



## Cornell University Berry Team

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## *Juneberries - A New Crop for Your Berry Operation?*

**O**n March 5, 2011 I attended, along with 65 other interested people, an all-day Juneberry workshop in Geneva, NY, hosted by Cornell Cooperative Extension of Ontario County. This workshop was just one facet of a larger educational project of CCE Ontario, in partnership with the Northeast Sustainable Agriculture Research and Education Program, and headed up by Jim Ochterski.

The project began in March 2010 with the expressed purpose of kick-starting the agronomic and economic potential of Juneberries in the Northeast region through education, financial analysis, and the development of marketing data and guidelines. Cornell Cooperative Extension of Ontario County, Happy Goat Farm, and three other cooperating farms are collaborating to develop trial plots, explore key crop infrastructure issues, lead a market introduction, and forecast costs and revenues. Commercial Juneberries represent a growing sector of sustainability: cultivating native permaculture species adapted to the bioregion. The objectives of the project are to:

- 1) Determine basic establishment and projected management costs on four on-farm trial plots.
- 2) Evaluate the effectiveness of weed and mammal damage suppression with weed mats and grow tubes.
- 3) Quantify the consumer appeal of this minor fruit in you-pick, farm market, CSA, restaurant, and small-scale processing market channels.
- 4) Disseminate the information gathered through at least three workshops / tours, one production booklet, on-line resources, and grower trade periodicals.

Much has been accomplished to date toward reaching these objectives, with more to come:

Summer 2010: Juneberry market acceptance evaluation at Empire Farm Days

Fall 2010: Web Site [www.juneberries.org](http://www.juneberries.org)

Fall 2010: Inclusion of [Juneberries](#) in 2011 Cornell Pest Management Guidelines for Berry Crops

Spring 2011: Addition of [Juneberries](#) to Cornell on line nursery guide.

Spring 2011: First all-day Juneberry workshop; Juneberry variety planting established at Cornell Orchards in Ithaca, NY.

*(continued on page 31)*



**Above left:** Juneberries ready for harvest. **Above right:** 5-yr. old Juneberry planting, Putney U-pick Farm, Michigan. Photos courtesy Jim Ochterski.

## Upcoming Berry Events

**March 30, 2011.** *GAPs Online Produce Safety Course.* The next English GAPs Online Produce Safety Course will begin March 30 and will run through April 19, 2010. Registration is now open. If you have any questions about the course, please contact Betsy Bihn at [eab38@cornell.edu](mailto:eab38@cornell.edu) or at 315 787 2625.

**April 2, 2011.** *Growing Berries in Tunnels and Greenhouses,* Cornell Cooperative Extension Office, 480 North Main St., Canandaigua NY 14424. For more information: Nancy Anderson (585) 394-3977 x427 or e-mail [nea8@cornell.edu](mailto:nea8@cornell.edu).

**April 12, 2011.** *Capital District Berry Pruning Meeting.* The Berry Patch at Stonewall Hill Farm, 15370 NY Route 22, Stephentown, NY 12168. For more information: Laura McDermott, 518-791-5038.

**April 14, 2011.** *Capital District Berry Pruning Meeting.* Scotch Ridge Berry Farm, 5092 Scotch Ridge Rd., Duanesburg, NY 12056. For more information: Laura McDermott, 518-791-5038.

**April 26, 2011.** *High Tunnel Berry Production Workshop.* Radisson Hotel, 700 Elm Street, Manchester, New Hampshire. More information: 3200 or [su-zanne.hebert@unh.edu](mailto:suzanne.hebert@unh.edu).

**October 11, 2011.** *Southern Tier Commercial Berry Growers Workshop,* Belfast Fire Hall, Belfast, NY. Pre-registration required; to register contact Colleen Cavagna at 585-268-7644 ext. 12 or email [cc746@cornell.edu](mailto:cc746@cornell.edu). **Deadline for registration: Oct. 3rd, 2011.**

**October 16-19, 2011.** *ISHS Symposium on High Tunnel Horticultural Crop Production,* Ramada Inn and Conference Center, State College, PA. For more information contact Michael Orzolek at (814) 863-2251 or [mdo1@psu.edu](mailto:mdo1@psu.edu) or visit <http://horticulture.psu.edu/cms/ishs2011/>.

## GAPs Online Produce Safety Course March 30, 2011

The next English GAPs Online Produce Safety Course will begin March 30 and will run through April 19, 2010. Registration is now open. Each course is limited to 25 people. There will be a \$50 fee for taking this course. The

last three courses have filled before the beginning of the course so if you are interested in participating, please register early to make certain you get a seat. To register, follow this link to the registration page at

[www.ecornell.com/gaps](http://www.ecornell.com/gaps), check the Add to Cart Checkbox and click the Add to Cart Button. If you have any questions about the course, please contact Betsy Bihn at [eab38@cornell.edu](mailto:eab38@cornell.edu) or at 315 787 2625.

## NH High Tunnel Production Workshop April 26, 2011

**When:** April 26, 2011, 9 AM to 4 PM

**Where:** Radisson Hotel, 700 Elm Street, Manchester, NH

**Cost:** \$30 per person – includes lunch.

This workshop will provide growers with up-to-date information on producing berry crops in high tunnels, and will provide research and extension personnel with information on grower's needs.

**Program:**  
8:30 - 9:00 - Registration  
9:00 - A virtual tour of tunnels

used for berries - Kathy Demchak, Penn State University  
9:20 - How tunnels affect berry plant growth - David Handley, University of Maine  
10:00 - Growing berries in high tunnels: tricks of the trade - Kathy Demchak  
10:45 - Grower panel: Experiences with high tunnel berry production  
11:30 - Berries in tunnels: which ones pay? - Kathy Demchak  
Noon  
1:00 - Coping with tunnel insects & diseases - Sonia Schloemann, University of Massachusetts  
2:00 - Open discussion time for grower questions

3:00 - Grower input on research and extension needs

Two (2) Pesticide Applicator Training (PAT) recertification credits will be offered. **Questions?** Please contact Suzanne Hebert at 603-862-3200 or [suzanne.hebert@unh.edu](mailto:suzanne.hebert@unh.edu).

**Registration Deadline:** April 19, 2011.

Online registration is strongly encouraged.

To register online, visit: [https://www.events.unh.edu/RegistrationForm.pm?event\\_id=8398](https://www.events.unh.edu/RegistrationForm.pm?event_id=8398).

## Southern Tier Berry Growers Workshop October 11, 2011

Allagany/Cattaraugus Cooperative Extension will host an all day workshop for commercial berry growers Wednesday, October 12, 2011 from 8:30 AM to 4:30 PM at the Belfast Fire Hall, 11 Merton Ave., Belfast NY 14771. They have an expert team of Cornell University Faculty and Staff lined up as speakers for the workshop: Dr. Marvin Pritts, Cathy Heidenreich, and Dr. Courtney Weber from the Dept. of Horticulture, Dr. Greg Loeb from the Dept. of Entomology and Dr. Kerik Cox from the Dept. of Plant Pathology and Plant-Microbe Biology.

Both potential and established growers will learn something new at the work-

shop. The morning session will cover commercial production of blueberries, strawberries, raspberries and blackberries from pre-plant through marketing. This comprehensive look at production will include site selection and preparation, plant establishment and maintenance, harvest and post-harvest handling of fruit, production economics and marketing.

During the afternoon session, commonly grown commercial berry varieties (strawberry, raspberry, and blueberry) will be discussed along with new varieties in terms of their performance under NYS conditions. Viruses, root diseases and arthropod pests of the same will be covered, including diagnostics, biology, ecology, and al-

ternative management tools.

The afternoon will finish with a discussion of season extension techniques for raspberries and blackberries for using high tunnel technology. Four strategies for extending the season in cold climates will be presented, and cultivar performance data will be shared. Tunnel construction and management, the economics of tunnel production, and high tunnel cautions will be discussed.

**Fee:** \$25.00 includes lunch (non-refundable). Pre-registration required; to register contact: Colleen Cavagna at 585-268-7644 ext. 12 or email [cc746@cornell.edu](mailto:cc746@cornell.edu). **Deadline for registration: Oct. 3rd,**

## Capital District Berry Pruning Meetings April 12 and 14, 2011

**T**wo workshops are scheduled on blueberry and bramble pruning techniques plus an update on scouting for potential insect pests of berries. Check the date and the location for the site nearest you. The program will be very similar, but each site has something different to offer, so read the description carefully.

### Tuesday, April 12, 2011

1:00 pm—2:30 pm

The Berry Patch at Stonewall Hill Farm

15370 NY Route 22, Stephentown, NY 12168

Owner Dale Riggs does an excellent job pruning blueber-

ries to encourage berry size and overall yield. She also grows several kinds of brambles in high tunnels with great success. She has a Friday strawberry cultivator, which has proved to be invaluable on her farm. Join us to learn about pruning, pest control and high tunnel production.

### Thursday, April 14, 2011

1:00 pm—2:30 pm

Scotch Ridge Berry Farm

5092 Scotch Ridge Rd.,  
Duanesburg, NY 12056

Owner Charles Holub grows many types of berries for direct market. We'll prune blueberries and brambles but also

take a look at currants and gooseberries. We'll calibrate a backpack sprayer and learn to scout for Brown Marmorated Stink bug and Spotted Winged Drosophila.

Directions: Call for directions, or use GPS or a map search for the addresses listed above.

There is a nominal fee of \$10 per farm which can be paid at the workshop, but you **MUST** pre-register by April 11th!

Bring employees that help with pruning or pest management and get pesticide credits while you learn.

Register by contacting Marcie

at 272-4210 Extension 111 or email [mmp74@cornell.edu](mailto:mmp74@cornell.edu).

For more information call Laura McDermott at 518-791-5038, Chuck Bornt, 518-859-6213 or Crystal Stewart, 518-775-0018.

*Both meetings offer 2.5 DEC pesticide recertification credits in categories 1a, 22 and 10.*

## EPA Releases Report Containing Latest Estimates of Pesticide Use in the US

**E**PA's report, *Pesticides Industry Sales and Usage: 2006 and 2007 Market Estimates*, is now available at <http://www.epa.gov/opp00001/pestsales/>. This report contains the latest estimates of agricultural and nonagricultural pesticide use in the United States. It illustrates graphically historical trends and levels of use over the last 20 years. Also included are data on imports, exports, and pesticide producers and users. The report contains statistics on pesticide sales and usage based on available information taken from Agency records of registrations, USDA surveys of pesticide use, and other public and proprietary sources. Highlights include:

- In the United States, pesticide sales were approximately \$12.5 billion at the user level, which accounted for 32% of the nearly \$40 billion world market in 2007.

- Pesticide use in the United States was 1.1 billion pounds in 2007, or 22% of the world estimate of 5.2 billion pounds of pesticide use.
- Total pounds of U.S. pesticide use decreased by approximately 8% from 1.2 to 1.1 billion pounds from 2000 to 2007.
- Use of conventional pesticides decreased about 3% from 2002 to 2007 and 11% from 1997 to 2007.
- Approximately 857 million pounds of conventional pesticide active ingredient were applied in 2007.
- Organophosphate insecticide use decreased about 44% from 2002 to 2007, 63% from 2000 to 2007, and 55% from 1997 to 2007.
- About 33 million pounds of organophosphate insecticides were applied in 2007.
- Eighty percent of all U.S. pesticide use was in agriculture.
- Herbicides remained the most widely used type of pesticide in the agricultural market sector.
- Among the top 10 pesticides used in terms of pounds applied in the agricultural market were the herbicides glyphosate, atrazine, metolachlor-s, acetochlor, 2,4-D, and pendimethalin, and the fumigants metam sodium, dichloropropene, methyl bromide, and chloropicrin.
- Herbicides were also the most widely used type of pesticide in the home and garden and industrial, commercial, and governmental market sectors, and the herbicides 2,4-D and glyphosate were the most widely used active ingredients.

The last report on pesticides industry sales and usage was published in 2001. Previous reports are also available at <http://www.epa.gov/opp00001/pestsales/>.



*"Herbicides remained the most widely used type of pesticide in the agricultural market sector. Herbicides were also the most widely used type of pesticide in the home and garden and industrial, commercial, and governmental market sectors."*



USDA News



**USDA Expands Access to Fresh Fruits and Vegetables for Schools Across the Nation**

*Investment Aims to Improve Nutrition and Provide Economic Opportunities to Producers*

**W**ASHINGTON, March 23, 2011 — Agriculture Secretary Tom Vilsack today announced that, as authorized by the Food, Conservation and Energy Act of 2008 (2008 Farm Bill), USDA will expand assistance to state agencies for schools operating USDA's [Fresh Fruit and Vegetable Program](#) (FFVP) in the 2011/2012 school year. The investment is part of the Obama administration's efforts to improve the health of our children by providing access to nutritious meals in schools and also serves as a valuable resource to schools that continue working to improve the health and nutrition of the foods they serve. The assistance will provide free fresh fruit and vegetables to children throughout the school day.

"Improving the health and nutrition of our kids is a national imperative and by providing schools with fresh fruits and vegetables that expand their healthy options, we are helping our kids to have a brighter, healthier

future," said Vilsack. "Every time our kids eat a piece of fruit or a vegetable, they are learning healthy eating habits that can last a lifetime."

The Fresh Fruit and Vegetable Program, authorized and funded under Section 19 of the Richard B. Russell National School Lunch Act and expanded in recent years as a result of the 2008 Farm Bill, operates in selected low-income elementary schools in the 50 States, the District of Columbia, Guam, Puerto Rico, and the Virgin Islands. This year, USDA plans to provide \$158 million in assistance to state agencies. States then select schools to participate based on criteria in the law, including the requirement that each student receives between \$50 and \$75 worth of fresh produce over the school year.

"The program is highly successful in introducing school-children to a variety of produce they otherwise might not have the opportunity to try," said Kevin Concannon, USDA Under Secretary for Food, Nutrition and Consumer Services. "I am pleasantly surprised when children tell me it was their first time trying a particular fruit or vegetable. Fortunately children are learning fruits and vegetables are healthy choices and tasty

alternatives to snacks high in fat, sugar, or salt."

In January, USDA published a proposed rule to update the nutrition standards for meals served through the National School Lunch and School Breakfast programs as part of the Healthy, Hunger-Free Kids Act of 2010, signed into law by President Barack Obama. The proposed rule, based on the latest science, will make the first major improvement to the nutritional quality of school meals in 15 years, and is an important component of First Lady Michelle Obama's Let's Move! initiative to solve the challenge of childhood obesity within a generation. The standards will significantly increase fruit and vegetables provided at lunch and for the first time, both fruits and vegetables will be served daily.

