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Cornell University
College of Agriculture and Life Sciences

New York Berry News

Cornell University Berry Team

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In Memoriam: Craig T. Michaloski

Greece, NY: February 4, 2012, age 56. Predeceased by his father, John Michaloski. He is survived by his loving wife and soul mate, Kathy Pearson; daughter, Jill (Jeremy) Wolf; son, Joe Michaloski; mother, Florence Michaloski; brothers, Mark & Shawn (Patty) Michaloski; father and mother-in-law, Jack and Dorothy Pearson; and sister-in-law, Anne Pearson; nieces and nephews, Megan, Margo, Matthew and Amy; and many good friends that have become family.

Craig passed away after a courageous battle with ALS; a battle he fought with spirit and dignity, without ever losing his incredible sense of humor. He loved baseball, golfing and skiing, and delighted in the time spent fishing with his family and friends. Craig dedicated 25 years of his life to his love of farming at Green Acre Fruit Farm. He was an extraordinary husband, father, son, brother, uncle, friend and coach. He will always be loved and sadly missed.

A Celebration of Life was held Friday, February 17th 2012 followed by a service at Aldersgate United Methodist Church, 4115 Dewey Ave. In lieu of flowers, please consider donations to Greece Little League or Aldersgate United Methodist Church Endowment Fund in Craig's memory.

"Craig was a leader among fruit growers - always trying something new, always willing to open his farm for others to learn, and always encouraging. He was admired by all and a true role model. Those of us in the Cornell community will miss him greatly." *Marvin Pritts, Cornell University*

"I had the privilege of meeting Craig when he was president of the NY Berry Growers Association shortly after I started working with Dr. Marvin Pritts at Cornell University.

Upcoming Berry Events

March 28 and 29, 2012. *Early Season Berry Field Meetings: Understanding Berry Fertility and Pest Issues for the Growing Season*. March 28, 2012 2:00 pm – 4:00 pm at Green Lake Berries, 359 Ross Ruland Road, South Cairo, NY 12482. March 29, 2012, 10:00 am – 12:00 pm at Hand Melon Farm, 533 Wilbur Ave., Greenwich, NY 12834. Additional topics will vary according to location. Green Lake Berry location will feature a discussion about berry crop site establishment, and bird exclusion using the Smart Net system will be discussed at Hand Melon Farm. Presented by the Capital District Vegetable and Small Fruit Program and supported by the Northeast SARE Program. Free for CDVSFP enrollees, $10.00 for non-enrollees. For more information contact Laura McDermott or to register contact Marcie Vohnoutka at (518) 272-4210 or mmp74 @cornell.edu.

March 28-29, 2012. *GAPs for Small Farms: Dispelling Myths, Getting the Facts, and Designing a Food Safety Plan for Your Farm*. 8:30am – 3:30pm both days. CCE of Cayuga County, 248 Grant Ave. Auburn, NY 13021. Pre-registration is required, and **the deadline to sign up is Sunday, March 20th**. To register for this workshop, visit the NOFA-NY website: www.nofany.or.

April 3-4, 2012. *Farm Food Safety Training with GAPS*. 8:30am – 3:30pm both days. CCE of Wayne County, 1581 ROUTE 88N, NEWARK, NY 14513. Pre-registration is required, and **the deadline to sign up is Monday April 2nd**. Call or email Craig Kahlke (Fruit team) at 585-735-5448, cjk37@cornell.edu, or Robert Hadad (Vegetable team) at 585-739-4065, rgh26@cornell.edu, for questions or for more information.

In Memoriam *(continued)*

Craig was a driving force in that organization and a wonderful help to the new berry extension specialist on the block (me). He was always stepping up to the plate whether to host a berry meeting on his farm, participate on a grower panel, demonstrate strawberry production equipment. Above all, he was a good friend.

I met Craig at a meeting shortly after his diagnosis - he casually mentioned his ALS and said he wasn't sure how it would come out. His matter-of-fact attitude and tremendous courage in the face of his illness was an inspiration to me. I was blessed to know and work with him. He will be greatly missed. "*Cathy Heidenreich, Cornell University*

"The industry was denied one of its charter members recently when Craig Michaloski was taken from us after fighting off a terminal illness.

The first time I met Craig was when he asked me to join him for an interview for the position I currently have with the NYS Berry Growers. It was a good meeting in which I knew right away that here was a man who had a passion. He loved the institution of farming. His current specialization was fresh berry production. What struck me with Craig was he had a sense of urgency that I personally liked. He wanted to improve the industry. No, he wanted the industry to catch up to where he felt it should be in truth of fact.

Craig served as my first Chairman and I was not disappointed. He wanted participation from everyone and he wanted to see improvements to both our marketing and research initiatives. During his Chair we began the search for a more progressive logo. This took time to find and even more time to select when we were approaching our final selections. I recall vividly that Craig had a particular design that he liked. Ultimately, the Board did not choose his design but never the less Craig fought for his design because he really felt it was the right path moving forward.

Craig we will try to push the envelope as you taught us. I hope some warm sunny June day you can look down on all of us and simply say "Well it is about time you finally got it right!" *Paul Baker, NY Berry Growers Association*

Strawberry Lovers, Prepare to Meet the Sweet, New Purple Wonder

Ithaca, N.Y. – Cornell's newest and darkest strawberry variety – Purple Wonder – is making its debut at the Philadelphia International Flower Show on Monday through an exclusive licensing agreement with seed giant W. Atlee Burpee Co.

"Purple Wonder is sweet and aromatic, with outstanding strawberry flavor," said Courtney Weber, Cornell small fruits breeder and associate professor of horticulture. "But the color is something you won't be able to find in any grocery store."

The medium-sized berries reward patience in picking: Berries turn from creamy-white to red before ripening into an intense burgundy. "The color develops all the way through the fruit, which might surprise consumers accustomed to supermarket fruit with color mostly on the surface," said Weber. "And letting the fruit ripen on the plant just makes the berries sweeter."

The berries and their purple juice can also be used to produce deep colored preserves and strawberry wine, and Purple Wonder's high antioxidant content gives them a healthy boost.
Burpee's lead horticulturist Grace Romero approached Weber last March, seeking something new and different to offer to home berry growers. The variety was market-ready, having been selected by Weber in 1999 and evaluated by growers in New York, Michigan and Illinois. Weber hopes Burpee will help Purple Wonder find its niche in backyard plots and patio pots.

Because the plants do not produce many runners, they are particularly appropriate for container gardening. Hardy enough for central New York, Purple Wonder should do well across temperate areas in the United States. Weber cautions that we are not the only mammals who find the fruit irresistible: squirrels and chipmunks have a taste for them, too.

According to Jessica Lyga, the Plant Varieties and Germplasm Licensing Associate for the Cornell Center for Technology Enterprise and Commercialization, a plant patent will be filed for Purple Wonder later this year. Purple Wonder is the 42nd strawberry variety released by the Cornell small fruits breeding program. Other recent releases include the 'Herriot' strawberry, a high-yielding midseason variety, and the 'Crimson Giant' raspberry, suitable for high-tunnel cropping systems and November harvest.

Weber breeds for adaptation to the temperate climates of the Northeast and Midwest as well as disease and insect resistance but readily admits that good flavor is the ultimate criteria.
"Let's face it: Berries often get eaten on the way home from the farmers market," he said.

High Tunnel Raspberries and Blackberries Updated and Expanded

Northeast growers can capture more of the lucrative local market for fresh berries by growing brambles (raspberries and blackberries) in high tunnels. And the place for them to start is with the updated and expanded edition of *High Tunnel Raspberries and Blackberries*.

High tunnels are relatively low-cost, usually unheated, plastic-covered hoop houses that can help growers fill late-spring and late-fall gaps in the market. Instead of early July, high-tunnel berries can be harvested in June. The field-grown season for brambles usually ends in early October. But growers using high tunnels continue to harvest berries through November.

Other benefits of high tunnels include:

- Floricane-fruiting raspberries and blackberries can over winter in climates where they would otherwise be killed by cold temperatures.
- Primocane-fruiting raspberries ripen where the growing season is otherwise too short.
- Berry yields from tunnels can be two to three times greater than field-grown, and the berries can be significantly larger.

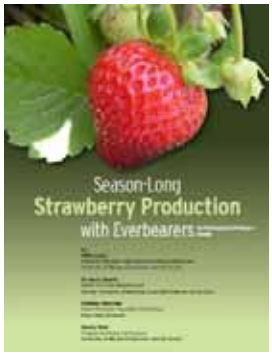
Tunnel-grown berries also have longer shelf-life with reduced pesticide inputs.

The 50-page production guide is available free online and features sections on:site and tunnel selection.

- Tunnel construction.
- Plant selection and planting.
- Care and management of plantings.
- Season extension and overwintering.
- Pest management.
- Harvest.
- Crop budgets.

The 2012 edition includes a new section on multiple-bay tunnel production, additional crop budgets, and new information on varieties, pests and diseases. The authors include researchers from Cornell University, Penn State University and Michigan State University who have helped pioneer berry production in high tunnels.

Publication Available Online: Season-Long Strawberry Production with Everbearers - *Kathy Demchak, Penn State*



For those of you who are interested in producing day-neutral strawberries, there's a guide out there for you – "Season-Long Strawberry Production with Everbearers for Northeastern Producers". This 70-page guide covers information on production techniques, economics, and pests in day-neutral production. The guide focuses largely on production in the plasticulture system, though alternative production systems are also discussed. It is the culmination of a research and extension project funded by SARE, and was also national winner at 2011 National Association of County Agricultural Agents Communications Awards in the Publications category!! Authors are Willie Lantz, Harry Swartz and Sherry Frick from the University of Maryland, and Kathy Demchak from Penn State University. The guide can be downloaded for free from the Penn State Vegetable and Small Fruit web site at http://extension.psu.edu/vegetable-fruit under the "publications" side-tab, and from the SARE Web site at www.sare.org. This publication was made possible with funds from SARE Project LNE06-241 "An integrated approach to developing a day neutral strawberry production industry".

(Reprinted with permission from: The Vegetable and Small Frit Gazette, Vol. 16 (3), March 2012)

Will New York Be Prepared For The "New" Farm Bill? Fay Benson-SCNY Dairy Team

About the author: Fay Benson has worked with Cornell's South Central NY Dairy Team for the past 9 years with grazing and organic dairies. Before that he operated a small dairy farm in Tompkins County for 20 years. He has worked on the NY Dept. of Agriculture's Crop Insurance Education Team for the past 4 years.

The USDA classifies New York as an underserved state for crop insurance, meaning, we aren't using crop insurance to cover our agricultural production at rates seen in other areas of the country. This will put New York at a disadvantage with the direction that the Farm Bill is heading, which is away from Direct Payments and Disaster Assistance to more of a reliance on Risk Management for farmer's protection from disaster events. The January 2012 report from the Congressional Budget Office crystallizes this direction.

Mandatory spending for agricultural support totaled $15 billion in 2011; it is projected to average $16 billion in each year between 2012 and 2022, under the baseline assumption that current farm programs remain in place after the 2008 farm bill (the Food, Conservation, and Energy Act of 2008, P.L. 110-246) expires in 2012. That spending will dip in 2012, to about $13 billion, largely because of changes in the timing of mandated payments for crop insurance and commodity programs. Starting in 2013, spending for the crop insurance program is expected to rise as a result of projected increases in crop prices and the value of insured crops. The higher spending for crop insurance will be offset by the scheduled termination of some other agricultural support programs, such as agriculture disaster assistance and payments to tobacco growers.[1]

If Crop Insurance is to become one of the key avenues for farms to receive federal protection from adverse weather or market events, New York Farmers will be at a disadvantage since they have not had the experience of using it on their farms. They will need to learn more about Crop Insurance and how it can fit their farm. If a natural disaster occurs or market prices plunge, crop insurance allows the producer to pay bills and remain in operation. Beyond this fundamental strength, there are other benefits of crop insurance to producers, government and the public.[2]

Producers Share in the Program Cost. When a producer wants crop insurance coverage, the producer must pay for it. While the program is partially subsidized by the government, producers have substantial "skin in the game."

Producers Receive Crop Insurance Indemnities in the Timeliest Way. While some farm programs may make payments fairly promptly, such as marketing loan benefits, others pay out long after the payments are needed. For example, the Supplemental Revenue Assistance Payments Program (SURE) payments may occur about 11/2 years after harvest. Crop insurance policies require the companies to pay within 30 days of claim settlement. Losses due to disasters like floods or hurricanes and prevented planting and replant payments may be paid well before harvest.

Producers Can Use Crop Insurance as Collateral for Loans. When bankers loan to a producer, they require an expectation that the loan can be repaid. Many producers use land, equipment or crops as collateral to secure the loan.

Producer Indemnities are not Capped by Arbitrary Payment Limits. There are no income caps to be eligible to buy crop insurance, and crop insurance premium subsidies and indemnities are not limited.

Crop Insurance Has Already Contributed to Deficit Reduction. While the budget for the new farm bill remains uncertain, it is likely to be quite limited. The crop insurance program has the benefit of having recently undergone substantial budget cuts, most of which have been earmarked for deficit reduction

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Will New York Be Prepared For The "New" Farm Bill? (continued)

To learn more about Crop Insurance:

A. Fay Benson Small Dairy Support, Cornell University SCNY Regional Team
NY Crop Insurance Education Team http://www.agriculture.ny.gov/AP/CropInsurance.html
Project Manager NY Organic Dairy Initiative http://www.cuaes.cornell.edu/cals/cuaes/organic/projects/dairy/dairy-initiative/
60 Central Ave Cortland, NY 13045
Phone: 607-753-5213 fax: 607-753-5212
afb3@cornell.edu

Sarah Johnston
http://www.agriculture.ny.gov/AP/CropInsurance.html
518-457-4531
sarah.johnston@agriculture.ny.gov

[2] Source: National Crop Insurance Services *TODAY ()* February 2011

[1] The Congressional Budget Office (CBO) : http://www.cbo.gov/ftpdocs/126xx/doc12699/01-31-2012_Outlook.pdf.

Agritourism Survey for Farm Owners

New York State farm owners are invited to participate in an online survey to determine the resource needs of farmers in the Northeast with respect to agritourism development. This survey is part of a multi-state study headed by Rutgers University and funded by the Northeast Sustainable Agriculture Research and Development (NESARE) program. Your responses will help guide the study in understanding the extent of agritourism in the Northeast, the benefits and challenges associated with agritourism, and the resource needs of farmers looking to start/expand their agritourism offerings.

