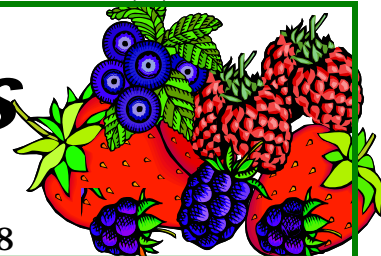




New York Berry News

CORNELL UNIVERSITY



Volume 07, Number 6

June 5, 2008

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CURRENT EVENTS

June 9, 2008. *Berry Field Meeting.* Albany and Schoharie County area. There is no cost for this program, but please pre-register by calling 518-885-8995. More information: <http://www.fruit.cornell.edu/berry.html>.

June 12, 2008. *Getting Ready for Raspberries – Raspberry Killed Sod Demonstration.* 3 PM, 5027 Dubois Rd, Ithaca, NY. More information: <http://www.fruit.cornell.edu/berry.html>.

June 30, 2008. *Strawberry Growers Field Meeting.* Modified Boom Sprayer Demonstration, Greenwich, NY More details follow.

July 2, 2008. *Strawberry Growers Field Meeting,* Long Island, NY. More details follow.

July 9-10, 2008: *Handling Berries and Other Perishable Produce for Quality.* Gro-Moore Farms, Rush, NY and Schoharie Valley Farms, Schoharie, NY, respectively. More details follow.

July 16, 2008: *Strawberry Weed Management demonstration trial at Cornell Orchard, followed by High Tunnel Raspberry and Blackberry Tour;* 1:30 to 3:45 PM, Ithaca NY. Directions and registration information follow.

July 14-16, 2008: *The 9th International Vaccinium Symposium* will be held at Oregon State University in Corvallis. For more information: <http://oregonstate.edu/conferences/vaccinium2008/>.

July 23, 2008: *Day Neutral Strawberry Workshop* held in conjunction with the Pennsylvania Vegetable Growers' Association's Vegetable and Small Fruit Field Day at Rock Springs, PA. For more information: Kathy Demchak, 102 Tyson Building, University Park, PA 16802 or email kdemchak@psu.edu.

August 6, 2008. *Currant Growing Workshop.* More details follow.

August 20-21, 2008. *NASGA Summer Tour.* Based out of Columbus, Ohio. News brief follows with details.

September 23, 30, October 7, 14, and 21: *Building a Successful Small Farm Operation* in Orleans County. Contact Paul Lehman of Niagara County CCE or Lynn O'Brien of Allegany/Cattaraugus County CCE for more information.

Nov. 6-8, 2008. *Southeast Strawberry Expo,* at the Hilton Charlotte University Place, Charlotte, NC. Includes Strawberry Plasticulture Workshop for New Growers, farm tour, educational sessions, and trade show. For more information, email info@ncstrawberry.com

Dec. 8-10, 2008. *North American Raspberry & Blackberry Conference,* in Grand Rapids, MI, as part of the Great Lakes Expo. More information, email info@raspberryblackberry.com.

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



STRAWBERRY GROWERS FIELD MEETING

Monday, June 30th, 2008

4:30 pm - Condzella Farms

5 Benjamin Street, Wading River, NY 11792

Route 25A East to Wading River-Manor Road, North 1/2 mile to North Country Road, East 1/2 mile to Farm.

7:00 pm - Wickham Fruit Farm

28700 Main Road, Cutchogue, NY 11935

From Long Island Expressway (495) take Exit 73, follow Old Country Road (Route 58) east to Route 25 to Cutchogue, approximately 14 miles.

Join Cornell Cooperative Extension berry and weed specialists plus berry farmer hosts John Condzella and Tom Wickham as they show their demonstration plots for weed control in strawberries.

These two farmers are using different **techniques of planting through killed cover crops** plus a **biodegradable "plastic" mulch** to help reduce problems with weeds in this high value crop.

We will also be talking about **strawberry renovation and weed control tactics**, as well as **foliar leaf analysis timing and protocol**.

There is no charge for this program, but please pre-register by calling Linda Holm at CCE in Suffolk County at 631-727-7850.



This meeting is being co-sponsored by Cornell Cooperative Extension, the New York Farm Viability Institute, the New York Berry Growers Association, and the Cornell Small Fruit Program Work Team.



STRAWBERRY GROWERS FIELD MEETING

Wednesday, July 2nd, 2008 at 1:00 pm

Join Cornell Precision Spray expert, **Dr. Andrew Landers**, from the NYSAES in Geneva as he demonstrates **a modified boom spray system** that should **improve spray penetration and efficacy** for high value row crops like strawberries.

We will also be talking about **strawberry renovation and weed control tactics**, as well as **foliar leaf analysis timing and protocol**.

There is no charge for this program, but please pre-register by calling 518-746-2560.

1.5 NYS DEC Pesticide Applicator recertification credits in categories 1a, 10 and 22 will be available for this class.

Directions to the Hand Melon Farm: The Hand Melon Farm is located at 533 Wilber Rd., Greenwich, NY 12834. You can find the farm stand on Route 29 east of Schuylerville NY across from the Washington County Fairgrounds. Wilber Avenue is immediately east of the stand, the farm is 1 mile down on the right.



This meeting is being co-sponsored by the Northeast Sustainable Agriculture Research and Education, Northeast Area Fruit Program, the New York Farm Viability Institute, and the New York Berry Growers Association.



STRAWBERRY GROWERS FIELD MEETING

Monday, July 7th, 2008 at 4:30 pm

Pray Family Farms
391 Route 9N, Keeseville, NY 12944

Join Northeast Regional Fruit Specialist Kevin Iungerman plus berry farmer host Darcy Pray while we discuss the demonstration plot for weed control in strawberries.

*Different **techniques of planting through killed cover crops** helps reduce problems with weeds in this high value crop.*

*We will also be talking about **strawberry renovation and weed control tactics**, as well as **foliar leaf analysis timing and protocol**.*

There is no charge for this program, but please pre-register by calling 885-8995 before July 4th.



This meeting is being co-sponsored by Cornell Cooperative Extension Northeast Regional Fruit Program, the New York Farm Viability Institute, the New York Berry Growers Association, and the Cornell Small Fruit Program Work Team.

CURRENT GROWING WORKSHOP AUGUST 6, 2008

Join Cornell Fruit Disease expert Dr. Kerik Cox, small fruit expert Steven McKay and Greg Quinn, currant grower and owner of The Currant Company, at a field workshop about growing currants for the commercial market. The workshop will be held at Walnut Grove Farm, 59 Walnut Lane, Staatsburg, NY 12580 on Wednesday, August 6th 2008.

Currants are a misunderstood berry crop with fantastic health benefits and a very promising role in the fresh and processed berry market. As interest and acreage in the fruit continues to grow, so do questions about their culture. NYS DEC Pesticide Applicator recertification credits will be available. More information forthcoming in the July Issue of NY Berry News.



Registration is free, but please call 518-828-3346 before August 4th so we can plan appropriately.

This program is being sponsored by Cornell Cooperative Extension, NY Farm Viability Institute and the NYS Berry Growers Association.



STRAWBERRY HERBICIDE DEMONSTRATION TRIAL AND RASPBERRY HIGH TUNNEL TOUR



Wednesday, July 16, 2008

Sponsors: Cornell Small Fruit Program Work Team
New York Farm Viability Institute
NYS Berry Growers Association

MORNING SESSION: NY Weed Science Field Day

H. C. Thompson Research Farm

Freeville, NY (10 miles Northeast of Ithaca, Fall Creek Road, Rt. 366 extension)

MORNING SESSION ONLY

8:00 am

Registration

Coffee (beverage), doughnuts and fruit at the trial packet (\$8.00)

8:30 am - 11:00 am

Vegetable Crop Weed Control (Dr. Robin Bellinder)

11:00 am to 12 noon

Strawberry Weed Control (Dr. Robin Bellinder)

Note: You must attend the entire morning session to receive DEC or CCA credits

LUNCH ON YOUR OWN

AFTERNOON SESSION: Strawberry Herbicide Demonstration Trial

Cornell Orchards

Route 366, Ithaca, NY, across from Vet School

1:30 pm - 2:30 pm

Planting year and fruiting year early season weed control with various herbicides, biofilm, and mechanical cultivation (EcoWeeder).
(Dr. Marvin Pritts, Cathy Heidenreich, Mary Jo Kelly)

AFTERNOON SESSION: Raspberry and Blackberry High Tunnel Tour

Department of Horticulture High Tunnels

Maple Avenue, Ithaca, NY, off Route 366.

2:45 pm - 3:45 pm

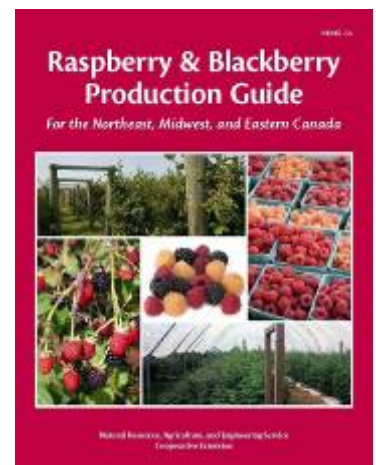
Tour of high tunnel black and red raspberries and blackberries.
(Dr. Marvin Pritts, Mary Jo Kelly)

For more information: Cathy Heidenreich, 315-787-2367 (or mcm4@cornell.edu) before July 12th.

NEW BOOK HELPS BERRY GROWERS SUCCEED

ITHACA---The new Raspberry and Blackberry Production Guide for the Northeast, Midwest, and Eastern Canada, NRAES-35 (\$37.00 plus S&H/sales tax, 157 pages; May 2008), is a comprehensive resource for both novice and experienced growers, as well as for crop advisors and educators. All aspects of raspberry and blackberry culture are covered, including site selection and preparation, trellising and pruning, nutrient management, irrigation, pesticide application, harvesting, budgeting, and marketing. The guide will enable growers to make informed decisions regarding crop production and marketing, paving their way to a successful operation.

More than 70 cultivars are described, including summer-fruiting red, black, and purple raspberries; fall-fruiting red and yellow raspberries; thornless, thorny, and fall-fruiting blackberries; and hybrid berries. These cultivars either have performed well or show the most promise for the Northeast, Midwest, and Eastern Canada. Field production, high-tunnel production, and greenhouse production are reviewed. In addition, the guide includes more than 35 descriptions-illustrated with 70 color photos-of insects, mites, diseases, and physiological disorders.



Raspberry and Blackberry Production Guide for the Northeast, Midwest, and Eastern Canada, NRAES-35, is divided into 14 chapters: The History and Biology of Cultivated Raspberries and Blackberries; Site Selection and Site Preparation; Plant Selection; Production Methods; Trellising and Pruning Brambles; Water Management; Soil and Nutrient Management; Insect and Mite Scouting and Management; Disease Management and Physiological Disorders; Weed Management; Spray Application Technology; Harvesting, Handling, and Transporting Fresh Fruit; Marketing Bramble Fruits; and Budgeting. Included in this 157-page guide are 134 color photos, 36 line drawings, 30 tables, a glossary, a table of conversions, and much more.

The Raspberry and Blackberry Production Guide was authored by eighteen university- and government-based experts from the United States and Canada. Three of the authors also served as technical editors---Lori Bushway, Extension Horticulturist, Department of Horticulture, Cornell University; Marvin Pritts, Horticulturist, Department of Horticulture, Cornell University; and David Handley, Extension Horticulturist, University of Maine at Highmoor Farm.

Raspberry and Blackberry Production Guide for the Northeast, Midwest, and Eastern Canada, NRAES-35, is available for \$37.00 per copy (plus shipping and handling) from NRAES, Cooperative Extension, PO Box 4557, Ithaca, New York 14852-4557. You can order online at www.nraes.org. Shipping and handling for one copy is \$6.00 within the continental United States. New York residents, add 8% sales tax (calculated on both the cost of the publication and the shipping and handling charges). Major credit cards are accepted, and checks should be made payable to NRAES. For more information or a free publications catalog, contact NRAES by phone at (607) 255-7654, by fax at (607) 254-8770, or by e-mail at nraes@cornell.edu.

If ordering from outside the continental United States, please contact NRAES; if ordering more than one copy, contact NRAES or visit our web site at www.nraes.org.