Depending on enrollment and the allotment spent on each child, USDA estimates the expanded assistance could help schools serve additional 600,000 to 950,000 students in school year 2011-2012.

Based on funding levels provided by the 2008 Farm Bill, subject to Congressional action, the school year 2011/2012 FFVP planned allocations by State are:

State	Allocation	State	Allocation	State	Allocation
Alabama	\$2,763,159	Louisiana	\$2,702,175	Oklahoma	\$2,508,596
Alaska	\$1,755,808	Maine	\$1,908,818	Oregon	2,528,331
Arizona	\$3,162,258	Maryland	\$3,009,165	Pennsylvania	\$4,724,303
Arkansas	\$2,301,796	Massachusetts	\$3,200,777	Rhode Island	\$1,840,549
California	\$10,801,714	Michigan	\$4,026,562	South Carolina	\$2,724,946
Colorado	\$2,824,910	Minnesota	\$2,892,915	South Dakota	\$1,781,539
Connecticut	\$2,464,720	Mississippi	\$2,314,514	Tennessee	\$3,150,893
Delaware	\$1,802,271	Missouri	\$3,062,478	Texas	\$7,804,444



## USDA News



State	Allocation	State	Allocation	State	Allocation
District of Columbia	\$1,728,948	Montana	\$1,824,916	Utah	\$2,264,162
Florida	\$6,234,011	Nebraska	\$2,032,086	Vermont	\$1,734,894
Georgia	\$3,978,048	Nevada	\$2,248,485	Virginia	\$3,560,546
Hawaii	\$1,916,724	New Hampshire	\$1,905,874	Washington	\$3,244,569
Idaho	\$1,968,034	New Jersey	\$3,756,315	West Virginia	\$2,038,684
Illinois	\$4,756,050	New Mexico	\$2,089,722	Wisconsin	\$2,987,737
Indiana	\$3,184,978	New York	\$6,376,788	Wyoming	\$1,719,518
Iowa	\$2,334,084	North Carolina	\$3,940,380	Puerto Rico	\$922,269
Kansas	\$2,286,251	North Dakota	\$1,746,491	Guam	\$44,771
Kentucky	\$2,654,152	Ohio	\$4,435,706	Virgin Islands	\$27,167

Improving child nutrition is the focal point of the Healthy, Hunger-Free Kids Act signed by President Obama in December 2010. The legislation authorizes USDA's child nutrition programs, including the [National School Lunch](#), School Breakfast, [Summer Food Service Program](#), and the [Special Supplemental Nutrition Program for Women, Infants and Children](#). The Act allows USDA, for the first time in over 30 years, the chance to make real reforms to the school lunch

and breakfast programs by improving the critical nutrition and hunger safety net for millions of children, and help a new generation win the future by having healthier lives. The Healthy, Hunger-Free Kids Act is the legislative centerpiece of First Lady Michelle Obama's [Let's Move!](#) Initiative to end childhood obesity in a generation.

USDA's Food and Nutrition Service (FNS) oversees the

administration of 15 nutrition assistance programs, including the Fresh Fruit and Vegetable Program, that touch the lives of one in four Americans over the course of a year. These programs work in concert to form a national safety net against hunger. Visit [www.fns.usda.gov](http://www.fns.usda.gov) for information about FNS and nutrition assistance programs.

*"Improving the health and nutrition of our kids is a national imperative and by providing schools with fresh fruits and vegetables that expand their healthy options, we are helping our kids to have a brighter, healthier future. Every time our kids eat a piece of fruit or a vegetable, they are learning healthy eating habits that can last a lifetime."*

## NY NASS NEWS

### 2009 On-Farm Renewable Energy Production Survey

The 2009 On-Farm Renewable Energy Production Survey counted 202 farms in New York that produced renewable energy on their operations, according to King Whetstone, Director of USDA's National Agricultural Statistics Service (NASS), New York Field Office. These farms saved an average of \$5,067 on their utility bills in 2009.

In New York, there were 58 operations reporting 65 wind turbines that were owned and operated by farmers. There

were also 156 operations using solar panels to generate energy. New York farms reported owning and operating 16 methane digesters, ranking second nationally behind Wisconsin.

This survey, conducted as a follow-on to the 2007 Census of Agriculture, gathered information about energy production using wind turbines, solar panels, and methane digesters on American farms.

This is the first step in a comprehensive effort by NASS to

collect and publish detailed data on the agriculture sector's contribution in the production and use of renewable energy.

Complete results of the 2009 On-Farm Renewable Energy Production Survey are available online at [www.aqcensus.usda.gov](http://www.aqcensus.usda.gov).

Tables are available as PDF, Text, or CSV files. For further information or assistance, please call the New York office at 800-821-1276 or send an e-mail to: [nass-ny@nass.usda.gov](mailto:nass-ny@nass.usda.gov).



## TRACTOR ROLLOVER FACTS

- Each year 4 out of every 100,000 American workers die on the job.
- The fatality rate for farmers is 800% higher than all American workers.
- The tractor is the leading cause of death on a farm.
- The most frequent cause of tractor related deaths are side and rear overturns.
- Farmers in the Northeast experience the highest rates of overturn death.
- 80% of deaths caused by rollovers happen to experienced farmers.
- 1 in 7 farmers involved in tractor overturns are permanently disabled.
- 7 out of 10 farms will go out of business within a year of a tractor overturn fatality.
- ROPS are 99% effective in preventing injury or death in the event of an overturn when used with a seatbelt.
- ROPS remain 70% effective without the use of a seatbelt.

## 2011 ROPS REBATE PROGRAM

The 2011 NYS ROPS (rollover Protective Structure) Rebate Program will rebate 70% of the cost of purchasing and installing the ROPS (Rollover Protective Structure) up to \$765 maximum rebate. This includes the cost of the ROPS (rollbar, ROPS with awning or ROPS cab), shipping, and installation charges.

Apply on-line (<http://ropsr4u.com/>) or call the ROPS Rebate Hotline (1-877-ROPS-R4U or 1-877-767-7748) for registration and pre-approval.

You must be a resident of the state in which you are applying for a rebate. There are no other qualifying conditions.

Pre-approval is required only to

ensure that funding is available for the rebates.

Rebates are available on a first come first served basis.

ROPS Rebate Program staff will research the type of equipment needed, provide estimated costs as well as sources for purchasing ROPS and send this information to you.

Participants may order the ROPS from whichever source they choose as long as the ROPS are SAE Certified.

When ready to make your purchase, you must re-contact the ROPS hotline staff via email or by phone (1-877-767-7748). They cannot guarantee your rebate until

you confirm with them where you ordered your ROPS and what the estimated cost is. It is at this point that your rebate money will be reserved and an approval letter will be issued to you confirming your participation in the program.

They recommend that you have your rollbar professionally installed but you have the option of self-installing. In this case, a "before" and "after" photo is required as your proof of installation.

Only one tractor per farm can be rebated during a program year.

Upon submission of receipts for all expenses and proof of installation a rebate check will

NEW YORK STATE

Over 800 New York farmers have installed rollbars through this program.

ROPS Rebate Program

PENNSYLVANIA VERMONT NEW HAMPSHIRE

OVERVIEW

ROLLOVER FACTS

APPLY

INFO FOR SELF-INSTALLERS

TRACTOR DEALER LOCATOR

FAQ

VIDEOS

INFORMATION LINKS

PARTNERS

CONTACT

"This is a great program. Without it, most likely I would not have installed the ROPS on my tractor. It's a great incentive." - Fred

New 2011 Rebate  
**70% off**  
Save up to \$765 on costs to retrofit your tractor!

NYCAHH Roswell Healthcare Network Farm Bureau Farm Family

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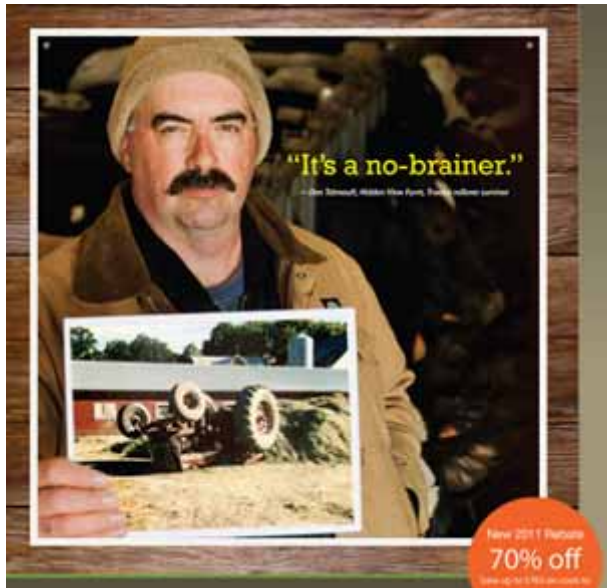
## 2011 ROPS REBATE PROGRAM (continued)

be mailed to you within 30 days.

For more information contact:

Barbara Bayes  
Program Coordinator,  
ROPS Retrofit Program  
New York Center for Agricultural  
Medicine and Health (NYCAMH)  
One Atwell Road,  
Cooperstown, NY 13326  
Phone: (877) 767-7748 or (607)  
547-6023 x231  
Fax: (607) 547-6087

Email: [bbayes@nycamh.com](mailto:bbayes@nycamh.com)



<http://www.nycamh.com/>

## NEW YORK BERRY GROWER ASSOCIATION (NYS BGA) NEWS

### A Planned Meeting With the Dean

*Dale Ila Riggs, Chair, The Berry Patch, Stephentown NY*

One of the major goals of the NYSBGA is to support research into issues facing the NYS berry industry. In the past, members made voluntary contributions to a research fund that the Board of Directors would then allocate to one or two research projects carried out by NYS researchers or extension staff.

Two years ago the Board decided that since supporting research is a fundamental mission of the Berry Growers Association, 40% of each member's dues would automatically be allocated to research. Of course, additional voluntary research dollars are gratefully accepted by the Association.

2010 gave me the best raspberry crop I've ever had. Since part of the increase in yield was from knowledge gained through Cornell

sources, I put some of those 2010 raspberry dollars into a voluntary contribution to the research fund.

This year, when the Board met with Cornell faculty and staff in the fall, we asked "How can the Berry Growers Association be most helpful to you?" The response was that the most helpful thing that the Berry Growers can do is to provide \$5000 - \$7000 a year for the Cornell faculty to be able to hire a summer worker to collect data from their various research plots. This data is the basis of the recommendations that Cornell is able to make for our industry.

Every person reading this column that has ever benefitted from a new variety developed by Courtney, a fertilizer or weed control recommendation from Marvin, an insect control recommendation from Greg, a disease control recommendation from Kerik, or an educational program coordinated by Cathy, Laura, Molly, or Steve should be a member of the Association.

That knowledge you gained and used on your farm has already returned dividends far exceeding the price of membership.

On April 1st, the Board of Directors will be meeting with Dean Boor at Cornell to see if there are creative ways that the Association and Cornell can work together to benefit the industry and Cornell, and to come up with the summer research funds that are needed so much and are so beneficial to the industry.

If you have a creative idea that you think might work, let anyone on the Board of Directors know. It's time to think "out of the box" because the old style of operating (expecting the state and Cornell to pick up the tab) is history.

Next month, I'll let you know how the meeting went....



*"It's time to think 'out of the box' because the old style of operating (expecting the state and Cornell to pick up the tab) is history."*

## TUNNEL TALK



### About the Author:

Chris Wien is a professor in the Horticulture Dept. at Cornell University, working on cut flowers and vegetables in high tunnels and the field. A current project includes encouraging introduction of high tunnels into school garden programs.

### Contact information:

Dr. Chris Wien  
Cornell University  
Department of Horticulture  
156 Plant Science Bldg.  
Ithaca, NY 14853  
[hcw2@cornell.edu](mailto:hcw2@cornell.edu)

*“That single layer of plastic on a frame can quickly become a very unfriendly environment for your plants on a sunny day. Without ventilation, temperatures in the tunnel can easily exceed 90 F, even on days where outside temperatures are in the 30’s.”*

### High Tunnel Ventilation Tricks – Chris Wien, Cornell University

Getting a new high tunnel, or hoping to purchase one in the near future? That is a wonderful prospect, and it is amazing how that simple structure can increase the length of the growing season, and the things you can grow. But that single layer of plastic on a frame can quickly become a very unfriendly environment for your plants on a sunny day. Without ventilation, temperatures in the tunnel can easily exceed 90 F, even on days where outside temperatures are in the 30’s. So letting some of that cool air in to moderate temperatures inside is essential. How is that usually done, and are there other techniques that make that chore easier?

During the period of the year when outside conditions are too cold for plant growth, but the high tunnels are hot, you can introduce some of that cool air by slightly raising the roll-up sides. Ideally, the hot air rises into the gables, and if there are vents there, is exhausted through the vents. So end vents are a useful feature in a high tunnel that is shorter than about 100 ft. The longer the tunnel, the less efficient the end vents, and the more the middle area in the tunnel will stay warm.

Roll-up sides expose the plants planted near the edge of the tunnel to cold air. To lessen that risk, tunnel manufacturers have developed drop-down sides, in which the air inlet is raised a couple

of feet above the plants. The mechanism for this type of ventilation relies on a series of pulleys hooked to a cranking mechanism, which can be operated by hand, or mechanically. See examples at [www.growerssupply.com](http://www.growerssupply.com).

Assuming that you don’t have time to hang around the tunnel during the day, the ventilation needs for the day need to be estimated from a weather forecast in the morning. If predictions are for cloudy conditions, you may leave the sides and end vents closed. If sunny conditions unexpectedly arise, the high tunnel could get suddenly too hot, and plant growth could suffer. To guard against that problem, a couple of devices have been developed that relieve you from the responsibility of rushing home to ventilate. For the end vents, a temperature-activated piston can open them to release hot air. These do not require electric power, and are available from many greenhouse supply firms.

Automatic openers for the side vents are also available. They operate on a thermostat mounted in the high tunnel. For roll-up sides, one commercial high tunnel manufacturer supplies a power grid-operated motor vent that adjusts openings to the inside temperatures desired ([www.rimol.com](http://www.rimol.com)). Another high tunnel maker (Howard Hoover, Penn Yan NY (315-536-3192) has developed a battery-powered side vent opener activated by an adjustable thermostat in the high tunnel. In this model, the degree of maximum vent

opening is manually set, and the temperatures which trigger the side vents to open or close are also adjustable. The latter system operates on a 12-volt battery, which under spring or fall temperature conditions, requires charging about once a week. With our high tunnels at our research farms in Freeville and Ithaca, NY, we have eliminated the need to charge the battery by hooking it to a 20-watt solar cell, available from national hardware store chains.