This information will be used to generate educational materials for Extension agents in the Northeast region to improve the agritourism resources available to farmers such as you. Even if you are currently not interested in agritourism development for your operation, the research team would appreciate your participation to further understand the reasons farmers may choose to not pursue agritourism.

Below is the link to the survey. It should take you approximately 15 to 20 minutes to complete. Your responses will be kept anonymous. If you do not wish to take the survey online, but instead would prefer a paper copy mailed to you, please follow the link and indicate you would like a paper survey at the bottom of the consent form. Or Contact your local Cooperative Extension office.

Survey Link: https://acsurvey.qualtrics.com/SE/?SID=SV_8D69llUBxpD7js8

Thank you for your participation.

Audrey Reith, Equine/Livestock Educator, Orange & Ulster Counties

NYS Department of Ag and Markets News (continued)

Governor Cuomo Announces Nearly $1 Million in Aid to New York Farms Affected by Hurricane Irene and Tropical Storm Lee

Funds to Help 97 Farms in 18 Counties

Governor Andrew M. Cuomo today announced nearly $1 million in additional recovery aid to New York farms affected by Hurricane Irene and Tropical Storm Lee.

NYS Department of Ag and Markets News (continued)

The funds are Round 2 of the Farm Operation Match Component of the Agriculture and Community Recovery Fund (ACRF). The grants will go to 97 farms in 18 counties to replace feed for livestock, as well as farm-raised crops for retail and wholesale operations that were lost as a result of Hurricane Irene and Tropical Storm Lee. The first round of grants awarded $1.3 million to 143 farms in 21 counties.

"It has been more than six months since flood waters damaged and destroyed farms across the state, and farmers are still feeling the storms' effects," Governor Cuomo said. "These funds have enabled us to provide vital assistance directly to the farms that were hit the hardest, many of which are family owned, and are facing huge financial burdens as they struggle to rebuild."

Round 2 of the ACRF Farm Operations Match Program will include a total of $949,727 in aid awarded to 97 farms in 18 counties. Under the program, farmers can receive a 50 percent match for the cost of replacing livestock feed, up to $50,000. They can also receive a 50 percent match, up to $10,000, to help cover the purchase of fruits, vegetables, bedding plants, nursery and flowers needed to replace storm-damaged farm products to maintain retail operations. Round 2 of the Farm Operation Match Program also included a component for Wholesale Farm Operations, which provided funds, up to $10,000, to cover the replacement of crops lost in the disasters that would then be offered for wholesale. The first and second rounds of the Farm Operations Match Program have collectively awarded a total of $2,314,460.

New York State Agriculture Commissioner Darrel J. Aubertine said, "With fields washed away just in time for harvest, many farmers lost a significant amount of crops to the floods this past summer. This round of funding under the Governor's Agricultural and Community Recovery Fund will help share the financial burden the floods put on our farmers by providing cash to cover half of the replacement cost for livestock feed, as well as for crops to retail and wholesale."

Immediately following the Hurricane Irene and Tropical Storm Lee, Governor Cuomo created the Agricultural and Community Recovery Fund (ACRF) to help rebuild the agricultural industry and farming areas in the impacted areas. This was the first disaster recovery program designed specifically for agriculture in the history of New York State. To date, ACRF has completed three successful components, including the ACRF Conservation Component, ACRF Farm Operation Match Component (Round 1 and Round 2), and the ACRF Main Street Component. Those programs have paid out almost $7 million in cash payments to 552 family farms and $3 million in grants to small businesses in 15 local municipalities across six counties, to help them rebuild and reopen.

A fourth component of the ACRF, the On-Farm Capital Program, is currently accepting applications. This program will help pay for capital losses experienced on the farm, including certain minor structural repairs, permanent fixtures and equipment. The deadline for submitting applications is April 2, 2012. Program guidelines and applications for the Capital On-Farm Needs Program are available here: http://www.agriculture.ny.gov/disaster-assistance-and-resources.html.

In addition to ACRF, Governor Cuomo announced $50 million in additional flood recovery funds, of which farmers and small business owners are eligible for $21 million for physical flood-related damage costs, not covered by other federal, state or local recovery programs, or any third party payers. The guidelines and application for that program can be found here: http://www.esd.ny.gov/BusinessPrograms/FloodRecovery.html.

The combined impacts of Hurricane Irene and Tropical Storm Lee had a devastating effect on New York State agriculture resulting in an estimated 200,000 acres of cropland damage and $73 million in agricultural damages to crops, buildings, equipment and land resources.

Governor Cuomo Expands Successful "Freshconnect" Program to Benefit Farmers and Communities Statewide

Competitive Grants Will Fund Programs that Increase Access to New York Grown Fresh Food in Underserved Neighborhoods

Albany, NY (March 6, 2012). Governor Andrew M. Cuomo today announced the expansion of his FreshConnect program, which brings fresh food from New York farms to underserved communities throughout New York. The expanded program will award competitive grants to support projects across the state that make New York farm products more accessible to low-income residents and areas in need.

"This is a win-win for both consumers and farmers that will create jobs and provide better, fresher food to New Yorkers that need it," Governor Cuomo said. "We must ensure that all of our citizens have access to fresh, healthy, and affordable food, and nothing better fits the bill than the items grown right here in our stated New York's farmers. Our Fresh Connect initiative has proven to be an excellent way to bridge the gap between farmers and underserved consumers while also creating local jobs. We are expanding the initiative this year by supporting innovative programs that will help us continue to meet the needs of all New Yorkers."

In 2011, Governor Cuomo launched the FreshConnect program to create new farmers' markets and support existing markets that provided fresh produce to high-need areas throughout the state. Through the program, eleven new farmers' markets were created and four

NYS Department of Ag and Markets News (continued)

existing markets received support. Combined, they provided a viable market location for over 100 farmers, helped create local jobs for youth in urban areas, and facilitated an increase in the sale of locally-grown food.

After the success of last year's program, the initiative is now expanding to include not just farmers' markets, but other projects that connect underserved communities with New York farm products. Potential projects include:

- programs to increase access to farm products at food pantries
- delivery programs that send farm goods to areas in need
- programs for low-income individuals to access food directly from a farm, including through Community Supported Agriculture (CSAs)
- new farmers' markets that are located in low-income neighborhoods

satellite markets that purchase produce from an existing market and resell it in an area that cannot support its own market

Grants to support organizations that implement a FreshConnect project will be awarded through a competitive process. Regional market authorities, public benefit corporations, not-for-profit corporations, and local government entities are eligible to apply, including farmers' markets that participated in the FreshConnect program last year. A Request for Proposals is available at the Department of Agriculture's website: www.agriculture.ny.gov/RFPS.html. Applications will be due by April 2, 2012.

This year's FreshConnect program will also continue the "FreshConnect Checks" initiative, a rebate incentive that encourages Food Stamp recipients to use their benefits at farmers' markets. FreshConnect Checks will provide $2 rebate checks for every $5 in food stamps spent at participating markets. In addition to Food Stamps, FreshConnect-funded projects are encouraged to accept other nutrition incentives, such as Women, Infants, and Children (WIC) Fruit & Vegetable Checks, Farmers' Market Nutrition Program coupons, and Senior Farmers' Market Nutrition coupons, to ensure that all citizens have access to fresh fruits and vegetables, regardless of income. In 2011, over $2 million in Food Stamp sales occurred at farmers' markets throughout the state.

The FreshConnect program has been designed to meet the needs of local communities throughout the state. In some places, the program serves rural or urban populations that do not have sufficient access to grocery stores; in others, it provides low-income, high-unemployment neighborhoods with healthy, New York-grown produce, as well as local jobs. The program's flagship 125th Street Fresh Connect Farmers' Market, located at the Adam Clayton Powell Jr. New York State Office Building in Harlem, attracted approximately 2,000 people each week it operated in 2011. A market manager to operate this market for the 2012 season is now being sought through the Department of Agriculture's website: www.agriculture.ny.gov/RFPS.html.

New York State Agriculture Commissioner Darrel J. Aubertine said, "New York is a leading producer of a wide variety of fresh fruits and vegetables, including apples, cherries, cabbage, sweet corn, green beans, onions, and more. I commend the Governor's vision and leadership in helping New Yorkers gain greater access to our farm fresh products through the FreshConnect program."

New York State Health Commissioner Nirav R. Shah said, "The health benefits associated with increased access to fresh food are clear. Through Governor Cuomo's leadership, we are expanding the FreshConnect program so that we can continue to provide underserved New Yorkers with affordable and healthy food, support our state's growing agricultural industry, and help create jobs in communities throughout New York."

Empire State Development President, CEO & Commissioner Kenneth Adams said, “Improving our state's business climate means also improving the quality of life and well-being of all New Yorkers. Under Governor Cuomo’s leadership, ESD is proud to work with our partners in state government and the private sector to help support our local farmers and ensure that healthy, fresh foods are available in every corner of the state.”

Senator Patty Ritchie, Chair of the Senate Agriculture Committee, said, "Governor Cuomo's FreshConnect program was a great success last year. It supported New York's farmers while performing a valuable service for underserved areas of our state. I am pleased that this year, the program will be even bigger and better. Through the FreshConnect program, we can continue to foster economic development around local farms while helping to provide all New Yorkers with access to the wonderful products grown in our state."

Assemblyman William Magee, Chair of the Assembly Agriculture Committee, said, "Last year, Governor Cuomo's FreshConnect initiative helped to provide new venues for our state's farmers, allowing them to develop their businesses and broaden the availability of their top-quality products. This year, the competitive grants process of the expanded FreshConnect will support even more innovative

NYS Department of Ag and Markets News (continued)

programs to offer greater opportunities for New York farmers. I am proud to support this initiative, which is a win for farmers and a win for communities in need."

President of the New York Farm Bureau Dean Norton said, "Governor Cuomo's FreshConnect program represents an investment in New York's agriculture industry. Connecting consumers with New York farmers creates a stronger business climate on both a local and statewide level and helps to extend the reach of New York's excellent products to communities in need. I am excited that our farmers will continue to prosper thanks to the expansion of this innovative program."

Executive Director of the Farmers Market Federation of New York Diane Eggert said, "Farmers' markets continue to be one of the best ways for consumers to find locally-grown healthy fruits and vegetables. Our markets were given a tremendous boost last year with Governor Cuomo's FreshConnect program. Through this program, markets have been able to grow throughout our state, giving farmers the ability to connect with more New Yorkers, regardless of where they live or their income. Our wireless EBT program at the markets has also been very effective in helping more people obtain fresh produce. The Governor has a true commitment to supporting New York's farmers and we are pleased that he is once again offering this successful program."

Kathryn J. Boor, PhD, the Ronald P. Lynch Dean for the College of Agriculture and Life Sciences at Cornell University, said, "New York's farmers and consumers alike have benefitted from Governor Cuomo's FreshConnect program. The expanded program will now help even more New Yorkers, as it will offer new methods to provide fresh and nutritious produce to communities in need."

FreshConnect is administered through a partnership between the New York State Department of Agriculture and Markets, Empire State Development, and the Office of Temporary and Disability Assistance.

Almost 1.5 million New Yorkers live in areas with limited supermarket access. Expanding access to fresh food in underserved communities has been shown to both improve nutrition and lower costs related to obesity and diet-related disease, while also fostering community and economic development.

STATE ANNOUNCES AVAILABILITY OF FUNDS FOR FRESH CONNECT PROGRAM
Eligible Projects Will Increase Access to Fresh Produce in Underserved Areas; April 2 Deadline

New York State Agriculture Commissioner Darrel J. Aubertine today announced the availability of $300,000 in funds to support Governor Cuomo's initiative, the Fresh Connect Program. This program will award up to $10,000 per project for eligible projects that increase access to locally grown, fresh foods by low-income and/or underserved communities across New York State.

"As mentioned in his State of the State, Governor Cuomo is committed to helping New Yorkers gain greater access to our farm fresh products," the Commissioner said. "We are pleased to once again offer assistance to those organizations that wish to join the Governor in this endeavor and will provide up to $10,000 per project for eligible and creative proposals that help him achieve his mission."

The goal of the Fresh Connect Program is to enhance the nutrition and economic health in New York State by supporting projects that connect underserved communities with New York farm products. Eligible projects must increase access to fresh food in low-income and/or underserved communities, and can include, but are not limited to: new farmers' markets; satellite youth markets; delivery systems for fresh produce; transportation for low-income individuals; a CSA-share type model for distributing produce; or forming new partnerships or programs to better connect low-income and/or underserved communities with New York farm and food products.

Local government entities, regional market authorities, public benefit corporations, and not-for-profit corporations are eligible to apply, including farmers' markets that participated in the Fresh Connect Program last year. Successful applicants can receive up to $10,000 with a 25 percent matching requirement of cash or in-kind services. The RFP and application are available on the Department's website or by calling 518-457-2195. Applications are due into the New York State Department of Agriculture and Market by April 2, 2012.

The Fresh Connect Program will be administered through a partnership between the New York State Department of Agriculture and Markets, Empire State Development, and the Office of Temporary and Disability Assistance. In addition to this RFP, the State will also offer Fresh Connect Checks, a nutrition incentive to encourage Food Stamp recipients to use their benefits at participating farmers' markets by giving shoppers using Food Stamps a $2 coupon for every $5 of their Food Stamp benefit spent at the market.

Last year, during its pilot season, the Fresh Connect Program supported more than a dozen farmers' markets in helping them to expand and better meet the needs by providing fresh produce to low-income or underserved communities. Expanding fresh food access in underserved communities has been shown to improve nutrition and lower costs related to obesity and diet-related disease while fostering community and economic development.

NYS Department of Ag and Markets News (continued)

Be on the Alert for Inclement Weather and Other Hazards that Threaten Safety and Property with NY Alerts

Having the information you need before an emergency can make a difference. NY-Alert is a free early-warning program that sends text messages, emails and even phone calls to advise you of serious hazards that can threaten safety and property. The New York State All-Hazards Alert and Notification web-based portal is part of New York State's ongoing commitment to provide New Yorkers with information so that they will understand the risks and threats that they may face and know how to respond accordingly. Each of us has the responsibility to be as prepared as possible for any emergencies that may arise. One of the keys to preparedness is having up-to-date information.