STRAWBERRY GROWERS ANNOUNCE SUMMER TOUR IN OHIO



Travelers from throughout North America will soon be visiting the fertile valleys of Ohio's farm country, when the North American Strawberry Growers Association holds its annual summer tour on August 20 and 21. Strawberry growers from throughout the United States and Canada will visit approximately 10 Ohio farms that specialize in strawberries, blueberries, raspberries, and vegetables. As growers, the visitors hope to learn by sharing while observing and discussing the farming techniques found here in Ohio.

"Farm visits are an exceptional way for growers to expand their knowledge and abilities," said Kevin Schooley, executive director for the association. "As the group travels and tours, they share ideas and methods for better growing, safe effective means of pest control, reducing fuel and labor expenses, managing the soil and the environment, and overall learning to produce better, sweeter berries as efficiently as possible."

Among the farms to be visited are the Champaign Berry Farm, in Mutual, which has more than 27 acres of raspberries; The Blueberry Patch & Café, in Lexington, said to be the largest blueberry grower in the state; Polter's Berry Farm, in Fremont, with 13 acres of strawberries among other crops on the 2,000 acre farm; Holthouse Farms, in Willard, a grower of salad vegetables; Jacquemin Farms, in Dublin, which sells much of their produce in their own farm market; Robert Rothschild Farm, in Urbana, which features pick your own crops, as well as their own café; and Fulton Farms, in Troy, which grows strawberries and vegetables for retail and wholesale markets.

The headquarters hotel for the North American Strawberry Growers Association tour will be the Drury Inn at the Convention Center in Columbus. Tours will then proceed by bus to the respective Ohio farms. For further information, visit the website at <http://www.nasga.org>, or call executive director Kevin Schooley, at (613) 258-4587.

NYS AGRICULTURAL SOCIETY SEEKS NY FARMS WITH SUCCESSFUL FARM SAFETY PROGRAMS; \$500 AWARDS

Applications Due: July 1, 2008

Agricultural Safety and Health are important issues to the New York State Agricultural Society. The benefits of a planned and meaningful farm safety program don't end with reducing simple injuries and down time; the rewards often include saving lives of family members and employees. The Society's Farm Safety Award recognizes New York farm operators who have unique and successful farm safety programs for their employees. Applications must be submitted by July 1 and include a summary of farm safety programs and activities. Nominees are evaluated, and up to 2 farms are selected to receive recognition and a cash award of \$500 per farm, sponsored by Cargill, Inc.

To apply or nominate someone, visit www.nysagsociety.org (Awards & Contests, Farm Safety). Applications are available online or can be requested by contacting the Society's Executive Secretary, Penny Heritage, at 518-384-1715.

The Society's mission is to improve New York agriculture through education, leadership development and recognition programs; the organization has been strengthening our states agriculture since 1832. For more information or to join the Society please visit www.nysagsociety.org

EARLY-FLOWERING, WINTER-HARDY HAIRY VETCH RELEASED FOR NORTHERN UNITED STATES

Don Comis, ARS News Service, Agricultural Research Service, USDA, (301) 504-1625, donald.comis@ars.usda.gov

April 17, 2008. Agricultural Research Service (ARS) geneticist and breeder Thomas Devine and collaborators have released "Purple Bounty," the first winter-hardy, early-flowering vetch for the northern United States.

Until now, hairy vetch--a cover crop and weed-suppressing mulch favored particularly by organic farmers--had limited use north of Maryland because it copes poorly with northern winters. But Purple Bounty has survived winters as far north as upstate New York.

(Right - Geneticist Thomas Devine (left) and technician H. David Clark examine flowering and seed development in hairy vetch plants.)

Devine, with the ARS Sustainable Agricultural Systems Laboratory in Beltsville, Md., spent nine years breeding this variety. He used traditional breeding methods so that the variety would be acceptable to organic farmers. He started with several hairy vetch types from Auburn University in Auburn, Ala., and from the U.S. National Plant Germplasm System, then maintained in Georgia. There he found early-flowering types.

From these, Devine selected for improved winter hardiness while maintaining early flowering. He harvested seed from plants that survived winters at Beltsville and at the University of Maryland farm at Keedysville in northern Maryland. Purple Bounty emerged from nine cycles of selection, with the right blend of winter hardiness and early flowering.

It flowers two weeks earlier than a commonly used variety. This allows farmers to plant their main crop earlier in spring and use corn and tomato varieties that require a longer growing season.

Limited quantities of seed should be available for planting in 2008, with commercial quantities available in 2009.

Devine's collaborators on the release of Purple Bounty included the Rodale Institute near Kutztown, Penn.; the Cornell University Agricultural Experiment Station at Ithaca, N.Y.; and the Pennsylvania Agricultural Experiment Station at University Park.

Read more about the research in the April 2008 issue of Agricultural Research magazine, available online at: <http://www.ars.usda.gov/is/AR/archive/apr08/vetch0408.htm>

ARS is the U.S. Department of Agriculture's chief scientific research agency.

STILL SEEKING A CAUSE OF COLONY COLLAPSE DISORDER

Kim Kaplan, ARS News Service, Agricultural Research Service, USDA (301) 504-1637, kim.kaplan@ars.usda.gov

May 5, 2008. The Agricultural Research Service (ARS) and the Apiary Inspectors of America have conducted a combined survey of beekeepers to get a snapshot of how well managed colonies made it through the winter of 2007-08.

Surveyed beekeepers reported a total loss of about 36.1 percent of their honey bee colonies, up about 13.5 percent from the previous winter. Losses attributed to Colony Collapse Disorder (CCD) appear to be about the same, with just over one-third (36 percent) of the operations reporting some lost colonies in which all adult bees disappeared, a primary symptom of CCD, according to Jeff Pettis, research leader of the ARS Bee Research Laboratory in Beltsville, Md.



The combined survey, which was conducted by telephone interview, checked on nearly 19 percent of the country's 2.44 million colonies.

ARS is continuing to vigorously seek the cause or causes of CCD.

One issue complicating such research is that, so far, researchers only have samples taken after a CCD incident is reported. With just the one set of samples, especially since the adult bees have disappeared, researchers cannot look for specific changes in affected bee colonies preceding the collapse.

(Left: Entomologist Jeff Pettis examines a screen used to monitor Varroa mites, a major pest of honey bee colonies worldwide and a possible contributing factor to colony collapse disorder.)



To deal with this, in February 2007, Pettis and cooperators from universities and states began taking samples about every six weeks from cooperating migratory beekeepers that move their colonies to provide pollination. Two of the apiaries being sampled had suffered outbreaks of CCD in 2006.

Some of these apiaries did have a CCD incident in late 2007 or early 2008. The stored samples will hopefully give researchers an opportunity to see what changed, and more direction to find the cause or causes.

Read more about CCD research by ARS in the May/June issue of Agricultural Research magazine, available online at: <http://www.ars.usda.gov/is/AR/archive/may08/colony0508.htm>.

ARS is the U.S. Department of Agriculture's chief scientific research agency.

HIGH TUNNEL TOUR OF ENGLAND, OCTOBER 5-9, 2008

Michigan State University is organizing a 5-day bus tour of Haygrove tunnels in England, October 5-8 for growers, Extension folks, or any other interested people. This four day tour will provide a real tunnel education on Haygrove's farms (300 acres of tunnels!), several other farms and at Reading University's poly research tunnels. Graham Moore, Haygrove's head grower (and walking encyclopedia of tunnel knowledge!) will join the tour.

A visit to a medieval castle (www.warwick-castle.co.uk) will be included but this is not a "touristy" tour - it's a tunnel tour. Bring work shoes because you'll be walking through acres of tunnels talking to the growers who manage them.

We know it's difficult to get away from the farm during the growing season but this tour is a great investment in your future. \$799 single occupancy, \$699 double includes 5 nights lodging, 5 breakfasts, 3 lunches, 1 dinner, coach transportation and entry to Warwick Castle. Airfare is not included. The registration deadline is August 22nd; call MSU at 517-355-5191 x1386 to register.

Ralph Kramer, the Haygrove High Tunnels representative for the Eastern U.S., developed the itinerary. We will tour cherries, raspberries, and strawberries and possibly other crops under tunnels, see the latest developments in tunnel structures, poly, management demos, packing sheds, strawberry harvesting rigs, etc. We will also visit Warwick Castle.

Lodging will be in mid-level hotels on the outskirts of the cities. Deadline for registration is August 22, but you may want to register and purchase your air ticket earlier.

Full details and registration forms are posted at: <http://www.hrt.msu.edu/TUNNELTOUR/>. Contact Eric Hanson at MSU (517-355-5191 x1386, hansone@msu.edu) with any questions.

General Itinerary:

Friday (Oct 3) - depart US Friday night (recommended)

Saturday - arrive Heathrow, check into airport hotel and visit London on your own.

--- OR ---

- depart US early AM and arrive Heathrow late Saturday, check into airport hotel

Sunday - breakfast and lunch provided

- tour departs airport hotel

- visit Warwick Castle and tour Haygrove facilities and farms

- to hotel, dinner on your own

Monday breakfast, lunch and dinner provided

- tour Haygrove farms all day

- back to same hotel

Tuesday breakfast and lunch provided

- visit farms on the Welch border (am) and other farms (different crops when possible)

- to hotel, dinner on your own

Wednesday - breakfast and lunch provided

- visit several farms and Reading University's poly trials

- tour ends at airport hotel, dinner on your own

Thursday - breakfast provided

- fly home or tour England on your own

There are US tours listed on the website <http://www.tunnelbuzz.com/>, as well as more info about the England tour.

SARE AWARDS FOR BERRY PROJECTS

The Northeast Sustainable Agriculture Research and Education (SARE) program recently granted \$494,543 to 62 farmers, agricultural service providers, agricultural nonprofits, and other rural development groups in the Northeast. The goal of this funding effort, which offers awards of \$10,000 or less, is to test new, interesting approaches to making farming more sustainable. The average award was about \$8,000.

Projects ranged from \$3,182 to see if mating disruption of the grape root borer is heavily dependent on type of trap or trap color, to \$10,000 to see if easements on agricultural land can be financed through installment agreements, specifically agreements that give landowners semiannual tax-exempt interest over the long term rather than a lump sum payment all at once.

Other projects address issues like how farmers can use the Internet for taking orders and collecting payments, improving honeybee health through mite control and habitat enhancement, the viability of different kinds of farm-based biofuels, and seeing whether multilevel beds in a high-tunnel structure can be managed using winches and cables for a more efficient use of space.

Projects are chosen for their innovative design, sustainable approach, and potential for benefit to other farms across the region. Northeast SARE also works in partnership with the Northeast Regional Center for Rural Development to fund projects that benefit the rural agricultural economy. Northeast SARE serves Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, West Virginia, and Washington, D.C. To learn more about Northeast SARE, go to www.uvm.edu/~nesare.

Below is a list of the projects that were awarded for berry or berry related research.

Propagating day-neutral strawberry plugs for fall planting. Project # FNE08-647

Jim Strawser, Swanton MD

Extending the strawberry season improves profits, and day-neutral plug plants have shown good survival rates and higher yields than bare-root plants. Because day-neutral plug plants are not readily available in the U.S., exploring on-farm production is worth exploring. The farmer will grow three U.K. varieties; induce improved runner growth, and then use the runners for field planting in the late summer and early fall. Outreach will be through an extension publication and through winter grower meetings. \$3,395

Improving design to minimize costs and risks associated with pest control in strawberries. Project # ONE08-087

Andrew Landers, Cornell University, Geneva NY

A new type of low-drift sprayer will be field-tested to see what its drift characteristics are, and also to find out how a new boom affects coverage on strawberries as the canopy grows. The goal is to move away from a per-acre application rate more suited to grasses and other two-dimensional crops to a more precise canopy row volume rate specific to strawberries, much the way fruit growers develop tree-row volumes that account for a three-dimensional crop \$9,971

Improving pollination through bumblebee habitation: Evaluation of nest-box types in bumblebee colonization.

project # ONE08-079

Steve Bogash, Penn State Cooperative Extension, Franklin County, Chambersburg PA

Commercial honey bee losses have sparked interest in native pollinators and how to support improved pollinating through enhanced nesting success; right now, it appears that only a very small number of emerging wild queens go on to establish new colonies. The project manager will test different bumblebee nest box designs, heights, and other variables, and monitor about 120 test sites across five farms. \$9,833

Using high tunnels to produce blackberries organically in West Virginia. Project # FNE08-638

William Jett, Lost Creek WV

High-tunnel use is not widespread in this part of the region, and the farmer will use one to demonstrate how to grow organic blackberries, a high-value and popular small fruit. Because blackberries are perennials, they will be container-grown to allow them to be moved in and out of the high tunnel as the seasons change. Eight varieties of thorn-free blackberries will be evaluated, and a budget developed for organic high tunnel blackberries. Outreach will be through an extension tour, a field day, and a project summary that will be made available through extension. \$6,318

Low-input management practices for container ericaceous nursery crops. Project # ONE08-092

Gladis Zinati, Rutgers University, New Brunswick NJ

Azalea and rhododendron are prized landscape plants sensitive to high rates of irrigation and fertilizer. The recent availability of commercial ericoid mycorrhizal inoculum has sparked interest in new ways to grow high quality, low-input nursery plants, and the project manager will test a range of both naturally occurring and commercially available fungi at various fertilization rates to assess their horticultural properties, nutrient content, and resistance to root rot. The goal is to identify low-input management practices that lead to high-quality plants; project results will be disseminated to nursery growers, extension, and researchers in New Jersey and around the Northeast. \$9,985.