Fig. 2. Adjustable thermostat that controls roll-up sides of a high tunnel. Developed by Howard Hoover, high tunnel manufacturer, Penn Yan, N.Y.

To see the roll-up side opener in action, go to: [http://www.youtube.com/watch?v=WVUj7o\\_vuJA](http://www.youtube.com/watch?v=WVUj7o_vuJA). to see a short video clip of an automated drop-down ventilation system operating, see: [http://www.youtube.com/watch?v=FJdPJ8P\\_zoA](http://www.youtube.com/watch?v=FJdPJ8P_zoA). It was developed by our vegetable research farm manager, Steve McKay (607-844-8167), who is show in the clip.

These innovations show that the drudgery of temperature control in high tunnels can be significantly reduced. Try these labor-saving devices in



## TUNNEL TALK—(continued)



Fig. 1. Cool air from outside goes in the roll-up sides (right) and warm air in the highest parts of the tunnel flows out the gable vents.



Fig. 3. Battery-driven motor that rolls up the tunnel sides below (left), and solar cell that maintains charge in the battery (below right).

your own high tunnel.

### Tips To Keep High Tunnel Crops Frost-Free This Spring

Chris Wien, professor in the Department of Horticulture at Cornell University, offers a few pointers to help protect high tunnel crops from frost this spring. Specifically, he points out two procedures that can be implemented immediately and a third technique that is more for long-term production.

#### 1. Construct a low tunnel over the crop in the high tunnel.

Spun-bonded fabric works best, with the heavier materials (1 to 2 ounces per square yard) providing better frost protection, he says.

“The fabric should not touch the plants, but be held up by wire hoops or pipes,” explains Wien. “The fabric it-

self will freeze, so if the plants are touching the fabric, they also will freeze.”

#### 2. A gas-fired heater can be used in the high tunnel for those cold nights when crops are inside.

“This also will help to slide snow off the high tunnel plastic on days when wet, heavy snow threatens to collapse the tunnel,” he adds.

#### Long-term Technique

Make sure that the tunnel plastic covering the high tunnel is an IR (infrared)-blocking kind, says Wien. “On those clear, cold nights in spring when the temperature dips below freezing, reducing the heat loss from the tunnel with IR-blocking plastic will keep temperatures inside 2 to 4 F warmer.”



**SCRI High Tunnel Berry Survey Online until April 1<sup>st</sup>** - K. Demchak, Penn State University

As part of a large nationwide effort, berry crop researchers are working to identify grower research and Extension needs in the area of high tunnel berry production. If you have an interest in high tunnel berry production, and have not yet participated via the online survey or a paper copy at a meeting, we'd like your input.

We thank you in advance for your help with this project. To participate in the study please click on the secure link: <https://www.surveymonkey.com/s/hightunnel> or copy and paste this address into your browser.

## On the Organic Side...

### ORGANIC STRAWBERRY PRODUCTION

*Dr. Eric Sideman, Organic Crops Specialist, Maine Organic Farmers and Gardeners Association (MOFGA), Unity, Maine, [esideman@mofga.org](mailto:esideman@mofga.org).*

*Editor's note: This is an excerpt from a larger publication MOFGA Fact Sheet #1 [Organic Strawberry Production](#) available from their web site at: <http://www.mofga.org/>.*

#### Introduction

Similar to any organic crop production, producing strawberries organically entails a system approach to the whole farm. Many of the practices are the same in organic and conventional strawberry systems, but the fundamental approach to soil husbandry and pest management may be quite different. Successful organic strawberry production depends on building a biologically active soil with good structure and reservoirs of nutrients, and ridding the site of weeds and soil borne pests BEFORE the strawberries are planted. After that, management of a successful organic strawberry farm depends on crop rotation to distant fields and the use of cover crops to maintain soil health and fertility and prevent build-up of weeds and pests. Although conventional systems are able to maintain strawberry beds for five or more years controlling weeds, diseases and pests with chemicals, organic growers rely on crop rotation.

This fact sheet is a guide to farm scale organic strawberry production of June bearing varieties in a perennial matted row system. There are day neutral varieties that produce strawberries in the fall, and many other production systems such as annual beds, raised bed plasticulture or ribbon row, but the matted row is still the most common system in the Northeast for early summer berries. In a matted row system of growing strawberries bare root plants are typically planted in the early spring. Blossoms are removed and the plants are allowed to establish runners forming filled rows by the fall of the first year. Strawberry picking begins in June and early July the second year.

The demand for strawberries is the greatest in the early summer, whether it is from pick-your-own or farm stand customers, or even the local wholesale markets. Of course, anyone planning a commercial enterprise should start with an investigation of the market because the local market may be saturated, or favor one way over another for reaching customers. But remember that organic strawberries may attract a special segment of any market, and also attract customers from far away.

The labor requirement for strawberry production is high. Novice commercial growers may want to start with as few as a 1,000-2,500 plants (a quarter acre or less) and gradually expand after the management and soil systems are well developed and the labor demand is understood. Pick-your-own operations have another consideration that is less of a concern for folks who market from a stand or at farmers markets. The planting has to be large enough so you are not picked out quickly and forced to turn away customers who may have planned a whole day around picking. This would probably be a customer forever lost. I believe that a quarter of an acre is the minimum for a PYO strawberry operation open to the public. Another option for small scale commercial growers would be to allow PYO only on an invitation basis where you can match berry abundance with the number of customers.

#### Site Selection

##### *Soil Type*

Strawberries will grow on most soil types but very sandy soil may lead to drought problems and heavy, clay soils with poor drainage may lead to disease problems such as red stele. Strawberries will do best in soil with the following characteristics:

- 1) High in organic matter
- 2) High level of fertility
- 3) Well drained, yet able to hold a continuous supply of moisture.
- 4) pH 5.7-6.2

##### *Air Drainage and Frost Protection*

Strawberry blossoms are killed by cold temperatures. Ideally, a strawberry bed should be slightly higher than the surrounding land so that cold air will drain away to lower ground. A few feet of elevation often will be enough to protect delicate blossoms from a late spring frost, which will kill them.



**About the Author:**  
Eric came to MOFGA in 1986 to become what some call "the nation's first Organic Extension Agent." He provides technical support for farmers and gardeners, serves as staff scientist for MOFGA, plans and produces educational events for MOFGA and Cooperative Extension, and serves on various agricultural committees for the Maine Department of Agriculture and the University of Maine.



<http://www.mofga.org/>

## On the Organic Side... (continued)

Strawberry blossoms can tolerate temperatures from 32o to 29o F, depending on the stage of development, but remember this is the temperature of the blossom not the air and radiational cooling can cause the blossom temperature to be significantly colder than the air. If the conditions favor radiational cooling, air temperatures even slightly above 32o F could induce frost damage. A frosted blossom will develop a dark center in a day or so, and not produce fruit.

A slight slope to the land often will aid air drainage. Berries on a southern slope may be more susceptible to late spring frost because blossoms may open earlier than those on a northern slope. On the other hand, berries on a southern slope will ripen earlier.

Commercial growers should not attempt strawberry production without some means of frost protection. Some growers use floating row covers and cover the fields on nights when frost is predicted and uncover during the day to allow pollination.

Most commercial growers use overhead irrigation to protect the blossoms from low temperatures. Irrigation is started as the air temperature approaches 32o F, and as the temperature drops ice forms over the blossoms. As long as liquid water is applied to the field the temperature of the blossom will not drop below 32o F because as ice forms heat is released from the water. Once irrigation begins, it should not be shut off until the sun comes out in the morning and the ice melts. This is important because just as liquid water turning to ice gives off heat, ice turning to liquid water will take heat from the blossom and could cause the blossoms to get colder than the air.

### Preparing the Soil

Soil must be prepared well before strawberries are planted in order to build fertility, organic matter, and soil structure, as well as get rid of pests and weeds. Once strawberry plants send out runners and form the matted row the only weed control for an organic grower will be by hand pulling. Since weeds can quickly out compete and take over a strawberry field it is important to have a field free of weeds and a reduced weed seed bank BEFORE the berries are planted. Grubs (larvae of June beetle, Japanese beetle and others) that live happily under sod are another reason to prepare a field well in advance of strawberry production.

Organic growers rely on starving the grubs out by getting rid of the sod at least a year before planting the strawberry plants. Most important in preparing land for organic strawberry production is the need to build fertility and soil health in advance. Organic growers create a farm system where soil structure, cation exchange capacity and reservoirs of plant nutrients are built and then the soil supports the crop. A successful strawberry grower should begin improving the soil at least a year ahead of planting. (See MOFGA Fact Sheet #1 for a more detailed discussion of organic soil fertility.)

Organic growers will benefit from preparing at least three distinct fields that are distant from each other. How distant is a matter of how far strawberry pests such as the clipper can fly and that is not that predictable, but even 500 feet helps and more is better. Over a year or two of strawberry production weeds and pests begin to build up and organic growers manage this build up by rotating out of fields. With three fields a grower can have one in strawberry production, one with establishing plants and one out of strawberries either lying fallow or growing green manures.

Four separate fields could allow for two years of picking before rotating out of strawberries with one field in first year picking, one field in second year picking, one field in establishment and one field out of production. I would not recommend more than two years of picking before rotation in organic production because of build up of disease and insect pests. I also recommend more fields because more fields could allow for more time out of production, and the more time in cover crop the greater the benefit for the soil.

### Preparing New Land (Pasture, Fields, etc.), or fields in weedy condition

The following is an example of how one could prepare sod ground starting a year and a half before planting the berries:

- 1) Plow in late summer (a year and a half before planting berry plants)
- 2) Soil test and apply the recommended amount of lime *Note: See [MOFGA Fact Sheet #1](#) for a more in depth discussion on reading the soil test results and meeting nutrient needs with natural amendments. And [MOFGA Fact Sheet # 11](#) for a list and description of natural sources of crop nutrients. Fact sheets are available on the MOFGA website, [www.mofga.org](http://www.mofga.org).*
- 3) Plant a winter cover crop in early September. Winter rye works well for those with tractor implements to till in all the plant matter, while oats or annual rye grass are recommended for those working with a tiller or by hand because they will be winter killed and easy to till in the spring.
- 4) The following spring, till in the fall cover crop and add the recommended amounts of rock powders such as Sul-Po-Mag for magnesium and potassium, and rock phosphate for phosphorus. Also, this is an ideal time to add manure and/or compost. Common rates of manure applications are:

Poultry & rabbit: 5-8 tons per acre (35 lbs. / 100 square feet)  
Cow: 10-15 tons per acre (65 lbs. / 100 square feet)

## *On the Organic Side...*

If you use poultry manure you need less lime and rock phosphate. Poultry manure will supply approximately 15 pounds of phosphorus per ton.

5) The spring a year before planting strawberries, plant a green manure crop or series of crops for the season. The choice of green manure is complicated by many factors such as your major goal. Usually, when trying to bring sod ground into condition for strawberry production, your primary concern is weed control. The following is a good plan in most cases:

- a) In the spring, plant oats
- b) Plow oats under in early summer. For a summer cover, plant sorghum-Sudan if you use tractor implements, buckwheat if you use a tiller or turn by hand.
- c) Plow summer crop under late in August or very early September and plant a cover crop of oats for the fall and winter.

*Note: If your land is in really weedy condition, then you will need to be much more aggressive in getting rid of perennials such as quackgrass and depleting the seed bank of annual weeds. See MOFGA Fact Sheets "[Using Green Manures](#)" and "[Controlling Garden Weeds](#)" for details on using a series of green manures alternating with fallow periods to get weeds under control. You must do this BEFORE you plant the berries.*

6) Plow under oats as early as possible in the spring, wait a few weeks, cultivate and plant strawberries.

### Varieties

The choice of strawberry varieties is based on factors including taste, use of berry, winter hardiness, disease resistance, and ripening date. The [University of Maine Cooperative Extension Bulletin #2184](#), describes the characteristics of most of the varieties suitable for New England and is available by calling your local Extension office.

### Planting

Strawberries should be planted early in the spring. Late spring plantings may have problems when hot, dry weather arrives because they did not have time to develop adequate roots. Depth of planting is extremely important. The crowns should be just level with the ground.

In the matted row planting system, plants are set 18-24 inches apart in rows 4 feet apart. All runners are allowed to root, but the beds are kept 18-24 inches wide by cutting off runners that extend into the alleys with a hand hoe, rolling colter wheel, cultivator or rototiller.

To ensure early runners and vigorous plants, all blossoms should be removed the planting year. Failure to do this may result in weaker plants which may not be able to produce as high a yield.

### Fertility

As pointed out above, for the most part fertility is established prior to planting based on soil testing and is primarily maintained with a good rotation of legume green manures. However, since June-bearing strawberries set their buds for the following year's fruit in the fall it is crucial to have adequate fertility, especially nitrogen, available at that time. To get a good bud set nitrogen fertilizers are applied in the mid-late summer before the bearing year, giving organic fertilizer materials enough time to break down and become available by early fall. A common practice is to apply enough high nitrogen materials such as fish meals, seed meals or alfalfa meal to supply 30 pounds of actual nitrogen per acre. Compost can be used as a supplement and serves well to condition the soil and balance nutrients, but does not serve well to provide enough available nitrogen at the time needed. An inch of compost and the appropriate amount of a high nitrogen organic material directly over the rows is recommended. Less can be used if a good legume cover crop was growing the year before.

### Mulching

Strawberries should be mulched over the winter to protect the plants from extreme cold and, more importantly, from damage by rapid freezing and thawing of the soil. Although threshed straw is the most commonly used mulch, any material that will provide protection without matting can be used. This includes marsh hay, Sudan Grass, pine needles, or coarse wood shavings (not sawdust). Mulch should be applied after 15-20 frosts, but before the temperature drops below 20oF. The exact time will vary from year to year and place to place. In central Maine, growers lay the mulch around the week before Thanksgiving.

Mulch should be applied 4-6 inches deep over the rows. This will take 100-150 bales of straw per acre. Mulch should be removed in the spring as soon as possible, and is usually raked into the aisles where it can serve to suppress weeds and conserve moisture. Many growers like to leave it on the plants somewhat longer in order to delay blossoming (hoping to delay it beyond the danger of a late frost). This may work, but has been shown to reduce total yield.