The website contains critical emergency-related information including instructions and recommended protective actions developed in real-time by emergency service personnel. Concurrent with the posting to this website, that same information is disseminated through various communications systems (e.g. email, cell phones, media outlets) to those who sign up.

The information posted there will include severe weather warnings, significant highway closures, hazardous materials spills, and many other emergency conditions. Additionally you will find information regarding response actions being taken by local and state agencies and protective actions that you should take to protect you, your family and your property.

By signing up for NY-Alert, you can receive warnings and emergency information via the web, your cell phone, email and other technologies. You select the type of warnings you want to receive, and how you want them delivered.

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NY NASS NEWS

New York Farm Numbers Decrease

February 27, 2012. The number of farms in New York for 2011 decreased from a year earlier, reports King Whetstone, Director of USDA's National Agricultural Statistics Service, New York Field Office. The number of farms for 2011 is estimated at 36,000. Land in farms was 7.00 million acres. Farms with sales over $500,000 increased by 50 to 1,800 while farms with sales between $250,000 and $499,999 fell by 150 to 1,300. The area of land operated by farms in these two groups totaled 2.50 million acres, equal to a year ago. The next smaller sales class, farms with sales between $100,000 and $249,999 decreased by 200 to 3,200 while land operated by these farms decreased to 1.10 million acres. There were 10,800 farms with sales between $10,000 and $99,999 compared with 10,700 a year earlier. Land they operated totaled 1.80 million acres. There were 100 less small farms with sales between $1,000 and $9,999 in 2011, at 18,900. Land in farms for this class remained the same as last year at 1.60 million acres.

The number of farms in the United States in 2011 is estimated at 2.2 million, down slightly from 2010. Total land in farms, at 917 million acres, decreased 1.85 million acres from 2010. The average farm size is 420 acres, up 1 acre from the previous year.

Farm numbers and land in farms are broken down into five economic sales classes. Farms and ranches are classified into these "sales classes" by summing their sales of agricultural products and government program payments. Sales class breaks occur at $10,000, $100,000, $250,000, and $500,000.

Farm numbers increased slightly in the $10,000-$99,999, $250,000-$499,999, and $500,000 and over sales classes. Higher commodity prices and larger value of sales contributed to changes in the number of farms within these sales classes. Farm numbers increased 1.3 percent, to slightly over 600,000 farms in the $10,000 - $99,999 sales class and 1.9 percent in the $250,000 - $499,999 sales class to over 100,000 farms. Meanwhile, the number of farms in the $500,000 and over sales class increased by 5.9 percent, to 133,570 farms.

Land in farms increased in the largest sales class while decreasing in all other sales classes. Land operated by farms in the $500,000 & over in sales class increased 2.5 percent, to 305.7 million acres. Land operated by farms in both $1,000-$9,999 and $100,000-$249,999 sales classes decreased by 3.5 percent, to 100.7 million acres and 138.7 million acres respectively.

USDA News

Organics Take A Major Step Forward with U.S.-EU Partnership *Agriculture Deputy Secretary Kathleen Merrigan, U.S. Department of Agriculture, 1400 Independence Ave., S.W., Washington, DC 20250*

Travis Forgues is an organic dairy farmer in the town of Alburgh in northwest Vermont, almost at the Canadian border and surrounded on three sides by Lake Champlain. Like many of the other dairy farmers in northern Vermont, Travis is a realist. He went to college. He tried city life. But he was born into farming, and that's how he wanted to raise his own family. So Travis went to his dad and had a talk about organic farming, and he convinced his father, and then many others, to convert their land from conventional agricultural practices to organic. As Travis saw it, organics was a growing niche within American agriculture, and consumer demand for organically produced dairy was taking off. Better still, consumers were willing to pay more for organic products. Today, as a result of Travis' work, nearly 130 dairy farmers across New England have signed on to the "New England Pastures" organic dairy cooperative for Organic Valley.

Ten years have passed since the U.S. Department of Agriculture launched its National Organic Program (NOP). You may recognize the "USDA Organic" seal on thousands of fruits, vegetables, meat or other goods you can buy at the local market. The program combines detailed organic standards with a rigorous oversight and enforcement system. It also provides access to the U.S. market for imported organic products that meet our standards.

The integrity of this system has helped propel strong growth in consumer demand for certified organic products. Over the past decade, organic food sales more than quadrupled from $6.1 billion to nearly $27 billion. As organic exports expect to grow 8 percent annually over the next several years, this growth has also created important opportunities for international trade, supporting jobs here at home. While maintaining the rigor of the system and the trust of consumers, we can help drive further exports, economic growth, and support sustainable agricultural production by working to establish common organic standards with foreign nations.

Last week marked an important step forward for the organic food industry. I was happy to announce that beginning June 1, products certified as organic in the United States or European Union can be sold as organic in the other market, reducing costs and removing burdensome barriers for thousands of U.S. organic farmers wanting to export their goods to Europe. This agreement between the world's two largest organic producing markets is truly a game changer for America's blossoming organic industry.

This comes following work in 2009 to establish a similar agreement with Canada. And we are working to establish similar partnerships with Japan, South Korea, and Mexico as well. The growth by the organic industry is just one part of the impressive story of American agriculture.

Overall, agriculture is a bright spot in our economy, enjoying record exports, record incomes for farming families, and a trade surplus that is nine times greater today than it was just five years ago. Today, agriculture supports 1 in 12 jobs in the United States and provides American consumers with 83 percent of the food we consume. To sustain these successes and to continue to feed our nation and the world, the United States must continue to build a diverse agriculture industry and attract the smartest, hardest-working young people in the nation to careers in agriculture.

The fact that organics is an appealing practice for many young and beginning farmers is not lost on USDA. Currently, 30 percent of principal operators of farms are 65 years old or more. By diversifying our agricultural practices and working with new partners such as the EU to improve markets for our agricultural products, we are also investing our country's future.

For me, organics and beginning farmers are near and dear to my heart. I drafted the Organic Foods Production Act under the direction

USDA News…(continued)

of Senator Patrick Leahy of Vermont, then Chairman of the Senate Committee on Agriculture. Today, more than 20 years later, the organic industry has blossomed. National surveys have indicated that more than two-thirds of U.S. consumers buy organic products at least occasionally, and 28 percent buy organic products weekly. And, most importantly, organics have given many farmers, young and old, a second chance.

With the EU partnership, as with the Canadian arrangement before it, Travis Forgues sees a more stable future for his family and community. It means higher incomes for organic farmers and ranchers, more opportunities for small businesses, and jobs for people who package, ship, and market organic products. Estimates show the market for U.S. organic sales to the EU could grow more than 300 percent within the first few years. It is another major win for the American economy and President Obama's jobs strategy. More importantly, it is a win for Travis, his young family, and many others like them.

NASGA News

Summer Tour 2012 Plans Taking Shape

Early planning for the 2012 Summer Tour is underway. Our destination is Nova Scotia, Canada during the week of August 13th.
At this point we plan on staying in the Halifax area or near the airport. On day one we will head to the Annapolis Valley and visit a number of progressive berry farms as well as at least one of the berry nurseries in the area. We will have supper at one of our stops and head back to the hotel in the late evening.

On day two we will head north east and visit the largest strawberry farm in Nova Scotia. We also hope to visit one of the larger farm markets in the area along with some other progressive farms. We hope to wrap things up in time to be back in the

NASGA Distinguished Service Awards

At the annual conference in Las Vegas I had the honor of presenting Lifetime Recognition Awards to **Dr. Gail Nonnecke** and **Dr. Marvin Pritts**.

It was one of the highlights of the conference for me as I have admired both of these folks for many years. Both Gail and Marvin were given plaques honoring their service to NASGA and the entire berry industry as co-chairs of the NASGA Research Committee since 1991. Gail also served as editor of Advances in Strawberry Production.

Not only have they put in countless hours on the Research Committee and Advances but throughout NASGA's history they have been frequent contributors to the education program including this year in Las Vegas. It has truly been a pleasure for me to get to know them and I know that our organization is forever in their debt. *Bill Jacobson, NASGA*

North American Strawberry Growers Association

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New York Berry Growers Association News (continued)

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Why Should Growers Fund Research?

Dale Ila M. Riggs, President, NYS Berry Growers Association, Owner, The Berry Patch, Stephentown NY

(Note from author: this article that this first appeared as an editorial in the Fruit Quarterly in January 2012, but the message holds true, a short 2 months later!)

I just returned from the fall Board meeting of the NYS Berry Growers Association. At the fall meeting, we spend part of our time meeting with Ithaca and Geneva faculty and Extension staff who are working with berry crops – getting updates on work they've been conducting, discussing emerging needs, and batting around ideas for how research or educational programs can be done differently. It's my favorite activity with the Berry Growers Association.

But this meeting was a sobering one. Spotted Wing Drosophila (a fruit fly) has been found in NYS and already caused economic losses in fall raspberries. Blueberry scorch virus and blueberry shock virus, two potentially devastating diseases to the blueberry industry in this state are knocking on the borders. Critical survey work must be done to confirm if they are in New York State. Brown marmorated stink bug is in the state, but it's not yet clear if it will be an economic problem. Weed control in berries continues to be a challenge. On the positive side, a new strawberry variety developed in NYS will be available to plant this year, another is in the final stages of testing. New raspberry varieties aren't too far away. Blackberry production in tunnels is showing great promise. A high tunnel production guide for berries will soon be available.

Truly serious problems face the industry, but opportunities in the industry abound as well. Interest in locally grown products continues to increase. Whenever transportation prices rise, smaller scale growers can more ably compete against large scale shipped in product. And NYS holds what may be the ultimate trump cards. We have a great water supply – something our Western and Southern competitors cannot rely on every year. We also have a great team of researchers and Extension staff performing yeoman's duty to bring in grant dollars to be able to do work vital to the industry.

Unfortunately, grant dollars are becoming harder to come by. Nationwide, universities are telling their faculty and staff that they must come up with their own operational expenses. The success rate for funding is less than 10%. At Cornell, the college no longer provides funds for hiring technicians in the College of Agriculture. Cornell researchers must come up with approximately $75,000 a year in outside funding if they want to have a technician to maintain their plots, collect and analyze data that results in recommendations that help us run our farms more effectively.

It's time for every single grower in NYS (of any agricultural product) to put some of their own money into research that is being done to benefit us. Yes, we all pay a lot of taxes and we should get something for our industry from those taxes. But agriculture doesn't get much from state tax dollars, and that's not going to change. Get used to it. Do something positive rather than gripe about it. The Berry Growers Association automatically puts $50 of every member's dues into a research fund that is used by Cornell researchers to benefit our industry. If every one of the over 300 berry growers in NYS did their part, we would have over $15,000 to help fund summer assistants, travel, and some supplies for our research and Extension team to continue to help the industry. Whether you want to help fund industry driven research by an individual donation or through the Berry Growers Association doesn't matter. What matters is that we start supporting our respective industries with our own dollars. If we aren't willing to help support ourselves, why should a state or college administrator think the industry is worth supporting?

New York Berry Growers Association News (continued)

NYSBGA "Meet the Board" John Hand, Hand Melon Farm LLC, Greenwich, NY

John Hand is the owner and manager of Hand Melon Farm LLC in the town of Easton, NY, in Washington County. The Hand Melon Farm currently grows over 100 acres of vegetables and small fruits. John has been on the Board of directors for the NY Berry Growers Association for 6 years.

The farm was originally purchased in 1908 by John's great grandfather, who died only 1 year later, leaving his wife with two young sons on their new farm. The older son, Allen Furman Hand, who was only 18 years old, began dairy farming to make a living. In 1925 he tried growing cantaloupes, which was a pretty successful cash crop. As the melon business grew, Hand realized that applying the family name to the melons could help in marketing. His wife, Florence, was a bit of an artist, and between them they came up with a logo for the farm featuring a red hand inside a circle along with the farm's name and location. The red "Hand" logo is a well recognized and important marketing tool to this day.

The dairy enterprise continued into the 1960s, along with the increasingly successful melon crop. By then, John's father Aaron Allen (known as A.A.) had taken over management of the farm, and continued to diversify, raising chickens for eggs, as well as sweet corn and other vegetables for the roadside stand on NY Route 29, East of Saratoga Springs. By the early 1970s, both the dairy and the chicken operations had been phased out, with the farm increasingly concentrating on the vegetable business. In the late 1970s, A.A. began growing strawberries for pick your own, which was well received by the local customers and quickly became a profitable business. Continuing to capitalize on the interest in pick your own, A.A. planted 2 acres of Heritage raspberries, and 1 acre of blueberries.

In 1984 John graduated from Cornell and joined the farm with his father. In 1988 A.A. passed away, and at the end of the season, John temporarily closed the farm, not being certain he was ready to be a farmer forever. After a 1 year hiatus, John returned to the farm, with the support of his mother as a silent partner. Since that time, the operation has grown in complexity, with a diverse mix of crops, marketing through the roadside stand, pick your own, as well as some wholesale. The farm employees over 30 full and part time people during the busy season.

Currently there are about 6 acres of strawberries, the same 2 acres of Heritage raspberries (which really need to be replaced), and 2 acres of blueberries with another 1 acre to be planted this year. This past year bird netting was installed over one of the blueberry patches. John sees continuing interest in small fruits. "With the ever increasing interest in buying local, customers often call to ask 'what can we pick right now?' One of our goals is to have berries to pick from strawberries in early June continually through frost in October."

John says that one of the most interesting things that he has learned while being involved with the Berry Growers Association was from a comment by Cornell plant breeder Courtney Weber. Courtney sees good growth potential in the raspberry market, especially grown under cover. "Why would you grow them any other way?" said Weber. John also feels that with declining budgets for Cooperative Extension, growers are going to need to provide more support than ever for research and being involved with the New York Berry Growers Association is an excellent way to do that.

On the Organic Side...

Fungicide Use Strategies for Organic Production – *Mike Ellis and Mizuho Nita, Ohio State University*

Unfortunately, there are not many options to choose from when one considers current fungicide use strategies. The current options are:

1. **Do Not Use Fungicides** This is always an option, but may not be a wise decision for commercial grape plantings in the Midwest. This option should not be confused with "organic" production. Grape growers in "organic" production systems will most probably use Sulfur or Copper to some extent for disease control. Sulfur and Copper are fungicides. Growers that choose not to use fungicides must rely completely on cultural practices, disease resistance, or biological control agents or products for disease control. For strawberries, caneberries and blueberries organic fungicides are often of little value against the more common diseases such as Botrytis fruit rot (gray mold); therefore, little or no fungicide will probably be used in organic production of these crops.