OZONE MIGHT HELP MAKE BEE HIVES CLEANER AND SAFER

Marcia Wood, ARS News Service Agricultural Research Service, USDA, (301) 504-1662, marcia.wood@ars.usda.gov

May 14, 2008. Ozone, which is already used to sanitize drinking water and swimming pools, might help make hives cleaner and safer for America's beleaguered honey bees. That's according to results from preliminary laboratory tests by Agricultural Research Service (ARS) entomologist Rosalind R. James. She leads the agency's Pollinating Insects Biology, Management and Systematics Research Unit at Logan, Utah.

James tested ozone's effects on two pesticides, coumophos and tau-fluvalinate, both widely used by beekeepers to control varroa mites, a major enemy of bees. Studies elsewhere indicate that residues of these chemicals can accumulate in hives, including in the honeycomb. Beekeepers typically reuse the honeycomb after the honey has been extracted.

For the experiment, she placed glass vials of the pesticides in a small, tightly sealed chamber, then exposed the chemicals to a flow of ozone gas. Keeping the chamber at 50 percent relative humidity, she tested different temperatures and different ozone and pesticide concentrations.

Applying 500 parts per million of ozone in an approximately 93 degree Fahrenheit chamber for 10 to 15 hours degraded low concentrations of both pesticides, but 20 hours were needed to break down higher concentrations of tau-fluvalinate.

James also looked at ozone's ability to zap the greater wax moth, a honeycomb pest, in all of its life stages, from egg to adult. Wax moths attack bee young and damage the honeycomb.

Young wax moth larvae and adults were killed by just a few hours of ozone exposure. However, eggs, the most resistant life stage, had to be exposed to the gas for a few days.

Further tests are needed to find out whether the breakdown products of the degraded pesticides pose a hazard to bees, James noted.

In related work, James is finding that ozone can destroy microbes that cause major bee diseases such as chalkbrood and American foulbrood, but much higher ozone concentrations and longer fumigation times are needed.

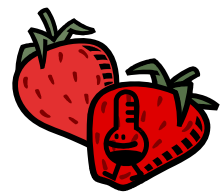
ARS, along with the National Honey Board, headquartered in Firestone, Colo., and O3Co., Inc., of Idaho Falls, Idaho, provided research support.

ARS is the U.S. Department of Agriculture's chief scientific research agency.

JUNE BERRY BAROMETER

HELPING TO KEEP YOU UP TO THE MARK!

Cathy Heidenreich, Western NY Berry Extension Support Specialist, Department of Horticulture, Cornell CALS, Ithaca, NY 14853



After three nights this past weeks with temperatures in the upper 20's to low 30's in some regions hopefully our frost danger is over for this season. Now if we only had a little rain...most regions of the state and running 1-3" below normal for rainfall, so be sure to irrigate, especially with a full crop load just before and during harvest.

ALL BERRY CROPS:

1. **Fertilization** – Now would be the time to make those second split applications for established blueberries, currants, gooseberries, and raspberries.
2. **Weed management** – Hand-weeding or spot applications to control weeds. Get out that wick wiper, flame thrower, 2-gallon garden sprayer and walk those plantings- spot treatments now can prevent major problems later!
3. **Pest management** – Scout! If you see problems developing, check out the berry diagnostic key for help in identifying the culprits (<http://www.hort.cornell.edu/diagnostic/> Problems? Check out the berry pest management guidelines for control strategies (<http://ipmguidelines.org/BerryCrops/>). See disease update by Kerik Cox later in this issue for details.
4. **Irrigation** – Keep water on berry crops, especially during fruit development and harvest. Strawberries and blueberries typically need 1-2 inches of water per week either in the form of rain or irrigation.
5. **Harvest Post Harvest** – Getting ready now can save headaches later. Are all of the aisles easily accessible to equipment and/or customers? Scheduled delivery for portapotties and handwashing units yet? Sufficient harvest supplies on hand? Directional/informational signs in place? Temporary labor trained and ready to go?

STRAWBERRIES:

Established plantings:

1. **Diseases** – The forecast for hot humid weather continues. See berry disease update by Kerik Cox that follows for more.
2. **Insects** – Reports of strawberry root weevil problems are coming in. Scout weak areas of the field for root damage and/or grubs at the base of plants. Watch leaves for notching by weevil adults. Other reported pests include strawberry root worm – watch for feeding damage by adults. You may not see the beetles themselves as they are nocturnal feeders. Check out the review of strawberry insects in last month's issue for more details.
3. **Slugs and Snails** – Recent rains may bring population explosions just now as berries are starting to be harvested. Options for control may be found in the berry pest management guidelines for control strategies (<http://ipmguidelines.org/BerryCrops/>). Sluggo (iron phosphate), one of the products listed, is an OMRI approved product labeled for organic use.
4. **Harvest/Post harvest** – Got your market lined up? Your pickers? Plenty of harvest-related supplies in stock? Cold room fired up and ready to go? See article by Craig Kahlke in this issue for more details on maintaining strawberry fruit quality after harvest.

New plantings:

1. **Plant establishment** – More of the same for this month! Runners need good soil contact to root. Keep the 18" planting strip weed free by hand weeding or using cultivation equipment for good runner establishment. Direct runner plants from aisles back into planting row area. Remove blossoms as they open to encourage good plant establishment and growth.

BLUEBERRIES:

Established plantings:

1. **Diseases** – The forecast for hot humid weather provides ideal conditions for anthracnose. See berry disease update by Kerik Cox that follows for more.
2. **Insects** – Insects of concern for the petal fall/post bloom period include fruitworms, leafrollers, Blueberry tip borer, and Plum curculio. Blueberry maggot is a concern as fruit begins to turn blue.
3. **Harvest** – Birds may be a concern again this year due to early season lack of rainfall. Be sure to get your bird control tactics in place before fruit starts to ripen. Article follows on bird management strategies.

New plantings: – More of the same for this month!

1. **Plant establishment** – Remove emerging flower buds between the palms of the hands to promote good plant growth and establishment.
2. **Critter Patrol** – Watch for deer browse on new plants. Take immediate steps to deter feeding. For more information check out:

RASPBERRIES AND BLACKBERRIES:

Established plantings:

1. **Pollination** – Honey bee colonies are usually not needed for brambles as the flowers produced large quantities of nectar, attracting both wild and domesticated bees.
2. **Diseases** – Remember that first gray mold spray should go on at 5-10% bloom if the weather continues to be wet, warm and humid. Signs of infection include gray fuzzy masses on blossoms or ripening fruit. Hot humid weather may also bring out powdery mildew on brambles. Watch undersides of leaves, flower buds, and developing fruit for white powdery mycelium (fungal growth). See the disease update by Kerik Cox later in this issue for more on raspberry diseases.
3. **Insects** – Insects of concern during late pre-bloom to bloom include Raspberry fruitworm, raspberry sawfly, Tarnished plant bug and Japanese beetle.
4. **Irrigation** – Did you know a raspberry plant in summer can use up to ¼” of water per day? Available moisture can be depleted in just a few days after a heavy rainfall. Brambles need a continuous (*but not excessive*) supply of water throughout the growing season – about 1-2” per week.

New plantings: – More of the same for this month!

1. **Plant establishment** – Avoid cultivation or herbicides until plants are well-established. Apply a dilute liquid fertilizer once new growth appears.
2. **Irrigation** - same as for established plantings.

CURRENTS AND GOOSEBERRIES:

New and Established plantings

1. **Diseases** – Watch for leaf diseases such as white pine blister rust (yellow-orange powdery spots), powdery mildew (white powdery spots), or leaf spots (black necrotic spots) on leaves. Be sure to check both upper and lower leaf surfaces.
2. **Insects** – Preharvest insects of concern include Gooseberry fruitworm, Currant borer, Imported Currant worm (already reported in the Hudson Valley region), Japanese beetles, and Two-spotted spider mites. **Irrigation** - Ribes require less water than many other small fruit crops – about ½ -1” per week. On drought-susceptible soils more irrigation may be needed.

BERRY DISEASE UPDATE

Kerik Cox, Department of Plant Pathology, Cornell University's New York State Agricultural Experiment Station, Geneva, NY 14456

We should be near the end of bloom for berries in western of NY at this point. My blueberries in Geneva are in petal fall, and the ones we're working on in Western NY were at full bloom to pink about a week or so. The good news is that there hasn't been a lot of rain, except for a sprinkling just before Memorial Day weekend and last weekend. Some weather forecasts indicate that there may be rain this coming this week and warm temperatures, but things can drastically change. I really don't think you need to worry about applying fungicides for disease right now unless you have a history of a specific disease problem. Obviously, if you are applying a program for particular disease, this short dry spell doesn't mandate skipping a spray.

Late leaf rust of brambles: This disease can be a problem on your red raspberries. If you've had this disease in the past, you should make fungicide applications on a 14-day schedule. Unfortunately, the Nova 40W and Rally 40WSP labels specify rust pathogen genera and the late leaf rust pathogen genus is not included. Both Cabrio and Pristine are labeled for the late leaf rust pathogen and can be applied for this disease. If you aren't sure about a product, check the label. If it lists "rusts" without genera, you can use the material. If it lists specific genera and '*Pucciniastrum* sp.' is listed, you can also use the material.

Blueberry anthracnose: Anthracnose programs should have been started during bloom. You are probably past the petal fall chlorothanil allowance window. Hence, there should be no more Bravo or Echo applications. In my trial, I'm using Switch and Pristine, but Captivate and Cabrio are also good choices. If you are on a budget, then Ziram is your best option.

Mummyberry disease of blueberries: Unfortunately, there's not much utility in applying fungicides in the late stages of bloom for mummyberry. The flower infection phase of the disease begins by bees vectoring the pathogen from blighted shoots to the stigmatic surfaces of flowers whereby the fungus grows through the stylar canal and infects the ovaries. If you have severe mummyberry and are planning on putting late applications, go for the fungicides with the best kickback activities such as Indar 75WSP (don't use Indar 2F in NY) and Pristine.

STRAWBERRY HARVEST AND STORAGE/SHIPPING CONSIDERATIONS

Craig Kahlke, Area Extension Educator - Fruit Quality Management, Lake Ontario Fruit Program – Niagara County Cooperative Extension, 4487 Lake Ave., Lockport, NY 14094

We will be harvesting strawberries very soon, so now is a good time to discuss handling of the fruit associated with harvest and post-harvest activities. Strawberries are among the most perishable of all fruits, and thus it is critical that marketing channels are open before harvest starts. Strawberries are extremely susceptible to bruising, and rough handling at harvest and during any time thereafter will encourage fungal growth and decay. It is critical that personnel be trained in the careful picking and handling of fruit. In addition, fruit quality declines as the season progresses, so the highest quality fruit will be earliest in the season. With varying degrees of ripeness in single plantings, it is also extremely important that the fruit is harvested as near peak ripeness as possible.



Strawberries Destined for Direct Markets

Since most strawberry markets in the Northeast are consumed very close to the farms in which they are produced, many growers lack and may not need the cold storage facilities used by long-distance shippers such as those employed by the production areas in California and Florida. Direct market channels are ideal for many growers in the Northeast, as fruit loss is further accentuated from shipping from the farm to wholesalers, and from the wholesalers to retail markets. By bypassing wholesale shipping, fruit loss due to bruising and fungal decay can be reduced by 20%. For optimum quality, it is critical that direct market fruit is harvested at or very near peak ripeness. Top quality strawberries should be fully ripe, with a uniform red color, be firm, flavorful, and show no signs of decay or disease.

