing on agricultural labor. All individuals who are interested in this important issue are invited to register and attend. This forum is a great start to the Expo and does require pre-registration (detailed information follows below).

Plan to spend two full days at the Oncenter as the educational commodity sessions take place on February 11 and 12, 2009. Session topics include the latest in research and grower experiences regarding production and marketing of a variety of fruit and vegetable crops, including potatoes, tree fruit, onions, tomatoes and peppers, cabbage, **berries (agenda follows)**, cut flowers, sweet corn, beets and carrots, vine crops, and beans and peas. In addition, this year's Expo will have sessions focusing on fresh market organic crops, soils and tillage, greenhouses and high tunnels, GAPS for small-sized growing operations, and ecological weed management. Take advantage of the special two-day Expo rate in order to gain the maximum amount of information to take back to your business. Expo sessions provide the know-how needed to grow your farm through knowledge, innovation and research!

The Empire State Fruit and Vegetable Expo is sponsored by the New York State Vegetable Growers Association, Empire State Potato Growers, New York State Berry Growers Association, New York State Horticultural Society and Cornell University and Cornell Cooperative Extension. Trade show and exhibitor information is currently available and the Expo program, which includes detailed educational session information and a pre-registration form, will be available in early December. Free shuttle bus service is available from the Holiday Inn Liverpool, right off exit 37 of the New York State thruway. Make plans now and mark your calendar to attend the best Empire State Fruit and Vegetable Expo yet!

For more information, visit <http://www.nysaes.cornell.edu/hort/expo/> or contact Jeff and Lindy Kubecka, New York State Vegetable Growers Association, PO Box 70, Kirkville, NY 13082 or email [nysvga@twcny.rr.com](mailto:nysvga@twcny.rr.com). For trade show information and exhibiting, please contact Dan Wren, Lee Trade Shows, PO Box 121, Palatine Bridge, NY 13428 or email [dwren@leepub.com](mailto:dwren@leepub.com).

## **2009 BECKER FORUM: "PROACTIVE APPROACHES TO IMMIGRATION AND WORKFORCE ISSUES"**

The 2009 Becker Forum promises to continue the tradition of excellence that has been established as this intensive all-day session focuses on the constantly changing issues surrounding agricultural labor and immigration issues. A variety of speakers will present at the Forum providing their unique perspectives on the changes occurring in agricultural labor, and will also provide practical and positive approaches for agricultural employers to apply with regards to public perception of the immigration issue and human resource management.

Issues presented during the Forum will include the impact that a new Congress and President will have on immigration reform, presented by Craig Regelbrugge, Sr., Director of Government Relations, American Nursery and Landscape Association based in Washington, D.C. Regelbrugge's presentation will provide an update on immigration reform under the new administration. Monte Lake, Partner in Siff Cerda and Lake, LLP, also from Washington, D.C. will address the issues relating to the Social Security no-match letters. The morning session will conclude with a presentation focusing on how agricultural employers can impact public opinion regarding the polarizing issue of immigration as it relates to

agriculture. The afternoon sessions provide agricultural employers with human resource management techniques that can be employed immediately on the farm, including how to create a high performance business culture. Dr. Bernie Erven, from Erven HR Services, LLC and Professor Emeritus at Ohio State University will be presenting throughout the afternoon to provide agricultural employers with ideas, vision and practical techniques to improve their human resource management skills. A special Leaders' Forum will occur at the end of the Forum as a vehicle for providing input on how future immigration legislation can be impacted.

The Becker Forum will be held on Tuesday, February 10, 2009 from 8:00 a.m. to 4:30 p.m. at the Holiday Inn Liverpool in the Syracuse, NY area. Attendees must pre-register to attend the Becker Forum (registration cost is \$55). Information on registering is in the Empire State Fruit and Vegetable Expo Program, which is currently available from the New York State Vegetable Growers Association or on the web at <http://www.nysaes.cornell.edu/hort/expo/>. This premier event has been sold out consistently and this year promises to be the same! Sponsors for the Forum include Dairylea, Dairy Farmers of America, Farm Credit, National Grape Cooperative, Cornell Cooperative Extension, CCE Vegetable Program Work Team, Cornell Farmworker Program, NYS Horticultural Society, the NYS Apple Association, the NYS Vegetable Growers Association, New York Farm Bureau, and Agricultural Affiliates.

## **EMPIRE FRUIT AND VEGETABLE EXPO BERRY SESSION - A BERRY GOOD DEAL!**

*Thursday, February 12, 2008*

### **BALLROOM WEST**

- 8:50 am**     **Announcements/welcome/DEC credit sign up** - *Paul Baker, NYSBGA Executive Secretary*
- 8:55**         **What's new from industry?**
- 9:00**         **Soil management for optimal blueberry production** - *Marvin Pritts, Cornell*
- 9:25**         **Post harvest handling of small fruit - practical options for smaller producers** - *Chris Watkins, Cornell*
- 9:50**         **The berry best of berry internet** - *Cathy Heidenreich & Laura McDermott, Berry Extension Support Specialists, Cornell*
- 10:00**        **High tunnel raspberries and blackberries** - *Marvin Pritts, Cornell*
- 10:25**        **A grower perspective: Adding blueberries to your fruit farm** - *Jim Bittner, Singer Farms, Appleton*
- 10:45**        **NYS berry growers: The next generation** - *Rebecca Harbut, Cornell*
- 11:05**        **NYSBGA Annual Business Meeting** - *Paul Baker, NYSBGA Executive Secretary*
- 11:10**        **LUNCH & VISIT TRADE SHOW**
- 1:00 pm**     **Announcements and DEC credit sign up** - *Paul Baker, NYSBGA Executive Secretary*
- 1:05**         **What's new from industry?**
- 1:10**         **Blueberry varieties** - *Mike DeGrandchamp, DeGrandchamps Farm, South Haven, MI*
- 1:40**         **Strawberry herbicide update** - *Robin Bellinder, Cornell*
- 2:10**         **BREAK & TRADE SHOW ICE CREAM SOCIAL**
- 2:40**         **Practical ecology and management of white pine blister rust in currants** - *Kerik Cox, Cornell and Steven McKay, Hudson Valley Fruit Program*
- 3:10**         **Managing fruitworms and maggots in blueberries** - *Greg Loeb, Cornell and Molly Shaw, South Central NY Ag Program*

- 3:40**      **Virus diseases of small fruit: Tips for avoiding and assessing presence of viruses in blueberries and raspberries** - *Kerik Cox and Marc Fuchs, Cornell*
- 4:10**      **Designing a better sprayer for pesticide application in strawberries** – *Andrew Landers and Laura McDermott, Cornell*
- 4:35**      **ADJOURN – distribute DEC credits**
- 4:40**      **Optional Q & A with speaker panel**

## BEGINNING A SUCCESSFUL SMALL FARM OPERATION

Thinking of starting a new farming enterprise but not quite sure where or how to begin. Cornell University Cooperative Extension can offer you training and resources to assist you in selecting an enterprise suited for success. An introductory course designed for small, part-time or perspective farmers will be held on Saturdays, February 21st and 28th from 9 AM to 3 PM at the Brant Town Hall; 1294 Brant-North Collins Road; Brant, NY. The sessions are sponsored by the Cornell Small Farms Program - Beginning Farmer Project and New York State Farm Viability Institute.