2. **Protectant Fungicide Program** In a protectant program, fungicides are used as a protective barrier on the plant surface. This chemical barrier prevents the fungus from entering the plant. It works much like paint on a piece of wood to keep out water. Protectant fungicides (such as sulfur and copper) are not systemic and cannot move into plant tissues. Once the fungus penetrates into the plant, protectant fungicides will not control it. As the protective barrier breaks down or new foliage is produced, additional applications are required to maintain the protective barrier. Protectant fungicide programs have been, and still are very effective; however, they generally result in a fairly intensive use of fungicide. On grapes, protectant fungicides are usually applied on a 7-10 day schedule early in the growing season and on a 10-14 day schedule later in the season. Obviously, maintaining a protective barrier on the plant surface throughout the growing season requires several applications. The following is a brief description of some disease control materials that are commonly or traditionally used in organic production systems. Copper fungicides, elemental sulfur and liquid lime sulfur are the old "standard" fungicides, and have been used for many years in organic production systems.

Note: Prior to using any material in the organic system, it is important that the grower consult his/her organic certification agency or program to be positive that use of the material is permitted.

Copper Fungicides

When different formulations of copper are dissolved in water, copper ions are released into solution. These copper ions are toxic to fungi and bacteria because of their ability to destroy proteins in plant tissues. However, because copper can kill all types of plant tissues, the use of copper fungicides carries the risk of injuring foliage and fruit of most crops. Factors promoting this injury include: 1) the amount of actual copper applied, and 2) cold, wet weather (slow drying conditions) that apparently increases the availability of copper ions and, thus, increases the risk of plant injury. Because of the potential to injure plants and to accumulate in soil, the use of copper fungicides in conventional production systems has largely been replaced with conventional fungicides that are generally safer to plant tissues and often more effective. Several terms are used when discussing copper as a fungicide. The original material used was copper sulfate (also known as blue vitriol or bluestone). When this material was combined with lime in the French vineyards, the combination became known as Bordeaux mixture.

Bordeaux Mixture

Bordeaux mixture is a mixture of copper sulfate and hydrated lime in water. It has long residual action and has been used for years to control many diseases, including downy mildew and powdery mildew of grape. It can be made (mixed) on site by combining copper sulfate with spray grade lime. It is also commercially available as a dry wettable powder.

Fixed Copper Fungicides

Following the discovery and use of Bordeaux mixture, several relatively insoluble copper compounds or fixed coppers were developed. Fixed copper formulations release less copper ions and are generally less injurious to plant tissues (safer to use) than Bordeaux mixture, but their use is still limited because of their potential to injure plants and lack of compatibility with other pesticides. Some of the more common commercial formulations of fixed copper include C-O-C-S, Kocide 101, Tribasic Copper sulfate, Champ, and Tenn-Copp 5E. There are several fixed copper fungicides registered for use on small fruit.

Sulfur Fungicides

About the Author:

Mike Ellis is professor of plant pathology at Ohio State University. In addition to his responsibilities in research and teaching Mike is a State Extension Specialist with The Ohio State University Extension. It is his duty to provide the most reliable and current information available on diagnosis and control of fruit crop diseases to Ohio fruit growers and other interested clientele.

On the Organic Side...(continued)

Sulfur is available as liquid lime sulfur and as dry wettable powders or liquid (flowable) formulations of elemental sulfur.

Liquid Lime Sulfur
Liquid lime sulfur can be used at high concentrations as a dormant spray on raspberries and blackberries for control of cane blight, spur blight and anthracnose and on grapes for control of anthracnose. At high concentrations, it should be used only when plants are dormant. It can cause severe damage if applied after green foliage appears. Lime sulfur has a foul odor that many people dislike. It is also registered for use on grapes and caneberries as a more dilute concentration for use during the growing season.

Dry Wettable Sulfurs or Flowable Sulfurs
Sulfur for use as a fungicide is available under many trade names. The microfine wettable sulfurs or flowable sulfurs are usually much less injurious to foliage and fruit than liquid lime sulfur, but their use during hot weather (above 85°F) may result in some leaf burning and fruit damage. Sulfur fungicides are very effective for control of powdery mildew on most fruit crops, but are not highly effective for control of most other fruit crop diseases. Growers should note that sulfur is lethal to some beneficial insects, spiders and mites. These beneficial insects are natural predators of harmful insects and mites that affect fruit crops. Killing these beneficial insects may increase certain pest problems, especially mites. Specific comments on fungicide use will be made in the text for each crop where applicable.

"New Alternative" Disease Control Materials for Small Fruit
Many products are currently available or currently being introduced as "biological control agents" or "biopesticides". These include living microorganisms, "natural chemicals such as plant extracts, and "plant activators" that induce resistance in plants to disease. For most of these products, independent evaluations are currently being conducted; however, their effectiveness under moderate to high disease pressure is uncertain.

Although many of these new products have great potential for use within organic production systems, their effectiveness needs to be determined in field tests. It is important to remember that registration of these materials for control of a specific disease on a crop is no guarantee that they will provide effective control under moderate to heavy disease pressure. In addition, many products may be effective for only one or a few diseases and most have very limited residual activity (they have to be applied often). It is also important to remember that these are registered pesticides and growers need to be certain that their use is permitted within their organic certification program.

The biological control committee of the American Phytopathological Society has developed a web page for **"Commercial Biocontrol Products Available for Use Against Plant Diseases".** The web page address is: http://www.oardc.ohio-state.edu/apsbcc/ This web page lists all the products currently available along with information such as registered crops and diseases controlled. It also lists the name of the company that manufacturers or distributes the product along with phone numbers and web site addresses. This site is updated regularly and is a valuable resource for growers interested in these products. The following are a few of the most common "alternative disease control products currently registered for use on small fruit.

• **AC10** (*Ampelomyces quisqualis*) is a biofungicide registered for control of powdery mildew in grapes, strawberries, blueberries, raspberries, currants, and gooseberries. *A. quisqualis* is a fungus, that parasitizes powdery mildew fungi. Preliminary results in grapes in Michigan show moderate disease control. Adding an adjuvant such as Nufilm (0.02% v/v) enhances its efficacy. Application should start as soon as susceptible tissue becomes available and continue on a 7 to 14 day schedule. A minimum of 2 sequential applications if needed to maintain the population of *A. quisqualis*. The following chemicals cannot be tank-mixed with AQ10: sulfur and potassium salts of fatty acids.

• **Armicarb 100** (potassium bicarbonate=baking powder) is a reduced-risk, protectant (contact) fungicide. Armicarb 100 is registered for control of powdery mildew and other diseases in grapes, blueberries, strawberries, and brambles. Preliminary results in grapes in Michigan indicate moderate control of powdery mildew. Start applications at the first sign of disease and continue on a 7-14 day schedule. The preharvest interval (PHI) on all crops is 0 days.

• **Galltrol** (*Agrobacterium radiobactor* strain 84) is a biological control product for control of crown gall, caused by Agrobacterium tumifaciens on several tree fruit and nut crops. The active ingredient is the bacterium, Agrobacterium radiobactor strain 84. On small fruits it is effective for control of crown gall on raspberry and blueberry. It is not effective for controlling crown gall on grapes. It is purchased as a pure culture grown on agar in petri plates. The bacterial mass from one plate is diluted into one gallon on non-chlorinated water and plants are treated with a pre-plant dip in the solution or as a soil drench.

• **Kaligreen** (potassium bicarbonate = baking powder) is a reduced-risk protectant (contact) fungicide. Kaligreen is registered for control of powdery mildew on grapes, strawberry, brambles (raspberry and blackberry) and blueberry. It provides good control of powdery mildew when applied on a frequent-protectant program of 7 to 10-day intervals. It has little or no efficacy against most other fungal diseases on small fruit. It is formulated as a micro-encapsulated powder that is mixed in water and sprayed directly on

On the Organic Side...(continued)

the crop. Kaligreen has a preharvest interval (PHI) of 1 day on all small fruit crops.

• **Messenger** (harpin) is a reduced risk product registered for use on grapes, blueberries, cranberries, strawberries, brambles, and currants. The active ingredient is derived from a protein produced by certain bacteria. This protein stimulates natural plant defenses. Messenger has no direct effect on pathogens. The efficacy of this material for disease control or suppression has not been sufficiently confirmed. Messenger has a 0 day PHI.

• **Mycostop** (*Streptomyces griseoviridis* strain K61) is a biocontrol product registered for use on all fruit crops for control of several important pathogenic fungi that cause seed, root, and stem rot and wilt diseases. The active ingredient is the bacterium, Streptomyces griseoviridis strain K61. It is sold as a powder formulation that is mixed with water and applied as a spray or a drench.

• **Oxidate** (hydrogen dioxide) is a broad-spectrum bactericide/fungicide registered for use in grapes, blueberries, cranberries, strawberries, and brambles. It is a rather corrosive material and works by oxidizing fungal and bacterial cells. The efficacy of the material for disease control has not been sufficiently confirmed on several diseases. In one Ohio fungicide evaluation, it provided no control of grape black rot.

• **Serenade** (*Bacillus subtilis*) is a biocontrol product registered for control of powdery mildew, Botrytis bunch rot and sour rot in grapes. Serenade is also reported to provide some suppression of downy mildew. This product needs further evaluation, but preliminary results show a moderate level of control of Botrytis bunch rot and powdery mildew. Serenade did not control grape black rot in Ohio. Good coverage is important for control. Applications are recommended on a 7-10 day schedule. Serenade has no maximum seasonal application rate and has a 0 day PHI.

• **Trichodex** (*Trichoderma harzianum*) is a biofungicide registered for use on all small fruit crops for control of a wide range of diseases, but primarily for control of Botrytis fruit rot. It is sold as a wettable powder formulation that is mixed with water and sprayed directly onto the plants.

• **Trilogy** (Clarified Hydrophobic Extract of Neem Oil). The label states that Trilogy is a broad spectrum fungicide of certain diseases and controls mites in citrus, deciduous fruits and nuts, vegetable crop, cereal grains and other miscellaneous crops. The label does not state what diseases are controlled on specific crops. Trilogy is registered for use on grapes, strawberry, brambles (raspberry and blackberry), and blueberry. Trilogy is a liquid that is applied for diseases as a 1% solution in sufficient water to achieve complete coverage of the foliage. As the efficacy of these new materials is tested and validated, they will be included in these guidelines where appropriate.

Efficacy of Disease Control Materials for Powdery Mildew

Powdery mildew is different from most other plant diseases caused by fungi, because the fungus that causes it lives almost entirely on the surface of infected plant parts. The fungus may penetrate only one cell layer deep into the plant. Thus, it is exposed to eradication following topical treatment with a range of products that do not affect many other pathogenic fungi that colonize deeper into infected plant tissues. Research in New York and other locations has demonstrated that many new and "alternative materials can provide effective control of powdery mildew if applied often enough (7 day schedule) through the growing season. These materials burn out the fungus growing on the surface, but do not provide protection against new infections; thus, repeated applications are important. These materials include: Nutrol (manopotassium phosphate); Kaligreen and Armicarb (potassium bicarbonate baking soda); oils such as Stylet Oil and Trilogy; and dilute solutions of hydrogen peroxide (Oxidate). Unfortunately, these materials have little or no effect on many other small fruit diseases. In addition, organic growers need to consult with their certification agency or program to be sure that any material they use is "certified" or acceptable as organic.

Organic Fungicides and Biocontrol products for Strawberry Disease Control

Most organic fungicides and biocontrol agents are not highly effective against the overall disease complex on strawberry. A number of products including sulfur, salts and oils will provide good control of powdery mildew if applied on a 7 to 10 day schedule; however, these materials have little or no activity against most of the other leaf spot or fruit rot diseases. Emphasis for controlling these diseases, as well as powdery mildew, should be placed on the selection and use of disease resistant cultivars (Table 1). If a high level of resistance is not available in adapted varieties, growers should at least avoid the selection of highly susceptible varieties. Copper fungicides have limited use on strawberry. The potential for plant injury using copper fungicides is high on strawberry. In addition, copper fungicides are not highly effective against most of the leaf spot and fruit rot diseases. In order to apply sufficient copper to obtain control, the potential for plant injury is probably unacceptable. Copper fungicides have been recommended and used for control of angular leaf spot (bacterial blight) with varying levels of success. Once the disease is established in the planting, copper fungicides will do little to control it. There are several biocontrol products registered for control of Botrytis fruit rot. Their efficacy under moderate to severe disease pressure needs to be determined.

On the Organic Side...(continued)

Organic Fungicides for Bramble Disease Control

Liquid Lime Sulfur Lime sulfur is recommended for use on brambles as a delayed-dormant application in early spring (when buds show 1/4 inch green). It is used at the rate of 10- 20 gal per acre. If applied at this rate later in the season (after ¼ inch green) it can cause severe damage to leaves and young canes. Lime sulfur is recommended for control of the cane infecting fungi (anthracnose, cane blight and spur blight). The delayed dormant application in spring is intended to eliminate or reduce the overwintering inoculum for these diseases on canes. Where cane diseases are a problem, this spray is very important. Where good sanitation is used, (old fruited and infected canes are removed from the field) and cane diseases are not a problem, the need for this spray may not be necessary, or at least it would probably be safe to use the lower rate, especially on red raspberries. Lime sulfur has a bad smell (rotten eggs) so there can be a problem spraying it around your neighbors. Some growers have received complaints from neighbors after applying lime sulfur. In addition, lime sulfur is very caustic. It is harmful to machine parts, paint (especially on cars) and sprayers. Special care should be taken to avoid drift to nontarget objects and proper protective clothing should be worn by the applicator.

Copper Fungicides If a dormant application of fungicide is required, and lime sulfur cannot be used, Bordeaux mixture or a fixed copper fungicide can be used in its place. Although lime sulfur is the proven material, dormant sprays of copper should provide some level of control. The use of copper in the growing season (after leaves are present), could result in significant plant damage.

Sulfur Sulfur is available as a wettable powder or in flowable formulations. Sulfur is registered for control of powdery mildew. Sulfur has little or no activity against the other bramble diseases caused by fungi. Because powdery mildew is generally not a serious problem in the Midwest, sulfur is of little importance within the bramble disease management program. There are several biocontrol products available for control of Botrytis fruit rot. Their efficacy under moderate to severe disease pressure needs to be determined.