Temperature is the single most important factor affecting shelf life of strawberries.

If cooling down to the recommended 32 F is an issue for growers, research shows that strawberries held at 50F storage at high humidity will benefit storage life greatly as compared to room temperature storage. In addition, strawberries at 50F tend to retain their color and glossy appearance better than berries stored at 32F. Many direct-market local growers claim approximately 90% of their strawberries are consumed the day they are harvested, thus in these cases, it is very critical that the berries be at peak ripeness. The berries are most often harvested in morning only when field heat is low, are usually then shipped out to markets on refrigerated trucks the same morning, reach the retail shelves by afternoon, and are bought and consumed within a day or two.

Strawberries Destined for Long-Distance Markets

For strawberries that are being transported beyond local markets, there are two factors that impact on maximum shelf life potential. First, the fruit will hold up better if they are harvested at the white tip stage, rather than fully ripe. Second, cooling is critical. As soon as harvest occurs, it is imperative that field heat is removed from the fruit. It is recommended that cooling is started within an hour of harvest. Ideally, 32F forced-air cooling with high humidity (85-95% RH) is recommended. Refrigeration without forced air can also be used, however, shelf-life will be shortened. Proper forced-air cooling removes field heat from fruit in around 90 minutes, while simple refrigeration without forced air can take about 9 hours. Proper ventilation around, below, and above the fruit is essential for removing field heat quickly.

Covering containers with plastic prior to cooling, and not removing plastic until berries are at room temperature for several hours after reaching market shelves will prevent condensation buildup on the inside of the bag and delay fungal growth. It is estimated that an hour delay in cooling the fruit results in reducing shelf life of fruit by one day.

Following field heat removal, shipping on refrigerated trucks to market destinations is essential. If cold storage will be limited at market destination, as stated in the section on direct marketing, research shows 50F storage at high humidity will benefit storage life greatly as compared to room temperature storage. In addition, strawberries at 50F tend to retain their color and glossy appearance better than berries stored at 32F. Shelf life from harvest to market and on the consumer's table is about 14 days maximum.

For growers interested in exploring the potential of longer distance markets, including a demonstration of forced-air cooling and its applications for other produce, see the "Handling Berries and other Perishable Produce for Quality" twilight workshops information elsewhere in this issue.

Acknowledgments – I wish to thank Jim Coulter, Marvin Pritts and Chris Watkins for their help in providing information for this article.

Resources:

1. Strawberry Production Guide for the Northeast, Midwest, and Eastern /Canada, NRAES-88.
2. 2008 Pest Management Guidelines for Berry Crops, Cornell University, Cooperative Extension.
3. Shin, YJ, Liu, R.H., and Watkins, C.B. Temperature and relative humidity effects on quality, total ascorbic acid, phenolics and flavonoid concentrations, and antioxidant activity of strawberry. *Postharvest Biology and Technology* 45: 349-357, 2007 (Online 5/3/07).
4. USDA, ARS Agriculture Handbook Number 66, The Commercial Storage of Fruits, Vegetables, and Florist and Nursery Stocks.

BIRD MANAGEMENT STRATEGIES FOR FRUIT CROPS

Cathy Heidenreich, Western NY Berry Extension Support Specialist, Department of Horticulture, Cornell CALS, Ithaca, NY 14853

Tree fruits and small fruits are a good food source for birds, especially in dry years when other food sources may be in short supply (Could one of those years be 2007?). Damage to commercial fruit crops by birds during these years may be a serious problem. Some studies estimate up to 30% of blueberry crops may be lost under such conditions.



Three types of bird damage may occur in small fruit plantings – whole berry removal, fruit knocked off bushes by foraging birds, or punctures/pecking damage. Whole berries may be stripped from bushes or canes or holes pecked in attached fruit in the case of brambles and blueberries. Larger fruits are most often slashed or partially consumed such as cherries, strawberries, apples, plums etc. However, most birds prefer a fruit size of 1/2-inch or less in diameter so that they can swallow the fruit whole. Smaller birds may puncture fruit, leaving them open to infection by fruit rots. Punctured fruit are difficult to detect during harvest and sorting. Fruit developing post-harvest fruit rots from pecking injuries jeopardize pack quality.

On many farms bird damage is minimal. Growers may choose to ignore the problem or consider small losses incurred as part of the costs of small fruit production. Other growers may experience substantial losses with large portions of the crop being consumed or damaged. If you have experienced serious bird damage in the past, there is definitely cause for continued concern. If bird damage in your plantings has been minimal, you may only need to address bird management in years when damage is likely to increase significantly.

How to decide if bird management is warranted? A study done in New Zealand suggests a simple pretreatment cost-benefit analysis of the bird control technique(s) under consideration should be used to make bird management decisions. In this instance, the bird control technique under review was repellents. Cost effectiveness was calculated based on the cost and effectiveness of each repellent, the value of the crop, and the loss to birds if the crop was not protected (Table 1). Total cost was calculated based on cost of raw materials + labor to make an application x the number of applications needed.

So, for example, if your fruit crop is worth \$10,000/acre, the expected loss to birds without treatment is 20%, and the bird repellent under consideration is 50% effective, then the repellent should cost less than \$1,000/acre to be cost effective. The same sort of simple cost benefit analysis would also be applicable to other bird management techniques. In the case of netting or other durable equipment such as distress callers or canons, however, the duration of the technique (i.e. life of the netting) would need to be factored in as well.

Table 1. Maximum total cost per acre allowable for a bird repellent treatment to be cost-effective on a fruit crop yielding \$10,000/acre¹. (Source: Spurr and Coleman, 2005 with some revision by the author)

Loss to Birds	Effectiveness of treatment (i.e. reduction in loss to birds)			
	25%	50%	75%	100%
5%	<\$125	<250	<\$375	<\$500
10%	<\$250	<\$500	<\$750	<\$1,000
20%	<\$500	<\$1,000	<\$1,500	<\$2,000
30%	<\$750	<\$1,500	<\$2,250	<\$3,000

¹For fruit crops of differing values, simply multiply the values in the table by the value of the fruit crop divided by \$10,000 i.e. for fruit crops valuing \$25,000/acre, multiply the corresponding table value by 2.5. For a fruit crop valuing \$5,000/acre multiply the corresponding value by 0.5.

In the event a bird problem develops, how to determine who is the culprit? Fire up those binoculars and do a little investigative birding. Early morning and evenings before dusk are times when birds are most active. Refer to table one for the most probable miscreants (bold type). While these may be the most frequent/numerous visitors to your fruit plantings, other birds may visit as well.

Table 1. Common fruit-feeding birds.

<i>Most of diet is fruits and berries</i>			
Catbird, Gray	Waxwing, Cedar		
<i>Some of diet is fruits and berries</i>			
Bluebird, Eastern	Grackle, Common	Robin, American	Towhee, Eastern
Blackbird, Red-winged	Grosbeak, Rose-breasted	Siskin, Pine	Vireo, Red-eyed
Bluebird, Eastern	Gulls	Sapsucker, Yellow-bellied	Vireo, White-eyed
Bobwhite, Northern	Jay, Blue	Sparrow, Song	Vireo, Yellow-throated
Bunting, Indigo	Kingbird, Eastern	Sparrow, White-throated	Warbler, Palm
Cardinal, Northern	Kingbird, Gray	Starling, European	Warbler, Yellow-rumped
Crow, American	Kinglet, Ruby-crowned	Swallow, Tree	Woodpecker, Downy
Dove, Mourning	Meadowlark, Eastern	Tanager, Summer	Woodpecker, Hairy
Finch, House	Mockingbird, Northern	Thrasher, Brown	Woodpecker, Pileated
Finch, Purple	Oriole, Baltimore	Thrush, Hermit	Woodpecker, Red-bellied
Flicker, Northern	Oriole, Orchard	Thrush, Wood	
Flycatcher, Great Crested	Phoebe, Eastern	Titmouse, Tufted	

(Source: [NSIS: Florida's Fruit- and Berry-Eating Birds](#). Names in bold indicate the most common species found in small fruit plantings.)

Whatever the tactics employed, decisions on bird management need to be pro-active. Discouraging bird feeding becomes difficult, if not impossible, once a feeding pattern has been established and birds recognize your planting as a food source.

Is a somewhat peaceful co-existence possible? Yes, if you take a long-term approach to bird management and have your annual tactics in place and employed well before fruit begins to ripen. Use several tactics simultaneously, and vary the types and locations of tactics frequently for best results.

Remember to keep good records from year to year on amounts of bird damage occurring, control tactics used, and their success (or lack thereof), along with environmental conditions of years when bird damage increased. Be vigilant in observation and scouting, and always begin tactics before fruit begin to ripen and feeding habits become established.

What bird management tactics should you include in your arsenal? Everything but the kitchen sink! Birds, like other animals, become accustomed to various scare tactics over time. Unfortunately, no one single tactic is effective as a stand alone method of bird control, with the exception of bird netting. Tactics to consider include the following: cultural practices, exclusion, sensory deterrents, scare devices, and protection/development of predator habitat.

Cultural management begins with site selection. The site where your planting is located may be a critical factor in bird problems later. Plantings located closer to urban environments where robins and starlings are more abundant may have greater damage. Isolated plantings may receive more damage. Smaller plantings tend to exhibit more damage than larger plantings. So much fruit is available in larger plantings that damage on any one site is generally low. Locate new plantings away from convenient cover or perch sites such as woods, hedgerows, power lines, and brushy fields. Control grass and weeds in and around plantings to limit numbers of seed-eating birds. Bird damage to small fruit is often greatest on early ripening varieties, as they mature when other fruits may not be available. Netting on these varieties may be cost effective.

Various methods of exclusion may be used, including row covers, netting, and other types of physical barriers. These barriers simply prevent birds from reaching fruit.

Netting continues to be the most complete and effective way to reduce bird damage in small fruit plantings. In some cases, netting is placed directly over plants or bushes. In other instances, a framework is constructed over the planting and netting is suspended on the frame. That said, it is relatively expensive compared to other methods and probably the most labor intensive. However, it is also the most durable. Netting materials, with proper care, may last 3 to 10 years.

Several commercial small fruit growers in the northeast use netting on frames, supported by wire. The netting support structure is 6 to 10 feet above the ground and allows for routine agricultural activities to be carried on under the netting, such as spraying, mowing, and fruit harvest. Netting is removed and stored each season to prolong netting life.

Nylon, polyethylene, cotton, plastic-coated wire and other netting materials are available. Select netting with a $\frac{3}{4}$ " mesh to exclude small birds. Support posts that are pounded rather than augured give stronger support. Augered posts should be set in concrete for additional stability. Tops of poles are generally covered with some type of smooth covering (rubber inner tubes, plastic bottles etc.) to protect netting as it is applied and removed, and as it moves in the wind. Pounded anchor posts need to be set outside netted areas to serve as additional support for outside posts.

Bird netting cost varies considerably with type, manufacturer, and quality (available from many sources, see list at end of article). The initial installation costs may be quite high but costs may be pro-rated over the 3 to 10 year life of the material. One estimate indicates material and labor to erect a 1 acre bird netting system 7-8 ft in height is approximately \$2,280 (Dellamano, 2006). Additional annual costs involved application, removal and winter storage of netting; these costs were estimated to be approx. \$619/acre for the same system.

Sensory deterrents are those which assault the senses. They may target a single sense, such as a repellent applied to fruit to discourage feeding or more than one sense such as motion activated lights/sprinklers, or owl models which emit predator calls followed by bird distress calls.

Bird repellents are often portrayed as an effective, "clean, green" method of bird management. There are currently 2 bird repellents labeled for use in NY State. They are the methyl anthranilate-based products Bird Shield and Rejex-It Crop Guardian. Research here and in other states (Michigan, Oregon, Washington, Florida) indicates these products have both positive and negative aspects.

The active ingredient methyl anthranilate is similar to the chemical responsible for the major flavor component of Concord grapes. It is manufactured in large quantities by food processors and is considered safe for human consumption by the FDA. However, it is a volatile compound and has a short residual on exposed fruit giving good repellency for approx. 3 days, then gradually losing effectiveness. In addition, a large amount of product needs to be consumed in one bite in order for it to be most effective. Application technologies for small fruit such as air blast sprayers are designed to apply small amounts of product uniformly over larger areas, thus reducing product efficacy.