Topics to be covered:

- **Agriculture 101** - An introduction to agriculture in WNY and an overview of agricultural terminology.
- **Basics of Farm Bookkeeping & Taxes** – This session will introduce participants to financial systems available for use and explore tax related farm issues.
- **Basics of Soil & Plant Fertility** – Soil the foundation of farming.
- **Selecting an Enterprise** - Taking inventory of your “farm” resources and analyzing your marketing opportunities. Without these steps you could encounter a roadblock in your path to a successful farm enterprise. This session will help attendees find a match between their interests and available resources.

Enrollment will be limited. **Pre-registration is required by February 7th, 2009.** Cost for the workshop series is \$100/individual or farm enterprise. For more information or to receive a registration form, contact Sharon Bachman at 716-652-5400 ext. 150 or Lynn O'Brien at 585-268-7644 ext 18. E-mail contact is: [lao3@cornell.edu](mailto:lao3@cornell.edu).

## 2009 CORNELL PEST MANAGEMENT GUIDELINES FOR BERRY CROPS NOW AVAILABLE

The 2009 edition of the Pest Management Guidelines for Berry Crops is now available. This annual publication provides up-to-date pest management information for blueberry, bramble (raspberry and blackberry), strawberry, ribes (currant and gooseberry), cranberry, and elderberry production in New York State. Supplemental information on wildlife management and harvesting, handling, and transporting berries is also included. It has been designed as a practical guide for berry crop producers, crop consultants, ag chemical dealers, and others who advise berry crop producers.

In addition to annually revised pesticide and crop production information, many changes have been made to the 2009 edition of the Berry Guidelines including:

- Addition of two new chapters on cranberry and elderberry production.
- Revised nutrient management guidelines.
- Significantly updated weed management sections for all berry crops, including identifying both herbicide and non herbicide weed control options for blueberries, brambles, and strawberries.
- Identifying pesticides that may be acceptable in organic production systems.
- The addition of several new pests, including crown gall, blueberry viruses, and ants in blueberries; late leaf rust and fireblight in brambles; Japanese beetles and angular leaf spot in strawberries; and cane blight in ribes.

The 2009 Pest Management Guidelines for Berry Crops can be obtained through your local Cornell Cooperative Extension office or directly from the Pesticide Management Education Program (PMEP) Educational Resources Distribution Center





at Cornell University. To order from PMEP, call (607) 255-7282, send an email to [patorder@cornell.edu](mailto:patorder@cornell.edu), or order on-line at <http://hosts.cce.cornell.edu/pmep/shop/>. Cost for the Guide is \$25, shipping included.

## **STATE TO HELP FUND CERTIFICATION TO ENSURE FOOD SAFETY**

*Producers Encouraged to Obtain Third-Party Audits to Verify Good Ag Practices*

*Jessica Chittenden New York State Department of Agriculture & Markets, IOB Airline Drive • Albany, New York 12235 • 518-457-3136, [www.agmkt.state.ny.us](http://www.agmkt.state.ny.us).*

**J**anuary 12, 2009. New York State Agriculture Commissioner Patrick Hooker today announced a new program that will offer financial support for growers and handlers of fresh produce to obtain third-party audits and/or water tests to verify effective food safety practices. The New York State Good Agricultural Practices Certification Assistance Program will reimburse up to \$750 per eligible applicant, using USDA Specialty Crop Block Grant Program funds provided through the 2008 federal Farm Bill.

"Food safety has become an important marketing and health issue for the produce industry," the Commissioner said. "Buyers are demanding assurances from growers that their product is safe, making it necessary for growers and handlers to certify they have a food safety program in place. This program will help increase the number of New York growers and handlers using third-party audits to verify their program and further protect New York's consumers. I want to thank New York's congressional delegation for making this program possible through their support of the federal Specialty Crop Block Grant Program."

The New York State Good Agricultural Practices Certification Assistance Program will strengthen food safety and subsequently increase marketing opportunities for growers and handlers by paying the cost, up to \$750, of Good Agricultural Practices (GAP) and Good Handling Practices (GHP) audits. Costs allowed under the program will include audits, informational assessments and costs of water testing done in 2008 or 2009 by a qualified third-party, which could be the New York State Department of Agriculture and Markets or a private auditor.

In addition, Specialty Crop Block Grant Funds will be used to create a water quality data base, which will provide an objective measure of current irrigation water quality, as it relates to on farm irrigation water management practices.

For more information on New York State Good Agricultural Practices Certification Assistance Program and how to apply, growers and handlers can contact Bill Lyons, Farm Products Grading Manager for the Department's Division of Food Safety & Inspection at 518-457-2090 or [bill.lyons@agmkt.state.ny.us](mailto:bill.lyons@agmkt.state.ny.us).

New York State's specialty crop sector is a vital part of the State's agriculture industry as well as New York's overall economy. New York nationally ranks second in apples and cabbage, third in grapes and cauliflower, and fourth in tart cherries, pears, pumpkins, sweet corn, and snap beans. Last year, New York farmers received \$980 million from the sale of fruits and vegetables.

## **CORNELL SMALL FRUIT NURSERY GUIDE UPDATED FOR 2009**

**W**ondering where to get those Black Diamond currants or Itasca strawberries you need for your new planting this year? Help is on the way! Just go to the Cornell Small Fruit Nursery Guide located on line at: <http://www.fruit.cornell.edu/Berries/nurseries/index.html>.

This two-part nursery guide for berry growers cross references scores of cultivars with the nurseries that sell them. Included in the guide are strawberries (June-bearing, day neutral, Alpine), Blueberries (Northern and Southern highbush), cranberries and other related plants (huckleberry, lingonberry, bilberry etc.), brambles (summer red, black, and purple raspberries, fall red and yellow raspberries, thornless and thorny blackberries and other related berries), Currants (red, black, white, pink), gooseberries and Jostaberries, and other specialty crops (beach plum, hardy kiwi, pawpaw, persimmon, Gogi, serviceberry, many others).

The [Nurseries](#) page contains an alphabetized listing of nursery businesses throughout the United States and Canada that have requested to be included in this guide. If you own a nursery that sells berry crops, see below to find out how to be included on this list.

Cultivar pages for each crop (see click down menu in left-hand column of web site) list specific cultivars followed by the nurseries that sell them.

For advice on cultivars best suited for your area and needs visit Cornell's cultivar review pages ([strawberries, raspberries, and blueberries](#) or [currants and gooseberries](#)) or contact your [local office](#) of Cornell Cooperative Extension. (Outside New York, check your phone book or browse the [USDA/CSREES directory](#).)