Table 1. Disease resistance of Several Strawberry Cultivars Commonly Grown in the Midwest

June Bearing		Disease Resistance[a]				
Cultivar	**Season**	**Verticillium Wilt**	**Red Stele**	**Leaf Diseases[b]**	**Powdery Mildew**	**Comments**
Earliglow	Early	R	R	R	PR	Standard for early cultivars; berry size medium. Excellent flavor, but only moderately productive.
Veestar	Early	T	S	T	PR	Early, productive. Has performed well in Southeast PA, with medium bright berries. Fruit shows some *Botrytis* resistance.
Annapolis	Early	I	R	S	S	Fruit medium-large, firm, and glossy with good flavor. Plants runner freely. Fairly susceptible to *Botrytis*.
Northeaster	Early	R	R	I	S	Very large, early, and firm fruit with aromatic flavor and aroma. King berries slightly rough. Well adapted to heavy soils. In PA, for trial only.
Mohawk	Early	R	R	PR	T	Medium-sized fruit, comparable to Earliglow. Good flavor. Tolerant of *Botrytis*. Has been very variable, as two lines of plant material exist. Plant only small quantities.
Avalon	Early	R	R	T	R	Large berry with good color and flavor, average productivity and vigor. Has performed well in Southeastern PA. For trial only.
Sable	Early	U	R	PR	S	Veestar x Cavendish cross. Productive, well suited to U-pick operations. Available in small quantities. For trial only. Produces dense beds; *Botrytis* control may require more effort than usual.
Evangeline	Early	U	S	U	R	Medium yields of conical, firm berries. Flavor good if fully ripe. Berries produced on stiff, upright stalks. May not runner well. For trial only. Limited quantities available.
Honeoye	Early-mid	S	S	PR	T	Large fruit, productive; has performed well in PA, but lack of red stele resistance a concern. Tends to become soft in hot weather. Flavor distinctive, "Perfumy".
Cavendish	Early-mid	I	R	PR	S	Very large firm fruit with good flavor. Very productive (yields 85% of Kent) and moderately vigorous. Tends to ripen unevenly in certain years.

On the Organic Side...(continued)

Table 1. Disease resistance of Several Strawberry Cultivars Commonly Grown in the Midwest

June Bearing		Disease Resistance[a]				
Cultivar	**Season**	**Verticillium Wilt**	**Red Stele**	**Leaf Diseases[b]**	**Powdery Mildew**	**Comments**
Brunswick	Early-mid	U	R	U	U	Good size and flavor. May perform better in cooler locations. Susceptible to Phytophthora crown rot. For trial.
Raritan	Mid	S	S	S	S	Widely planted cultivar in spite of disease susceptibility; first fruits are large, but size decreases more rapidly than most cultivars. Very flavorful.
Guardian	Mid	R	R	R	S	Very productive, firm, large fruit, sometimes rough (uneven) looking. *Botrytis* is generally more prevalent in Guardian. Tends to get a "Long neck" which breaks down and allows easy entry for slugs and sap beetles. Susceptible to Sinbar injury.
Redchief	Mid	PR	R	R	R	Productive, with good color and size. Flavor average. Excellent disease resistance.
Lester	Mid	S	R	R	U	Productive, good-sized berry. Flavor is good, though size tends to "run down" quickly. Fruit if fairly susceptible to *Botrytis*.
Kent	Mid	S	S	S	T	Extremely productive berry with large firm fruit. Tends to yield fruit in middle of rows, resulting in high rot, so keep rows narrow. Flavor average. Susceptible to Sinbar injury.
Settler	Mid	T	U	T	S	Large attractive moderately firm fruit. Very susceptible to Sinbar injury. In PA, for trial only.
DelMarvel	Mid	R	R	R	U	Very vigorous plants, with high production, large, firm, aromatic fruit. In PA, for trial only.
Primetime	Mid	R	R	R	U	Medium-firm berry with mild, lightly aromatic flavor. Good *Botrytis* resistance. In PA, for trial only.
Mira	Mid	U	R	S	R	Glossy, medium-red, tart berries. High yielding in areas north of PA. Good winter hardiness. Vigorous plants. In PA, for trial only.
Eros	Mid	S	R	U	U	'Allstar' hybrid from England, with darker fruit color than 'Allstar'. Large fruit, well-balanced flavor. Available in small quantities. For trial only.
Darselect	Mid	U	U	T	U	Attractive fruit with good color and quality. Vigorous. Available in small quantities for trial.
Jewel	Mid-late	S	S	PR	R	Large soft fruit; can be very dark. Tends to soften in hot weather. Very productive, though dense foliage can encourage *Botrytis*.
Allstar	Mid-late	R-T	R	T	T	Productive, elongated, flavorful berries. Lighter color than most berries. Good fruit size. Has become the standard mid-season berry in PA, in spite of light color. Has potential for the annual system on plastic mulch. Susceptible to angular leaf spot.
Seneca	Mid-late	S	S	U	U	Round, large, medium-red, exceptionally firm fruit with firm skin. Plant is vigorous. Flavor mediocre, but firmness of fruit may be useful for shipping market. Has potential for the annual system on plastic mulch.
Lateglow	Mid-late	R	R	T	T	Productive, good size and flavor. First berries extremely large, though size "runs down" over season. Extremely vigorous plant and needs to be controlled.
Latestar	Mid-late	R	R	R	U	Mild flavor, but variable yields and small fruit size. Vigorous plants. Flowers and ripens a few days later than 'Allstar'. In PA, for trial only. Susceptible to gray mold.

On the Organic Side...(continued)

Table 1. Disease resistance of Several Strawberry Cultivars Commonly Grown in the Midwest

June Bearing		Disease Resistance[a]				
Cultivar	**Season**	**Verticillium Wilt**	**Red Stele**	**Leaf Diseases[b]**	**Powdery Mildew**	**Comments**
Winona	Mid-late	T	R	R	U	Large, firm conical fruit with bright red-orange color and good flavor. Released from Minnesota. May be marginal quality when warm. In PA, for trial only.
Mesabi	Mid-late	R	R	R	R	Large, dark-red fruit with good flavor. Winter hardy. Skin tends to become weak in warm weather.
Cabot	Mid-late	U	R	T	U	Huge berries, averaging 20-30 g over season. Berries rough-looking with firm flesh and tender skin. Available in small quantities. Greatest value may be as a "novelty berry" Doesn't runner well. For trial only.
Delite	Late	R	R	R	U	Large berries, very resistant to disease, average flavor.
Sparkle	Late	S	R	S	S	Flavorful, high-quality, attractive but soft fruit. Tends to grow very thickly. Size decreases rapidly during harvest season.

Day neutral		Disease Resistance[a]				
Cultivar		**Verticillium Wilt**	**Red Stele**	**Leaf Diseases[b]**	**Powdery Mildew**	**Comments**
Tribute		PR	R	T	R	Slightly later than 'Tristar' with larger fruit. Flavor not as strong, and plants are more vigorous.
Tristar		R	R	T	R	Bears an early crop, smaller than 'Tribute' flavor is excellent. Flesh and skin firm. Moderate vigor. Size reduced when weather too hot.
Everest		U	U	U	U	An alternative for growers who wish to try a day-neutral other than Tribute or Tristar. Recommended for small quantity trials only.

Plastic culture system		Disease Resistant[a]				
Cultivar	**Season**	**Verticillium Wilt**	**Red Stele**	**Foliar Diseases[b]**	**Powdery Mildew**	**Comments**
Sweet Charlie	Early	U	U	U	U	Good flavor and size. Yields lower than for Chandler but produces crop for early market. Tends to break dormancy and flower during warm spells in late winter and early spring.
Chandler	Mid	U	S	S	S	Standard berry for this production system. Large, firm berries. Flavor is sweet if allowed to ripen fully, and not over-fertilized with nitrogen.
Camarosa	Mid	U	U	S	S	Large, firm berries. Productive and vigorous in warmer climates. Flavor fair. Cool fall temperatures may negatively affect flower bud initiation.
Marmolada	Mid	R	U	U	U	Requires high nitrogen rates for high yields. Large, glossy, bright red fruit with red flesh. Flavor fair. In PA, for trial only.

[a] I = intermediate, PR = partially resistant, R = resistant, S = susceptible, T = tolerant, U = unknown. [b] Includes leaf-scorch and leaf spot. *Used with permission from the Commercial Berry Production and Pest Management Guide, 2002-2004", The Pennsylvania State University.*

On the Organic Side...(continued)

Organic Insecticides...What Works and What Doesn't – *Scott Guiser, Horticulture Educator, PSU Extension*

In late January I was fortunate enough to hear Dr. Galen Dively of the University of Maryland give an overview of organic insecticides at the Mid-Atlantic Fruit and Vegetable Grower's Conference. Did you miss it? I'll try to provide a recap.

I have a copy of the Conference Proceedings (write-ups of the presentations) as a reference which will help me recall key points. If you missed the Mid-Atlantic Conference, mark your calendar for Jan 29-31, 2013... it's a fantastic educational (and social!) event.

Galen prefaced his remarks about specific products with these observations:

In organic systems, insecticides are used as a tool of last resort... after all non-chemical approaches have been employed. They are not intended as the basis for insect management in these systems. This often puts the products at a disadvantage because they frequently work best on immature stages of pest's life cycle.

Many pest control products are listed at OMRI (Organic Materials Research Institute) and are approved under the USDA National Organic Program but double check with you certifying agency before proceeding.

Organic insecticides have several problems or limitations compared to conventional insecticides, including:

Short residual activity

Most have limited contact activity, requiring ingestion to be effective

Less effective on mature insects, requiring precise timing to hit immature insects

None have systemic activity

Short shelf life

Lacking in reliable efficacy (do they work?) data

Expensive

Interesting...an article in the February 2012 issue of Vegetable Growers New echoed Galen's points about the limitations of these products. Still, growers found them useful. So, despite these limitations, organic growers have several good tools for insect management. Here is an overview:

Azadirachtin products, such as Neemix and Aza-Direct are extracts of oils found in the Neem tree. These products are insect growth regulators and prevent insect molting (slow) and also serve as feeding deterrents and repellents. Fair to good control of beetles (Cuke, Colorado potato, Mexican bean, and flea) is reported. Note however, that with cuke beetles, even minimal feeding can transmit the bacterial wilt organism to cucumber and cantaloupe.

Pyrethrum is the naturally derived insecticide found in daisy flowers and commonly marketed as Pyganic. Quick knockdown but very short residual activity are key traits. Fair to good control of aphids, whiteflies, thrips as well as knockdown of cuke, Colorado potato and flea beetles were noted.

A new product called Azera is a combination of a pyrethrum (like Pyganic) and azadirachtin (like Azadirect/Neemix). Control of Japanese beetle, aphids, imported cabbage worm, leafhoppers and cucumber beetles was improved over use of azadirachtin alone in recent studies. It even provided good squash bug control if timed to target nymphs, just after egg hatch. The limitations of one ingredient are partially covered by the other.

Bt products are well known for their ability to control lepidopteron (caterpillar) larvae such as imported cabbage moths in cole crops. Good spray coverage and repeat applications are important. Some Bt strains control non-lepidopterons. Not all Bts are alike and some are not labeled for organic production.

Spinosad, sold as Entrust to the organic market, provides very good control of caterpillars and thrips. Fair to good control of flea beetles and Mexican bean beetle was noted. Some growers note control of Colorado potato beetle.

Soaps and oils – provide good knockdown of soft bodied insects such as aphids and mites. Repeat applications and excellent plant coverage are important. Oils provide more residual activity than soaps but still this effect is short lived. Both soaps and oils have potential for phytotoxcity.

Plant Extracts such as d-limonene (citrus) and rosemary extras disrupt insect neuroreceptors and act as anti-feedants. Fair to good control of aphids and spider mites reported.

On the Organic Side...(continued)

Mineral dusts kaolin clay sold as Surround, repel and/or irritate insects and disrupt feeding and egg laying. Maryland research showed that Surround applied alone or in combination with sulfur, Azera or Trilogy provided 55-86 % stink bug control. Residue from Surround may not be acceptable for some fresh market crops.

In conclusion, Galen provided the following suggestions for improving the efficacy of organic insecticides:

Use 50 -100 gallons of spray solution to ensure good plant coverage.

Arrange nozzles (such as drop nozzles) to improve plant coverage.

Monitor pH of spray water and buffer as needed.

Calibrate sprayers.

Apply controls when pests are in the early stages of development.

Consider adjutants to increase coverage and efficacy.

More than 130 participants were attracted to Galen's excellent presentation. As he noted, efficacy data on organic insecticides is sparse. His work and presentation were very much appreciated.

(Reprinted with permission from: The Vegetable and Small Frit Gazette, Vol. 16 (3), March 2012)

Focus on Food Safety

Produce Safety Alliance March Update - *Gretchen Wall, Produce Safety Alliance Program Coordinator, glw53@cornell.edu*

To those of you working in agriculture, it's no surprise how busy the winter months can be. Conferences, extension workshops, grower meetings, winter maintenance – and before you know it, spring has arrived! Although some areas never get a break and produce fresh fruits and vegetables year-round, we have been busy working with growers across the country in the "off season".

Working Committee Updates
We are in the home stretch with many of our Working Committees (WC) entering their final conference calls and discussing their draft summaries. Many thanks to all of you who have participated in the WCs and to the WC co-chairs who have provided keen leadership. As the WCs finalize their reports, they are being posted to the PSA website, so we invite you to follow their progress.

PSA Focus Groups
To supplement the output from our working committees, we have started collecting information from small fruit and vegetable growers in focus groups. We have been discussing challenges to implementing Good Agricultural Practices, preferred methods of learning, and attributes of effective training programs to minimize food safety risks at the farm. When we are finished, a summary of these listening sessions will be made available on the PSA website.

PSA by the Numbers
In other exciting news, this week the PSA exceeded the 400 mark for members subscribed to our general listserve. As we move forward through the curriculum development process, we hope this base of growers, industry representatives, educators, regulators, and consultants will continue to grow and aid in the future roll out of the program.