Applications of sucrose syrups have been demonstrated to repel birds from blueberry plantings. The exact method of repellency is not well documented, but it is thought birds such as European Starlings and American Robins are unable to digest the disaccharides in sugar. Most birds are able to digest simple monosaccharide sugars found in fruits. Sugar solutions in New York were applied to blueberry plantings when fruit began to turn blue. In this trial 230 lbs of sugar was dissolved in 21 gallons of hot water, for a total of 40 gallons of sugar solution. Olympic Spreader Sticker was also added at 310 PPM. The treatment cost \$40-\$50/acre and was applied 4 times during the season for a total control cost of \$160. Bird damage was reduced 50% where sugar solution was applied versus untreated adjacent plots. The total expense was far less than losses to birds experienced in the non-treated plot. An increase in Japanese beetles and yellow jackets was observed, however, in year 2 in treated plots.

Sound may be used as bird repellent, causing fear, pain, disorientation, communication jamming, audiogenic seizures or internal thermal effects. The sounds most frequently used fall into 2 categories: distress calls, and noise makers (pyrotechnics).

Distress call repellents have been used successfully to drive birds from fields or roosts. However, these calls are species specific, so a grower must be able to identify the bird causing damage for them to be successful. Units are also available that incorporate predator calls as well as distress calls. Most units are programmable as to time between calls, species of bird, randomized calls, etc. Units are battery, solar, or electrically powered and cover 1 to 8 acres. They range in price from \$250 to \$3,500 depending on the size of the area to be protected and accessories needed. Some auditory units come packaged in the form of visual deterrents. One unit available is called the "Screech Owl" (Birdbusters), and pivots on a bearing with the wind, providing both auditory and visual deterrent in one unit.

New York studies have shown distress call devices to be effective for 7-10 days in plantings with high bird pressure. Use of predator models in conjunction with distress call units gave further reduction in feeding. Best results were obtained when units were moved regularly and used in conjunction with visual scare devices. Distress calls have a tendency to have more long-term effects than noise makers.

Pyrotechnics, or noise makers, such as bangers, poppers, and sirens provide short term control of birds. They may include Bird Bombs, Bird Whistlers, and Shell Crackers (Sutton Ag). However, these products are often as annoying to neighbors and customers as they are to the birds! In fact, a group of concerned (annoyed) citizens in British Columbia has even developed a web site called, appropriately, Ban the Canon, located at: <http://bancannons.tripod.com/devices.html>. This web site provides information on all sorts of bird control alternatives to pyrotechnics in an effort to reduce noise pollution caused by propane cannons and the like in their province.

The "Zon Gun" is a lightweight portable propane-fired cannon that emits automatic thunderclaps that deter pest birds and other nuisance wildlife. The intervals between detonations can be adjusted from 2-30 minutes. The standard model is fully automatic, ground mounted, and rotates a full 360 degrees for wide coverage. Cost for this unit, plus timer and tripod is \$650.

Many types of visual scare devices are available from simple holographic tapes to large predator kites. Terror eyes are an inflatable visual scare device that confuses birds with lifelike reflective predator eyes and markings. They come in 3 colors (black, orange and yellow) and cost approximately \$5 - \$45 each.

Another visual scare device is flash tape, or holographic ribbon. These come in various length rolls, materials and colors and repel birds by producing an optical, audible discomfort zone.

Position the length of ribbon where nuisance birds will see and hear it. Make sure the length of ribbon can move freely with the wind. Approximate cost of this type of material ranges from \$4-\$88 a roll depending on roll length and material.

Other Devices

Other bird scare devices utilize various techniques such as lights, sprinklers, and motion. "Scarecrow" is one such device which uses an infrared sensor that detects birds when they are present, and releases an immediate shot of water to startle them and keep them away. Another device, "ScareWyndmill" uses motion to frighten birds, along with blades painted with special uv light reflecting paint. They have been found effective on small birds, and tested in blueberry plantings.

Encouraging Natural Predators

Owls and Hawks are natural predators of birds that may be a problem in small fruit plantings. One method of bird management to consider then is how best to encourage these birds to live in the vicinity of fruit plantings. An easy way to encourage owls is to install nest boxes the size that owls would use. The Sharp-shinned Hawk is a regular visitor to bird feeders, where it eats birds, not seed. The great majority of this hawk's prey is small birds, especially various songbirds such as sparrows, wood-warblers and American Robins.

There are also companies who will visit your property and bring trained hawks or falcons with them to attack your bird situation. Usually hawk silhouettes or heli-kytes that simulate hawks in flight are flown simultaneously, and the problem birds will stay away for a good while thinking that the silhouettes are the real thing.

A Word About Wildlife Conservation and Protection

The following birds, for various reasons, may be permanently removed from plantings: European Starling (introduced species not protected by state or federal law), Red-winged Blackbird (protected by State and Federal law--but a depredation order allows you to take these birds *when they are committing or about to commit damage to crops.*) and American Crow (protected by State and Federal law--but a depredation order allows you to take these birds *when they are committing or about to commit damage to crops.*) All other species listed in Table 1 are protected by State and Federal law and would require special permits from the Federal government (US Fish and Wildlife Service) and the State (New York Department of Environmental Protection) to live trap and relocate or kill these birds to protect crops. Be sure to check with state and local authorities in your area regarding local bird control ordinances.

JONES FAMILY FARM STRAWBERRY SCHOOL: EMPLOYEE TRAINING AT ITS BEST

Laura McDermott, Berry Extension Support Specialist, Eastern NY, Cornell University's College of Agriculture and Life Sciences, Department of Horticulture, based at Washington County CCE, Hudson Falls, NY

When you click on the “About Us” tab on the Jones Family Farm website <http://www.jonesfamilyfarms.com/>, you can read a story still familiar to some of us involved in agriculture. Continued reading helps you see that this farm family has managed to set themselves apart. Their notion of being stewards isn't exclusively about the land, despite their founders quote "Be good to the land, and the land will be good to you". The Jones family makes agricultural education their mission and they start by thoroughly schooling their employees.

Terry Jones, the great-great grandson of founder Philip Jones, his wife Jean and their son Jamie and his wife Christiana share the multitude of managerial tasks associated with operating a 400 acre direct market farm. Additional management includes Christmas Tree Manager, Will Jones, a cousin of Terry's, who also grew up on the farm and five other farm managers along with Terry's father Philip who operates a farm sawmill. (Right: David Halko, a college student summer worker, answers questions at the Jones Family Farm.)

The Jones family cultivates 200 acres of Christmas trees, 15 acres of strawberries, 15 acres of blueberries, and 25 acres of pumpkins, gourds and squash. The farm also manages 50 acres of hay land and 50 acres of woodlots. Several acres of grapes are in production for the farm's winery. The farm is located on the edge of Fairfield County, which carries the distinction of being one of the wealthiest counties in the nation, primarily because “Gold Coast” towns like Greenwich, Darien and Westport lie in the southwestern corner approximate to NYC. Fairfield County is the most populous county in Connecticut with 905,000 people living in 837 square miles. It is in this setting that the Jones family farms and they try to convey to their suburban and city neighbors the importance of maintaining beautiful, productive farmland, even in the midst of a developed area.



For extra seasonal labor to help sell the crops they grow, the Joneses strive to recruit recently retired adults and student labor. Their summer labor force consists of 20-24 carefully recruited college and high school students. High School students are recruited at school work fairs and by advertising on bulletin boards near guidance offices. The farm uses a savvy approach with attractive, color informational flyers featuring happy, young people working outdoors on the farm. These ads mention the farm web site which link to a job description and application. The farm has even provided a small “finder's fee” to current school staff members who refer excellent candidates that are selected for employment. The student staff provides the farm with the backbone of its summer farm retail labor – helping farm guests, cashiering, parking cars, harvesting for the farm market, etc. If students perform well, they can be moved to more advanced jobs.

The dozen college students come from local schools or from colleges with whom the Jones' have a relationship. UNH, Cornell, Rutgers and UCONN have supplied students in the past. The summer internships are advertised well in advance of the season and stress the promise of an educational experience. The farm has supplied housing for some of the students as necessary.

The college students spend their first week on the farm in late May “getting their hands dirty” and bonding with each other. They come to understand that farming is hard, physical work. This week provides a crucial “light-bulb” moment, if the intern or management realizes there is a problem; an exit can be made before the farm invests in their training. Strawberry School starts the first week of June. Every afternoon for a week the student interns spend 3-4 hours learning about all aspects of the farm and specifically about growing strawberries. This school is no joke, the workers are being judged the moment that introductions begin. Management observes as employees introduce one another – this approach helps determine who has strong “people” skills. Role playing activities that draw on real life situations are interspersed throughout the week long program. The students are being judged on their ability to handle tough situations with aplomb. Additionally, employees are given instruction on body language – how to appear “fresh” when they've been on their feet for hours and how to stay engaged and ready even when doing repetitive work..

In addition to soft skills, employees are presented with lessons on: Integrated Pest Management (IPM), agricultural land stewardship and preservation, nutrition, sustainable farming, the culture of strawberries, the basics of managing a sales display, farm and food safety, the history of the farm and even recipe tips. A comprehensive manual is provided for each student to keep. Lessons are held all over the farm – some in a classroom setting, but many are in the field. You can see why the farm prioritizes college students – employees need to be well adapted to absorbing lots of information in a short time period.

Students need to pass a test in order to complete strawberry school successfully. Upon passing, the interns are presented with the farm uniform and then allowed to do jobs that have more contact with the public. A small ceremony helps students take some pride in their accomplishment.

The lessons don't end with strawberry school. Blueberry and Christmas tree school is held in July as these crops provide the bulk of the work in mid-late summer. The focus on three crops doesn't mean that employees are off the hook for all other crops grown on the farm. Information about everything grown on the farm is presented and employees are expected to know it all. The Jones Family Farm also has a training program for employees that advance to a supervisory role. Communication through the season continues to include educational information. Every two weeks a farm newsletter is included with paychecks. There is also a blackboard near the time clock for updates on food safety issues or other breaking news that might elicit questions from the public.

This approach to employee training has proved to be very successful for the Jones family. Nora Catlin, the Floriculture Specialist with Cornell Cooperative Extension in Suffolk County was a past employee of the Jones Family Farm. Nora worked at the farm for 3 summers while she attended college and said that "the training was a treat really, a nice change of pace from the more physical farm work. It was very nice to have good, correct answers for customers, because the customers had so many questions".

The rest of us involved in direct marketing food are indebted to the efforts of the Jones Family. As Jean Jones points out, the Jones Family Farm may be a farm visit stop for some of the most powerful decision makers in the country, be it in the media, politics, or business. It helps all farmers to have these customers waited on by employees that REALLY know something about farming.

Information for this article was taken from the Jones Family Farm website and interviews with Jean Jones and Nora Catlin.

PLANT TISSUE ANALYSIS – WHAT'S REALLY HAPPENING INSIDE THOSE PLANTS

Laura McDermott, Berry Extension Support Specialist, Eastern NY, Cornell University's College of Agriculture and Life Sciences, Department of Horticulture, based at Washington County CCE, Hudson Falls, NY

Given the current price of fertilizer, it only makes sense that berry growers utilize all the tools available to determine nutrient status of plants to help avoid inappropriate fertilizer applications. A plant tissue analysis can do just that.

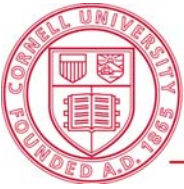
When determining where you should sample within the field, keep in mind that fertilizer regimes should be the same within the area sampled. Significant differences in soil type should also be separated. Age of planting should be the same, and if possible, the cultivar should be the same. The last criteria may be challenging for a berry grower that has small acreage and many varieties. Choose a variety that typifies the vigor of most of the plants, and sample randomly through that planting. If you have problem areas in the field or varieties that are not thriving, they should be sampled separately. When sampling, keep in mind the end result and how you will put that information to use.

Samples for tissue analysis should be gathered in mid-summer, after the annual shoot elongation has slowed and for most berry crops, after harvest. It is this time when plant nutrient levels are the most stable and the snapshot provided by the tissue analysis would be the most accurate. Specifically, strawberry leaves should be sampled in late July or early August. The leaves should be finished expanding following post-harvest renovation. For raspberries, you will want to gather fully expanded leaves from primocanes in early August. When sampling blueberries, choose young leaves that are exposed to full sun in late July. Blueberries will still be fruiting, but as long as fruit expansion has mostly occurred, the timing is still good. Gather a minimum of 30 leaves per sample and remove the stems. The leaves then need to be washed, dried and sent to the lab.