### **Not finding what you need in Cornell's Nursery Guide?**

More information about nurseries that sell particular cultivars can be found in the Fruit, Berry and Nut Inventory (Third Edition) edited by Kent Whealy and Joanne Thuente of [Seed Savers Exchange](#). This 520-page comprehensive "catalog of catalogs" contains 75 sections divided by fruit type, source information for obtaining the catalogs of 280 mail-order nursery companies, and nearly 6,000 cultivar descriptions keyed to suppliers. Everything commercially available can be scanned to locate desired cultivars. The 3rd edition (2001) is currently out of print, but the 4th edition is underway and should be available in late 2009.

### **Are you selling quality berry crop plant material?**

Let us know each fall by November 15 and we'll add you to our Cornell's Nursery Guide for Berry Growers released annually in December. Please provide the following information:

- Nursery Name
- Website Address
- Email Address
- Mail Address
- Fax
- Phone
- Cultivars you currently sell
- Cultivars you are not selling this year but sold last year

Mail or email the information and/or catalog to: (Attention or Subject line "**Berry Nursery Guide**")

Cathy Heidenreich  
Cornell University College of Agriculture and Life Sciences  
Department of Horticulture  
134A Plant Science Bldg. Ithaca, NY 14853  
[mcm4@cornell.edu](mailto:mcm4@cornell.edu)

*(Please note: Inclusion in this listing is by request of the business owner. No endorsement or discrimination is intended or implied.)*

## **Q & A REGARDING AGRO-ONE SOIL TESTING**

**L**ast month's issue of New York berry News featured an article explaining that Cornell University will be moving its commercial soil testing and plant tissue analytical services currently conducted through the Cornell Nutrient Analysis Lab (CNAL) to Dairy One Cooperative under a collaboration named Agro-One. The following is a list of questions and answers intended to address common concerns.

### **Q. Why is the transfer of CNAL commercial soil and plant tissue analytical services taking place?**

A. The move away from providing commercial laboratory services is consistent with Cornell's focus on research and spinning off commercially-viable technologies to the private sector. The opportunity to free up resources previously dedicated to routine soil and plant tissue analytical services will allow Cornell to enhance its research capabilities and focus on the development of innovative and expanded agro-environmental analytical services. Through Agro-One a critical analytical resource will be preserved and enhanced over time. Please see November 11, 2008 Agro-One announcement.

### **Q. What is the timetable for this transfer?**

A. It is anticipated that the transfer will be completed by late winter 2009, in time for early spring soil samples. Until a formal announcement of the transition, soil samples can still be submitted to CNAL for analysis. There will not be an interruption of soil and tissue testing services in the transition.

### **Q. Will samples be tested the same way Cornell tested them in the past (Morgan) or will they be run by Mehlich III with a calculated Morgan equivalent value?**

A. It is the goal of Agro-One to provide soil and plant tissue testing services that are consistent with how Cornell has performed them in the past. Interpretations of soil test results based on Cornell's recommendation system will remain in place. A Morgan extraction method will be available through Agro-One.

**Q. What quality control measures will be in place to ensure accuracy of Agro One soil & tissue analysis?**

A. Dairy One uses a variety of industry-leading quality control measures in all of its laboratory operations. Specifically, Agro-One will follow QC guidelines developed cooperatively with Cornell and also work within the framework of the Soil Science Society of America's North American Proficiency Testing (NAPT) program. .

**Q. Can I use my pre-paid Cornell soil test kits?**

A. Cornell pre-paid soil test kits can be used as long as supplies last and will be honored at Agro-One. Pre-paid soil kits can still be ordered through CNAL until further notice and will be honored.

**Q. Where do I get new Agro One soil & plant tissue test sample kits, and what submission procedures will be implemented?**

A. Information will be forthcoming on how and where to get new sample kits. Cornell and Agro-One will provide appropriate options for sample submission and forms consistent with past offerings and stakeholder expectations.

**Q. Will the Agro-One kits be pre-paid or pay-as-you-go?**

A. Details on Agro-One service packages and pricing will be forthcoming, but will include an option for pay-as-you-go.

**Q. How will I get Agro-One results (mail, email, fax, etc?)**

A. Analysis results will be available via mail, email, and fax. Results will be formatted to pull in to widely used nutrient management software.

**Q. Who will make recommendations?**

A. The Cornell recommendations system will continue to be used through Agro-One for the wide variety of crops and soils it has supported in the past. Cornell will maintain and develop the system as it has traditionally done.

**Q. What is the expected turn around time?**

A. Dairy One's current average turn around time for soil tests is four days. It is anticipated that this will be the same or better under Agro-One. If non-routine tests are requested, turn around time may be affected. Dairy One prides itself on its laboratory turn around times and customer focus.

**Q. What services will be offered by Agro One?**

A. Services currently available from Dairy One will continue as well as a "Cornell Package" that is anticipated to be very similar to current CNAL packages of services. Agro-One will be working with Cornell to improve testing technology as well as bringing new test to market for the benefit of farmers and their advisors.

**Q. What will the Agro One soil test & plant tissue analysis services cost?**

A. Testing charges will be competitive with similar testing services.

**Q. Will Extension staff get copies of submitted soil samples from their counties?**

A. Agro-One will work with CCE personnel to receive or access soil sample data similar to past practices and providing flexibility to producers and CCE. Dairy One has extensive experience in providing data in a variety of formats and channels and will collaborate with Cornell on making data accessible in efficient and confidential formats.

**Q. I would like to use the Dairy One pick up point in my area to send my soil samples. How do I go about doing that?**

A. Agro-One plans to take advantage of the Dairy One transportation network for sample receiving. Detailed information will be forthcoming.

**Q. Can I still get the Cornell Standard, Low Range or High Range pH kit? Where do I order them? What will they cost?**

A. The pH kits will remain available through Cornell. Detailed information will be forthcoming.

**Q. How will future Cornell soil fertility research be done?**

A. It is anticipated that Cornell soil fertility research will continue as it has in the past. All aggregate soil test data through Agro-One will be available to Cornell for research and extension purposes.

**Q. Who do I call if I have a question about a sample or recommendations?**

A. Information will be forthcoming, but it is anticipated that people will call Agro-One regarding samples and results. Cornell and CEE will remain responsible for questions related to interpretation and recommendations.

**Q. How will this impact CNMP development.**

A. This should have little or no impact on CNMP development and the Cornell recommendations will basically remain available.

**Q. Can I still submit soil samples for analysis to the Cornell Nutrient Analysis Laboratory?**

A. Cornell is moving away from routine soil and tissue testing, and will focus on research, analytical innovations, emerging agro-environmental issues, and special requests. Cornell will offer new analytical services, such as the soil health test, for a limited time until they become viable for commercialization through Agro-One and other labs.

## **SOME WEED CONTROL OPTIONS FOR NY PLASTICULTURE**

*Kevin Jungerman, CCE Northeastern NY Commercial Fruit Program, Ballston Spa, NY*

**T**he production of strawberries on black plastic, whether as an annual crop, or retained for multiple years, will require a different weed management strategy than perennial matted row strawberries. Combining black plastic with preplant fumigation should allow excellent control of most weeds in the row and also allow considerable suppression of plant diseases, and plant parasitic nematodes in new plantings. Areas such as North Carolina, South Carolina, Tennessee, and Virginia, which once relied on Methyl Bromide for weed control in plasticulture strawberry nursery fields and / or fruit production fields, now, as producers everywhere, are needing to orchestrate alternative strategies. At this time, the basic alternative approach includes three features: the application of pre-emergence herbicides to preformed planting beds before plastic is laid down, the subsequent application of post-emergence herbicides either selectively or over the top of the strawberry crop, and then, as needed, a follow-up with weed removal by hand.