Current Events in Produce Safety: February 2012
Sprout producers will get special help in meeting future produce safety standards set by the Food Safety Modernization Act (FSMA) as the FDA announced on February 28th the creation of a new Sprouts Safety Alliance (SSA) to identify best practices for the safe production of sprouts. The Alliance is a one year, $100,000 grant to the Illinois Institute of Technology's Institute for Food Safety and Health (IIT IFSH) to develop training materials, self-audit tools, and serve as a resource hub for industry and regulators. Read more about the Sprouts Safety Alliance.

Focus on Food Safety - (continued)

Upcoming Online GAPs Training Course
The next Online GAPs Training Course has been scheduled. It will begin April 11, 2012. If you are interested in receiving more information or would like to register for either of these courses, please visit www.gaps.cornell.edu.

Spotlight Series
This month, we are introducing a new section of our newsletter. In future issues, we will be highlighting a new program, resource, or research as it pertains to current events in produce safety. Our first highlight will be of the University of Georgia Center for Food Safety. It recently launched a new website which is devoted to summarizing scientific research on food safety of leafy greens. As such, the primary audience is targeted at researchers, governmental regulators, leafy green growers and suppliers, third party auditors, food industry professionals, and graduate students.

For an overview of the project additional information is provided in the attached abstract or the project's website titled "A Systems Approach for Produce Safety – A Research Project Addressing Leafy Greens".

Keep Up-To-Date
Get the latest updates on the PSA's activities and future produce safety regulations through our listserve. To sign up, please visit our website at http://producesafetyalliance.cornell.edu/psa.html. Interested in a handout to use at meetings? Download the PSA Flyer to share with others.

Other Resources
The calendar is continually updated online with committee meeting dates. Miss a meeting? All WC meeting notes and summaries are available for download as they are received.

As always, please do not hesitate to contact myself or Betsy Bihn (eab38@cornell.edu) if you have any questions.

Focus on Pest Management

USDA's Proposed 2013 Budget Threatens the Elimination of the IR-4 Program

March 6, 2012. The IR-4 Project was established by Congress in 1963 to assist domestic growers of fruits, vegetables, herbs, ornamentals and other specialty crops by facilitating through US EPA the registration of safe and effective technology to protect these high value crops from insects, plant diseases, weeds and other pests. In FY 2012, IR-4 was funded by Congress under USDA-NIFA Research and Extension Activities at $11.913 million. Additionally, USDA-ARS was provided with slightly less than $4.0 million for a companion research effort.
President Obama, in his FY2013 budget plan, eliminated funding for Minor Crop Pest Management (IR-4) and proposed to consolidate IR-4 Project funds with funds from various IPM programs into a new project called Crop Protection. Specialty crop producers are very concerned as to how this budget consolidation will eliminate the activities of the IR-4 Project to support research for pesticide labeling for specialty crops. Specialty crop growers believe that now, more than ever, adequate funding for the IR-4 Project is absolutely necessary to assist them to provide the public with safe fruits, vegetables and ornamental plants at a reasonable price.

The Friends of IR-4 does not support the lumping of IR-4 with other line items in the budget. The IR-4 has a long history of supporting U.S. agriculture and we believe that continuing IR-4 funding as a separate line item is in the best interest of Specialty Crops.

Why Congress Should Maintain and Adequately Fund the IR-4 Project?

There are still many pest management voids on specialty crops - For nearly 50 years, specialty crop producers have depended on the IR-4 Project to facilitate the registration of conventional chemicals and biopesticides for use in their plant protection programs. The IR-4 Project has delivered over 13,000 new uses to help growers manage pests. However, specialty crop agriculture continues to be severely threatened by many pests including invasive pests such as the Brown Marmorated Stink Bug and Spotted Wing Drosophila.

Enhanced food safety -Over 80% of IR-4 research and supported registrations is with lower and reduced risk products that manage pests with minimum potential for adverse effects IR-4 helps to ensure that sickness from pesticide contamination in food is almost non-existent in the US and the public can confidently eat fruits and vegetables which are being promoted as key for a healthy diet.

Focus on Pest Management

Economic development – There is great opportunity to expand export markets for specialty crops. However, pesticide residues can be a barrier to trade when there is limited agreement by importing countries about the amount of acceptable pesticide residue. IR-4 is working with EPA and international regulatory authorities to harmonize acceptable levels of pesticides to eliminate traded barrier.

Public health pesticides –In conjunction with the Department of Defense, this new initiative by IR-4 facilitates registrations of new pesticide products to manage pests that transmit diseases to humans such as West Nile Virus, Dengue Fever, Lyme Disease and Malaria. This cooperative project will benefit deployed US military forces as well as the general public

Exceptional return on taxpayer investment –Recent data from Michigan State University reports that the IR-4 Project efforts contribute over **$7.2 BILLION** to US Gross Domestic Product. The federal funding provides over a 200 fold return on investment. More importantly, the federal funds for IR-4 provide supports over **100,000 jobs** throughout the United States.

Urgent! Support Needed for IR-4 Program! Please contact your US senators and Representatives and urge them to support the IR-4 Program!

2012 Berry Crop Label Updates - *Laura McDermott, CDVSFP Extension Specialist and Cathy Heidenreich, NYS Berry Extension Support Specialist*

There have been a few additions and changes to pesticides available to berry producers for 2012, some of which specifically address invasive species like Spotted Winged Drosophila and Brown Marmorated Stinkbug. Below is a list of pesticides that have new labels and those materials that have 2(ee) labels or Special Local Needs (SLN) labels. Remember that the applicator must have a copy of the Primary label AND the supplemental label in their possession during application. The list below features hotlinks that should help the reader access the labels easily. If the hotlinks do not work, please refer to the NYS Pesticide Product, Ingredient and Manufacturer System (PIMS) website, http://pims.psur.cornell.edu/.

Basic use information is listed so that the user has an idea of how this product might fit into their pest control arsenal; please be sure to read to the label carefully for application details and call your extension agent if you have questions. More detailed information can be found in the 2012 Cornell Pest Management Guidelines for Berry Crops, http://ipmguidelines.org/BerryCrops/.

FIFRA Section 2(ee) labels on pesticides mean that they are classified for restricted use only in New York State. The supplemental 2 (ee) recommendation and the primary label should be in the applicators possession at the time of application.

Fumigants

Paladin (EPA Reg. No. 55050-4) and Paladin EC (EPA Reg. No. 55050-5) fumigants contain the new active ingredient dimethyl disulfide. Paladin contains 98.8% dimethyl disulfide and Paladin EC contains 93.8% dimethyl disulfide. Both products are formulated as liquids. They are labeled as a pre-plant soil fumigant for control and suppression of weeds, soil-borne plant pathogens, and nematodes strawberries and blueberries.

Both Paladin and Paladin EC are federally restricted use due to inhalation exposure to humans. Application of both of these products is limited to a maximum of 40 contiguous acres and a maximum rate of 449 pounds of dimethyl disulfide per acre

Insecticides/Miticides

Admire Pro systemic (EPA Reg. No. 264-827). Foliar application only to control aphids, spittlebug, whiteflies on bushberries, strawberries and caneberries.

Portal (EPA Reg. No. 71711-19): twospotted spider mite, cyclamen mite in low growing berries. The NYSDEC has recently approved a revised 2(ee) recommendation for the use of Portal Insecticide (EPA Reg. No. 71711-19) against the unlabeled pest cyclamen mite on low growing berries including lowbush blueberry, cranberry, and strawberry. **This revised label now requires that a minimum of 300 gallons of water per acre be used.**

Courier, (EPA Reg. No. 71711-20). Control of whiteflies, potato leafhopper on low growing berries including strawberries. Not for use on LI

Platinum (EPA Reg. No. 100-1291): whiteflies, leafhoppers, aphids, strawberry root weevil, grubs complex on bushberries, and low

PIMS

Product, Ingredient, and Manufacturer System:

http://pims.psur.cornell.edu/

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

Berry Diagnostic Tool

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

Focus on Pest Management *(continued)*

growing berries including strawberries. Not for use on LI.

Vetica (EPA Reg. No. 71711-32): Lepidoptera control onlow growing berries including strawberry. Not for use on LI.

Lannate LV (EPA Reg. No. 352-384) and Lannate SP (EPA Reg. No. 352-342) for control of cranberry fruitworm, blueberry maggot on bushberries plus BMSB on blueberries.

Acramite (EPA Reg. No. 400-503) For control of two-spotted spider mite on caneberries, small fruit vining berries and low growing berries.

Zeal Miticide 1 (EPA Reg. No. 59639-138) - use on cane berry, low growing berry, and small fruit vine climbing for several mite species. (See supplemental label approved Sept 20, 2011.)

Radiant SC (EPA Reg. No. 62719-545) for use on strawberry against the unlabeled pest spotted wing drosophila. Radiant SC can be used as part of an integrated program to manage spotted wing drosophila. This use is limited to ground application.

Actara, EPA Registration No. 100-938, 2(ee) label to control brown marmorated stink bug (Halyomorpha halys) on Bushberry Subgroup. It is also registered to control aphids and leafhoppers on low growing berries like strawberry, but this does not include cranberry.

Movento, EPA Reg. No. 264-1050, for control of Grape Tumid Gallmaker on gooseberry and small fruit vining subgroup excluding fuzzy kiwi.

Chlorpyrifos – 2(ee) Recommendation for the use of Lorsban Advanced (EPA Reg. No. 62719-591) to control the unlabeled pest Brown Marmorated Stink Bug on several agricultural crops.

Insecticide Deletions
Guthion use on blueberries was restricted in 2010. No aerial applications are allowed and, 1.5 lb maximum application rate. **Note:** Guthion may not be used on highbush blueberries after 9/30/2012.

Thionex currently labeled for control of cyclamen mite, spittlebug. Supplemental label lists crops and date of phase-outs. (July 2012 for annual strawberries, July 2016 for perennial and biennial strawberries and blueberries)

Herbicides

New Products
Sandea, EPA no. 81880-18-10163, Supplemental label approved in 8/2011 authorizes use in controlling certain broadleaf weeds and nutsedge in highbush blueberry. Pre-emergence and post-emergence directed application allowed.

Dual Magnum, EPA no. 100-816, Weeds managed include most annual grasses and certain broadleaf weeds. A copy of the SLN label (SLN NY-110004) must be in the possession of the user at the time of application. Pre emergence banded application is recommended (DTH = 28) This label authorizes use on Highbush Blueberry and caneberries. Dual Magnum is a restricted use product; Not for use on Long Island.

Firestorm, EPA no. 82557-1-400, Controls most annual broadleaves and annual grasses and suppresses perennial weeds. Labelled for use on Caneberries, bushberries and strawberries. This is a restricted use product; Post emergence, directed spray consistent with technique used when spraying paraquat dichloride, which is the active ingredient.

Label Changes:
Prowl H20 (strawberry) EPA Reg. No. 241-418 - As of September 2011, the Prowl H20 label became a

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Primary label that lists strawberries. See label for special instructions for application of Prowl H2O through sprinkler irrigation systems. Prowl H2O can be used as follows:

Before planting strawberries apply to the soil surface to prevent most annual grasses and suppress several broadleaves like velvetleaf or purslane. Irrigate after application to activate herbicide OR shallowly incorporate. Do not apply to soil that will be covered in plastic, but applications to row middles between the beds are allowed. Post transplant applications may be made ONLY if no foliage on dormant plants is exposed to spray. A 2nd application between rows may be applied 35 days before harvest, but material must not come in contact with foliage.

Apply to strawberries in fall or winter dormancy. Do not apply if new seasonal growth has appeared.

Arrow EC, EPA no. 66222-60. Annual and perennial grasses managed on the previously labeled crops which included non-bearing Vaccinium and Rubus spp. to now include all bushberries, caneberries, cranberry and strawberry. PHI is 14 days for bushberries, caneberries and strawberries; 30 days cranberries; Restricted use product; Post emergence application; Always use with 1% v/v finished spray volume COC.

Select Max, EPA no. 59639-132. Annual and perennial grasses controlled in Berry crops; new supplemental label 8/2/11; previously non-bearing Vaccinium and Rubus spp.were allowed, now all bushberries and caneberries. PHI = 14 days; Restricted use product for Post emergence application; Application on Long Island is restricted to no more than 32 fl oz (0.25 lb ai) per acre per season;

Disease Snapshot: Currant Cane Blight - *Zachary Frederick, Graduate Student and Kerik Cox, Assistant Professor, Plant-Pathology & Plant-Microbe Biology, Cornell University*

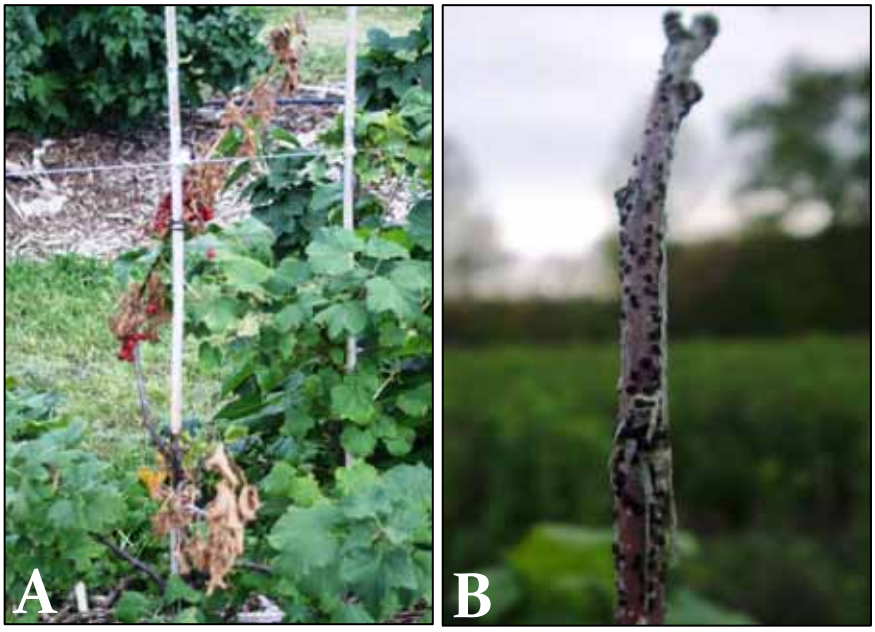
Disease Name: Currant Cane Blight

Cause: *Botryosphaeria ribis*

When to watch for it: Summer, as the fruit ripens, and late summer when the growths emerge from infected tissues.

First line of defense: Prune out infected canes and burn them.