Preparing the samples should be done soon after picking, before the leaves wilt. If you cannot immediately accomplish this, store the samples in a refrigerator, but still don't allow leaves to wilt. Wash the leaves in distilled water, which can be purchased in most pharmacies. Rub them gently together removing dirt and spray residue. Leaves should not sit in the water. After washing, remove leaves and rinse them once more before allowing them to dry, in an open paper sample bag, until brittle.

Samples should be sent, with payment of \$28/sample and a completed submission form, to the Cornell Nutrient Analysis Lab, 804 Bradfield Hall, Cornell University, Ithaca, NY 14853. To download submission and instruction forms, go to <http://cna.cals.cornell.edu/>.

For an excellent explanation of how tissue analysis fits with soil testing in a nutritional program for berry crops, go to: <http://www.fruit.cornell.edu/Berries/genprodpdf/Nutrient%20anal%20samp%20cost%20benefit.pdf>.



Soil pH is more important than fertilizer for blueberries

Molly Shaw

South Central NY Ag Team, Fruit and Vegetable Program
April 2008
Special thanks to the NY Berry Growers' Association for helping to fund this project.

Most farmers know that blueberries like an acidic soil. What may be news is that keeping soil pH low is even more important than fertilizer applications when it comes to getting good yields on soils with adequate nutrient reserves.

The Blueberry Nutrition Survey was initiated summer 2007 because blueberry farmers in the South Central NY area use different fertilizer programs that vary widely from the standard (as recommended in the Blueberry Production Manual, see figure 1 for growers' fertilizer rates), and most of those farmers weren't sure how well their individual programs were working. 50% of the farms involved did not take regular leaf or soil samples to measure bush nutritional status.

Figure 1. Fertilizer rates used on 10 blueberry farms in the Southern Tier of NY

Farm	avg #N/ A/yr	leaf N (%)	avg #K/ A/yr	Avg #P/ A/yr	SOM%
1	65	1.80	0	0	2.3
2	7		0	0	3.0
3	52	1.74	0	0	4.1
4	20	1.67	0	0	5.3
5	25	1.58	0	0	4.7
6	88	1.92	0	0	5.6
7	13	2.06	11	42	4.8
8	165	2.20	22	35	3.7
9	87	1.73	0	17	3.8
10	64	1.52	92	0	8.7

Growers' nitrogen applications (average over 3 years) ranged from 7 lbs/A actual N to 165lbs/A actual N. (Actual N per acre means that if you put 100 lbs of urea on an acre of blueberries you've really only applied 46 lbs of actual nitrogen, because urea is 46% nitrogen by weight). Some growers used ammonium sulfate, others used urea; 15-15-15 and MAP were applied on one occasion each. Six growers calculated the actual N/A they wanted and measured fertilizer accordingly, while the other four did not apply their fertilizer with a target N rate in mind.

We took this survey to evaluate the widely varying fertilizer regimes against bush health and yield. We used soil and leaf tests to take a "snapshot" of the nutritional status of blueberries on 10 farms to determine how past fertilizing practices are affecting the health and yield of the bushes. This was not a controlled study where we can conclude cause and effect relationships between fertilizer and yield, since many management and site factors were different between farms. What we were able to do is to draw correlations between nutrient status and management inputs and from there make recommendations for management adjustments.

Soil and leaf analyses were taken on 10 area blueberry farms in July, 2008, just before and during harvest. Seven of the 10 farms were on relatively heavy clay-silt loam soils such as Volusia that are typical of the upland soils in South Central NY. Two were on gravelly soils, while the remaining farm was on fertile, well drained river flats soil. Comparing yields on heavy versus lighter soil types showed no significant difference in our small sample size. Samples were analyzed by Cornell Nutrient Analysis lab. A yield estimate was taken at the same time as the nutrient samples. Bluecrop was sampled wherever possible, Blueray in the couple instances where Bluecrop wasn't present. Growers were surveyed about their fertilizer program, weed, insect, and disease control, irrigation, mulching and pruning over the last 3 years.

Lessons Learned:

Soil tests and leaf tests don't match up

The Blueberry Production Manual recommends using a soil test to determine soil pH, and then to use a *leaf analysis* to determine if the bush is actually getting enough of the other nutrients to grow optimally. This implies that the soil nutrient levels on the soil test can't be used alone to develop a good recommendation.

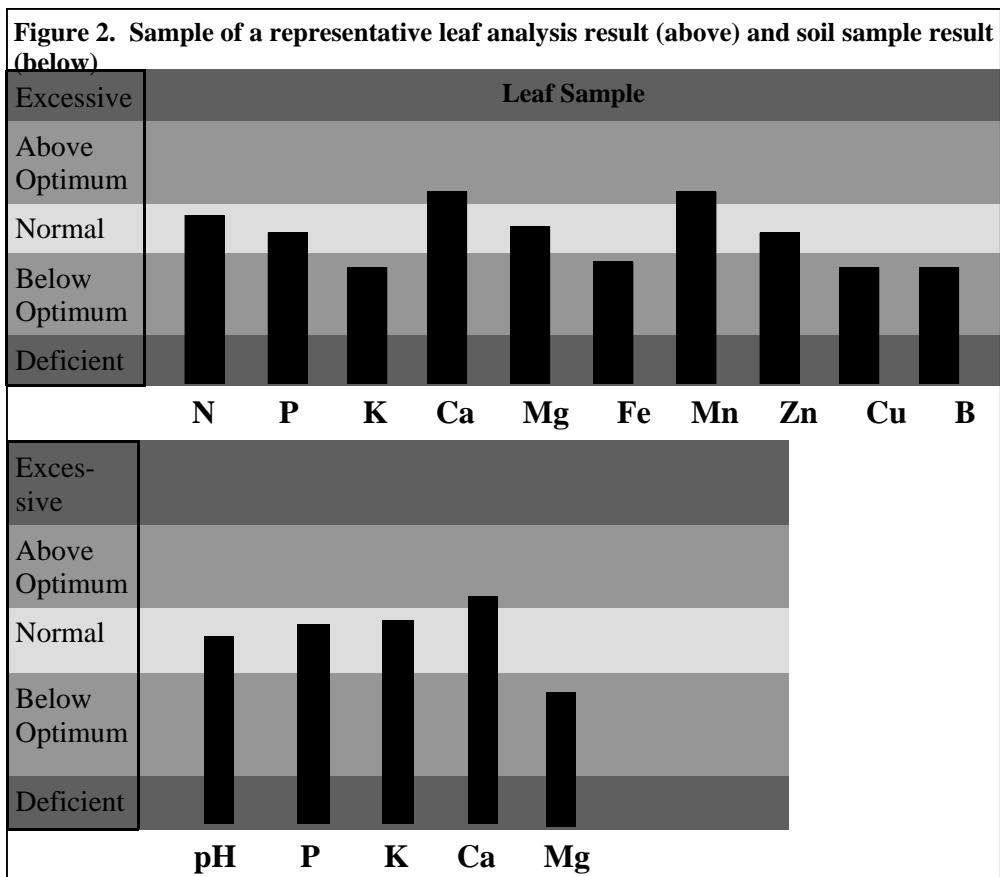
Sure enough, in our study we found no correlation between levels of nutrients in the soil and the levels measured in the blueberry leaves, except for Zn (figure 2). No correlation means, for example, that low magnesium in the soil didn't match up with low magnesium in the leaves.

Despite the low soil test the leaf test showed that the bush actually had enough magnesium for optimum growth. The soil levels didn't match the leaf levels for P, K, Ca, Mg, Fe, or Mn. Zn was the only nutrient where the soil test and the leaf test told the same story. Cu and Boron were not measured in the soil. Nitrogen levels in the soil test are not a good predictor of N available to the plant in any crop, since the regular soil test only shows a snapshot of the N available at the time the sample was taken, and does not predict the N release from the soil for the rest of the season.

The idea that the nutrient levels on the soil test for blueberries leaves a lot of the story untold has been a really tough concept for many farmers to accept. An allegory can be used to explain. Nutrients in the soil can be looked at like the food in a child's house. Lots of things affect whether that kid eats the food and is nourished by it, simply having food in the cupboard is not enough to assure that the child is getting proper nutrition. The doctor looks at the child's growth and appearance to determine if that child is adequately fed. If the kid isn't growing right occasionally even a blood sample (likened to the leaf analysis) is taken to try to pinpoint a cause. The factors in the "blueberry house" that affect how many nutrients it actually takes up include soil pH, root health (wetness, drought, disease), weed pressure, etc. Blueberry plants actually take up many nutrients via their symbiotic root fungi, called mycorrhizae, so factors that affect the symbiont also affect the blueberry.

How can a nutrient be in adequate supply in the soil but low in the leaves? If the soil pH is too high, many nutrients aren't in the chemical forms that the blueberry plant can pick up, so there can be adequate amounts in the soil but not enough in the leaves. Also, if the blueberry plant happens to be growing rapidly, either because of a N application or because of the time of year, nutrient levels in the leaves can be diluted in the expanding leaves and come up low in the leaf test while levels in the soil are quite adequate. It is for this reason that leaf tests should be taken just before or during harvest, when the spring flush of growth is over and the leaf expansion factor is minimized.

Conversely, how can a nutrient be at low levels in the soil while the leaf test shows that the blueberry plant has enough of this nutrient? This can happen when the bush is growing slowly for some reason, be it a deficiency



in another nutrient, improper pruning, winter damage or poor root growth. The plant isn't growing very fast so even the low amount of nutrient in the soil can keep up with the demand by the plant.

The miss-match between soil test results and leaf test results mean that although the soil test is important to determine pH, **the soil test alone can't be used to determine if the bush has enough of any one nutrient.**

Lower soil pH correlated with higher yield.

So why would anyone use a soil test if it doesn't tell whether the bush has enough nutrients or not?

It turns out that the only factor we measured with a strong correlation with yield was soil pH (see figure 3). Farms with lower pH soils tended to have higher yields. That itself is reason enough to keep close tabs on the soil pH in the blueberry planting. In fact, Gary Pavlis, the blueberry specialist at Rutgers Extension, even recommends that the New Jersey growers check their soil pH every spring and fall.

More Nitrogen fertilizer did not correlate with a higher yield.

The standard recommendation from the Highbush Blueberry Production Guide (NRAES) is to apply 65 lb/A actual N to mature bushes in the form of ammonium sulfate or urea, and to adjust the applications of other nutrients based on leaf analysis results.

We found no correlation between leaf N levels and the amount of N applied. Neither were there correlations between leaf N and yield nor applied N and yield. This means that applying more nitrogen didn't lead to more nitrogen in the leaves or to higher yield, in our survey (see figure 4.) So in our group of growers, lack of nitrogen didn't appear to be limiting blueberry growth or yield, and farms applying higher rates of nitrogen didn't have higher yields.

In fact, none of the nutrients tested in leaves really seemed to be limiting yield in our survey.

In general, higher yielding farms did not have higher nutrient levels in the leaves (no correlation between leaf nutrient levels and yield). Phosphorus was the one exception, showing a weak correlation between measured leaf levels and yield, even though most growers' leaf analysis showed P to be in the optimal range. This might indicate that a result on the low end of "optimal" P on the Cornell leaf analysis is actually still a little low, but our result may not be significant and we cannot draw conclusions from only one season of surveying.

If leaf tests are supposed to be a more accurate look at bush nutritional status, then how can leaf nutrient levels

Figure 3. In our survey, as pH went down, yield went up (correlation = -0.687, p-value = 0.028).