Weeds will always trend towards the chaos-end of management, situations where strawberries are planted year upon year in the same fields. It only makes sense to rotate into different fields to prevent increases in persistent weeds. Care must always be taken with rotation schemes to ensure that a plot previously treated with herbicides has no carry over residues that may be detrimental to the following strawberries. One should consult herbicide product labels for information as to what crops may be planted safely in succession.

Jennings, Monks, and Michem of the North Carolina Extension service cite three areas where weeds are likely to easily get a foothold in strawberries that are grown on plastic (the underline terms are my doing):

The Alleyway Opening. The middles between rows will generally possess much of the same excellent fertility and moisture as the plant rows. Weeds will germinate there and grow easily. Very quickly, they may overreach and shade strawberry plants in the production rows.

A practice to deter weed development in the middles is to apply a pre-emergence herbicide there before weed emergence. A complementary (or back up option - depending upon weed dynamics) is to apply a post-emergence herbicide to young, actively growing weeds - nipping them well before their bud, a timing that is most effective. Between row herbicide application should always be banded and not applied over in-row plastic as this can be detrimental to strawberry plants because the herbicide can remain active on the plastic and cause crop injury.

Another option for row middles is the seeding of ryegrass immediately after laying row plastic. The fast emerging rye crowds out and suppresses weed development, and the rye also limits soil, wind and water erosion from the middles. Prior to strawberry harvest, the ryegrass can be suppressed then killed, with sethoxydim (Poast). Growers sometimes apply wheat straw to middles. The straw should contain no weed seeds.

Strawberry planting holes. Weeds commonly emerge from the same planting hole as the strawberry plant itself, directly competing for nutrients, moisture, and sunlight. This can reduce strawberry growth, yield and quality, and if extensive



enough, this can result in crop death. The best way to prevent this is the use of pre-emergence herbicide to the preformed bed prior to laying the plastic, and then if need be, complementing this tactic with a post-emergence over-the-top herbicide, and finally, hand weeding; frequent field passes will quickly disclose any of these planting-hole weed-control failures.

**Perimeter Invasion.** Weeds such as curly dock, vetch, horseweed, sow thistle and prickly lettuce often establish at the ends of fields. If allowed to go to seed, these weed seeds will invade the production field via wind, water, critter, and equipment. Scout your non-crop borders at the ends of fields, along fencerows, and ditches, and be prepared to implement cultural and/or chemical control so as to prevent weed flowering and seed proliferation.

The table on the following page outlines a possible scenario for weed control in NY plasticulture strawberries.<sup>1</sup> Other choices are possible. Consult the Cornell 2008 Pest Management Guidelines for Berry Crops.

### POSSIBLE HERBICIDE OPTIONS FOR PLASTICULTURE STRAWBERRIES IN NY

Timing/Use	Material	Rates/Acre	REI (hrs)	Restrictions. Comments
<b>PREPLANT</b> Broad-spectrum suppressant of Weeds, nematodes, and diseases. Annual grasses and broadleaf weeds	<b>Sodium methyl dithiocarbamate</b> Vapam HL	50 - 75 gal	48*	*Post-treatment planting varies by soil type and soil conditions. Range 14 - 21 days or more. Often applied in the fall prior to planting. Vapam can be applied through irrigation system.
	<b>Napropamide</b> Devrinol 50DF Devrinol 10G	8 lb 40 lb	12	New plantings: In a weed-free soil, spray plant beds and incorporate herbicide, and lay plastic within 24 hours. If weed pressure is from broadleaf annuals, apply Devrinol to the soil surface immediately prior to plastic. If soil is dry, apply sufficient water to wet to a depth of 2" - 4".
<b>PRE-EMERGENCE</b> Annual grasses and broadleaf weeds  Annual grasses and small-seeded, broadleaf weeds	<b>Napropamide</b> Devrinol 50DF Devrinol 10G	8 lb 40 lb	12	Apply directly to weed-free soil middles between plastic. Use a shielded sprayer. Mechanically incorporate or irrigate to a depth of 1 to 2 inches within 24 hours of application.
	<b>DCPA</b> Dacthal Flowable  Dacthal 75W	8-12 pt  8-12 lbs	12	Apply directly to middles between plastic. Note: fall application can injure ryegrass (emerged and not) seeded in row middles. Small grain will be controlled if applied prior to emergence. Rainfall or overhead irrigation is needed within 24 hours for activation.
<b>POST-EMERGENCE</b> Non-selective weed control  Non-selective weed control  Broadleaf weeds  Annual and perennial grasses (E.G. bermudagrass or johnsongrass).  Annual and perennial grasses	<b>Glyphosate</b> Roundup (Various)	Varies by weed problem	12	Apply with hooded spray or wiper applicator to prevent contact with any portion of the crop or plastic. Strawberries are most susceptible to fall Roundup injury. Do not apply within 14 days of harvest.
	<b>Paraquat</b> Gramoxone Max 3 L	1.3 pt	12	Apply with hooded sprayer or shields to protect crop. Spray solution will severely injure or kill green tissue on contact. Add a non-ionic surfactant added at 1 pt/50 gal of spray solution for optimum results. Apply in a minimum spray volume of 20 gal /A. Limit of 3 applications per season.
	<b>Clopyralid</b> Stinger 3L	0.33-0.67 pt	12	Apply as a broadcast application in the spring before harvest or do so post-harvest. Do not apply within 30 days of harvest. Do not use in combination with other pesticides or with surfactants. Controls ragweed, clover, vetch, dock, cocklebur, thistle, dandelion, sowthistle, nightshade and other weeds.
	<b>Clethodim</b> Select 2EC	6-8 oz	12	For newly planted or established plantings. Use sequential hi-rate applications for perennial grasses. Add a non-ionic surfactant at 1 qt/100 gal. of spray solution) or crop oil concentrate at 1 gal per 100 gal. spray solution. Do not apply within 4 days of harvest. Seasonal use cannot exceed 32 oz /A.
	<b>Sethoxydim</b> Poast 1.5EC + oil concentrate	0.75-2 pt + 2pt	12	For newly planted and established plantings. Sequential applications will be necessary for perennial grass control. The addition of a non-ionic surfactant (1 qt/100 gal of water) or crop oil concentrate (1 gal/100 gal. of water) is necessary for optimum results. Do not apply within 7 days of harvest. Total use cannot exceed 2.5 pt per acre per year.

**Source:** 1. Article and table adapted from "Weed Control Options For Strawberries On Plastic", Katherine M. Jennings, Research Assistant Professor David W. Monks, Extension Horticultural Specialist Wayne E. Mitchem, Extension Associate. Revised 12/06. Author Reviewed 12/06 HIL-205-B. North Carolina Cooperative Extension Service.