Summary: Currant cane blight caused by *Botryosphaeria ribis* is a serious fungal disease of *Ribes* plantings in the northeastern United States. The pathogen attacks the wood, and often the first noticeable symptoms are in the summer with the sudden wilting of shoots. Wilted shoots will quickly die, and the infection can progress further into the shoot and cause the death of canes and entire bushes.



A: *B. ribis* has infected and killed the apical shoot of a red currant during fruiting. **B**: *B. ribis* stroma erupting from dead tissues in lines.

Late in the season black, wart-like growths emerge in parallel rows from dead and dying shoots. When infected shoots are cut open, the infected pith will appear blackened. *B. ribis* overwinters as mycelia, pycnidia, or perithecia in infected host tissues.

Singer and Cox demonstrated in 2010 that dormant applications of copper hydroxide and sulfur combined with pruning are the most effective form of management. Results from pruning alone were inconsistent, and fungicide applications alone do not prevent cane blight because *B. ribis* is inside of the wood. During the season, applications of tebuconazole, benomyl, thiophanate-methyl, azoxystrobin, or mancozeb can be used as protectant sprays, but offer no curative value..

Focus on Pest Management…*(continued)*

Expect Worker Protection Standards (WPS) Inspections - *Sandy Menasha and Alice Wise, CCE - Suffolk County*

(Note: At the Cornell Pesticide Management & Education Program Update last November NYS Dept. of Environmental Conservation (DEC) staff explained that they would be increasing inspections for Worker Protection Standard compliance along with their record-keeping inspections. Brush up on the requirements of the Worker Protection Standard!

If only immediate family members work on your farm do you think the Worker Protection Standard doesn't apply to you? Wrong! The use of personal protective equipment (PPE), following early entry worker requirements, and compliance with re-entry intervals (REI) for non-handlers still apply.)

Time to go through the checklist to make sure everything is in order for the upcoming season. For more information, the EPA website has extensive WPS information on-line. Alternatively, the Region One DEC office may be contacted at 444-0340.

Check decontamination kits and upgrade as necessary:

--coverall, soap and a stack of single use towels

--put out fresh water, enough for routine washing (at least 1 gal. per worker using the site) and emergency eye flushing. If the decontamination kit might be used by a pesticide handler, there must be enough water for washing of the entire body in case of emergency, at least 3 gal. per handler using the site.

--if including eyewash, check expiration date.

--decontamination kits must be within ¼ mile of all workers. Portable kits might be a better option for growers with a large operation.

--make sure all your handlers and workers know where the decontamination sites are and what they contain.

Where eye protection is required on a pesticide label, the WPS guidelines say the eyewash must be "immediately accessible" to a pesticide handler. The need for eye protection will be listed on the pesticide label in the box entitled "Agricultural Use Requirements", in the section listing PPE (personal protective equipment). The emergency eyeflush water (1 pint) must be carried on the tractor. However, if the applicator gets off the tractor to adjust something, the eyewash must be carried on their person.

Check your central posting area. This has been a source of violations in years past. Make sure emergency contact information is accurate. If the WPS safety poster is in poor condition, get a new one. Have your blank pesticide application forms together – they need to have location and description of area to be treated, product name, EPA registration no., active ingredient(s), date and time pesticide is scheduled to be applied, and the restricted-entry interval (REI). You are required to post this information before each application begins. Note that the 30 day posting requirement for all applications starts after the REI expires. A farm map is suggested for the central posting area so that workers can easily ID the location of all farm fields.

Train new workers within ---5 days. Handlers and early-entry workers who will come in contact with anything treated during the REI must be trained before they do work. Remember also that handlers and workers must be trained at least once every 5 years – check your records on long-term employees. All training must be done by a licensed applicator.

Look at the "Agricultural Use Requirements" box on the pesticide label for a list of required PPE. Make sure PPE is adequately stocked – chemical resistant suits, gloves, aprons, protective eyewear, boots, and respirators. Check unopened respirator cartridges or canisters for an expiration date.

Start accumulating copies of pesticide labels. All applicators must have a copy of the label immediately accessible. Some growers deal with individual labels, some put together a notebook to be carried with the tractor.

Just to recap, when making a pesticide application, the following items must be on the tractor: appropriate pesticide label(s) and one pint of eyewash or water for eyewash. Additionally, the licensed applicator must carry their license on their person. Don't forget, if the applicator gets off the tractor to adjust something, the eyewash must also be carried on their person. Also, they must be wearing the appropriate PPE if they get off the tractor to check the sprayer or something in the treated field.

Tidy up your pesticide storage area. A disorganized, messy storage area is a red flag to an inspector. Pesticide storage guidelines can be found at http://www.dec.ny.gov/regulations/8871.html. (AW, SRM)

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Designing a Better Sprayer for Pesticide Application in Strawberries

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Strawberry growers using conventional boom sprayers find it difficult to obtain good disease and insect control due to poor pesticide coverage on the undersides of leaves, on the lower leaves, and on the fruit when the strawberry plant is in full canopy. Inadequate crop protectant coverage results in higher levels of disease and insect activity translating to consumer rejection of poor quality fruit and lower overall profitability of the planting.

This project allowed an opportunity to work with strawberries – a high value crop with a low, 3-dimensional canopy. Strawberry diseases are a big concern for growers, so adequate spray coverage is important – better coverage would allow growers to make fewer applications of fungicides during the growing season.

Drift is often targeted as being the biggest source of problems with spray deposition. In fact there are other, inter-related factors that combined with drift, make designing the perfect crop protectant delivery system a challenge. These include the sprayer design, the droplet size and the size of the spray fan. The air volume, direction and velocity will also affect the amount of material that is deposited vs. the amount that is lost to drift. Application rate, nozzle orientation and the speed of the tractor, plus the skill and attitude of the tractor operator are also factors. Additionally the crop canopy will determine deposition rate and the weather has a great deal of influence.

There is very little work published specifically for strawberry spraying. Nils Bjugstad, a colleague at the University of Norway has conducted an eight year trial on improving spraying equipment. Bjugstad and Sonsteby (2004) observed the main issue is to obtain approximately the same spray and pesticide coverage and amount on the leaf surface on the outer and inner leaves as well as the upper and underside of the leaves (mainly spraying against grey mold in Norway).Because the plant canopy increases considerably during the growing season, they concluded that they had to adapt the volume rate according to this change of mass. As shown in their papers, they recommend using three nozzles in the start of the season; two from each side and one from the top, and for larger plants five nozzles per single row; one from the top and two from each of the sides, and in this way adjust the volume rate from 6 litres (12.5 pints), 9 litres(19 pints), 12 litres (25 pints) per 100 m (109 yards) row length as the season progresses.

A prototype 'modified boom' was built at Cornell University and in 2007 the first field work was conducted to determine appropriate volume rates, proper nozzle selection and the best pressure and nozzle positioning. There were 3 treatments, one from a traditional boom, a hoop with 3 nozzles and a hoop with 5 nozzles. Deposition onto the crop was measured by adding Pyranine fluorescent tracer into the sprayer tank. Leaves were picked from the top, middle and bottom part of the canopy. Three leaves from each area were placed into plastic bags and sealed. 10 plants per treatment were selected, there were five replicates.

It was found that adjusting the volume rates from 6 litres/100 meter of row length to 9.5 litres then finally to 12.5 litres per 100 metres row length as the season progressed and as the crop canopy grew resulted in the best spray deposition over the season. (Table 1.)

Table 1. Application Volumes

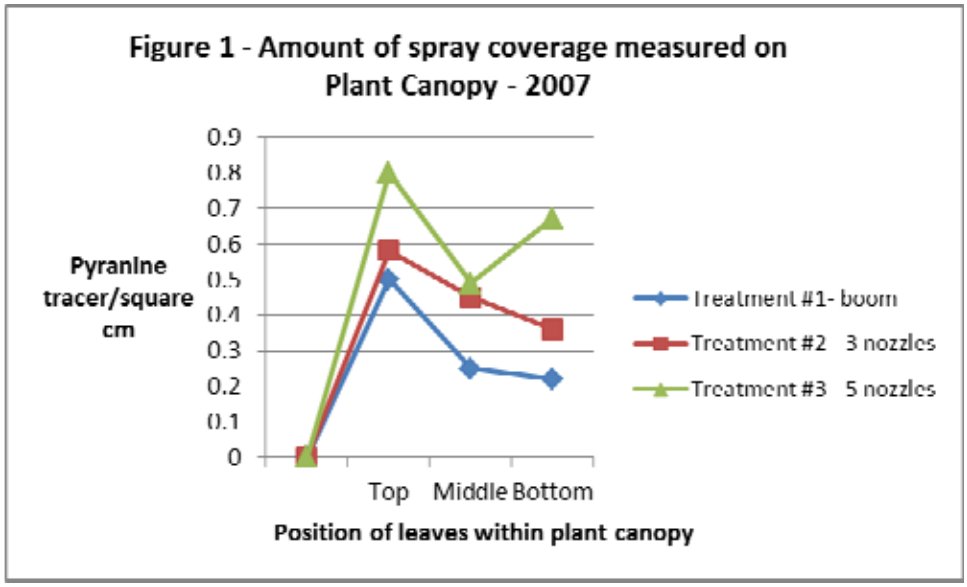
Treatment	Litres/100 meter	Gallons/A
1	6	40
2	9.5	79
3	12	105.2

The most appropriate nozzles were found to be 02 and 03 nozzles because 015 nozzles were too small and the resulting small droplet size increased the risk of drift and lowered the capacity (rows per hour). See Table 2

Treatment #	Nozzle Type	Nozzle Number	Flow rate/nozzle	Pressure	Speed
1	Flat fan – yellow 80 02	Horizontal boom	0.98 l/m (0.26 gpm)	5 bar (75psi)	3.2 km/h 2 mph
2	Flat fan – blue 80 03	3 nozzle hoop	1.52 l/m (0.4 gpm)	5 bar (75 psi)	3.2 km/h 2 mph
3	Flat fan – blue 80 03	5 nozzle hoop	1.52 l/m (0.4 gpm)	5bar (75 psi)	4.0 km/h 2.5 mph

Designing a Better Sprayer...(continued)

Best coverage results were at 75 psi with the nozzles 4-8 inches above the target. (Figure 1.)



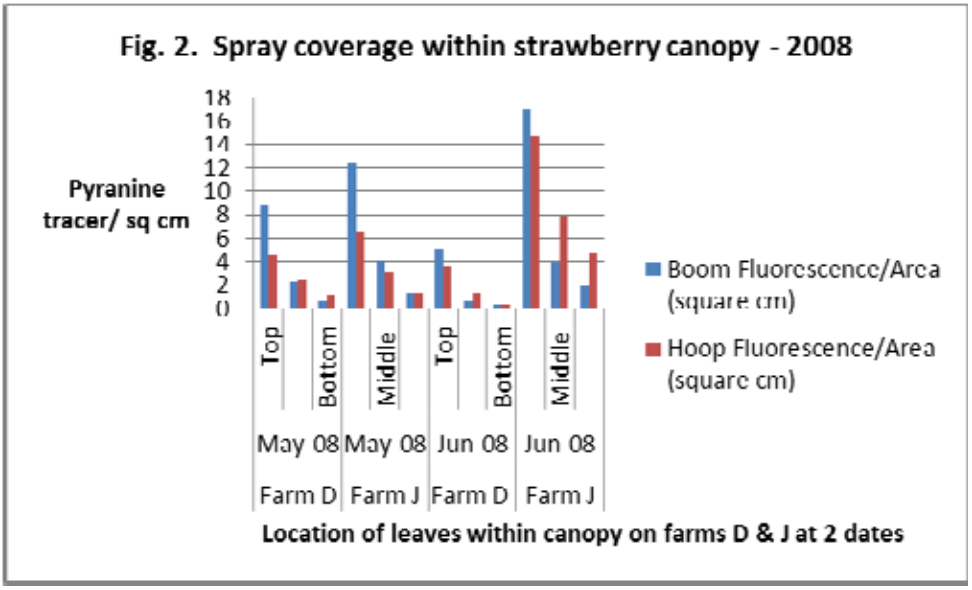
The following growing season, 2 more "hoops" were constructed and fitted to the sprayers belonging to berry growers John Hand of Hand Melon Farm in Greenwich, NY and Dale Ila Riggs of The Berry Patch in Stephentown, NY. The modified booms or hoops were connected to the existing plumbing system. The hoop was designed with 5 nozzles and the grower could target the canopy with the appropriate number of nozzles, most likely increasing from 3-5 targeted nozzles as the strawberry canopy developed.

Modified boom attached to spray rig.

Close up of boom design with all 5 nozzles.

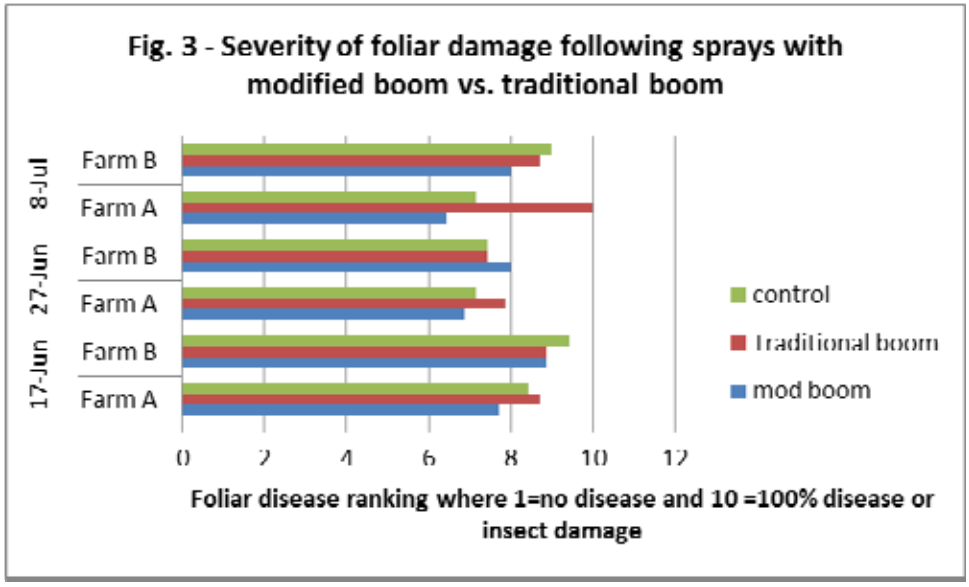
Florescent pyranine tracer was used to reveal the coverage of spray distributed throughout plant canopy at two different dates. The traditional boom sprayer delivered the best coverage to the outer leaves at both farms on both dates, but this was not the case for the mid and lower canopy leaves as the season progressed. The farm (Farm D) with the smaller boom sprayer and lower pressure application got better coverage from the modified hoop sprayer in the mid and lower canopy leaves and the improved coverage continued throughout the season. The larger boom that uses higher pressure during spray application did not see an advantage to the hoop until later in the season. Then, the inner and lower leaves were covered more thoroughly by the modified boom than they were with the traditional boom. (Figure 2.)