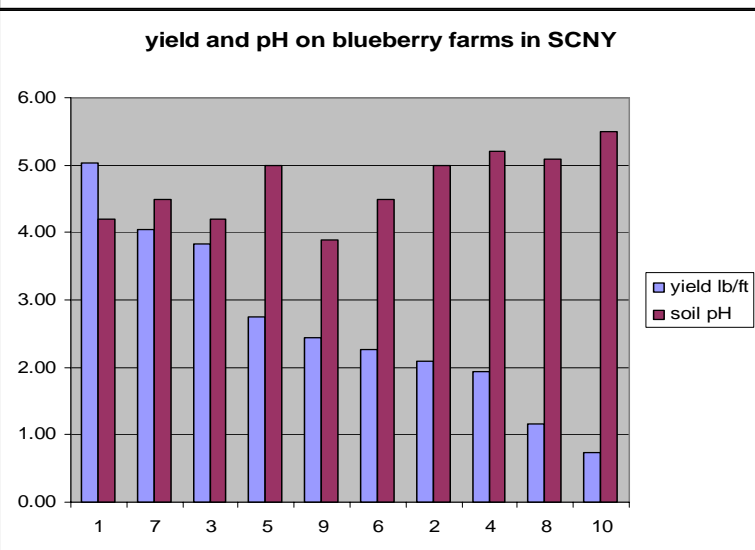
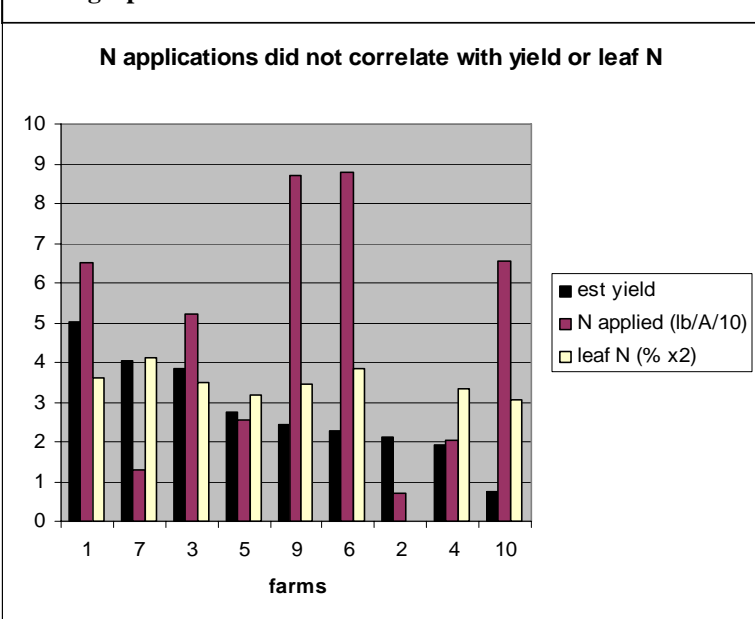


Figure 4. Higher nitrogen applications did not correlate with higher yield or higher leaf N. Farm #8 is omitted from this chart as an outlier. It's 165lb/A N application rate was too high to fit on the graph.



not correlate with yield?

Plant growth generally follows a yield response curve (figure 5). Much lack of correlation between yield and fertilizer (or yield and leaf levels) can be explained with the plant growth/nutrient response curve. When the nutrient in question is anywhere in the optimal region, increasing it doesn't increase yield, so correlation with leaf levels and yield or with fertilizer applications and yield would not show up. We suspect that in general, nutrients are in the optimal region and are not limiting to blueberry yield in our region.

Recommendations:

1. Test the soil, adjust pH to 4.5 or lower. In our sample of 10 South-Central NY blueberry growers, some of the highest yielding farms had pH's below 4.5.
2. Use shoot growth to indicate Nitrogen status. The bottom line is how well the plant grows and produces shoots for next year's crop. If new shoot growth is less than 1 ft long and you are already applying the recommended 65lb/A of actual nitrogen, use a leaf test to determine if any other nutrients are limiting.
3. And remember, as Gary Pavlis (Rutgers Extension Blueberry Specialist) says, "If you aren't doing a good job pruning, fertilizing is just icing on a bad cake."

Questions and Answers

1. Q: If soil pH and yield are significantly correlated (yield goes up as pH gets lower), and this is because more soil nutrients are available to blueberry bushes at a lower pH, then why don't we see higher nutrient levels in blueberry leaves grown on a lower pH?

A: Growth rates are variable between the farms. If low pH stimulates greater growth, then nutrient levels in leaves of the rapidly growing plants could be diluted rather than enhanced.

2. Q: How can the soil test say low in a nutrient (Mg, or instance), and the leaf test say Mg is adequate?

A: This can happen when the plant isn't growing very fast, so Mg uptake keeps up with demand—even though soil levels are low.

3. Q: My leaf test says my nutrient level is "satisfactory." Wouldn't higher than just "satisfactory" be better?

*A: The "satisfactory" level is a place where additional applications of that nutrient are unlikely to make a measurable difference in growth or yield. So, yes, the ideal may be a little higher than the **lowest** value of the satisfactory range, but one is unlikely to see a measurable response by applying more.*

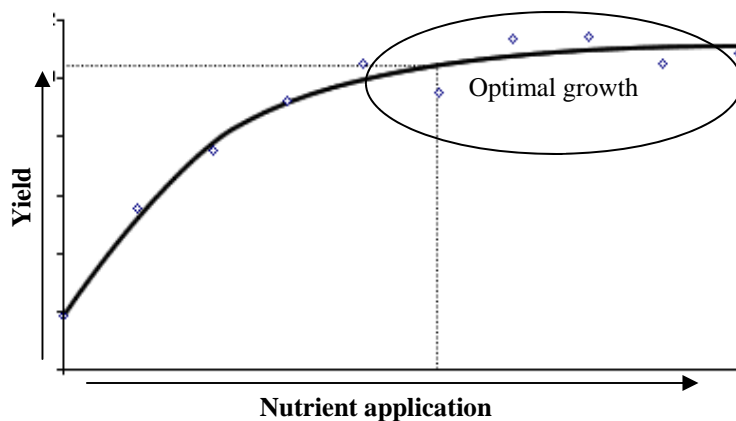
4. Q: My soil test shows high K, but K is low in the leaf test. Why?

A: We see this a lot in blueberries where either the soil is clayey (blueberries have a hard time with root proliferation in clay soils), or where boron is low. Boron is used for auxin synthesis during root growth. Less root growth means less nutrient uptake. Higher than ideal pH can also contribute to this problem.

5. Q: My leaf Mg is a little low, and my pH is fine (4.5 or even lower). How can I fix that?

A: Epsom salts (magnesium sulfate) adds magnesium without changing the pH. Sulpomag is also a good

Figure 5. A sample yield/response curve shows that at in the optimal range, increasing the nutrient level available to the plant does not significantly increase plant yield. Therefore, in the optimal range, yield and nutrient application rate no longer correlate.



source of magnesium, while also having some potassium. Price them out (dollars per pound actual Mg) and use the least expensive.

6. Q: If I increase my N applications, can't I get better yield?

A: Not as indicated by our study, no. If nitrogen isn't limiting as shown by the leaf test, then it's not going to help to add more.

5. Q: My yields are on the low end, but the soil test shows that pH is fine, and the leaf test shows adequate nutrients. What's going on?

A: Plants that aren't growing very fast will often have high levels of nutrients since the nutrients accumulate and have no place to go. This doesn't mean that yields will also be high. Plants that are growing rapidly and producing lots of yield will often have low leaf values because the nutrients don't accumulate in leaves and have someplace to go. Length of growing season, soil constraints on root growth, and winter injury can also contribute to low yield.

6. Q: My leaf N levels were a little low so I fertilized with N, I tested again and now all my nutrients are showing up low! What's going on?

A: The plants likely weren't growing well because of low N. You fertilized with N and the plant began to grow more—and dilute the levels of nutrients in the leaves, even N. Suddenly many nutrients appear to be “deficient” but in reality, it is because the plant is growing rapidly and the existing nutrients are diluted—irrespective of soil values.

7. Q: Iron shows up as a little low in my leaf test, but my pH is 4.5, should be low enough. What do I do?

A: First off, Cornell uses 70 ppm as the low end of the normal range, while the Blueberry Production Guide uses 60 ppm as the low end of normal. If your value shows up above 60 ppm and your pH is low enough, that's probably not a problem. If it's lower than 60 and your pH is 4.5 or lower, be aware that Al, which is more available at lower pH's, competes with Fe for uptake, and could be contributing to the deficiency.

Many thanks to Marvin Pritts, Cornell University Berry Specialist, for his extensive input into this project and this article.

WEATHER NOTES

NEW YORK CROP WEATHER SERVICE NOTES

Week ending May 11th: Temperatures averaged mostly below normal. Lows dipped below freezing in several areas. Rainfall was below average in nearly all regions. Amounts ranged from none in Albany to almost an inch in New York City. This seasons Growing Degree Days total from 34 to 141 above normal. Totals for the week ranged from 5 to 86.

Week ending May 18th: The week got off to a chilly start Sunday morning with lows in the 30's but under strong sunshine temperatures climbed into the upper 60's to low 70's by afternoon. A deep upper trof then moved across the region resulting in much cooler temperatures Monday. As the upper trof moved east into the Atlantic temperatures again warmed up Tuesday and Wednesday with Massena in the St. Lawrence Valley reaching 80. The warm spell was brought to an abrupt end by a cold front which moved east to the Hudson Valley and then stalled over the region as a wave moved northeast resulting in Friday being a cloudy and cool day. High pressure then moved in Saturday bringing seasonable temperatures. For the week temperatures averaged close to normal. Precipitation for the week varied widely, some areas including Albany, Rochester, Glens Falls and Honeoye were much below normal with less than a tenth of an inch while over an inch at Franklinville and Norwich.

In the Lake Ontario fruit region, strawberry buds were beginning to open. On Long Island, strawberry fields were at or near full bloom.

Week ending May 25th: It was another chilly week across the state as most climatic divisions averaged 5 to 10 degrees below normal for the week. Precipitation for the week was also below normal in many areas with the exceptions being the St. Lawrence Valley, Western and Eastern Plateau and Coastal Climatic Divisions which had near normal precipitation. An upper level low persisted across eastern Canada for much of the week. A series of weak troughs of low pressure moved through the state early in the week followed by a fairly strong cold front on Wednesday which resulted in some thunderstorms containing small hail. While these systems did not produce a lot of rainfall, they reinforced the cold air already in place across the region and created cool and windy conditions. The low pressure system finally moved east into the Canadian Maritimes Friday into Saturday as a large ridge of high pressure started to nose into the state. The coldest temperatures during the week occurred early Tuesday and Wednesday mornings with frost occurring in some areas. .

On Long Island, cool weather continued. Frost at the beginning of May affected strawberries.

Week ending June 1st: It was another cool week across much of upstate New York with temperatures averaging 5 to 10 degrees below normal. The coolest morning was Wednesday, when patchy frost occurred. Slightly warmer temperatures occurred across southeast New York and Long Island, where temperatures averaged near, or slightly above normal. High pressure dominated much of the state during this week with several reinforcing surges of cooler air moving southeast from central Canada, accompanied by scattered showers mainly across southeast New York and Long Island producing rainfall amounts of one quarter of an inch or less. A low pressure system moved into the Great Lakes on Saturday. A warm front, followed by a cold front associated with this system brought widespread showers and thunderstorms to much of the state on Saturday producing locally heavy rainfall of one to two inches.

In Monroe County, frost conditions caused strawberry losses, and parts of the county were still in need of rain. In Ontario County, there were frost conditions on May 28 and 29, and damage was unknown. On Long Island, the strawberry harvest started.