## On the Organic Side... (continued)

### Renovate or Rotate?

Conventional growers keep fields in production for many years and renovate their fields after harvest. Within a week after harvest they mow the old foliage to one inch above the crown and narrow the rows to 10-12 inches with a rotovator or tiller. This practice is questionable for organic growers because without herbicides the weeds often are the better competitor and take over when released from the shade of the strawberry foliage. Organic growers may be better off not mowing and just narrowing the rows and fertilizing at this time.

Better yet, growers with enough land may find their most profitable system is one in which strawberries are picked for only one year and then the field rotated. Growers are going to have to decide for themselves what works best for them but it is unlikely that organic growers will be able to harvest more than two years from a field before weed and pests become unmanageable.

### Crop Rotation for Insect, Disease and Weed Management

Crop rotation is the best tool organic growers have against insects, diseases and weeds. As soon as the final crop is harvested the land should be plowed. Deciding what to do next depends on which problem is the worst, e.g., insects, weeds, disease, or fertility. It is important to learn the biology of the weeds and pests that have become major problems during strawberry production and practice a rotation of crops that best interrupts their success. If no problem has gotten out of hand, then green manures should be used that will best improve the soil and reduce the need for off farm sources of fertility.

### Weeds

It cannot be said too often that crop rotation is the best tool organic strawberry growers have against weeds. Once the field is established the only alternative is hand weeding and that is futile on any large scale of production. Deciding on the type of rotation depends on the type of weeds in the field. The key to using crop rotation for weed control is to starve out perennial weeds by repeated tillage during fallow periods and using competitive cover crops, and to diminish the weed seed bank by repeated tillage that stimulates weed seeds to germinate and then kill them before they produce new seeds. (See the MOFGA fact sheet "[Controlling Garden Weeds](#)" for details on weed control.) Scout your fields and determine if your weeds are perennial or annual weeds, if they are spring, summer or fall flowering and when they germinate. Then use this information to decide on which green manure crops to use and when and how long your fallow periods should be.

An example of a strawberry rotation that works well on organic farms in New England is to plow under the strawberries just after harvest and then bare fallow the land until late August. Then plant a winter rye/hairy vetch mix in late August. Allow that to over winter and grow into mid-late May the following year and then plow it. Bare fallow the field for two to four weeks and plant a summer cover crop (cow peas or soy beans if a legume is desired, sorghum-Sudan grass or buckwheat if not). Then in late August take down the summer cover crop, bare fallow again for a few weeks to kill weeds and use up the seed bank of fall germinating weeds, and then plant an oat cover for the fall. Then back to strawberries the following spring. If you have the land, the soil will benefit and the pests will suffer more with a longer rotation out of strawberries. Two to three years out of strawberries is recommended.



*Organic Strawberry production: In a typical matted row system strawberry rows are allowed to get no more than 18 inches wide and the aisles are at least a foot wide. Photos by Eric Sideman.*



Soil symphylan

Photo courtesy [NCSU](https://www.ncsu.edu)

## Should You Fumigate Your Soil? Points To Consider Before You Decide - Laura McDermott, Cornell University

**G**rowing berry crops, particularly strawberries, can be frustrating. Strawberries are seemingly finicky plants that seem to thrive in certain situations but can do very poorly in others. Success is mostly determined by a grower's attention to pre-plant details, but even the best farmers may find strawberries to be mystifying performers.

Most farmers in the Capital District do not fumigate their land, but every season poses a new opportunity to try new techniques, and soil fumigation is one of the management tools that raise questions.

First, consider the crop. Strawberry crops do show improved performance on fumigated soil, especially if its soil that has a history of Verticillium, black root rot or Phytophthora. Strawberry growers have to leave at least 5 years between a planting of infested berries and not follow with susceptible crops like tomatoes, melons, okra, mint etc... If crop rotation is not a possibility, then fumigation might be an answer. Remember that soil fumigation alone will not completely and permanently control against Phytophthora and cultivars that have genetic resistance to soil borne diseases should always be used.

Second, consider the pests. Soil fumigation kills many weed seeds, plant pathogens, nematodes and soil insects. The rate of fumigant necessary to adequately control all of these pests varies dramatically. Nematodes and soil insects are killed at lower rates than weed seeds and pathogens. High numbers of soil nematodes are a very good reason to fumigate, but be sure to do a nematode test and not just assume that's your problem.\* In 2005, methyl bromide was removed from NYS's crop protectant arsenal. That fumigant was the only material that could provide excellent weed control on a consistent basis. So, if you are looking for weed control as your primary target pest, fumigation may not be the best answer.

Thirdly, consider soil texture. Heavy soils have smaller spaces between soil particles which translates into higher fumigant rates to improve the penetration of the chemical. If you have heavy or compacted soil, you will need to work it well prior to fumigation to improve the effectiveness. This may be difficult for spring applications, given that heavy soils are often the last ground we work in the spring. Fall fumigation may be an alternative.

For effective fumigation, consider that soil temperature in the top 6" must be at least 50° F but no higher than 90°F. Higher soil temperatures favor volatilization and lower temps cause the fumigant to become more soluble in soil water.

Soil organic matter is another consideration. In general, organic matter, which more readily absorbs fumigant, would result in lower application rates. Too much crop residue, however, can cause inconsistent application and delays in the overall process. If one field has variable organic matter contents, that may affect the consistency of the overall application. Organic matter should be completely decomposed.

Consider the moisture of the soil during application. Moderate levels of soil moisture aid in fumigation, but droughty conditions or too much moisture will hinder the fumigant. Because soil fumigants move so much faster in air than water, saturated soil slows down the fumigant to a degree that its effectiveness is compromised.

Consider the implements needed for a good soil fumigant application. You will need normal tillage equipment to prepare the soil and remove crop residue and break apart clotty soil. Fumigants need to be injected at a depth that slightly exceeds the desired depth of control – because fumigants move up after application.



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## Should You Fumigate Your Soil? Points To Consider Before You Decide *(continued)*

Fumigation requires that the soil surface be sealed after the fumigant is applied. Gas fumigants like methyl bromide, used to require tarping, but liquid fumigants, which are the only materials labeled for use on strawberry soil in NYS, can be sealed in by rolling the soil or irrigating or covering with a tarp.

For best results, most fumigants need 2-3 days to “work” or rather volatilize and fill all the soil air spaces with the toxin. Vapam is the only fumigant that becomes a solution in soil water – which explains why Vapam can be applied through irrigation systems. Telone-C17 and Telone-C35 can be used as pre-plant fumigants for strawberries. These both, along with Vapam and Telone II, provide suppression of soil-borne diseases, nematodes and symphylans. Telone products also provide some suppression of wireworms while Vapam may provide the best weed suppression. Telone II is better on cold, dry soils than most other fumigants.

Table 2.3.1. Fumigants Registered for use on Fruit Crops in NY State. (Source: 2011 Cornell Pest Management Guidelines for Berry Crops)

Fumigant	Formulation	Rate/acre	EPA Reg. No.
*†1,3 dichloropropene	*†Telone II	27-35 gal	62719-32
Better, on cold, dry soils than most other fumigants. Controls soil-borne diseases and nematodes, symphylans, and wireworms.			
*†1,3 dichloropropene + chloropicrin	*†Telone-C17	32.4-42 gal	62719-12
Used as a preplant fumigant for strawberries. Controls soil-borne diseases and nematodes, symphylans, and wireworms.			
*†1,3 dichloropropene + chloropicrin	*†Telone-C35	38-50 gal	62719-302
Used as a preplant fumigant for strawberries. Controls soil-borne diseases and nematodes, symphylans and wireworms.			
sodium methyl dithiocarbamate	Vapam HL	37.5-75 gal	5481-468
May be applied through irrigation system. Broad-spectrum suppression and/or control of weeds, soil-borne diseases, nematodes, and symphylids.			
* = Restricted-use pesticide; may be purchased and used only by certified applicators or used by someone under the direct supervision of a certified applicator.			
† = Not for use in Nassau and Suffolk Counties. Pesticide labels that indicate ‘Not for use on Long Island, NY’ mean that use is prohibited in Nassau and Suffolk Counties only.			
CAUTION: Vapors from all fumigants are harmful. Strictly follow cautions given on label.			



## Pest Management Update

### TracBerry Software for 2011 *Juliet Carroll, NYS IPM Program*

The 2011 version of TracBerry will be coming out soon. It is an Excel-based record-keeping and reporting system for spray records. Visit <http://nysipm.cornell.edu/trac/downloads/default.asp> for availability updates and <http://nysipm.cornell.edu/trac/> for information about Trac.

### CleanSweepNY *Important Notice Regarding 2011 Collections*

The CleanSweepNY waste hauling contract will go out to bid soon and there will be no spring 2011 collection program. Once a Request for Proposal (RFP) is finalized by NYSDEC, it will be posted on the NYS Contract Reporter.



It is our goal that a contract will be in place for a fall 2011 program which will target the following NYSDEC Region 8 counties: Chemung, Genesee, Livingston, Monroe, Ontario, Orleans, Schuyler, Seneca, Steuben, Wayne and Yates Counties.

Much thanks goes out to Care Environmental, Corp. for their work during the last CleanSweepNY contract period.

To date, over 1,059,344 pounds of pesticides and other chemical wastes from schools and other entities have been collected and removed from New York State for disposal. This total includes the collection of over 715 pounds of elemental mercury collected from 379 participating schools. We look forward to providing pesticide disposal services and school

chemical disposal services to farmers, nurseries, greenhouses, certified pesticide applicators, landscapers, and schools in New York State to promote a Toxic Free Future for New Yorkers.



### Farmers are Being "Green" by Demonstrating Product Stewardship

Farmers all around western New York State are recycling their triple-rinsed plastic containers from agricultural crop protection products such as specialty pest control, crop oils, surfactants, micro-nutrient/fertilizer, and/or adjuvant products. USAg Recycling Inc. offers agricultural producers and custom applicators an environmentally "green" convenient option for disposing of their empty containers. This program is coordinated by Genesee County Soil & Water Conservation Districts Agricultural Environmental Management Committee (AEM) in conjunction with USAg Recycling, Inc. & Ag Container Recycling Council (ACRC).

USAg Recycling Inc. will be picking up agricultural plastic containers in several locations throughout New York State in the months of June and October, 2011. The service is free to farmers and provides an environmentally friendly alternative to burning or throwing away agricultural containers. Last year USAg Recycling Inc. collected 87,000 pounds of plastic containers from New York State, 5,000 pounds from the Genesee County SWCD Ag. Plastic Container Recycling Program. They are a contractor for the industry funded Ag

Container Recycling Council (ACRC) who in 2008 celebrated 100 million pounds of agricultural plastic containers recycled from across the United States. Today ACRC averages 8 million pounds collected each year. Collected containers are ground into chips and recycled as corrugated plastic field drainage pipe and other ACRC approved products. That's farmers helping to keep plastic out of the landfills.

Containers accepted are HDPE #2 plastic containers only, ranging from less than 1 gallon to 55 gallon barrels. Large 250 gallon shuttle totes must be cut into 2 foot wide pieces and free of any hardware. Cutting tanks in this manner facilitates proper cleaning and inspection, reduces storage area, and allows for direct feed into the granulation machine. To be acceptable for recycling, plastic containers must be empty, clean, uncapped, and dry. To help store containers until pick up time, bags that hold 50 to 60 - 2.5 gallon containers are available for free upon registration.

Exact pick up dates at local sites will be available within the first weeks of June and October.

Please contact Elizabeth Bentley-Huber at Genesee County Soil & Water Conservation District at 585-343-2362 or at [Elizabeth.Bentley-Huber@ny.nacdnet.net](mailto:Elizabeth.Bentley-Huber@ny.nacdnet.net), or Tucker Kautz with Monroe County Soil & Water Conservation District at 585-473-2120 Ext.#108 for more information and registration.

*"CleanSweepNY Fall 2011 program will target the NYSDEC Region 8 counties: Chemung, Genesee, Livingston, Monroe, Ontario, Orleans, Schuyler, Seneca, Steuben, Wayne and Yates ."*



### Berry Diagnostic Tool

<http://www.fruit.cornell.edu/berrytool/>



## Pest Management Update (continued)

### Safe Pesticide Storage

Tips - *Diane Brown, Michigan State University Extension*

**C**heck your storage area to ensure you are taking advantage of these practices for best results

Here is a checklist for evaluating your pesticide storage area this spring:

- \* Whether your pesticide storage area is an entire building, a room, a closet or a cabinet devoted to pesticide storage, keep it locked to prevent unauthorized entry, vandalism or theft.

- \* Post warning signs on doors and windows to let people know that pesticides are stored inside.

- \* "No Smoking" signs should also be posted, since many pesticides are flammable.

- \* Regularly check containers for leaks. Transfer the contents of leaking containers to a sound container with the exact same formulation and label. Follow label recommendations for disposal of damaged containers.

- \* Store pesticides in their original containers with the labels intact.

- \* Put the heaviest containers and liquids on the lowest (preferably metal) shelves. Be sure that shelves are sturdy enough to handle the load.

- \* To avoid cross-contamination, store each type of pesticide (herbicides, insecticides, fungicides) in a separate location or on a separate shelf within the storage unit.

- \* Store pesticides away from food, pet food, feed, seed, fertilizers, veterinary supplies and flammable materials.

- \* Outdated or unusable pesticides can be taken to a community "clean sweep" day

for free, safe disposal. Check with your local county Extension office for a list of dates and locations.

### Time to Inventory Your Stored Pesticides - *Diane Brown, Michigan State University Extension*

**B**efore the growing season begins, take a look to ensure pesticides are stored properly and in good condition

Properly stored pesticides can have a storage life of several years, but pesticides do need to be protected from moisture and temperature extremes. Before the next growing season begins is a good time to take inventory of existing pesticides to evaluate their condition. Water or excess moisture can damage pesticides containers and their contents. Moisture can cause metal containers to rust and paper or cardboard containers to split or crumble. Dry pesticides stored under these conditions may cake or crumble. Slow release products may release their active ingredients.

To prevent water and moisture damage

- \* Keep containers securely closed when not in use.

- \* Place opened bags of dry formulations (wetttable and soluble powders, dry flowables and granules) into sealable plastic bags or clear plastic containers to reduce moisture absorption and prevent spills.

- \* A jug containing a liquid formulation may be set inside a plastic pan set on the shelf to contain leaks.

- \* Keep bags off the floor; store on plastic pallets.

- \* Place metal drums in a drum rack or on a plastic pallet. Direct contact with the floor may make drums more susceptible to rusting.

- \* Avoid locating a pesticide

storage facility in an area likely to flood or where runoff water can be a potential problem.

The normal temperature range for storing liquid pesticides is usually 40° to 100° F.