**Notes:** I cross checked products and rates, and dropped two herbicide options that appeared in the original article - the preplant material Oxyfluorfen (Goal 2 XL) and post-emergent Carfentrazone (Aim 2 EC) - as these are not presently listed for use on strawberries in NY (according to a check of the Cornell 2008 Pest Management Guidelines for Berry Crops and also the Cornell PMEP site on 11/17/08). Pendimethalin (Prowl H2O), which is registered in NY for preplant use, is not approved for use in plasticulture. (It was not cited in the NC article.) Telone-C17 is a fumigant that is frequently used for conventional strawberries for disease control. In contrast, Vapam is broad spectrum, and it controls or suppresses bermudagrass, chickweeds, dandelion, ragweed, henbit, lambsquarters, pigweed, Nightshade, Nutsedge, Wild Morning-Glory, and other weeds. It also suppresses Nematodes, and Symphylids, and the soil-borne diseases Rhizoctonia, Pythium, Phytophthora, Verticillium, and Sclerotinia. I did not see any specific prohibition to the use of Vapam prior to a plasticulture planting. But as the label cites the requirement of extending the intervals before planting when applications are made involving tarps, I think it advisable to consider treatment in the fall prior to planting. A good effort has been made for accuracy here, but as always, end users are reminded they are always to consult the Product Label for final information as to appropriate rates, uses and restrictions. Mention of particular product carries no endorsement of use. It is solely done in the vein of providing information about options.

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## **BEST MANAGEMENT PRACTICES FOR SMALL FRUIT: - BLUEBERRY SURVEY SAID...**

Rebecca Harbut, Cathy Heidenreich, Laura McDermott, and Marvin Pritts, Department of Horticulture, Cornell University CALS, Ithaca, NY 14853

This is a second set of articles in a series detailing results of a NYS Berry Grower Survey conducted November 2007, as part of the 2007-2009 NYFVI Berry Production Efficiency Project. Survey participants were asked to identify management practices giving them the best production efficiency for various small fruit crops. Best management practices information collected from 89 growers across 37 NYS counties has been tabulated and will be shared through this series. Currants and gooseberries were highlighted in the December 2008 issue. Blueberries are the crop for discussion in this month's installment. Watch for raspberries and blackberries in February 2009, and strawberries in March, 2009.

### **PART I: SITE SELECTION AND WEED MANAGEMENT**

What did NY blueberry growers indicate was needed to get off to a good start? Four items consistently came up in growers' discussion of best management practices for blueberry plant establishment: good sites, good soil, good plants, and good first year maintenance. Management practices of particular note were adequate bed preparation before planting, use of 2 year old planting stock, drip irrigation, and mulching.

#### **Site Selection**

Selection of sites that are favorable for blueberry culture is the first step in getting a blueberry planting established. All were quick to admit that proper pH was absolutely critical to good plant establishment. This begins with preplant soil testing and soil amendment. Higher pH soils with calcium levels of 2000 or more, while excellent for other berry crops, are not appropriate for blueberries. Extensive annual soil amendment of such soils may bring pH levels down but it's a painfully slow and often expensive process. Even when pH levels begin to approach the desirable range (4.5 to 5.0) soil amendment on these types of soils must continue; high soil calcium continually neutralizes acidifying agents. Meanwhile, young plants on these soils struggle to get established under less than optimal growth conditions. If possible, select other sites on farm with soil properties closer to those desirable for blueberries. Other things to consider when selecting a planting site are exposure (frost pockets, open windy areas, areas with poor air drainage), soil drainage, and accessibility.



*New blueberry planting on the Tug Hill, photo L. McDermott.*



### *Bed Preparation*

The job is not over once a site has been selected. Adequate preplant bed preparation ranked highest over all for preplant best management practice. This starts with weed elimination/reduction prior to planting. Most growers started this process 1-2 years preplant, using various methods including cover crops, stale seed bed technique, herbicides, and cultivation. Some prepared only 4-ft planting strips while others prepped entire planting areas. Preplant weed management was done prior to soil amendment.

Another bed prep practice favored by growers was incorporation of organic matter. Most growers used peat moss for this purpose as it provides both needed organic matter and helps to lower pH. Some mixed moistened peat into planting holes while others spread and incorporated it over entire planting areas. Other soil amendments included compost, sand (to lighten heavier clay soils), kelp, and sawdust.

Preplant soil amendments (fertilizers, acidifying agents, and supplemental organic matter) should be incorporated into the top 8 inches of soil at least 1 year prior to planting.



*Bed preparation for blueberry planting, Geneva, NY, photo by C. Heidenreich*

### *Nursery Stock Selection*

Most blueberry growers responding to our survey indicated they had best success with 2 year old transplants - either bare-root or potted. Many specified they only purchased plants from reputable nurseries that provided certified virus-free planting materials. Several preferred to purchase plants in advance of planting and hold them in on-farm nurseries one year prior to out-planting in fields. A smaller number of growers preferred 1 year old transplants to older materials.

### *Planting/First Season Maintenance*

Potted plants were soaked with water just prior to planting. Some growers preferred to include various plant protective materials in their preplant pot drench or plant dip – others included a very dilute water-soluble fertilizer. Roots of potted plants were loosened and spread slightly during the planting process. Growers reiterated care was needed to plant at the proper level, not too deeply, not too shallowly. Newly planted bushes were immediately mulched and irrigated after planting. Drip irrigation was the method of choice, used both for watering, delivery of nutrients and in some instances, soil acidifiers. Mulches included wood chips, sawdust, and oak mulch. After planting, growers advocated regular watering and weed management. Flower removal was recommended for the first 2-3 years after planting to speed up plant establishment and growth.

### **Weed Management**

NYS blueberry growers use a variety of techniques to manage weeds after planting. The perennial nature of this berry crop makes weed management a constant challenge; not any one technique will do the trick. The majority of growers used herbicides and mulch as their first line of defense, coupled with hand weeding and mowing to a lesser degree. Most herbicide applications are done in spring (pre-emergent) when weeds are just starting to push, but berry bushes are dormant. Late/spring summer weed control consists mostly of spot applications and hand-weeding. Growers advocated sod alleyways and planting edges be routinely mowed to reduce weed seed re-entrance. Fall clean up applications are used to catch any weeds escaping earlier efforts. Some growers felt weed block or landscape fabric use under the mulch gave added weed control benefit.



*Blueberry planting where weeds have gotten ahead of the game, photo by L. McDermott.*

## PART II: PRODUCTION SYSTEMS AND FERTILITY

Most small fruit growers consider the care and maintenance of blueberries to be relatively easy, especially when compared to strawberries and brambles. Despite the less demanding nature of the crop, NYS blueberry growers believe that correct plant spacing, proper pruning and training, irrigation, proper nutrition and mulch are critical for the long term success of a blueberry planting.

### Production Systems

The surveyed growers had a lot to say about blueberry production systems. There is a general consensus that the most important of the “routine maintenance” jobs for a blueberry grower is proper and annual attention to pruning. A few growers have good luck with pruning mature plants every 2-3 years, but the vast majority of growers find that annual attention to dormant spring pruning affords best results in terms of plant vigor, new shoot growth, reduced pest problems, improved size and quality of berries and overall yield. Several growers that tried bi-annual pruning were either too heavy handed or too conservative when removing wood – they saw large decreases in yield that took many years to overcome.