**WEATHER REPORTS OF TEMPERATURES AND PRECIPITATION THROUGHOUT
NEW YORK STATE FOR WEEK ENDING SUNDAY 8:00am, May 11th, 2008**

	Temperature			Growing Degree Days (Base 50)			Precipitation (inches)				
	High	Low	Avg	DFN ¹	Week	YTD ²	DFN	Week	DFN	YTD	DFN
	Hudson Valley										
Albany	73	33	56	2	47	207	110	0.00	-0.76	3.57	-0.59
Glens Falls	74	29	52	-2	21	127	57	0.01	-0.78	4.03	-0.19
Poughkeepsie	77	38	57	2	50	233	111	0.72	-0.26	4.97	-0.08
Mohawk Valley											
Utica	66	31	48	-3	5	97	49	0.35	-0.63	5.50	-0.68
Champlain Valley											
Plattsburgh	74	33	52	-1	19	105	34	0.09	-0.54	3.13	-0.67
St. Lawrence Valley											
Canton	69	32	50	-3	12	141	81	0.29	-0.35	3.10	-0.81
Massena	68	31	51	-3	16	130	61	0.15	-0.41	2.49	-1.04
Great Lakes											
Buffalo	73	36	53	-2	29	231	141	0.26	-0.44	2.93	-1.02
Colden	74	30	50	-3	15	139	78	0.35	-0.42	2.70	-2.32
Niagara Falls	74	33	52	-3	25	185	85	0.34	-0.30	2.98	-1.21
Rochester	77	38	54	-2	31	244	139	0.26	-0.30	2.64	-0.90
Watertown	73	33	50	-3	16	151	88	0.28	-0.28	4.20	0.79
Central Lakes											
Dansville	78	34	52	3	21	183	90	0.13	-0.50	2.25	-1.56
Geneva	74	36	52	-3	20	163	77	0.13	-0.50	3.19	-0.75
Honeoye	78	33	51	-3	19	175	87	0.75	0.13	2.36	-1.57
Ithaca	76	32	51	-2	21	153	82	0.10	-0.60	3.02	-1.00
Penn Yan	77	37	54	1	33	216	130	0.05	-0.58	2.46	-1.48
Syracuse	77	34	53	-3	27	210	107	0.11	-0.60	4.02	-0.46
Warsaw	73	33	49	-3	14	143	92	0.28	-0.49	2.54	-2.05
Western Plateau											
Alfred	74	28	49	-2	9	98	48	0.21	-0.38	3.23	-0.50
Elmira	78	30	53	-1	29	173	93	0.07	-0.63	3.66	-0.12
Franklinville	75	27	49	-1	11	98	60	0.29	-0.48	3.29	-1.21
Sinclairville	75	30	52	2	23	132	78	0.24	-0.60	3.26	-1.90
Eastern Plateau											
Binghamton	75	35	53	-1	29	181	106	0.11	-0.63	3.20	-1.10
Cobleskill	73	30	51	-3	18	111	46	0.11	-0.66	3.16	-1.35
Morrisville	70	32	50	-3	13	121	61	0.30	-0.50	3.89	-0.46
Norwich	72	32	51	-3	13	109	41	0.22	-0.62	2.93	-1.75
Oneonta	74	34	55	4	33	163	106	0.04	-0.94	3.17	-1.84
Coastal											
Bridgehampton	76	38	57	4	51	124	53	0.92	0.04	4.03	-1.34
New York	77	50	62	3	86	266	77	0.99	0.10	4.33	-0.88

1. Departure from Normal

2. Year to Date: Season accumulations are for April 1st to date

The information contained in these weekly releases are obtained from the New York Agricultural Statistics Service (<http://www.nass.usda.gov/ny/>), who in turn obtains information from reports from Cornell Cooperative Extension agents, USDA Farm Service Agency, Agricultural Weather Information Service Inc., the National Weather Service and other knowledgeable persons associated with New York agriculture.

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NEW YORK STATE FOR WEEK ENDING SUNDAY 8:00am, May 18th, 2008**

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Poughkeepsie	80	40	57	-3	51	284	100	0.96	-0.02	5.93	-0.10
Mohawk Valley											
Utica	71	37	53	-1	23	120	41	0.45	-0.53	5.95	-1.21
Champlain Valley											
Plattsburgh	76	36	56	0	41	146	30	0.22	-0.41	3.35	-1.08
St. Lawrence Valley											
Canton	78	34	56	2	42	183	85	0.17	-0.47	3.27	-1.28
Massena	80	34	55	-1	37	167	55	0.16	-0.40	2.65	-1.44
Great Lakes											
Buffalo	70	43	55	-3	35	266	125	0.37	-0.33	3.30	-1.35
Colden	69	37	52	-4	17	156	56	0.57	-0.20	3.27	-2.52
Niagara Falls	71	42	55	-3	38	223	69	0.39	-0.24	3.37	-1.45
Rochester	75	42	56	-2	43	287	127	0.09	-0.53	2.73	-1.43
Watertown	77	36	55	2	38	189	87	0.25	-0.38	4.45	0.41
Central Lakes											
Dansville	76	37	54	-3	31	214	69	0.27	-0.36	2.52	-1.92
Geneva	75	41	54	-2	35	198	63	0.31	-0.33	3.50	-1.08
Honeoye	76	37	54	-3	29	204	66	0.49	-0.13	2.85	-1.70
Ithaca	75	33	52	-4	24	177	62	0.54	-0.21	3.56	-1.21
Penn Yan	75	41	56	-1	42	258	123	0.24	-0.40	2.70	-1.88
Syracuse	77	39	56	-3	42	252	93	0.51	-0.19	4.53	-0.65
Warsaw	68	39	51	-3	13	156	70	0.66	-0.11	3.20	-2.16
Western Plateau											
Alfred	70	32	49	-5	9	107	22	0.90	0.27	4.13	-0.23
Elmira	75	32	53	-4	31	204	77	0.53	-0.17	4.19	-0.29
Franklinville	69	33	50	-3	13	111	45	1.09	0.32	4.38	-0.89
Sinclairville	71	34	51	-4	12	144	56	0.85	-0.02	4.11	-1.92
Eastern Plateau											
Binghamton	73	37	53	-4	31	212	91	0.91	0.14	4.11	-0.96
Cobleskill	76	34	53	-2	31	142	36	0.42	-0.41	3.58	-1.76
Morrisville	71	38	53	-3	27	148	49	0.56	-0.28	4.45	-0.74
Norwich	76	33	51	-4	18	127	17	1.08	0.24	4.01	-1.51
Oneonta	82	36	55	2	33	196	102	0.76	-0.22	3.93	-2.06
Coastal											
Bridgehampton	70	39	54	-3	32	156	39	0.81	-0.03	4.84	-1.37
New York	74	49	60	-3	72	338	65	0.83	-0.01	5.16	-0.89

1. Departure from Normal

2. Year to Date: Season accumulations are for April 1st to date

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**WEATHER REPORTS OF TEMPERATURES AND PRECIPITATION THROUGHOUT
NEW YORK STATE FOR WEEK ENDING SUNDAY 8:00am, May 25th, 2008**

	Temperature			Growing Degree Days (Base 50)			Precipitation (inches)				
	High	Low	Avg	DFN ¹	Week	YTD ²	DFN	Week	DFN	YTD	DFN
	Hudson Valley										
Albany	71	36	51	-10	18	281	58	0.33	-0.45	3.96	-1.75
Glens Falls	67	30	49	-10	6	172	-1	0.32	-0.52	4.42	-1.48
Poughkeepsie	70	39	53	-8	26	310	50	0.56	-0.42	6.49	-0.52
Mohawk Valley											
Utica	63	33	45	-11	2	122	2	0.39	-0.59	6.34	-1.80
Champlain Valley											
Plattsburgh	66	35	51	-7	17	163	-11	0.55	-0.11	3.90	-1.19
St. Lawrence Valley											
Canton	65	37	49	-8	7	190	42	1.16	0.46	4.43	-0.82
Massena	69	37	51	-7	15	182	15	0.68	0.12	3.33	-1.32
Great Lakes											
Buffalo	65	37	48	-12	7	273	67	0.31	-0.41	3.61	-1.76
Colden	62	35	45	-12	0	156	6	0.71	-0.13	3.98	-2.65
Niagara Falls	64	38	49	-11	10	233	12	0.29	-0.39	3.66	-1.84
Rochester	67	39	51	-9	13	300	73	0.23	-0.40	2.96	-1.83
Watertown	64	33	48	-9	1	190	38	0.56	-0.07	5.01	0.34
Central Lakes											
Dansville	65	35	49	-11	6	220	11	0.10	-0.57	2.62	-2.49
Geneva	65	36	50	-9	15	213	16	0.26	-0.44	3.76	-1.52
Honeoye	69	35	49	-11	5	209	7	0.24	-0.41	3.09	-2.11
Ithaca	65	33	47	-11	0	177	7	0.17	-0.60	3.73	-1.81
Penn Yan	67	39	52	-8	18	276	79	0.21	-0.49	2.91	-2.37
Syracuse	65	37	50	-10	9	261	33	0.42	-0.35	4.95	-1.00
Warsaw	60	33	44	-12	2	158	26	0.65	-0.16	3.85	-2.32
Western Plateau											
Alfred	64	29	44	-12	0	107	-24	0.46	-0.27	4.59	-0.50
Elmira	67	29	48	-11	4	208	21	0.35	-0.41	4.54	-0.70
Franklinville	61	29	44	-12	0	111	7	0.65	-0.17	5.03	-1.06
Sinclairville	64	30	45	-12	0	144	11	0.50	-0.41	4.61	-2.33
Eastern Plateau											
Binghamton	63	36	48	-11	5	217	38	0.62	-0.15	4.73	-1.11
Cobleskill	65	39	49	-9	6	148	-10	0.58	-0.27	4.16	-2.03
Morrisville	65	34	47	-10	3	151	2	0.55	-0.32	5.00	-1.06
Norwich	66	31	48	-10	3	130	-33	0.50	-0.35	4.51	-1.86
Oneonta	70	32	49	-8	6	202	60	0.52	-0.46	4.45	-2.52
Coastal											
Bridgehampton	70	38	55	-4	38	194	18	0.51	-0.33	5.35	-1.70
New York	70	50	59	-6	62	400	28	0.66	-0.18	5.82	-1.07

1. Departure from Normal

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**WEATHER REPORTS OF TEMPERATURES AND PRECIPITATION THROUGHOUT
NEW YORK STATE FOR WEEK ENDING SUNDAY 8:00am, June 1st, 2008**

	Temperature			Growing Degree Days (Base 50)			Precipitation (inches)				
	High	Low	Avg	DFN ¹	Week	YTD ²	DFN	Week	DFN	YTD	DFN
	Hudson Valley										
Albany	83	39	64	2	101	382	74	0.19	-0.65	4.15	-2.40
Glens Falls	82	34	60	-1	73	245	0	0.26	-0.55	4.68	-2.03
Poughkeepsie	87	38	65	3	105	415	64	0.22	-0.75	6.71	-1.27
Mohawk Valley											
Utica	73	32	55	-3	43	165	-7	1.01	-0.04	7.35	-1.84
Champlain Valley											
Plattsburgh	79	41	61	0	78	241	-6	0.93	0.23	4.83	-0.96
St. Lawrence Valley											
Canton	74	30	56	-3	54	246	35	1.75	1.05	6.11	0.16
Massena	75	36	58	-3	58	240	6	1.86	1.23	5.19	-0.09
Great Lakes											
Buffalo	75	37	58	-4	61	334	49	1.01	0.22	4.62	-1.54
Colden	77	33	56	-4	46	202	-10	0.93	0.04	4.91	-2.61
Niagara Falls	76	37	58	-4	63	296	-6	0.95	0.22	4.61	-1.62
Rochester	83	36	61	-1	79	379	74	0.39	-0.27	3.35	-2.10
Watertown	76	30	57	-2	53	243	29	1.37	0.74	6.38	1.08
Central Lakes											
Dansville	86	32	59	-3	63	292	5	0.34	-0.43	2.96	-2.92
Geneva	83	35	60	-1	72	285	12	0.51	-0.26	4.27	-1.78
Honeoye	81	31	59	-3	67	276	-5	0.27	-0.47	3.36	-2.58
Ithaca	82	32	57	-3	58	235	-4	0.33	-0.50	4.06	-2.31
Penn Yan	85	40	63	3	92	368	95	0.30	-0.47	3.21	-2.84
Syracuse	83	37	60	-2	74	335	27	0.24	-0.54	5.19	-1.54
Warsaw											
Western Plateau											
Alfred	81	30	55	-4	37	144	-43	0.31	-0.56	4.90	-1.06
Elmira	86	30	60	-1	75	283	23	0.24	-0.57	4.78	-1.27
Franklinville	81	30	56	-1	48	159	5	0.71	-0.18	5.74	-1.24
Sinclairville	80	32	56	-3	46	190	-1	0.15	-0.83	4.76	-3.16
Eastern Plateau											
Binghamton	79	38	62	2	85	302	52	0.46	-0.33	5.19	-1.44
Cobleskill	80	37	61	2	77	225	1	0.89	-0.04	5.05	-2.07
Morrisville	77	35	59	0	65	216	6	0.56	-0.35	5.56	-1.41
Norwich	81	32	57	-3	55	185	-43	0.53	-0.38	5.04	-2.24
Oneonta	84	34	61	3	75	277	76	0.70	-0.30	5.15	-2.82
Coastal											
Bridgehampton	78	43	62	2	82	276	25	0.27	-0.58	5.62	-2.28
New York	85	53	69	4	137	537	51	0.49	-0.35	6.31	-1.42

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