Protection from temperature extremes is important because either freezing or excess heat can shorten their shelf life and reduce effectiveness. Low temperatures can cause the product to break down or separate, or the container to rupture. If a pesticide has frozen, contact the manufacturer for specific advice on what to do. Heat expansion of containers may cause them to break or overflow. More specific storage requirements for individual products can be obtained by contacting the manufacturer.

To prevent damage to pesticides from temperature

- \* Water soluble packages may attract moisture and become brittle when frozen. Store them in a warm, dry place.

- \* Storage areas should be insulated or temperature controlled to prevent freezing or overheating.

- \* Exhaust fans vented to the outside can help reduce temperatures and remove vapors and fumes from the storage area.

- \* Avoid storing pesticides in direct sunlight to avoid overheating or degradation of products.



**PMEP**

Pest Management  
Education Program:

<http://pmp.cce.cornell.edu/>



**PIMS**

Product, Ingredient,  
and Manufacturer  
System:



<http://www.omri.org/omri-lists>



***Di sease Snapshot: Blueberry Scorch - Keri k Cox, Cornell Uni versi ty***



**Disease Name:** Blueberry Scorch

**Cause:** Blueberry Scorch Virus (BISScV)

**When to watch for it:** Bloom to fruit maturity

**First line of defense:** Remove affected plantings and re-plant elsewhere with clean stock. Do not neglect aphid management

**Summary:** Blueberry scorch is named for a symptom of Blueberry Scorch Virus (BISScV).

Flowers and young developing leaves on plants with high titers of BISScV will rapidly

become blighted 'scorched' at bloom (*top left*).

Necrotic flowers and leaves will initially be brown, but later bleach to an ashy gray color.

If infections are severe enough, young developing twigs may be killed outright.

Given that bloom in northern regions of the United States may often still coincide with spring freezes, BISScV symptoms can be confused with those of frost injury.

In certain cultivars, spectacular chlorosis and marginal necrosis patterns may be observed. (*bottom left*)

Infected bushes will have poor growth and fruit production, and may be killed.

BISScV is vectored by aphids and may spread rapidly throughout a planting or between neighboring plantings within a season. Hence, it's best to remove and burn the infected plantings, and replant elsewhere the following year with certified virus-free stock.

Do not neglect aphid management, but an aphid management program alone isn't sufficient to prevent infection or the spread of the virus.

***Watch for Early Season Blueberry Pests While Pruning - Greg Loeb, Cornell Uni versi ty***



**Insect Stem Gall**

**Symptoms-** Large bulbous galls form on the stems, often near the terminals. (*center left*) Larvae of a tiny flightless wasp cause these galls. This is a periodically important blueberry pest, particularly in young plantings still being trained. The adults overwinter in the galls (*top left*), emerge in early June, and crawl or hop to other stems to deposit eggs. Galls form around egg deposition sites. Infestations are usually localized, but may be extensive (50 to 70 galls per plant).

**Scouting/thresholds -** None established.

**Resistant cultivars -** None known.

**Cultural management a)** Hand picking (pruning out) and burning the galls when the leaves fall after harvest is the most advisable course of

action; b) prune out and burn all insect-infested or galled wood found during spring pruning. Repeat during the growing season as blighted tips appear.

**Conventional and Organic Products -** Wasp emergence is so protracted it is difficult to predict; chemical measures are of little use.

**Scale Insects**

**Symptoms-** A number of species of scale insects, including Oystershell and European lecanium scale, feed on the twigs and can greatly reduce plant vigor. Look for the hard-covered female scale insects on small branches early in the spring during pruning (*bottom left*).

**Scouting/thresholds -** None established.

**Resistant cultivars -** None known.

**Cultural management -** Good

pruning practices should reduce the likelihood of scale problems.

**Conventional products a).** oil - (6 gal/A). Apply a delayed dormant spray consisting of 2-2.5 percent oil, early in the spring during bud swell (after the bud scales start to expand, but before the first leaf stands out from the clusters). Thorough coverage is essential for good results. Apply in 250-300 gal of water/A, at a pressure of 300-400 psi.

**OR b) pyriproxyfen-** Esteem (5 oz/A). Apply as crawlers first appear in spring. If applied at delayed dormant period, use with spray oil.

**OR c).** \*bifenthrin- \*Brigade WSB (5.3-16 oz/A). Apply as crawlers first appear in spring. Note: Do not apply more than 0.5 lb active/A per season.

## *Pruning Red Raspberries – Marvin Pritts, Cornell University*

### Fall Red Raspberries

**T**o prune primocane-fruiting raspberries for a single late season crop, the canes need only be cut to the ground in early spring. New canes will grow each year and fruit in late summer, the canes will be cut early the following spring, and the cycle continues.

It is important to cut old canes as close to the ground as possible so that buds will break from below the soil surface. If canes are not cut low enough, fruiting laterals may form on any remaining cane portion. These fruiting laterals are not healthy; they are entry sites for insects and disease pathogens. Also, any fruits that form will most likely rot, attracting pathogens and creating a source of inoculum (disease-conducting material) for the late summer crop. All canes that are cut from the planting should be removed from the area and destroyed. In warm climates, the primocane crop can be delayed by mowing the young primocanes a second time when they are approximately 1 foot tall. Pinching the primocanes (removing the growing tip) in July to stimulate growth of laterals will also delay fruiting. This is sometimes done to delay harvest until after the intense heat of July.

The timing of cane cutting is also important. Carbohydrates move from plant leaves into the crown in autumn, and from the crown to the buds in early spring. If canes are cut before all the carbohydrates reach the crown in autumn, the new canes may not be as vigorous the following year. Canes can also be cut too late, after carbohydrates have moved into the buds. From December through February, most carbohydrates are in the crown, so this is the ideal time to cut canes.

Yield of primocane-fruiting types is influenced mainly by (1) the number of canes per unit area and (2) the number of berries per lateral. Growers can influence the number of canes produced by plants. Since large numbers of canes do not seem to decrease fruit size in the fall crop of primocane-fruiting raspberries, growers should try to produce as many canes per area as possible. This can be done by planting narrow rows and more rows per acre. Row widths of 12-18 inches are considered ideal for harvesting. The distance between rows should be wide enough to allow available equipment to pass. The other factor influencing yield, the number of berries per lateral, generally depends on the particular cultivar being grown. The grower has little control except to choose productive cultivars.

### *Summer Red Raspberries*

**A** conventional system is traditionally used by bramble growers in the Northeast where there is no mowing or suppression of primocanes. Primocanes emerge and are permitted to grow throughout the season. The following year, they become floricanes, flowering and fruiting as new primocanes. Immediately after fruiting, however, the floricanes are cut at ground level and destroyed. Some carbohydrates are lost by cutting canes in summer. However, this loss is offset by the advantages of reduced disease inoculum and a reduction in dormant season pruning. In early spring, all remaining canes are topped (headed back) to a convenient height for picking, since little vegetative growth occurs in the second season. Canes are thinned to a desired number, usually 3-4 canes per square foot. When thinning, the most vigorous canes should be selected to produce the next crop -- those with good height, a large diameter, and no visible symptoms of disease, insect damage, or winter injury.

Productivity in summer-fruiting red raspberries is most closely related to the number of canes. Unlike the situation with primocane-fruiting raspberries, however, fruit size decreases as cane numbers increase. Growers must maintain a high number of canes, but not high enough to greatly reduce fruit quality. In general, 3-5 large canes per linear foot of row is the optimal range with a plant row width of 12-18 inches.

On summer-fruiting raspberries, buds at the top of a cane often winter kill because they are less mature and less hardy than buds lower on the cane. Spring pruning should be delayed until winter injury on canes can be identified, usually by mid-March. Canes should be topped as high as the trellis and harvest operations will permit, but below the point of winter injury. Severe topping will increase fruit size but will greatly reduce yield. To prevent a loss in yield, no more than the top one-fourth of a cane should be removed.

After pruning, canes are tied loosely to the trellis wire to prevent wind damage of laterals after bud break. Canes should be spaced evenly along the trellis wire, or equally divided and spread between sides of a V-trellis.

Tipping (pinching off the tips) of red raspberry primocanes during the growing season to promote lateral growth is not recommended in the Northeast. This procedure slows cane development, does not stimulate much branching, and makes the plant susceptible to winter injury.

## Variety Spotlight: Strawberries



Pam Fisher is berry crop specialist for the Ontario Ministry of Agriculture, Food and Rural Affairs, based in Simcoe, Ontario. She works with growers, researchers, industry, and other OMAFRA specialists to bring new technology and information to producers. She is editor of the Ontario Berry Grower newsletter, and Ontario Fruit Production Recommendations.

**New Series Of Strawberry Cultivars From University Of Guelph** - Pam Fisher, Berry Crop Specialist, OMAFRA

(Source: Ontario Berry Grower, March 2011)

**Variety Spotlight: Strawberries** - Courtney Weber, Cornell University

**A**t the Ontario Berry Growers Association 2011 Annual Meeting, Dr. Adam Dale announced the release of a new June-bearing strawberry cultivar, and new names for two previously released cultivars. The newest in this series, is 'Summer Ruby'. This variety was tested as 2V55, and released in February 2011. 'Summer Ruby' is a firm, large-fruited, early-midseason cultivar.

'Itasca' (tested as MNUS138) was released in 2005 by the University of Minnesota and USDA-ARS. It is a cross between 'Seneca' and 'Allstar'. 'Itasca' fruits in the early to early mid-season. It produces medium large berries for the early season that are round-conic to blunt wedge in shape. The fruit is firm, with a light red exterior color similar to 'Allstar' and orange red flesh. It has good flavor and yields. 'Itasca' is resistant to red-stele, and its foliage is highly resistant to mildew.

'Winona' seems especially sensitive to boron deficiency which can cause poor pollination and deformed fruit. It is suitable for you-pick and pre-picked on-farm sales. 'Winona' is similar to 'Jewel' in season. It is a very disease resistant and cold hardy variety.

**Best use:** U-pick and on farm pre-pick sales in the mid-season with 'Jewel', especially in sites with heavy disease pressure.



Previously released cultivars V151 and R14 have also been renamed. V151, released in 2007, will now be known as 'Summer Dawn'. 'Summer Dawn' is an early variety, slightly ahead of Annapolis in season. It is firm, bright-red, and conical in shape, with high yields.

**Best Use:** 'Itasca' is best suited to the early mid-season similar to 'Honeoye', especially in sites with heavy red stele pressure.

'Mesabi' (tested as MNUS 248) was released in 1997 by the University of Minnesota and USDA-ARS. 'Mesabi' resulted from a cross of 'Glooscap' x MNUS 99. 'Mesabi' is a mid-season berry ripening with 'Glooscap', 'Cavendish', and 'Kent'. 'Mesabi' produces large firm berries that are red all the way through with excellent flavor. It is a very winter hardy variety with excellent disease and root rot resistance.

**Best Use:** On-farm sales and local markets in far north locations and sites with heavy disease pressure.



'Summer Rose' Strawberry

Photo courtesy: B. Hughes, University of Guelph, New Liskeard

R14, released in 2009, will now be known as 'Summer Rose'. The variety is the latest of the three, similar in season to Serenity. Although slightly smaller but better quality compared to Serenity, Summer Rose is a large, red berry with good but moderate yields.



'Summer Dawn', 'Summer Ruby', 'Sapphire' (released in 2003), and 'Summer Rose' provide growers with four June-bearing, high quality strawberry varieties which are early-, mid-, late-mid- and late-season respectively.

'Winona' (tested as MNUS 210) was released by University of Minnesota and USDA-ARS in 1996. It's a cross of 'Earliglow' x MNUS52 ('Lateglow' x MDUS 4616) and is a late-season, June-bearing strawberry. 'Winona' ripens later than 'Kent', and 'Glooscap' and similar to 'Lateglow'. 'Winona' produces very large, firm fruit with a bright orange-red skin and flesh. It has a smooth, creamy texture and moderately intense but classic strawberry flavor.

The Ontario Berry Growers Association holds the rights to these varieties and they are all available from Strawberry Tyme Farms.

Ontario Berry Grower

<http://www.omafra.gov.on.ca/english/crops/hort/news/>

## Variety Spotlight: Blueberries – Cathy Heidenreich, Cornell University

'Nelson' Blueberry is an excellent late season variety suitable for machine harvest.

Released in 1988 by USDA, it is the result of a cross between 'Bluecrop' X G-107(F72 x 'Berkley').



(Photo: Nelson/© T. Kusibab, Agro-Partners)

'Nelson' is productive with

firm, attractive, good flavored fruit that can be machine harvested. The large, light blue fruit with small fruit scars hang on the bush for extended periods without deteriorating.

'Nelson' is a vigorous, upright, open, hardy bush with wide soil adaptation. Zones 4-7.

'Elliott' Blueberry is a very late season blueberry released in 1973.

It's parentage is 'Burlington' x ['Dixi' x ('Jersey' x 'Pioneer')].

For the last decade, 'Elliott' has been the leading late season blueberry for the fresh market. It is used extensively in controlled atmosphere storage programs to extend shelf life for up to 8 weeks.

The mild flavored, medium

sized, powder-blue fruit is firm but can be tart.

'Elliott' is a good producer with an upright bushy growth habit and is suitable for machine harvest.

It has some resistance to mummy-berry. Zones 4-7.



(Photo courtesy Miller Nursery)



'Titania' Black Currant

Photo courtesy:

[Spaulding Plant and Bulb Company](#)



'Captivator' Gooseberry

Photo courtesy:

[Veseys](#)

## Variety Spotlight: Ribes – Steven McKay and Cathy Heidenreich, Cornell University

'Blanka' is a late season white currant released in Slovakia in 1977. It is a result of a cross between 'Heinemann's Rote Spatlese' and 'Red Lake'.

'Blanka' is very reliable and easy to grow, having very heavy yields, good shelf life, and very long fruit clusters. The fruit is large, opaque, off-white.

'Blanka' shows some resistance to spring frost as it flowers mid-spring. It is very vigorous with a somewhat spreading growth habit.

'Blanka' has attractive green and red foliage.

Best Use: fresh fruit, juice, winemaking.

Bred in Ottawa Canada in 1935, 'Captivator' gooseber-

ry is a cross of American and European cultivars (*Ribes hirtellum* x *Ribes grossularia* var. *uva-crispa*).

It shows good resistant to powdery mildew and leaf spot, making it one of the most promising gooseberries for commercial production.

'Captivator' has sweet, pinkish red, medium-sized, smooth, teardrop-shaped fruit with good flavor. Fruit ripens mid-season over a period of 2 to 3 weeks.