Designing a Better Sprayer...(continued)



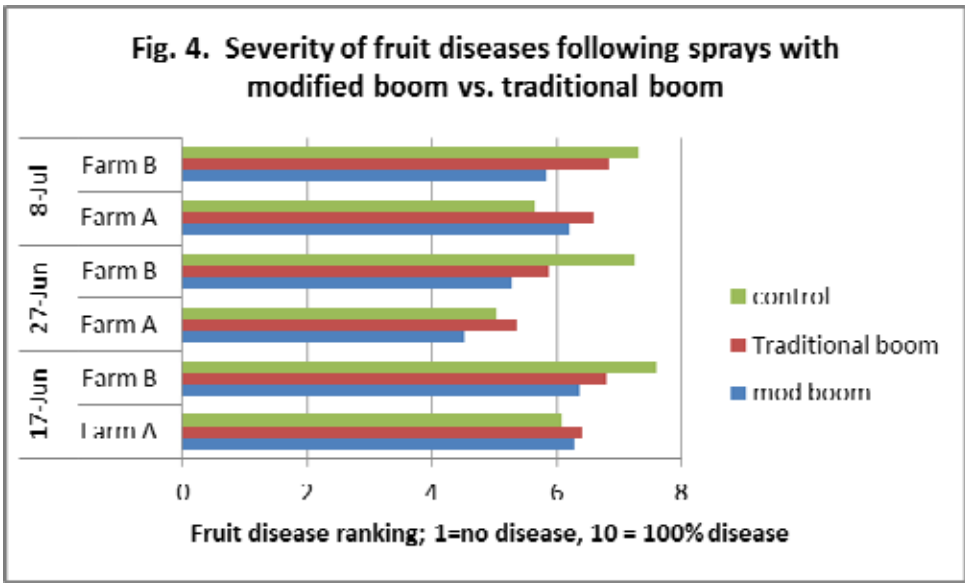
Biological effectiveness was rated by noting the presence or absence of infection or insect damage on leaf and fruit tissue. These observations were made for 3 different canopy stages on 2 farms. The degree of infection on leaf and fruit tissue was also rated. Seven leaves were evaluated for each of 5 replications with 1 being no infection/damage and 5 being entire surface infected/damaged. Twenty-five fruit for each of 4 replications were evaluated using the same rating system. This rating protocol helped to determine if differences existed in effectiveness of spray coverage from each treatment.

The biological data did not support significant statistical differences between treatments, however, clear and consistent trends are apparent. See Figures 3 and 4. For 4 of the 6 comparisons, the use of the modified boom (hoop) appears to have an advantage over the traditional boom in the control of foliar disease. For all 6 comparisons, the use of the modified boom (hoop) appears to result in a lower incidence of disease infection and/or insect damage on the fruit than does the use of the traditional boom.



Designing a Better Sprayer...(continued)

Table 2. Application Methods



Summary: Applying crop protectants to strawberries can be improved with attention to variables like drift reduction, appropriate nozzle selection, increasing spray volume as the canopy grows and applicator skill and attention. The use of a modified boom may help growers perfect spray application, but more work on this prototype is necessary to better understand the importance of factors like row alignment in the field. The two farmer participants observed that straight rows and level fields would positively affect the spray application from a modified boom even more than those field attributes affect the performance of a traditional boom. Conversely, sloping fields and crooked rows will make it very challenging to use the more exacting modified boom successfully.

Funding for this project was made possible by Northeast Region Sustainable Agriculture Research and Education Program (SARE) and The North American Strawberry Growers Research Foundation Inc. Additional funding that supported on-farm work was made available by the NY Farm Viability Institute. We wish to acknowledge the kind assistance of the cooperating growers, Dale Ila Riggs of Stephentown, NY and John Hand of Greenwich, NY.

Reference

Bjugstad N. and Sonsteby A. (2004) Improved spraying equipment for strawberries. In: *Aspects of Applied Biology 71*, International advances in pesticide application. pp.335-342

Understanding Soil pH: Part I

Ron Goldy, Michigan State University Extension

Soil pH is a standard characteristic measured by a soil test, but what does the number mean and how does pH affect plant growth? Here's a straight forward look at understanding pH that will help you get the maximum benefit from this measurement.

About the Author: Ron Goldy is a Senior Extension Educator for MSUE stationed at the Southwest Michigan Research and Center near Benton Harbor. He is responsible for applied field oriented research and educational extension activities for the Michigan vegetable industry. Ron's emphasis is on irrigation, new technologies and crops, variety evaluation and others.

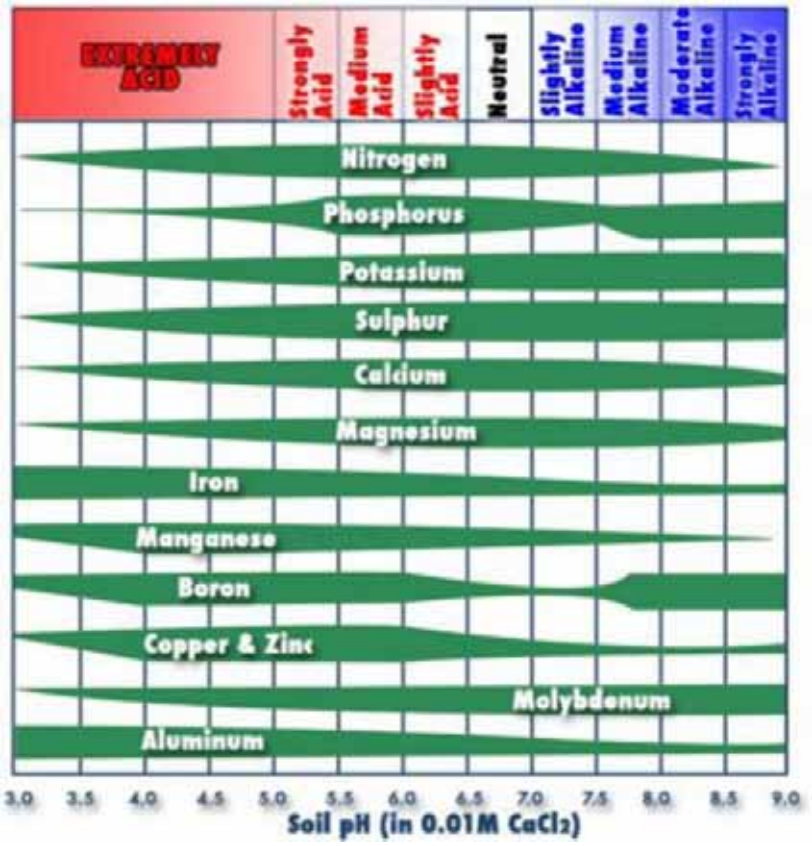
November 30, 2011.One of my college professors stated the only sentence that can start with a lower case

Understanding Soil pH (continued)

letter is one starting with the word pH. pH, however, is more important to crop production than just a grammatical oddity. Soil pH affects nutrient availability, heavy metal mobility, soil microbe activity, pesticide effectiveness and other characteristics critical to production success.
pH is a measurement of the power of hydrogen (hence "pH") or H^+ ions. pH is measured on a 0 (extremely acid – pure Hydrochloric acid) to 14 (extremely alkaline – pure sodium hydroxide) scale, with 7 (the concentration of H^+ ions at room temperature in pure water) being neutral. Both extremes are damaging to plants, which generally prefer values between 6 and 7.

One of the biggest reasons pH is important is because it affects nutrient availability. Most nutrients are available in good quantities around 6.5 (Figure 1). In Figure 1, the wider the bar the more available the nutrient, however, the skinny portions don't mean the element is not there, it means it is not available to the plant. Some organic soils have pH of 7.5 or higher, which means plants potentially will show copper, zinc, iron, boron and manganese deficiencies. It is too difficult to change pH of most organic soils, so the alternative is to apply these nutrients as foliar sprays during the growing season. Phosphorous is limiting in low pH soils, especially early in the season when soil is still wet and cool. That is why many blueberry plantings have purple, phosphorous deficient leaves that will eventually turn green when temperature warms.

Figure 1. Soil nutrient availability at various pH levels. T.S Tollefson, University of Saskatchewan.



pH is expressed on a base 10 logarithmic (log) scale, which means there is a ten-fold difference between numbers. That means 4 is 10 times more acidic than 5, 100 times more acidic than 6 and 1,000 times more than 7. This causes more confusion; how can a **lower** number be **more** acidic? This is difficult to explain, but I'll try. The formula is: $pH = -\log[H^+]$. So, pH is a negative (-) log number which is expressed as a fraction with 1 as the numerator (top number) and the pH value as the denominator (bottom number). When placed as the denominator, the smaller number yields a larger amount of the whole (1/3 versus 1/8). That is probably not an acceptable explanation if I was a chemist, but it gets the idea across.

The main elements affecting soil pH are calcium, magnesium and potassium and on their own these elements keep pH on the alkaline

Understanding Soil pH (continued)

side. Soil pH is related to how well the soil hangs onto these elements. In nature, sand typically has a lower pH than clay since water (rain) moves through sand faster than clay. Michigan has a fair amount of coral-based sands that are high in calcium, so newly exposed sand can be quite high in pH. Most non-amended, well-drained sand soils in Michigan will generally stabilize at a pH around 5.0 to 5.5, a value too low for most crops except blueberries and potatoes. Most commercial fertilizer applications also lower pH (except calcium nitrate and gypsum). When pH drops low enough, lime will be recommended to bring it back up. This is a chemical process and the reaction depends on how well lime is dispersed through the soil and soil temperature. The amount of lime needed depends on soil type. Because there are fewer binding sites, sand is easier to change than clay, silt or organic soils. It is not possible, or economical, to change some organic soils because there are too many sites to neutralize.

Occasionally, pH needs to be lowered. If it only needs to be lowered slightly, it can be done through standard fertilizing practices using an acidic fertilizer such as ammonium sulfate. If more significant changes are needed, you will have to add sulfur. Sulfur rate depends on soil type – don't guess, get a soil test done. Lowering pH with sulfur is a biological process. Soil borne bacteria takes sulfur, combines it with oxygen and water to make sulfuric acid. The rate this occurs depends on the amount of water and oxygen in the soil and temperature. If sulfur is applied in the fall, little change occurs until the next year when the soil warms. Aluminum sulfate is often recommended to lower pH, but I caution against using it since the aluminum portion can become toxic and becomes more available at a lower pH.

I will continue my pH discussion in my next article, "Understanding soil pH Part II." In the meantime, you may want to go to the following web sites to learn more about soil pH:
Soil pH and Nutrient Availability
Soil Quality Indicators: pH
Soil pH and Organic Matter

(This article was published on MSU Extension News. For more information from MSU Extension, visit http://news.msue.msu.edu.)

Understanding Soil pH: Part II

Ron Goldy, Michigan State University Extension

Growers know soil pH is an important soil characteristic, but may not understand what pH really is and what it does. pH is a standard characteristic measured by a soil test, but how does it influence soil productivity and eventually plant growth and yield?

In my previous article, "Understanding soil pH Part I," I discussed what pH measures, what the numbers mean, how pH affects nutrient uptake and, therefore, plant growth. But pH affects plant growth through more than just making necessary nutrients more available for uptake by the plant. This article continues the pH discussion looking at different soil characteristics influenced by pH.

Soil micro-organisms

Bacteria are generally more prevalent at higher pH and fungi at lower pH. Not surprisingly a soil pH between 6 and 7 will be the best environment to maximize both. When it comes to soil microbes, diversity is better. By making soil friendlier to good microbes it can help work against the bad ones. Microbes are also responsible for making soil nitrogen available through the nitrification process. There is a lot going on underneath your feet!

Knowing that pH affects microbial activity can help combat some diseases like potato scab (*Streptomyces scabies*) and club root (*Plasmodiophora brassicae*) of Brassicas. Both diseases are fungi whose severity is related to soil pH. Potato scab is less of a problem at pH 5.0 to 5.2, while club root is decreased at pH 7.0 to 7.3.

Heavy metals

Heavy metals like lead, mercury, copper, zinc, aluminum and cadmium become more mobile at lower pH. This generally occurs outside the normal range of crop production but there may be certain situations (application of sulfur or ammonium sulfate) where certain areas of the field may have a temporary pH low enough to allow release of these metals. If this happens, the biggest concern is that they would leach into ground water or run off into surface waters. This should not be a problem if a soil test is obtained and the

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Questions or comments about the New York Berry News?
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Understanding Soil pH...(continued)

proper amounts of product applied in the proper manner.

Pesticide interactions
pH affects pesticides in a couple ways. At lower pH, certain pesticides will bind more tightly to clay particles and, therefore, will be less effective. However, lower pH can reduce pesticide-leaching potential. This characteristic can also cause problems when soils are limed and pesticides liberated. When this happens, pesticide carryover problems can appear years after a pesticide was applied. pH also has an indirect effect on pesticides since pH affects microbial activity and microbes are responsible for degradation of some pesticides and greater microbe activity will lead to quicker pesticide breakdown. Organophosphate insecticides and other pesticides are more readily degraded at higher pH. Read the label for any precautionary concerns.

I hope after reading this and my previous article you have a better understanding and appreciation on the importance of soil pH in the performance of your crops. Do yourself a favor and conduct periodic soil tests to determine nutrient levels as well as pH. You should have a soil test done at least every three years, more often on sandy soils since they can change more quickly, and more often if you have a problem site you are trying to correct. For a general reference on soil acidity and liming go to, refer to MSU Extension Bulletin E1566 Facts About Soil Acidity and Lime.

(This article was published on MSU Extension News. For more information from MSU Extension, visit http://news.msue.msu.edu.)