The berry farmers surveyed mentioned aspects of pruning that they felt shouldn't be overlooked such as removing the oldest 1-3 canes in an effort to encourage new shoot emergence and the removal of damaged or diseased canes. Growers suggest that focusing on the center and bottom of bushes also helps. One grower uses a “formula” approach where he removes 1 cane for every six remaining. This same grower relates that varieties vary greatly in growth habit and that “pruning is art. Do it right, get sweet, big berries. Do it wrong, get limited crop and small berries”.

One grower mentioned training as an important aspect of their plant management practices. For varieties that tend to be weaker wood they tie the branches up using nylon stockings which last longer and cause less abrasion than rubber grape trainers.

There were two comments about rejuvenation pruning. Neglected blueberry plantings can be brought back into production if pruning is faithfully executed. Given the long-term perennial nature of the blueberry plant, it is well worth the effort to attempt rejuvenation if the site is appropriate for blueberry culture. One grower was trying to move the process forward by starting this drastic pruning in November. Aggressive pruning usually results in a massive flush of growth that will need to be stymied by a continued commitment to pruning over the next several years.

Proper mulching was the second most frequently mentioned cultural technique. Most growers use wood chips that are 4-6” deep. This layer is applied soon after planting - continued maintenance of the mulch layer is imperative. One grower mentioned that mulch is far better than using a weed whacker to control weeds around the plants – a very time consuming yet ineffective practice. Many of the responders had installed drip irrigation under or on top of the mulch. Trickle irrigation was used to deliver fertilizer and water throughout the season. One grower had experimented with using plastic mulch instead of sawdust or wood bark but was not happy with the results.



Plant spacing is also a critical component of a well managed blueberry planting. Specific dimensions mentioned varied from 9-12' between rows and 4-7' between plants. Plant spacing should correspond with the size of the equipment and should also accommodate your harvest force, be they hired labor or U-pick customers. One farmer mentioned that he erred in establishment by allowing too much room between the rows and not installing posts for netting at the time of planting. A final caution for newly installed plantings is to “be careful not to plant too deep” – advice from someone who knows!

All the growers that listed “doing nothing” in the way of managing blueberries admitted that this approach was a BIG mistake.

### Fertility

Ignoring the unique nutritional needs of blueberry plants was another big mistake noted by the vast majority of surveyed growers. Most growers understood the need for an appropriate fertility program and implied an understanding of the role that correct soil pH plays in the overall effectiveness of fertilizer and other soil amendments. Still, the responses of some growers reveal that fertility is not as well understood as it should be.



A best management approach towards proper blueberry fertility revolves around using the results of a complete soil analysis and, as the planting matures, an annual foliar analysis. Only one responder mentioned foliar analysis as a part of their fertility program. Foliar analysis for blueberries is crucial because soil tests do not indicate nitrogen availability. Although growers understand the need for a low soil pH, it may be that few growers understand the specifics of a good blueberry fertility program. Only one farmer mentioned that his target pH was 4.5 and no higher than 5.0 – this is the recommended range for blueberry culture. One grower stated that his target was 4.0 or lower, suggesting that there is no floor for soil pH in blueberry culture. As pH levels approach 3.8, some nutrients, like calcium, become deficient.

To alter soil pH prior to planting and during the productive life of the plantation, most growers surveyed used granular or pelletized sulfur or aluminum sulfate when the soil test indicated, although a handful rely only on organic matter to lower soil pH. Continual monitoring of the soil pH is important as it may take years to achieve proper acidification, and even then change is not permanent. Significant amounts of pre-plant acidifiers can be made, but sulfur as a maintenance acidifier should not be applied at a rate of more than 200#/acre in the early spring and again in late fall if necessary.

To keep leaf nitrogen at the recommended levels of 1.7 to 2.1%, most growers are using ammonium sulfate or urea as the N source in blueberry plantings. Ammonium sulfate is the best choice for fields where pH is still being amended, but urea is the most cost effective form of nitrogen. One grower mentioned an additional attribute - controlling mummy berry disease with a spring application of urea. Urea should be applied during cool, rainy weather or watered in after application to prevent volatilization.

Additionally, some NYS blueberry growers are using a balanced, complete fertilizer and others rely totally on manure based compost to supply nitrogen. Given the fact that blueberries need nitrogen right at bud-break, in April or early May, it is questionable if organic sources of nitrogen provide enough of this important element while soils are still very cool. Many responders mentioned that they follow the first N application with 2-3 additional applications before the end of June, which increases the efficiency of nitrogen use by the plant. Late summer nitrogen applications are not recommended as growth encouraged then would leave the plant susceptible to winter damage. Fall and winter nitrogen applications would be leached from the soil before the plant could utilize it. A few growers intimated that nitrate fertilizers were working well for them. This response indicates confusion on the growers' part because nitrate fertilizers are toxic to blueberries.

Phosphorus applications were not a huge issue and most who mentioned it were applying phosphorus in the form of a complete fertilizer indicating a spring or early summer application due to the presence of nitrogen. One grower mentioned that they applied a fall application of phosphate – perfect as there is no nitrogen. Many growers mentioned the need for added potassium. Most of these growers also needed magnesium and so used Sul-Po-Mag. No grower mentioned using potassium chloride as a potassium source, which would be less expensive, but should be applied with care as blueberries are sensitive to chloride.

A few growers mentioned the use of Epsom salts - a good material to use if you need to add magnesium and not add more potassium. If the soil pH is less than 4.5, growers could also use dolomitic lime as a less expensive source of magnesium, but this material was not mentioned by responders, probably because soil pH is not often that low. Materials should be applied at a rate to supply 50#/acre of magnesium.

A few growers pay attention to micro-nutrients like Boron, but if these nutrients are a problem it may indicate that soil pH is still not low enough. Usually blueberries will exhibit iron deficiency as a first indicator of improper soil pH, alerting the grower to deficiencies in other micro and macronutrients.

Some growers are applying nutrients as a foliar treatment which makes sense if these are micro-nutrients or supplemental nitrogen. Foliar nutrient sprays can be rapidly absorbed and utilized by plants, but only small amounts can be delivered due to phytotoxicity problems, therefore foliar sprays are not a good delivery method for macronutrients. Another important delivery method for many growers is trickle irrigation. Some growers are using the irrigation water as a means to deliver acidifier as well.

In summary, blueberry growers surveyed in NYS are aware of the unique requirements of this plant, but some have not implemented an effective fertility plan. A good number of respondents remarked that doing nothing seems to work well – this indicates that the native soil must be well suited for blueberry culture, but it doesn't convey that the farmer is particularly adept at management. There were many responses that seemed quite general and not well thought out and others that were simply incorrect. Blueberry nutritional requirements may be an area in which additional education would be helpful.