The plant is very hardy, moderately vigorous, upright, and nearly thorn-less, with moderate to heavy yield.

Best Use: fresh fruit, jams, jellies.

Developed in Sweden in the 1980's, 'Titania' black currant (US Plant Patent No. 11,439) (Altajskaja Desertraja x [Consort x Kajaanin Musta] – Tamas) is immune to white pine blister rust and has good resistance to powdery mildew.

'Titania' fruits mid-season over an extended period of time, producing large fruit, similar to 'Ben Lomond'. Fruit quality is good and yields are high. Flowering and ripening seasons are very similar to 'Ben Lomond'.

The plant is very vigorous - reaching heights of 6 feet. 'Titania' reaches full maturity in three seasons as opposed to four or five with most other popular varieties.

Best use: Machine harvest; juice, jams, jellies.



'Blanka' White Currant

Photo courtesy:

[Thompson Morgan](#)

**About the Author:**

Steve Reiners is an Associate Professor in the Department of Horticultural Sciences at Cornell University in Geneva, NY. He came to the Experiment Station in 1994 and his program focuses on soil fertility and general vegetable culture.

*"When using mulch,  
think "Fertilized  
Mulched Acre" or  
FMA."*



## SAVING YOUR FERTILIZER DOLLAR, REVISITED – Steve Reiners, Cornell University

*(Editor's note: This is a revision of an article first shared with us by Steve in 2008 when fertilizer prices in the US began to rise significantly; he recently revised it to reflect possible impacts on the 2011 production season)*

The cost of fertilizers has reached record levels this spring. Compared to a year ago, price per ton of urea is up \$76, DAP \$209, MAP \$207, Potash \$83, UAN \$90, and Anhydrous \$261. There are several factors that are causing the rise. High grain prices are resulting in increased plantings in 2011, which puts more demand on fertilizer. Mideast political instability has impacted the importation of urea, as Egypt has become a major exporter. Finally, China has imposed high fertilizer export tariffs. Growers can visit this website, [http://www.ams.usda.gov/mnreports/gx\\_gr210.txt](http://www.ams.usda.gov/mnreports/gx_gr210.txt), maintained by the USDA-Illinois Dept. of Ag, to monitor prices. By monitoring price trends growers may find a window when prices are lowest.

With costs skyrocketing, berry growers are rightfully asking how they can maintain yields and save on their fertilizer bill. Here are some suggestions.

**1) Soil test.** Not only does this reveal the soil's nutrient status, it will let you know if your pH is optimum. For most berry crops, the ideal soil is a well-drained, sandy loam with a pH of 6.2 - 6.8 and a moderate to high organic matter content (>3%). For blueberries, the ideal pH is between 4.2 and 4.8 and the ideal soil is a loamy sand with high organic matter (>4%). Planting in soils with a pH out of the preferred range will result in poor nutrient uptake by the target crop. Be sure to modify the pH with lime or sulfur to ensure that the appropriate range is obtained. Agro One is now handling soil testing previously done by Cornell. For more information visit their website at <http://www.dairyone.com/AgroOne/default.htm>.

**2) Take nitrogen credits.** Cover crops, manures, previous crops and even the soil organic matter (SOM) provide nitrogen. Figure about 20 pounds of N for every one percent SOM. A legume cover crop incorporated prior to planting will likely give 40 pounds of N minimum, with two to three times that amount in a well-established, legume sod. Even that field of cereal rye that was planted last fall has N in it, scavenged from last year's applications. Figure on 10-20 pounds of N once the rye begins to break down.

**3) Don't apply N preplant.** For nitrogen management growers must continue to rely upon scheduled fertilizer applications as large fluctuations in N that occur from week to week make estimating its availability with soil test and even leaf analysis of limited value. See tables 1 and 2 below for timing and amount of N necessary for berry crop production.

**4) Don't let N blow in the wind.** Broadcast applications of urea or ammonium based fertilizers have an increased chance of being lost through volatilization than do incorporating or knifing these same products into the soil. Any tillage or applicator that puts the nitrogen in the soil rather than on the soil improves efficiency of the nutrient. Applying N through drip irrigation systems or covering fertilizer with mulch is an easy way for berry growers to reduce volatilization.

**5) Use foliar testing to promote best nutrient efficiency.** Foliar tissue testing is the most reliable way to measure a plant's nutrient load. Using a combination of soil testing, tissue analysis, scheduled fertilizer applications and observation of crop response is currently a grower's best approach for managing nutrients in berry fields.

**Strawberries:** Collect 30 leaflets after renovation in July or August.

**Raspberries:** Collect 30 newly expanded leaflets from primocanes in early August.

**Blueberries:** Collect 30 newly expanded leaves from well-exposed branches in late July.

**Currants and Gooseberries:** Collect 30 newly expanded leaves from well-exposed branches in late July

**Cranberries:** Collect upright tips only ( no more than top 2" of growth), mixing flowering and vegetative uprights for about 1 cup material between mid-August and mid-September.

**Juneberries:** Collect 30 newly expanded leaves from well-exposed branches in early August.

Contact Agro-One for detailed instructions, submission forms, and fees for leaf analysis.

**6) Reduce tillage.** The quickest way to burn off organic matter is with conventional tillage. This puts lots of oxygen into the soil and microbe populations explode, at the expense of SOM. The perennial nature of berries and their relatively shallow roots makes cultivation a poor choice for weed control in berry crops; if you are using cultivation as a means of controlling weeds, you might want to reconsider.

## SAVING YOUR FERTILIZER DOLLAR, REVISITED—(continued)

7) **Don't over apply P.** If your soil level is high and you are planting when soils are still cool, use no more than 20 pounds of actual P/A as a starter. This will help the plants get established until soil P becomes available as the soil warms in the spring. If planting in warm soils after June 10 on high P soils, no additional P may be needed. For transplants on plastic mulch, a high P soluble fertilizer in the transplant solution may be enough on high P soils.

8) **Fertilized Mulched Acre.** When using mulch, think "Fertilized Mulched Acre" or FMA. Let's say you are planting on 5 foot centers, with the plastic mulch covering 3 feet and bare ground between the rows covering 2 feet. To figure the FMA, take the area of soil covered by mulch (3') and divide by the row center distance (5'), which gives 0.6 or 60%. If the soil test calls for 100 pounds of actual N per acre, you can cut this amount to only 60 pounds if you apply the N only to the area covered by the mulch. In this situation, you are only applying fertilizer where it will be used by your crop, not by weeds or ground cover growing between rows.

9) **Soak up residual N this fall.** Planting a rye (or rye/vetch) cover crop after removing a planting can hold on to nitrogen that would otherwise be lost. Tilling in the cover crop next spring will return that captured N to the soil surface.

Table 1. Nitrogen guidelines for berry crops. (Source: 2011 Cornell Pest Management Guidelines for Berry Crops)

Crop	Age of planting	Amount/ <i>timings</i> (actual N)	N source	Comments
<b>Strawberries</b>				
	0	30 lb/A, <i>early June</i> 30 lb/A, <i>early Sept</i>	calcium nitrate ammonium nitrate or calcium nitrate	Be sure plants are growing well prior to application.
	1+	70 lb/A, <i>at renovation</i> 30 lb/A, <i>early Sept</i>	ammonium nitrate, urea, calcium nitrate	Adjust fall amount based on leaf analysis.
<b>Raspberries and Blackberries (summer-bearing)</b>				
	0	25-35 lb/A, <i>4 weeks after planting</i>	calcium nitrate	Avoid touching plants with fertilizers after planting.
	1	35-55 lb/A, <i>in May or split between May and June</i>	urea or ammonium nitrate	Use higher amount on sandier soils or if irrigation is used.
	2+	40-80 lb/A, <i>in May or split between May and June</i>	urea or ammonium nitrate	Use higher amount on sandier soils or if irrigation is used.
<b>Raspberries (fall-bearing)</b>				
	0	25 lb/A, <i>4 weeks after planting</i>	calcium nitrate	Avoid touching plants with fertilizers after planting.
	1	50-80 lb/A, <i>split between May and June</i>	urea or ammonium nitrate	Use higher amount on sandier soils or if irrigation is used.
	2+	70-100 lb/A, <i>split between May and June</i>	urea or ammonium nitrate	Use higher amount on sandier soils or if irrigation is used. Adjust with leaf analysis.
<b>Blueberries</b>				
	0	Do not fertilize newly planted blueberries		Soil should be adjusted to pH 4.5 prior to planting.
	1	15 lb/A, <i>split between May and June</i>	ammonium sulfate or urea	Use ammonium sulfate where soil pH is >5.0.
	2	20 lb/A, <i>split between May and June</i>		
	3	25 lb/A, <i>split between May and June</i>		
	4	35 lb/A, <i>split between May and June</i>		
	5	45 lb/A <i>split between May and June</i>		
	6	55 lb/A <i>split between May and June</i>		
	7+	65 lb/A <i>split between May and June</i>		

**SAVING YOUR FERTILIZER DOLLAR, REVISITED**—(continued)

Table 1. Nitrogen guidelines for berry crops. (Source: 2011 Cornell Pest Management Guidelines for Berry Crops)

Crop	Age of planting	Amount/ <i>timings</i> (actual N)	N source	Comments
<b>Currants and Gooseberries</b>				
	0	25 lb/A, <i>4 weeks after planting</i>	calcium nitrate	
	1	50-80 lb/A, <i>split between May, June, August</i>	calcium nitrate	
	2+	70-100 lb/A, <i>split between May and early August</i>	calcium nitrate	
<b>Elderberries</b>				
	0	Do not fertilize newly planted elderberries.		
	1+	Apply 1/8 pound of ammonium nitrate for each year of the plant's age, up to one pound per plant. or Apply 0.5 lbs. 10-10-10 for each year of the plant's age, or up to 4 lbs. 10-10-10.	Ammonium nitrate or 10-10-10	In spring, spread fertilizer with a spreader in bands one foot wide along both sides of the rows.
<b>Cranberries</b>				
All varieties	0	50 lb/A	Alternate N-only products with N-P-K products with a 1:1:1 ratio	Use frequent applications (every 2-3 weeks) of 5-10 lb/A until late summer to promote good runner growth.
Small-fruited varieties (i.e. 'Early Black', 'Howes')	1+	20-30 lb/A*, split between roughneck (20-25%), bloom (30-35%), and fruit set (30-35%) growth stages	Ammonium nitrate	Wait to make first split application until soil temperatures are between 50 to 70°F**
Large-fruited varieties (i.e. 'Stevens')	1+	30-60 lb/A*, split between roughneck (20-25%), bloom (30-35%), and fruit set (30-35%) growth stages	Ammonium nitrate	Wait to make first split application until soil temperatures are between 50 to 70°F**
<b>Juneberries</b>				
	0	25 lb/A, <i>4 weeks after planting</i>	calcium nitrate	Avoid touching plants with fertilizers after planting.
	1	50-80 lb/A, <i>split between May and June</i>	urea or ammonium nitrate	Use higher amount on sandier soils or if irrigation is
	2+	70-100 lb/A, <i>split between May and June</i>	urea or ammonium nitrate	Use higher amount on sandier soils or if irrigation is used. Adjust with leaf analysis.

\*Rates > 40lb/A actual N should be used with caution to prevent vine overgrowth and reduced fruit set. Rates may need to be adjusted based on soil type and temperature, soil and tissue analysis results, and observations of plant growth and appearance.

\*\*If soil temperatures exceed 70°F and air temperatures exceed 70°F, reduce, delay, or omit N applications.

For more information on cranberry fertilization or other aspects of cranberry production consult: "Cranberry Production A Guide for Massachusetts", available from the UMASS Cranberry Station, College of Natural Resources and the Environment, East Wareham, MA.



## SAVING YOUR FERTILIZER DOLLAR, REVISITED—(continued)

Table 2. Nitrogen sources and calculation of actual N.. (Source: 2011 Cornell Pest Management Guidelines for Berry Crops)

Fertilizer	% actual N in fertilizer
Ammonium nitrate	34.0
Ammonium sulfate	20.5
Calcium nitrate	15.0
Diammonium phosphate	17.0
Potassium nitrate	13.0
Urea	46.0

To calculate the actual amount of fertilizer to apply, divide the desired amount of actual N by the percent N in the fertilizer and then multiply the result by 100. Apply the total amount of fertilizer in a 3-foot band in the row (1 foot band over the row for strawberries).

Example: Calcium nitrate, actual N 30 lbs/A on strawberries

Calculation:

$$\frac{30 \text{ lbs/A actual N}}{15 \text{ percent N in calcium nitrate}} \times 100 = 200 \text{ lbs/A calcium nitrate}$$

## STRAWBERRY MULCH REMOVAL TIME— Bob Tritten, Michigan State University

I am frequently asked by strawberry growers when is the right time or exact date to remove straw mulch from matted row strawberry beds. Straw is frequently used to prevent winter injury in strawberry beds. With our late spring this year it is particularly hard to zero in on this important cultural practice.

The best method I can recommend for the proper timing for mulch removal is to look for the beginning of leaf growth. Strawberry growers will need to inspect their fields. Randomly pick several spots in a field and pull the straw off of two feet of row. If you see newly emerging leaves (they may be a yellow color) that are beginning to grow from the crown of the plant, generally that is telling you that the strawberries are ready to begin growth for the season and that straw needs to be removed. I would check this in about 10 to 15 spots in the field. Concentrating on the earlier fruiting strawberries is usually a technique that will help to pinpoint straw removal. If you are on heavy soil and your soil has not dried yet, wait for a cold morning when there is a crust on the soil surface to reduce soil compaction

The typical time for removing straw in Michigan is mid to late March for the lower half of the lower peninsula, mid to late March for the northern half of the lower peninsula, and in the upper peninsula most likely early April. Strawberries growing close to Lake Michigan may also be uncovered a bit later than inland sites. Before you remove straw, check the forecast, if cold weather is predicted, you can delay a few days.

The earlier you remove the straw mulch, the earlier fruit will mature. Early growth may also necessitate more frost protection. In a really late spring like we are having in 2011, there is also a danger of leaving straw on too long. A study was conducted a number of years ago in New England where straw was removed periodically over a six week period. The highest yields came from plants that were uncovered earliest in spring as was practical, following either snow melt or ability to move straw removal equipment through the field without creating ruts. The later the straw was removed the more yield was reduced.