## **PART III: PEST MANAGEMENT**

Small fruits like blueberries are relatively pest free compared to other types of fruit, like apples for instance. Blueberry growers are quick to recognize and appreciate this fact as it makes their job that much easier

### *Disease Management*

Most growers rely heavily on pruning and delayed dormant applications of lime sulfur to kick off their disease management program each year. Removal and destruction of dead and diseased canes seriously reduces inoculum for new infections. Lime sulfur applications effectively shut down missed inoculum sources that may remain prior to green tissue emergence in the spring. Other diseases of concern are fruit rots; mummyberry topping the list in most instances. Growers indicated they used a 1-2 punch for fruit rots with one protective spray at bloom and another at petal fall. On sites where mummyberry was a recurring problem some growers raked beneath bushes in early spring to disrupt mummyberry spore release.

Not scouting for problems worked poorly in most cases – the damage was done and it was often too late to do anything by the time someone realized a problem existed.

### *Insect Management*

Scouting for insects ranked high in best management practices in this case- in some instances traps are used in conjunction with scouting. Insect pests of note included Japanese beetles, Cranberry fruitworms, blueberry maggots, tent caterpillars and Gypsy moths. Growers were quick to indicate however, that insect problems on blueberries are minimal in most years, and may not require management practices.

## **PART IV: BIRD CONTROL**

Bird damage in blueberries may account for as much as 30% of crop loss depending upon the year and the location. Damage is most frequently caused by just a few species, including robins, grackles and starlings, but other songbirds may also be problematic, especially in a dry year when other food resources are limited. These birds cause damage by eating the entire berry or puncturing it and/or eating a portion of the fruit leaving it unmarketable and prone to disease. Birds also knock berries off bushes as they forage.

Many NYS growers surveyed consider the proximity to convenient perches as the most important bird consideration made prior to planting. Fields that are bordered by woods or power lines or are adjacent to abandoned fields are more susceptible to bird damage. One grower reported that removing all high landing areas worked well as a bird management technique and another grower mentioned that planting too close to the forest or hedge row was most likely his biggest mistake in terms of bird control. The proper site may also explain why the second highest number of survey respondents reported that they have no bird management practice in place. The other explanation for these responses may be that these growers are not aware of the extent of their crop loss



*Bird netting on a mature blueberry planting in Chautauqua County, photo by C. Heidenreich*

Bird netting was indicated to be the control method that worked best for the greatest number of growers. Only one grower indicated that netting worked poorly but this grower didn't indicate the type of netting. Acrylic webbing that is draped over the bushes doesn't provide adequate control and is not as long lasting as plastic netting supported by a frame. Many growers are reluctant to invest in a net system due to the initial cost, but if the field is located in a heavy bird population area and if food safety and maximizing production are concerns, netting may be worth the investment.

Auditory frightening devices which include bird distress calls, bottle rockets, cannons, sirens etc. were mentioned as being effective, but a few growers said that cannons specifically were not helpful. Research has shown that birds quickly habituate to these noises and to be successful growers should make sure that sound is at least 130 decibels; sounds should cover a wide frequency range and be introduced at random intervals. The source of the sound should be moved frequently and combining visual deterrents and real danger (i.e. shooting) helped reinforce the frightening aspects of the noise. One grower noted that the distress recordings seemed to provide the best control in the evening and early morning, which might be the most important times for bird control. Combining that auditory advice with the suggestion that pickers

should be spread out through the entire field might provide U-Pick operations with good, low-cost control. Some farms may not be able to use auditory devices due to the location of neighbors to the field.

Visual deterrents, which are available in abundance in the marketplace, were widely found to be ineffective by the growers that responded to the survey. Specifically Mylar “scare” tape and owl eyes were identified as working poorly, but one farmer reported good success with the use of plastic owl models. Again, birds habituate very quickly to these deterrents so rotating them every few days may improve their effectiveness.

NYS blueberry growers are ingenious and willing to try many different approaches. Growers reported good results using sugar water sprays and the product ReJex-It® (methyl anthranilate) as a means of bird control. Research indicates that the species of bird pest may determine effectiveness of these products as certain species like starlings seem more averse than others. Another grower mentioned that an ultrasonic device that he tried worked only fairly well. Ultrasonic devices are reported to be of little use with many bird species because they cannot hear them.

Several growers reported success controlling bird populations by providing alternate food sources. Specifically mentioned were fields of rye and oats and another grower even planted 7 mulberry trees at the edge of his patch.

Dogs are frequently used for deer control and a farmer mentioned that his dog did provide a measure of protection from bird damage, but despite the reputation that house cats have for killing birds, another grower mentioned that his cat provided very poor bird control.

Encouraging natural predators by providing a well placed perch for hawks was one technique that worked well while shooting birds was also listed by several growers as a good way to control birds. NYS residents are reminded that all birds except feral pigeons, English sparrows and European starlings are protected by the Federal Migratory Bird Treaty Act. This means that there is no specific hunting season to abide by when controlling these species, but growers should know that this doesn't exempt growers from obeying other common hunting regulations i.e. obtaining a small game hunting license and attending a training class. For information about individual pest birds, refer to the Training Manual for Best Practices for Nuisance Wildlife Control Operators located at: <http://nwco.net/>. Growers are also encouraged to call their local USDA/APHIS office for information and assistance in controlling nuisance wildlife.

All in all, NYS blueberry growers indicate that birds are a problem and they are taking steps to help reduce the loss. For further information about bird control and help in determining if a particular bird control strategy will be helpful, see “*Bye Bye Birdie—Bird Management Strategies For Small Fruit*, 2007 New York Berry News 6(6):9-17. <http://www.nysaes.cornell.edu/pp/extension/tfabp/newslett/nybn66b.pdf>.

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#### Questions or Comments about the New York Berry News?

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

## Survey of blueberry plantings in New York

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**Project location(s):** Essex, Washington, Saratoga, Albany, Columbia, Dutchess, Tioga, Niagara, and Orleans counties in New York

**Abstract:**

Blueberry canker diseases are challenging to manage since management relies exclusively on proper pruning and plant health maintenance. Knowing which of the canker fungi are prevalent in NY blueberry plantings will allow growers to improve IPM practices aimed at maintaining plant health. A survey was continued in 2008 to ascertain which canker fungi are most common. On 12 farms surveyed in eastern NY, *Phomopsis* canker was prevalent, and in some locations quite severe. *Fusicoccum* canker and mummyberry were not found. *Botryosphaeria* canker was found at three farms. Other diseases of minor occurrence included *Botrytis* blight, a dieback (*Pestalotia* spp. or *Pestalotiopsis* spp.), and micronutrient deficiency. This work will be continued in 2009 in other regions of NY.

**Background and justification:**

New York ranked 10<sup>th</sup> in the nation in blueberry production, with 700 acres producing 1.5 million pounds valued at \$1.96 million in 2005 (Anonymous 2006). This survey was undertaken primarily to determine the prevalence of canker pathogens in blueberry plantings, but also to survey for other problems impacting blueberry production in NY. Carroll had worked in the Plant Disease Diagnostic Lab, Cornell University, where samples of blueberry cankers were the most commonly received for this crop, and included *Fusicoccum* canker and *Phomopsis* canker. Knowing which of the canker fungi are prevalent in New York blueberry plantings will allow growers to improve IPM practices aimed at maintaining plant health. With better knowledge of the diseases affecting blueberries in NY, growers will be able to apply targeted IPM practices for improved yields.