I also suggest that a light layer of straw be left on the plants. This layer would be about an inch thick. Leaves and flowers can grow up through this thin layer. Many times this will help to reduce disease problems later in the season, and will also help prevent some weed seeds from germinating if bare soil is exposed to sunlight. Lastly, mulch removal just prior to a rain event helps the plants respond well and keeps the mulch in place. (Source: [MSU Extension News for Agriculture](#))

**Pruning at a Glance:****Blueberries**

Plant Stage	Pruning suggestions
1-2 year old plantings	Little pruning required. Promote vegetative growth by rubbing off flower buds in March or April. Alternatively prune off shoot tips where flower buds are located.
3 year old plantings	If more than 2 new canes were produced previous year, leave the two healthiest new canes; remove the remaining new canes.
3-8 year old plantings	Continue light pruning, leaving the 2-3 best new canes from previous season, until plants reach full size. Eight year old plants should have 10-20 canes of various ages.
> 8 year old plantings	Annual removal of 8 year old canes. In general, 20% of older wood (one out of every six canes) may be removed without reducing yield. Berry number may be lower but fruit will be larger in compensation.
Planting needing rejuvenation	<b>Strategy 1:</b> Remove old, unproductive canes, leaving 2 or 3 older canes and all younger canes. The following years, remove up to 20% older wood until new cane growth occurs. Keep 2-3 new canes and continue to remove 20% oldest canes. <b>Strategy 2:</b> Cut all canes to ground level (delays harvest 3 years). Thin new canes to most vigorous 6-10 canes. <b>Strategy 3:</b> Summer hedge immediately after harvest; selectively remove dormant canes.

(Source: NIAES-55 Highbush Blueberry Production Guide)

## MARCH/APRIL BERRY BAROMETER – Cathy Heidenreich, Cornell University

Welcome to another year of the berry barometer. This series provides a month-by-month review of cultural and pest management considerations for various berry crops during the growing season to help keep you up to the mark. Management considerations are categorized first by berry crop and then by new or established planting.

### ALL BERRY CROPS:

#### *Established plantings:*

**Pruning** - Pruning should be approaching completion by now for berry crops in most areas. Finely chop brush in place or remove and burn it.

**Weed management** using Casoron 4G – In blackberry, raspberry, and blueberry plantings with nutsedge, and some stubborn perennial broadleaf weeds, Casoron 4G must be applied before soil temperature exceeds 45°F at 100 lb./acre for annual broadleaf and grass weeds, and 150 lb./acre for perennial weeds. (Source: D. Breth, *Fruit Notes Vol.11, No.4 March 9, 2011*)

**Drainage** - In berry plantings where water is standing, evaluate drainage systems and the need for treatment of Phytophthora root rot using Ridomil band application before growth begins in blueberries, and raspberries, before bloom in strawberries. (Source: D. Breth, *Fruit Notes Vol.11, No.4 March 9, 2011*)

**Pest management** – Perform routine sprayer maintenance, check for worn nozzles and replace as needed, do calibrations. Review last year's records for problem pests and pest locations. Were the products used successful? Should you start scouting sooner this year? Or make the first application at a lower threshold? Check product labels for efficacy against target pests. Order products as needed.

**Berry product update 2011** – See the February 2011 NYBN issue for details (<http://www.fruit.cornell.edu/nybn/newslettpepdfs/2011/nybn1002.pdf>).

**Irrigation systems** - Check for problems and/or leaks. Make any adjustments or repairs as needed.

**Trellis/fencing** – Examine existing trellis/fencing for problems; make needed adjustments or repairs.

#### *New plantings:*

**Plant materials** – Did you remember to order your plants? Check the 2011 Cornell nursery guide for sources if you still need to do so (<http://www.fruit.cornell.edu/berry/nurseries/>). This year's guide has been updated and expanded to include Juneberries. Verify you indicated a shipping date for plants that will allow you to plant as soon as the soil can normally be worked or danger of frost is past.

**Final site preparation** – Hopefully you did your site preparation homework! Depending on the crop this should start 1-3 years in advance of planting for best success. Remember to till under legume cover crops no less than 1 month before planting. Pre-plant herbicide applications are a big help in controlling perennial weeds in new plantings. Roundup is one alternative for this application. Remember Roundup applications need to be made 30 days before planting. Follow label instructions carefully. After weeds die, till to prepare for planting. Amend soil as recommended from your soil test results. Be sure to incorporate amendments to a depth of at least 8" prior to planting. Do a final soil fitting just prior to planting. Purchase seed for sod truck rows or planting borders.

**Irrigation systems** -Do you have sufficient irrigation supplies on hand to begin irrigating immediately after planting? This helps to settle soil around roots, reduce transplant shock, and promote establishment.

**Trellis/fencing** – Purchase needed materials and supplies. Install new structures for 2010 plantings.

### STRAWBERRIES:

#### *Established plantings:*

**Straw mulch removal** - Late March is typically the time for removing straw mulch depending on your growing region.

**Frost control** – Last year's early season warm up caught some growers off guard. Have frost protection ready to go and monitor temperatures closely. Frost free dates for much of the state fall between May 15<sup>th</sup> and 30<sup>th</sup>; what about your area?

**Spring weed control** – *Chateau SW*, *Chateau WDG* may be applied pre-emergence to dormant strawberries.

**Leaf spot diseases** – An early season application is recommended in plantings where leaf

## MARCH/APRIL BERRY BAROMETER –(continued)

disease was pressure was high the previous growing season and conditions are favorable for disease development. Control options include *Cabrio*, *Captan*, *copper*, *Pristine*, *Rally*, *Topsin M*.

### New plantings:

**Plant materials** – Check strawberry plants on arrival to be sure they are in good condition; moisten as necessary. Keep dormant runner plants in cold storage (30 to 32°F) in plastic bags if they cannot be planted immediately.

**Preplant weed management** – *Chateau*, *Goal 2XL*, or *Round up* 30 days before planting. *Prowl H2O* 24 hrs prior to planting.

**Final site preparation** –

- Do final fitting of planting. If planting into killed sod, do not till.
- Build raised beds if desired; 8-10" high x 24" wide.
- Lay out the field prior to planting day.
- Stake rows with wire flags.
- Check your row spacing to allow for easy equipment movement and access later on.

**Plant spacing** – In-row spacing for matted rows 18-24"; between-row spacing 48-52 inches, depending on equipment size.

**Planting** –

- If using biodegradable mulch, lay 1-2 days prior to planting. Apply at slightly looser tension than conventional plastics. Do not apply at temperatures above 80°F.
- If you use a mechanical planter, have it tuned up and ready to go.
- Place roots in water ½ to 1 hour before planting. Keep plants moist during the planting process.
- Plants should be set with the center of the crown level with the soil surface.
- Check planting depth after planting; firm soil around plants.
- Irrigate immediately to settle soil around roots and reduce transplant shock.
- *Aim EC*, *Aim EW* for weed management within 24 hrs after planting.

### BLUEBERRIES:

#### Established plantings:

**Spring weed control** – Spring pre-emergent options include *Aim*, *Callisto*, *Casoron*, *Devrinol*, *Sinbar*, *Surflan*, *Princep*, or *Velpar*. Post-emergent options include *Gramoxone Inteon* or *Scythe* which should be used before new cane emergence.

**Freeze damage** – We are entering the danger zone where spring weather may fluctuate extremely between hot and cold. Take precautions whenever possible. For an excellent MSU pictorial guide on blueberry growth stages and temperature damage thresholds go to: <http://www.blueberries.msu.edu/pdf/growthstages.pdf>.

**Canker Diseases** - The time for delayed dormant (as leaf buds begin to break) applications of lime sulfur or copper for problem locations is approaching. Do not apply sulfur within 2 weeks of an oil spray or when temperatures are above 75°F to avoid phytotoxicity.

**Scale insects** - Problems with scale insects last season? Apply an *oil spray* (2-2.5%) during bud swell (after bud scales start to expand, but before first leaf stands out from clusters). Apply in 250-300 gal water/A at 300-400 psi for thorough coverage. Oil may be tank mixed with *Esteem* (5 oz/A) at delayed dormant.

#### New plantings:

**Plant materials** - Two-year old bare root or potted plants are generally the best buy.

- Potted plants are more expensive than bare-rooted plants but many growers find they establish more quickly.
- Verify you indicated a shipping date for plants that will allow you to plant as soon as the soil can normally be worked and danger of spring frost is past.
- Check blueberry plants on arrival to be sure they are in good condition; moisten as necessary. Keep bare-rooted plants in cold storage (30 to 32°F) in plastic bags if they cannot be planted immediately. Containerized plants may be kept out doors until planting; keep them well watered.
- If potted plants are used, check to see if they are pot bound. If so, the root ball should be cut before planting to ensure good root spread and branching. Remove the plant from the pot and lay it on its side. Cut through the root ball perimeter 4-6 times, rotating the plant between each cut.
- Plant, gently spreading roots out along cuts. Firm soil around the plants.

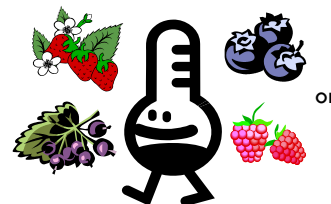
**Preplant weed management** –*Round up* 30 days before planting.

**Final site preparation**

- Do final fitting of planting.
- Layout planting; flag rows. Plow a very shallow furrow setting dormant canes, root cuttings plug plants into.
- Prepare raised beds if desired; 10-12" high x 4-6' wide at the base.

**Plant spacing** –

Spacing should be 4-5 feet in-row and 10 ft. between rows

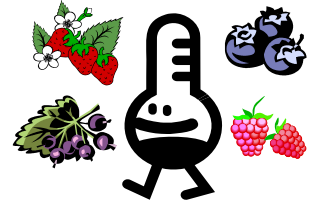


**MARCH/APRIL BERRY BAROMETER – (continued)**

PYO rows should be 200 ft. or less in length.

**Planting –**

- Prepare raised beds if desired; 8-12" high and 4 ft. wide.
- Wait to plant until severe freeze danger has past.
- Saturate peat bales and allow them to soak several days before planting.
- Layout the planting, flagging plant locations,
- Moisten roots ½ to 1 hour before planting.
- Planting holes need to be more wide than deep, to allow the roots to be spread out at planting. Incorporate approx. 1 gal peat moss into planting hole soil and back fill with the soil/peat mixture.
- Set plants at the same depth they were planted at in the nursery. Spread out roots.
- Fill hole with peat soil mix. Firm soil around plants.
- Irrigate immediately after planting (1" water) to settle soil around roots.
- Mulch with wood chips, sawdust or other materials.
- Remove at least 1/3 of top growth of newly set plant and rub off any flower buds to promote establishment and reduce transplant shock.
- Plant sod alleys or clean cultivate between rows.

**RASPBERRIES AND BLACKBERRIES:***Established plantings:*

**Assessing Cold Damage In Caneberries:** Michele Warmund, Horticulture professor at the University of Missouri and Dr. Bernadine Strik, Horticulture professor and berry extension specialist at Oregon State University suggest this simple method:

1. Put cane/branch sections in a Ziploc bag and store at room temperature for 4-5 days.
2. Then cut and check for injury symptoms.
3. Usually after 4-5 days the dead tissue, whether buds or vascular tissue, will have oxidized & turned brown.
4. For more information and photos: <http://www.berriesnw.com/SFU/2011/SFUdocs11/ColdDamageCane01-14-11.pdf>.

(Source: *Peerbolt Crop Management Small Fruit Update*)

**Spring weed control** - Pre-emergent herbicide options for spring include *Devrinol*, *Princep*, *Sinbar*, *Solicam*, or *Surflan*. Post-emergent options for spring include *Aim*, *Scythe* and *Gramoxone Inteon* applied before cane emergence.

**Cane Diseases** - Delayed dormant application of lime sulfur or copper may be beneficial in plantings with a history of disease.

Applications should be made on a calm day with sufficient water to soak canes completely. **Caution:** Sprays applied after ½" green tip may burn leaves, particularly in warm weather. **Note:** A delayed dormant application is not necessary for fall-bearing raspberries if last year's canes were mowed and removed or thoroughly shredded.

*New plantings:*

**Plant materials** – Check plants on arrival to be sure they are in good condition; moisten as necessary. Keep dormant canes at 35°F in plastic bags if canes cannot be planted immediately.

**Preplant weed management** – Round up 30 days before planting.

**Final site preparation**

- Layout planting; flag rows. Plow a very shallow furrow setting dormant canes, root cuttings or plug plants into.
- Do final fitting of planting; do not till if planting into killed sod.
- Prepare raised beds if desired; 10-12" high x 4-6' wide at the base.

**Plant spacing –**

- Red raspberries – 2-3' in-row spacing, 9-10ft between-row spacing. Cultivars that sucker vigorously should be set at the 3 ft. spacing; those that produce fewer suckers should be set at the 2 ft. spacing.
- Black raspberries - 3-4 ft. in-row spacing, 9-10ft between-row spacing.
- Purple raspberries - 3-5' in-row spacing, 9-10ft between-row spacing.
- Thorny blackberries - 3-4' in-row spacing, 9-10ft between-row spacing.
- Thornless blackberries - 4-5' in-row spacing in a hill system, 9-10ft between-row spacing.

**Planting -**

- *Dormant canes:* Do not allow roots to dry out before planting. Hold Plant by hand or machine to the same depth as canes were set in the nursery. Be sure plants are set vertically and not at an angle for best growth. Prune back to a height of 5" immediately. Prune back to soil level after new shoots emerge from soil.
- *Tissue culture plug plants:* Delay planting of tissue culture plug plants until all danger of spring frost is over. Apply water to transplant holes. Cover the top of the root ball with field soil to a depth of ¾ ". Firm soil around plug plant. Avoid herbicide applications or soil disturbances.
- *Root cuttings:* Raspberry root cuttings should be of variable length and 1/10" or larger in diameter. Plant root cuttings about 3" deep with approx. 2 ounces of root per hill or 3 feet of hedgerow. Blackberry root cuttings should be 3/8 to 5/8" in diameter

## MARCH/APRIL BERRY BAROMETER –(continued)

and 6" in length.

- After planting, a light layer of straw mulch will help reduce weeds and retain moisture. *Remember mulch is applied the planting year only.*
- Irrigate immediately after planting.
- Plant sod alleys or clean cultivate between rows.

### CURRANTS AND GOOSEBERRIES:

*Established plantings:*

**Spring weed control** - Product options include *Aim, Devrinol, Rage, Surflan, Gramox-one Inteon, or Scythe.*

#### Pruning

**Powdery mildew** – Powdery mildew overwinters on currant and gooseberry twigs.

Initially, white powdery patches of mycelium and spores appear on the leaves and shoots in early spring. In plantings where disease historically occurs, apply the first spray before disease onset. Conventional control options include *Rally, Cabrio, JMS Stylet Oil* or *Sulfur*. Organic options include *Organic JMS Stylet Oil*.

**Scale Insects** – If scale were a problem last season, the recommendation is a *dormant crop oil spray* (4 gal) in 10 gal water applied before the buds swell and burst in the spring.

**Currant stem girdler** - Currant stem girdler is a sawfly that emerges in late April or early May. Adult sawflies lay eggs in young, succulent shoot tips, then girdle tips below the eggs. Shoot tips die, reducing cane length. Sanitation is currently the only control strategy available for this insect pest in NY. Cut off affected tips below evidence of insect activity and destroy prunings.

*New plantings:*

**Plant materials** –

- Vigorous 1 year old plants are generally easier to transplant and less expensive to purchase.
- Bare-rooted plants may be preferable as containerized plants become root bound very quickly.
- Cut through circling roots of pot bound plants with a sharp knife before planting.
- For bare root plants, prune out dead or diseased roots and thick, wood roots that are kinked, twisted or point inward toward root collar. Shorten roots to fit planting holes.

**Preplant weed management** –*Round up* 30 days before planting.

**Final site preparation**

- Do final fitting of planting.
- Layout planting; flag rows.
- Prepare raised beds if desired (18" w x 12" h); cover with landscape fabric or black plastic mulch.

**Plant spacing** –

Red and white currants, and gooseberries

Fresh fruit spacing 3-4 feet in row, 10 ft. between-row.

Black currants

Fresh fruit spacing 4-5 ft. in row, 10 ft. between-row.

Mechanically harvest fruit spacing 2.5 -3 ft. in –row, 10 ft. between rows.

**Planting** -

- Dig planting holes 12" deep and 18" in diameter. Make a shallow cone of soil in center (8' high). Spread roots over cone.
- Set plants slightly more shallowly than grown in the nursery. Firm soil around plants. *Do not add amendments to the planting hole.*
- For larger plantings, plow a 12" deep furrow centered on the plant row and set plants into the furrow. Spread roots along furrows and firm soil around plants.
- Shorten canes to 1-2 buds above ground.
- Irrigate immediately.
- Mulch if desired.

### Pruning at a Glance:

#### Red and White Currants, Gooseberries, Jostaberries

Plant Stage	Pruning Suggestions
Year 1 (planting year)	Remove all 2-year-old and older wood. Keep 6 to 8 healthy, vigorous 1-year-old canes. Remove all damaged and/or diseased canes and roots, as well as woody roots twisting around collar or back into plant. Clean cuts, no stubs!
Year 2	Remove all but 3 to 4 of the most vigorous 2-year-old canes. Leave 4 to 5 of the most vigorous 1-year-old canes
Year 3	Leave 3 to 4 canes each of 1-, 2-, and 3-year old wood.
>= Year 4	Keep 3 to 4 each 1-, 2-, 3-year-old canes. Remove all canes 4 years old or older.

*(Source: "Currants, Gooseberries and Jostaberries—A Guide for Growers, Marketers and Researchers in North America"*

### Pruning at a Glance: Black Currants

Plant Stage	Pruning Suggestions
Year 1 (planting year)	Keep 10 to 12 healthy, vigorous 1-year-old canes. Remove all damaged and/or diseased canes and roots, as well as woody roots twisting around collar or back into plant. Clean cuts, no stubs!
>= Year 2	Remove half of the most vigorous 2-year-old canes, saving those with the most 1-year shoots. Leave 4 to 5 of the most vigorous 1-year-old canes

*(Source: "Currants, Gooseberries and Jostaberries—A Guide for Growers, Marketers and Researchers in North America"*

## Adapting Marketing to Changing Customer Behaviors and Demands

*Pelin Thorogood and Rand Schulman, principals of the Schulman+Thorogood Group*

*The following article was adapted with permission from Pelin Thorogood and Rand Schulman of the Schulman+Thorogood Group, and reprinted with permission from Cornell Enterprise, published by the Samuel Curtis Johnson Graduate School of Management at Cornell University. Pelin and Rand were speakers at the Agricultural Marketing and Management Program Work Team's 2010 Strategic Marketing Conference. This article summarizes many of the points made during their presentation.*



Online marketing and social media have dramatically changed the marketing practice. However, the more things change the more things stay the same. Marketing is still about knowing your audience, but the tools and tactics we employ to get to know and engage our target customer have changed – as has how we define and measure success. In this article, we explore how social media and “inbound marketing” are transforming marketing.

Social media is affecting customer behavior and expectations and creating a new breed of informed, socially engaged buyers. These new buyers rely a lot more on social media, and a lot less on advertising, to inform their decisions about the products and services they are considering. Traditional branding efforts are being trumped by customer-to-customer conversations taking place in social media. The fate of a company’s brand and reputation is transitioning into the hands, or rather the online reviews, blog posts and tweets, of these new customers.

Today’s model: first listen, and then engage. With the advent of social media monitoring and analysis tools, marketers now have much more than demographic data about their target audience. We can monitor and analyze the social conversation that is taking place across the web to extract customer sentiment about products and trends. We can then design effective marketing responses to engage and influence the buyer.

### The Evolution of Direct Marketing

Two main characteristics distinguish direct marketing from brand marketing. The first is that direct marketing sends its message directly to consumers, without the use of intervening commercial communication media. The second characteristic is the core principle of driving a specific “call to action.” This aspect of direct marketing involves an emphasis on trackable, measurable, positive responses from consumers, regardless of medium. Online marketing technologies and methodologies have transformed this originally print-based marketing form, making it one of the most predictable and accountable sources of demand generation. Here’s how:

*Email marketing* is replacing print-based direct marketing efforts as a more personalized, cost-effective, as well as green alternative.

*Behavioral targeting* (i.e., serving different Web pages to different visitors based on their prior Web site actions) enables businesses to present a personalized – and thus more relevant – web site experience to their visitors.

*Web analytics* empower marketers with the intelligence to determine if web site visitors from different programs or campaigns (e.g., banner advertising, Google adwords, LinkedIn, etc.) have more or less propensity to engage on the site (e.g., buy, fill out a form, read an article).

### Enter Inbound Marketing

Traditional (or outbound) marketing focuses on finding customers by building brand awareness and demand through activities such as PR, online and offline advertising, direct mail, and email promotions. It is the company reaching out to the customer to entice them to buy their products and services. Because of interrupt-driven and program-heavy (i.e., costly) outbound marketing campaigns, we are inundated with solicitations. Banners and pop-ups invade Web sites while spammers invade mail and email boxes. The problem: today’s new customer does not want to be sold to. They want to find the right products and services themselves.

*Inbound marketing* is a new approach to marketing that optimizes being found by customers, and attracts qualified buyers to the business. Social media engagement, search engine optimization, and link-building are all examples of effective inbound-marketing activities. Inbound marketing not only benefits the business by improving web site “findability” by qualified buyers, but also benefits the visitor with improved content relevancy and linked resources. Inbound marketing activities tend to be more people-heavy, rather than program-heavy since they rely on relevant content creation and community engagement.

Creating a content-rich web site — building relevant links, blogging, commenting on other’s blogs, tweeting, and curating discussion boards on Facebook and LinkedIn — all take time, but not a lot of program dollars. Inbound marketing leverages social media and networking to target and attract qualified buyers, and encourages the adoption of a culture of measurement to optimize the effectiveness of the inbound marketing mix.

### Creating a Virtuous Marketing Cycle™

The key to engaging customers is relevance, and relevance comes from a deeper understanding of customer behavior and sentiment. It comes from listening to the customer through all the newly available mediums before crafting the marketing messages for those mediums. The demands of the new breed of customer are not only forcing the evolution of the marketing practice but the marketing practitioners as well - and a new breed of marketer is emerging – the Content Engineer™. They listen to and engage customers in social media, building trust in their brand. They analyze visitor behavior and sentiment to optimize web site content for visitors as well as search engines. They

## ***Adapting Marketing to Changing Customer Behaviors and Demands*** *(continued)*

invest in quality link building to establish their web site in a community of related sites. Rich with buyer insights gleaned from inbound-marketing efforts, they charge forward with more effective outbound-marketing campaigns that resonate with customers in the here and now.

Empowered with new tools to decipher the new customer and the insights to engage them effectively in all the new marketing mediums, the new marketer has what it takes to synchronize the marketing cycle with the buying cycle – creating a virtuous cycle for businesses and customers alike.

Inbound marketing strategies will be unique to a firm based on their overall business goals and objectives, current activities and preferences, and a host of other factors. What's right for you, may not be for your neighbor. Nevertheless, in today's social media driven world, it's worth the effort to sit back and think about how you can best leverage your outbound marketing strategies with today's inbound marketing opportunities.

*The full video podcast of Pelin and Rand's presentation at the Strategic Marketing Conference is available on the PWT website. To read more, please check out the Fall 2010 edition of Cornell Enterprise, "The Birth of Customer 2.0 and the Death of Marketing As We Know It," 6 Dec 2010, at: [http://www2.johnson.cornell.edu/alumni/enterprise/fall2010/index.cfm?action=web\\_extra&web\\_extra\\_id=5](http://www2.johnson.cornell.edu/alumni/enterprise/fall2010/index.cfm?action=web_extra&web_extra_id=5).*

*(Source: Smart Marketing, March 2011. "Smart Marketing" is a marketing newsletter provided by the Cornell University Agricultural Marketing & Management Program Work Team for extension publication in local newsletters and for placement in local media. It reviews elements critical to successful marketing in the food and agricultural industry. Please cite or acknowledge when using this material. Past articles are available at <http://marketingpwt.aem.cornell.edu/publications.html>.)*

## ***Juneberries - A New Crop for Your Berry Operation?*** *(continued from page 1)*

### **What are Juneberries, Anyway?**

Juneberries (known elsewhere as saskatoons or serviceberries) are pome fruits within the genus *Amelanchier* - a sweet, blueberry-like fruit available early in the Northeastern berry season. Currently considered a minor fruit with virtually no commercial cultivation in the region, Juneberries are aligned with consumer preferences because they are similar in size and taste to blueberries and are a flavorful, locally-grown food source, nutrient-dense produce, and novel for use in cuisine and home food preparation.

Juneberries are indigenous North American shrubs, with relatively few pest and disease concerns, and they produce a nutrient-dense fruit with high levels of iron, calcium and antioxidant compounds. They ripen during a short period in early summer, bridging the retail fresh fruit season between strawberries and brambles. Juneberries are grown commercially in climates much less forgiving than the Northeast such as North Dakota, Saskatchewan, and northern Michigan, and consumer-friendly varieties are more available than ever. Yet, Juneberries are seldom planted for fresh retail or small-scale processing markets in the Northeast.

### **Juneberry Workshop: A Wealth of Information**

There's nothing like attending a workshop where you have people well-versed in whatever it is you're trying to learn. Such was the case at this workshop where speakers were Steve "Saskatoon" Fouch, Michigan State University Extension Juneberry/saskatoon specialist, and Jarvis "Juneberry" Blushke of Blue Sky Farm in Saskatchewan, Canada, veteran Juneberry/saskatoon grower and nurseryman. They, along with meeting host Jim Ochterski, covered cover all aspects of Juneberry production, including plant materials, variety selection, orchard establishment, pest and weed management, marketing, and profitability prospects in the Northeast. Cooperative growers Stephanie and Gary Craft of G and S Orchards in Walworth, NY were also on hand to share their insights on the project. Of course, Juneberries and Juneberry products were available for sampling.

The audience included commercial berry growers looking to diversify, potential commercial growers, processors, extension personnel, and home gardeners. Interest ran high in Juneberries as a commercial berry crop and at the end of the day participants took home all the knowledge they needed to get started with this new enterprise, and in some instances, transplants produced by Mr. Blushke for demonstration purposes at the meeting.

**FOR MORE INFORMATION:** Jim Ochterski, Agriculture and Natural Resources Issues Leader, Cornell Cooperative Extension of Ontario County, NY \$80 North Main Street, Canandaigua, NY 14424. 585-394-3977 x402, [jao14@cornell.edu](mailto:jao14@cornell.edu), [www.CCEOntario.org](http://www.CCEOntario.org) *(continued on next page)*

**TITLE...** author, affiliation



*Top left: Workshop presenters Jarvis Blushke and Steve Fouch, along with Jim Ochterski, project leader. Top right: Project grower collaborators Stephanie and Gary Craft, of G and S Orchards in Walworth, NY, sharing Juneberry production insights. Bottom left: Jarvis Blushke discusses Juneberry planting material and varieties. Bottom right: Juneberry plug plants produced in his nursery for use at the workshop. Below: Young one acre Juneberry planting, Cross Farms, Michigan.*







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 NYBN/](http://www.fruit.cornell.edu/NYBN/)

New York Berry News is a monthly commercial berry production newsletter provided by Cornell Berry Team members.

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

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*Editor's Note: We are happy to have you reprint from the NY Berry News. Please cite the source when reprinting. In addition, we request you send a courtesy [e-mail](mailto:mcm4@cornell.edu) indicating the NYBN volume, issue, and title, and reference citation for the reprint. Thank you.*

## On the Organic Side—(continued from page 13)



### NEW WEBPAGE TO FOCUS ON ORGANIC MANAGEMENT OF BROWN MARMORATED STINK BUGS

*The New Site will Report about Ongoing Efforts to Develop Organic Management Plans for this New Invasive Pest.*

*Matt Grieshop, Michigan State University Extension, Department of Entomology*

[The Organic Pest Management Laboratory](http://www.bmsb.opm.msu.edu) at Michigan State University has initiated a new webpage focusing on the organic management of the invasive brown marmorated stink bug (*Halyomorpha halys*).

This pest has only recently been detected in Michigan but has been causing serious crop losses in fruit, vegetable, field, and ornamental crops in Pennsylvania, New Jersey, Maryland and Virginia. It has also become a serious nuisance pest in these states due to its tendency to invade homes and other buildings in the fall.

The new web is titled [Organic Management of Brown Marmorated Stink Bug](http://www.bmsb.opm.msu.edu) and can be accessed via [www.bmsb.opm.msu.edu](http://www.bmsb.opm.msu.edu).

The major objectives of the site are to provide organic growers across the nation with access to information on the bug and its management, regional contacts, as well as a forum for organic growers to compare notes on how they are trying to manage this serious new pest.

The website is maintained by [Dr. Matt Grieshop](http://www.bmsb.opm.msu.edu) and [Dr. Anne Nielsen](http://www.bmsb.opm.msu.edu), both of the [MSU Department of Entomology](http://www.bmsb.opm.msu.edu).

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