Canker management relies exclusively on proper pruning and plant health maintenance. These diseases can be associated with winter injury, occurring on weakened branches, but can be serious primary causes of plant decline, reducing planting longevity. Other diseases that affect blueberry include anthracnose, which has emerged as a major threat to berry crops, *Botrytis* blight, mummy berry, and viruses. A canker disease found in states to the south, *Botryosphaeria* canker, had not been reported from NY prior to 2007 on blueberry (Carroll 2007b), although the



pathogen occurs on other woody plants in NY. Virus diseases can be propagated along with systemically infected cuttings and lead to serious decline of plantings. Viruses have been found in blueberry plantings in NY, though the extent and impact of their occurrence is not well understood. Carroll contacted extension educators in eastern NY regions to set up surveys to expand on the surveys of blueberry plantings done in western NY in 2007.

**Objectives:**

1. Survey blueberry plantings in New York State for canker and dieback diseases.
2. Identify other prevalent pest problems impacting blueberry production in New York State.

**Procedures and Results:**

1. *Survey blueberry plantings in New York State for canker and dieback diseases.*

Blueberry plantings were surveyed and samples were collected July 7-8 and 23 from 12 farms, one in Essex county, five in Washington county, one in Saratoga county, one in Albany county, two in Columbia county, and two in Dutchess county. The focus was to find out the prevalence of Phomopsis canker and Fusicoccum canker in blueberry plantings. Also, to look for Botryosphaeria canker since this disease has not been reported on blueberry from NY until it was identified in western NY in 2007.

**Table 1.** Prevalence of canker diseases found on blueberry in a survey of 12 farms in eastern NY.

Canker Disease	Samples with Disease	Farms with Disease
Fusicoccum canker, <i>Fusicoccum putrefaciens</i>	0	0
Phomopsis canker, <i>Phomopsis vaccinii</i>	47	11
Anthrachnose on twigs, <i>Colletotrichum</i>	0	0
Botryosphaeria canker, <i>Botryosphaeria dothidea</i>	4	3
Dieback, <i>Pestalotia</i> or <i>Pestalotiopsis</i> spp.	8	6

Samples were kept on ice in a cooler and brought back to the lab. A total of 150 twig and branch samples were incubated in moist chambers and the resulting fungal fruiting bodies were



**Figure 1.** Blueberry plant with 50% of branches infected with Phomopsis canker.

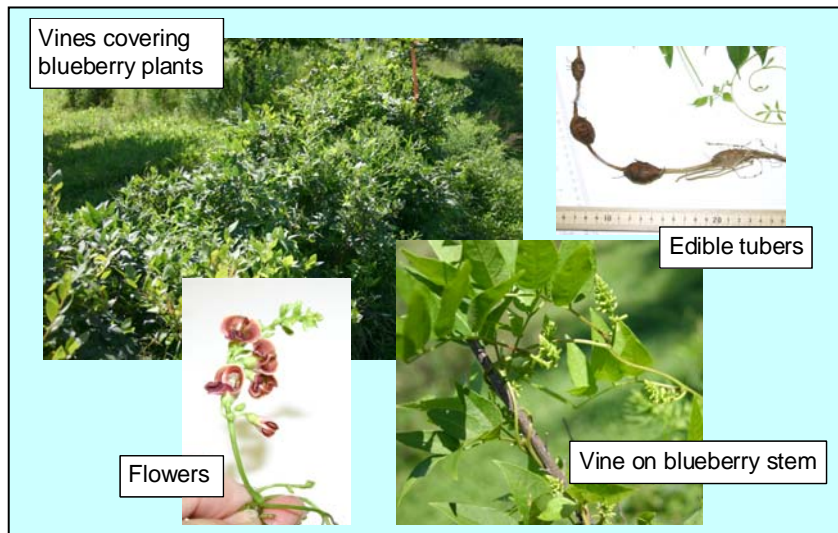
microscopically identified after several days' incubation. Putative identity of the fungi was based on morphology of the fungal fruiting bodies and characteristics and size of the spores. If no species is given, more than one species might have been involved. Results of the canker survey are given in Table 1.

Phomopsis canker was prevalent in blueberry plantings in eastern NY. Two of the plantings were severely affected; over half of plants were diseased and many of the diseased plants had 50% infected branches (Fig 1).

No *Fusicoccum* canker or anthracnose on twigs was found. A *Pestalotia*-like fungus was found on eight samples and this may be the same species, *Pestalotiopsis clavispora*, as reported from blueberry plantings in Chile (Espinoza et al 2008). This fungus was also observed on a small number of samples collected in 2007 from western NY, but thought to be secondary and not reported. Evidence of *Botryosphaeria* canker was found on three farms, most likely *Botryosphaeria dothidea* based on the botryose, stromatic fruiting body and large elliptical hyaline spores. This substantiates the find of this disease on one farm in western NY in 2007 (Carroll 2007b).

2. *Identify other prevalent pest problems impacting blueberry production in New York State.*

Other problems found included insect oviposition injury resulting in dieback and *Botrytis* blight. Only one farm had some symptoms that might have been attributable to virus infection. No



**Figure 2.** Groundnut, *Apios Americana*, vines were found infesting two blueberry plantings in eastern NY.

evidence of mummy berry on fruit was found. In addition, two plantings were infested with the weed groundnut, *Apios americana*, a perennial vine which grows from edible tubers (Iungerman 2008) (Fig 2).

Follow up on the 2007 identification of tobacco ringspot and tomato ringspot virus in a blueberry planting in Tioga county (Carroll 2007a), Marc Fuchs, virologist, and George Abawi, nematologist, confirmed the two viruses in

tissue samples and the presence of the nematode vector, *Xiphinema americanum*, in soil samples collected in spring 2008.

**Discussion:**

Phomopsis canker was found in all but one of the blueberry plantings surveyed in eastern NY. *Botryosphaeria* canker was found in three plantings, in Washington and Columbia counties, confirming the 2007 first find on blueberry in NY.

In general, plantings that are pruned routinely, irrigated, and fertilized appropriately are less prone to serious canker problems. However, wounds are not required for infection by Phomopsis or *Fusicoccum* cankers, spores can infect 1-, 2-, or 3-year old wood, and they are released throughout the growing season (Caruso and Ramsdell 1995). The severity of Phomopsis canker in three of the plantings in eastern NY suggests the need for research on specific treatments for managing this disease if it is unable to be controlled through cultural means.

We will continue surveying NY blueberry plantings for canker diseases and other problems in the coming years. A brief report on this study to the NY Berry Growers Association board meeting was received with interest and encouragement to continue.

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**Photo credits**

Figure 1, Kevin Iungerman, NE NY Fruit Program, Cornell Cooperative Extension  
Figure 2, Kevin Iungerman, NE NY Fruit Program, Cornell Cooperative Extension